

W

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Many thanks to the people who helped make this project possible. Our summer staffer Rachael Green made invaluable contributions. Finally, the biggest thanks go out to you, the customers who have chosen (once again) to purchase Big Sky Debate materials.

Enjoy the books and good luck to all of you this season! Thanks for being a part of something that is very exciting for us.

-- Pogie and Norm

**Big Sky Debate**

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Anthropocentrism Kritik

**A. ANTHROPOCENTRISM UNDERLIES OUR CULTURE OF EXTINCTION. FAILING TO CHALLENGE OUR ANTHROPOCENTRIC VIEWS WILL LEAD TO ECOLOGICAL COLLAPSE-Bender ‘03**

[Frederick; Professor of Philosophy; University of Colorado; The Culture of Extinction: Toward a Philosophy of Deep Ecology; 2003; pg. 18-19]

In the standard policy debate it seems we have only two options. On one side, business-as-usual has brought us up against vital planetary limits. Yet, for business-as-usual exploiters, Earth is nothing but a trove of resources. Ecocide, i.e., destruction of the ecosphere (detailed in chapter 1), is for them a meaningless term. Business-as-usual's defenders see only the prospect of endless growth, along familiar lines. On the other side, reform environmentalists leave the growth ideal uncontested, pro-posing so-called sustainable growth or sustainable development by modifying some current practices. Neither side sees that anthrogenic impact's exponential growth cannot continue indefinitely, until the ecosphere's stress tolerance and resilience are exceeded.If we follow business-as-usual policies, we might maintain the current growth-orientation for a few more decades. New technologies might raise material living standards, at least in the world's more affluent regions. By applying ever more energy and chemicals, agricultural output might rise a bit longer. Nonetheless, as sustainability theorist Donella Meadows and her colleagues argue, "if the policies that influence economic growth and population growth in the future are similar to those in the past, if technologies and value changes continue to evolve in the manner prevailing now, and if the uncertain numbers in the model are roughly correct," then we overshoot ecological limits by mid-century. Alternatively, imagine considerable success at environmental reform, "sustainable" growth leading to a "conserver society." Perhaps nonrenew-able resources turn out twice as plentiful as we now believe. Perhaps we allocate enough capital to reduce pollution to 1975 levels, an arbitrary benchmark of decent material living standards, with significantly less ecological impact than today. We could apply genetic and other, yet unknown technologies toward increasing agricultural yields. We might take steps to reduce global land erosion. We might rapidly deploy resource-saving technologies, until total resource consumption decreased to its 1975 level. Assume, wildly optimistically, that we succeeded in these Herculean tasks. Perhaps we might postpone ecological collapse until late this century. If everything stabilized at 1975 levels, total industrial output would stagnate sometime after 2050. By 2075 it would decline, as the costs of holding off ecological limits finally brought industrial growth to a halt." Turning the culture of extinction into a conserver society—against staunch business-as-usual resistance—will not avoid overshoot. Meadows's conserver model is deliberately and unrealistically optimistic, with no military sector to drain capital and resources from the productive economy, no war or civil strife, no nuclear accidents, no surprising environmental failures, nor any great pandemic.12 Short of this perfection, rising population and industrial production drive anthrogenic impact upward, to Earth's limits and beyond. As it turns out, so-called sustainable growth is not physically sustainable.

If business-as-usual and sustainable growth both fail, then we have to change the terms of the debate. We need to find a third way, one that identifies the common flaw of business-as-usual growth and palliative reform and proposes how to overcome it. That fatal flaw, I argue, is our anthropocentrism and human chauvinism. Anthropocentrism is the belief that humans are outside, and superior to, nature. To be a human-chauvinist is to act on the assumption that anthropocentrism justifies unlimited anthrogenic impact on the ecosphere. We are chauvinists because, as I argue in part 2, the culture of extinction's dominant worldviews, e.g., Christianity, modernism, and nihilism, are anthropocentric. Thus, whether we favor business-as-usual or sustainable development, we remain anthropocentric and human-chauvinist. We have not yet found a way to think "outside the box." Chapters 11 through 17, however, make the case for replacing our outmoded anthropocentric worldviews with ecocentric or nondualist ones. The key lies in reframing human identity as inextricably part of nature, i.e., as fully embedded in the ecosphere. Allow me to define some key terms, while pointing to some major themes I develop in later chapters.

**B. LINK: FOCUSING ON SPACE EXPLORATION IS A SIREN’S SONG, DRAWING US AWAY FROM THE DEEP ENVIRONMENTAL KNOWLEDGE NECESSARY TO SOLVE OUR PLANETARY CRISIS-Polk ‘07**

[Kevin Scott; M.S. in astronomy from the University of Washington; *Gaiome: Notes on Ecology, Space Travel and Becoming Cosmic Species*; 2007; pg. 39-40]

If building an ark is off the table, could there at least be a pragmatic middle ground? Could space tide us over with some valuable resources while we learn to live more sustainably? This seductive argument, often heard in space circles, smacks of Augustine of Hippo’s ancient prayer: “grant me chastity and continence, but not yet.”

Even now, after sixteen centuries, Augustine’s pious quip provokes a smirk: a virtue deferred is clearly no virtue at all. If it were convenient to mine space for immediate consumption, doing so would not so much buy us time as post- pone the ecological virtues. Space exploitation (as it’s called in the industry) would perpetuate a deliberate and possibly fatal ignorance that I call the Myth of Away.

Let’s unmask this myth with a few quick questions. Where does your tap water come from? When you’re done using it, where does the waste water go? Where do your electricity and fuel come from? Where do your clothes, your transport, your medicines, the building materials in your house or apartment come from? How about each item of food in your refrigerator? Where does your garbage go? Without extensive research, we don’t know where most of the things in our lives come from or go to: it’s just somewhere far away.

Indigenous peoples throughout the world, especially gatherer-hunters, know exactly where their food and water come from and where their waste goes. It is no coincidence that these “natives” consume dozens of times fewer resources than we do and, in many cases, waste practically nothing. Their economies are largely regenerative: food, body and construction wastes do not travel far in time or space before the local ecology reclaims and reconstitutes them into some other useful form. Surprisingly, anthropologists have found that most such peoples (prior to devastating encounters with consumer economies) en- joyed far more free time than we do and viewed nature not as hostile, but as benign and abundant.

By contrast, our industrial economy is extractive. As consumers, we buy something, use it up and throw it away. Then someone far away mines the earth to make the next item for our consumption. We don’t care where it came from or where it’s going, so long as we can have it when we want it. Ours is a global culture of disconnection, filled with pipes, highways and media that come from and lead to that ubiquitous, fictional non-place called “away.” By denying place and linearizing the once-cyclic resource flows of natural ecology, we automatically create both depletion and pollution. These problems are built into the physical shape of our assumptions about the world.

The Space Frontier is all about “away.” By exporting pollution and population and moving resources across ever greater distances, it promises only to expand the extractive economy of commercial empires, not to deepen the regenerative ecologies of life. Buying time with space resources is a siren’s song. It leads directly away from the ecological knowledge we need to live harmoniously wherever we are. It beckons us deeper into exactly the troubles of growth that we would most like to avoid.

Perhaps it is ecologically functional, then, that space is so expensive to reach. If you loaded the Space Shuttle up with straw, which then magically turned into gold in orbit, you would lose money due to the transportation costs. Would it be so surprising if recycling and conservation, already economical in many cases on Earth, hint at a better path to the cosmos? We will expand on this possibility in later chapters. For now, though, it’s clear that space offers no escape from our problems and probably won’t even supply us economically in the short run.

**C.** **BEFORE WE BEGIN TO EXPLORE SPACE, WE MUST FACE UP TO THE ENORMOUS EVOLUTIONARY TASK OF ENDING OUT EXPLOITATION OF THE ENVIRONMENT-Polk ‘07**

[Kevin Scott; M.S. in astronomy from the University of Washington; *Gaiome: Notes on Ecology, Space Travel and Becoming Cosmic Species*; 2007; pg. 239-40]

What will it take to live in space? I used to think the answer would come in the form of some clever invention or business plan. But as the preceding chapters have illustrated, our difficulties owe more to our behavior than to any lack of technology or money. When we build spacecraft like missiles rather than passenger vehicles, we end up with expensive, dangerous munitions. When we lob expendable, break-apart boosters and satellites into orbit, beyond reach of Earth’s cleansing ecology, of course the debris turns LEO into a shooting gallery. When ground-based solar and wind power are already beginning to compete with coal, why build solar power satellites and extract Helium-3? When we’re causing extinctions at a thousand times their natural rate, why expect arks and colonies to survive at all in a realm with no natural capital?

For thousands of years, human civilizations have been overthrowing life’s democracy and treating everything they see as a possession. As a result, we have come to live well beyond the capacity of this world to replenish what we consume. There’s no conquering our way out of this: until we learn the lessons of ecology, we’re stuck on a dying Earth in a dead solar system. To live any- where in the cosmos, especially here on our home of 3.8 billion years, we must face up to an evolutionary task. The work challenges not only our technology, but our very identity as a species. We need to find niches for ourselves that sustain rather than destroy the biodiversity that makes this a living planet. We need to become native to Earth again.

Millions of people are waking up to this task and its sobering enormity. To prevent the loss of half of Earth’s remaining species, to stop global warming, to end the resource wars, and—yes—to have a future beyond Earth, we must immediately and decisively reject the extractive economy and embrace regenerative ecologies. But how?

IMPACT: ECOLOGICAL DESTRUCTION

**ANTHROPOCENTRIC, INDUSTRIAL VALUES ARE AT THE ROOT OF OUR RAPACIOUS DESTRUCTION OF THE PLANET-Zimmerman ‘02**

[Michael; professor of philosophy, Tulane; “Deep ecology, ecoactivism, and human evolution”; ReVision; Spring 2002; Infotrac]

Today, a number of people are beginning to suspect that humanity's very attempt to gain control, an attempt that at one time appeared to be so laudable and noble, may end up in a total loss of control, the cost of which may be the extinction of millions of species, including homo sapiens.

Despite increasing recognition that an action-oriented stance is deeply implicated in ecological problems, most people conclude that the only alternative to an active, interventionist, control-oriented posture must be one of passive submission. From the ecoactivist perspective, such a passive stance borders on suicidal cowardice. Hence ecoactivists maintain that we must take decisive steps to counter the actions of industrialists bent on turning the planet into a giant factory. Deep ecologists join in the criticism of the often-rapacious industrial activism motivated by anthropocentric, naturalistic humanism, that is, the doctrine that humans are the origin of all value, purpose, and meaning. Yet deep ecologists do not concede that the only alternatives to anthropocentric humanism are either reactive activism or passivity.

Following Spinoza, for example, the deep ecologist Arne Naess (1984) argues that a humankind enslaved by the craving for control is not active at all but is instead passive, as if under a compulsion. Genuinely to be active would involve being freed from craving and being freed for the spontaneous affirmation of one's own being and the being of all other things. Instead of being enslaved to the ego's craving for control, people should be encouraged to cultivate Self-realization. Since deep ecologists maintain that all things are interrelated, the "self" in "Self-realization" must not be confused with the constricted ego-self. Self-realization is not a personal or private aim but a cosmological one.

**OUR CULTURE OF EXTINCTION IS PUSHING THE PLANET TO THE BRINK-Bender ‘03**

[Frederick; Professor of Philosophy; University of Colorado; The Culture of Extinction: Toward a Philosophy of Deep Ecology; 2003; pg. 16-17]

Radical environmentalist Christopher Manes, I believe, gets the credit for coining the phrase, "culture of extinction."6 This idiom captures the fact that industrial society's assault on the ecosphere, a.k.a.

anthrogenic impact, is as destructive as the meteorite that caused the extinction

of the dinosaurs. We of the culture of extinction treat Earth as if it were an infinite sink for our pollutants and wastes. We divert its waters for our use, ignoring the impact elsewhere. Our fossil fuel power plants turn rain¬water to acid. We prevent lightning fire from renewing forests. We hunt, fish, farm, and pollute countless species to oblivion. Our sprawling cities devour grasslands, wetlands, forests, and other formerly wild habitat. Our industrial effluents raise the tropospheric ozone level, even as our chloro¬fluorocarbon gases (CFCs) reduce stratospheric ozone. We pump up atmospheric carbon dioxide (CO2), causing global warming and climate change. Our trade and travel habits promote bioinvasion, the movement of species to places where they have no natural enemies. Our agriculture reduces genetic diversity, bringing many wild plant and animal species to the brink of extinction. Our toxic wastes eliminate birds, amphibians, and top predators. Nitrogen pollution from our industrialized farms creates algae blooms that stifle the world's streams, lakes, and rivers. The list goes on.

**A DEEP PATHOLOGY COMPELS US TO DESTROY EVERY ENVIRONMENT HUMANS ENCOUNTER-Berry ‘87**

[Thomas; director of Riverdale Center for Religious Research; “The Viable Human”; Environmental Philosophy: From Animal Rights to Radical Ecology; 2001; pg. 176]

A deep cultural pathology has developed in Western society and has now spread throughout the planet. A savage plundering of the entire earth is taking place through industrial exploitation. Thousands of poisons unknown in former times are saturating the air, the water, and the soil. The habitat of a vast number of living species is being irreversibly damaged. In this universal disturbance of the biosphere by human agents, the human being now finds that the harm done to the natural world is returning to threaten the human species itself.

The question of the viability of the human species is intimately connected with the question of the viability of the earth. These questions ultimately arise because at the present time the human community has such an exaggerated, even pathological, fixation on its own comfort and convenience that it is willing to exhaust any and all of the earth's resources to satisfy its own cravings. The sense of reality and of value is strictly directed toward the indulgences of a consumer economy. This nonsustainable situation can be clearly seen in the damage done to major elements necessary for the continued well-being of the planet. When the soil, the air, and the water have been extensively poisoned, human needs cannot be fulfilled. Strangely, this situation is the consequence of a human-centered norm of reality and value.

**OUR ANTHROPOCENTRIC DESTRUCTION OF THE NATURAL WORLD DESTROYS THE ENTIRE ENVIRONMENT AS IT SEPARATES US FROM IT-Gottlieb ‘94**

[Roger; professor of humanities at Worcester Polytechnic Institute; Cross Currents, Summer 1994; available at <http://www.crosscurrents.org/feministecology.htm>; retrieved 01 Aug 2011]

The problem with ecocide is not just that it hurts human beings. Our uncaring violence also violates the very ground of our being, our natural body, our home. Such violence is done not simply to the other -- as if the rainforest, the river, the atmosphere, the species made extinct are totally different from ourselves. Rather, we have crucified ourselves-in-relation-to-the-other, fracturing a mode of being in which self and other can no more be conceived as fully in isolation from each other than can a mother and a nursing child.

We are that child, and nonhuman nature is that mother. If this image seems too maudlin, let us remember that other lactating women can feed an infant, but we have only one earth mother.

What moral stance will be shaped by our personal sense that we are poisoning ourselves, our environment, and so many kindred spirits of the air, water, and forests?

To begin, we may see this tragic situation as setting the limits to Levinas's perspective. The other which is nonhuman nature is not simply known by a "trace," nor is it something of which all knowledge is necessarily instrumental. This other is inside us as well as outside us. We prove it with every breath we take, every bit of food we eat, every glass of water we drink. We do not have to find shadowy traces on or in the faces of trees or lakes, topsoil or air: we are made from them.

**THE STAKES COULD NOT BE HIGHER: FAILURE TO ACT RISKS THE ECOLOGICAL FUTURE OF THE PLANET AND THE ETHICO-POLITICAL FUTURE OF HUMANITY-Smith ‘08**

[Mick; Professor of Philosophy and Social Theory; Queen’s College; Suspended Animation: Radical Ecology, Sovereign Powers, and Saving the (Natural) World; Journal for the Study of Radicalism; 2.1; 2008; Project Muse]

Discussion of whether the reality of any situation merits the suspension of politics and ethics is beside the radical ecological political point (because such a suspension must always be resisted), although the question of the extent of sovereign power's involvement in manufacturing (producing) a crisis [End Page 6] situation, including an ecological crisis like global warming, is clearly not. The real concern is that sovereign power (and here, remember, Agamben is thinking primarily of state power) has, as part of its self-definition as "sovereign," accrued to itself the sole right to decide this question.14 That is to say, the sovereign power invested in a state's juridico-political system is exemplified precisely in those cases in which it politically manufactures (produces) a situation where the ethico-political norms—the protection of which, after all, form the very basis for its original claim to wield legitimate power—are deemed no longer to apply. The rule (of law) as an expression of sovereign power over life and death declares a state of emergency where "suspending itself, [it] gives rise to the exception and, [simultaneously] maintains itself in relation to the exception."15

There is thus a real, and devastatingly ironic, possibility that the idea of an ecological crisis, so long and so vehemently denied by every state, will now find itself recuperated by the very powers so responsible for bringing that crisis about, as the latest and most comprehensive justification for a political state of emergency, a condition that serves to insulate those powers against all political and ethical critique. We may find that the global war on terror will segue seamlessly into the crisis of global warming, a condition produced by previous technological interventions in the natural world, interventions of a kind that were initially deemed politically unchallengeable by everyone except radical ecologists. The growing (political and ecological) danger is that this emergency is used to legitimate further technocratic interventions, to further extend the state and corporate management of biological life, including the continuing reduction of humanity to bare life.

We should be clear what is at stake here: nothing less than the ecological future of the natural world and the ethico-political future of humanity. The dry bed of the Aral Sea, the burning forests of Southeast Asia, the devastated landscape wrought by the exploitation of the Athabasca oil-tar sands, the industrial-scale slaughter of seal pups on Canada's east coast, and a million other examples all reveal the likely destiny of the natural world without ethico-political intervention. As for the reduction of humanity to bare life, Agamben controversially suggests that its paradigmatic, and most extreme, materialization appears in the "final solution" of the concentration camp, a place where the political exception becomes the rule, where people are excised by sovereign power from the political sphere, with devastating results. In such localities, we encounter a peculiarly human form of "suspended animation," one where human possibilities for political and ethical involvement are removed, where human life becomes bare life. "Inasmuch as its inhabitants have been stripped of every political status and reduced completely to naked life [bare life], the camp is also the most biopolitical space that has ever been realised."

**ANTHROPOCENTRIC VALUES CANNOT PREVENT THE DANGERS OF ECOCIDE-Gottlieb ‘94**

[Roger; professor of humanities at Worcester Polytechnic Institute; Cross Currents, Summer 1994; available at <http://www.crosscurrents.org/feministecology.htm>; retrieved 01 Aug 2011]

Is there then no way out? Are Levinas's failings simply those of patriarchy? Is his reaction to the Holocaust all that we can expect in a traumatized world? Likewise, is the feminist critique hopeless in the face of historical reality? Is it perhaps not Levinas who is the dreamer but the feminist? After all, in a world made by men empathy, connection, and inter-identification have little chance or place. Does feminism's answer to male domination remain within the privatized and domesticated realm of the family or the intimate relationship, at least until patriarchy is ended? Is the feminist response to the trauma of male violence necessarily marginalized until social institutions come to reflect the logic of feminine personality styles and forms of relationship? Is the feminist dream of an ethical cosmos of care and compassion as alien to the real world of exploited wives and sexually abused children as Levinas's dream of infinite obligation is to the real world of the Holocaust? Are both these frameworks, different as they are, trapped by history, leaving us no way out? Are they simply lanterns waving dimly in a shrouded night of endless trauma?

Perhaps.

But perhaps not. Perhaps there is in progress another, even more encompassing Death Event, which can be the historical condition for an ethic of compassion and care.

I speak of the specter of ecocide, the continuing destruction of species and ecosystems, and the growing threat to the basic conditions essential to human life. What kind of ethic is adequate to this brutally new and potentially most unforgiving of crises? How can we respond to this trauma with an ethic which demands a response, and does not remain marginalized?

Here I will at least begin in agreement with Levinas. As he rejects an ethics proceeding on the basis of self-interest, so I believe the anthropocentric perspectives of conservation or liberal environmentalism cannot take us far enough. Our relations with nonhuman nature are poisoned and not just because we have set up feedback loops that already lead to mass starvations, skyrocketing environmental disease rates, and devastation of natural resources.

**HUMANS ARE DESTROYING THE PLANET FASTER THAN IT CAN ADJUST. OUR DEPENDENCE ON CONSUMPTION AND DEVELOPMENT WILL LEAD TO A MASSIVE EXTINCTION-Kowalewski ‘00**

[David; Deep Power: The Political Ecology Of Wilderness And Civilization; 2000; pg. xii]

Much later I felt I had the answer, but it was not an easy answer to have. I realized that civilization itself was responsible, and that the global ecocrisis could only be solved by re-orienting the human approach to just about everything. I realized that civilization's poisoning of our wild-within is what is poisoning the wild-without. So I invite readers to accept the challenge of the bumpersticker, "Question reality," and get ready for a walk on the wild side.

Currently civilization is trashing the earth faster than the earth can heal herself. The list of atrocities is endless: global warming, ozone-depletion, deforestation, declining sperm- counts, desertification, topsoil-erosion, fisheries-depletion, hazardous-waste dumping, outer-space pollution, acid rain, overpopulation, and so on. We are now on the brink of the earth's sixth mass extinction--the only one caused by humans. Civilization, in short, has a miserable track-record. The human species, as presently organized, has become maladaptive to the global environment.

But the point is not that humans are altering their environment--all organisms do that. The point is that humans are destroying their own life-support system, and threatening to drag millions of species down with them. This is the ultimate insanity and the mystery to be solved: Why suicidal ecocide?

My answer is that civilization--the matrix of institutions designed for maximum accumulation of material goods--has a built- in death-instinct. The written record says so. Historical civilizations collapse when they fail to maintain a harmonious balance with nature (Hughes, 1975). In the end the earth always wins, as the ruins of past civilizational constructs attest.

IMPACT: SPACE

**THERE IS NO POLICY IN PLACE TO CHECK OUR ANTHROPOCENTRIC AGENDA AND TO PROTECT POSSIBLE EXTRATERRESTRIAL LIFE-Daly and Frodeman ‘08**

[Erin, graduate student in the School of Life Sciences and Robert, chair of the Department of Philosophy at the University of North Texas; Separated at Birth, Signs of Rapprochement: Environmental Ethics and Space Exploration; Ethics and the Environment; 2008; <http://www.csid.unt.edu/files/env_ethics_and_space.pdf>; retrieved 18 Aug 2011]

To date, the discussion of natural places has turned on questions concerning intrinsic and instrumental values. Intrinsic values theorists claim that things have value for their own sake, in contrast to theories of instrumental value where things are good because they can be used to obtain something else of value (economic or otherwise). This debates tends tend to get caught up in attempts at extending the sphere of intrinsically valuable entities. Ethical extensionism depends on human definitions of moral considerability, which typically stem from some degree of identification with things outside us. This anthropocentric and geocentric environmental perspective shows cracks when we try to extend it to the cosmic environment. The few national or international policies currently in place that mention the environment of outer space (e.g. NASA's planetary protection policy, United Nations Committee on the Peaceful Uses of Outer Space) consider the preservation of planetary bodies for science, human exploration, and possible future habitation, but there is not yet any policy that considers whether these anthropocentric priorities should supersede the preservation of possible indigenous extraterrestrial life, or the environmental or geological integrity of the extraterrestrial environment.

**THERE IS NO VALUE SYSTEM NOR POLICY IN PLACE TO PREVENT HUMAN DAMAGE TO THE COSMOS. WE NEED TO EMBRACE A NEW PERSPECTIVE BEFORE SPACE EXPLORATION-Daly and Frodeman ‘08**

[Erin, graduate student in the School of Life Sciences and Robert, chair of the Department of Philosophy at the University of North Texas; Separated at Birth, Signs of Rapprochement: Environmental Ethics and Space Exploration; Ethics and the Environment; 2008; <http://www.csid.unt.edu/files/env_ethics_and_space.pdf>; retrieved 18 Aug 2011]

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**THE EXTENSION OF THE HUMAN SPECIES INTO SPACE WILL SIMPLY LEAD TO AN EXTENSION OF OUR ANTHROPOCENTRIC DESTRUCTION INTO THE COSMOS-Sadeh ‘09**

[Eligar; *Toward a Theory of Spacepower*; 2011; <http://www.ndu.edu/press/lib/pdf/spacepower/space-Ch13.pdf>; retrieved 11 Aug 2011]

An important issue within the context of the environmental theme of this chapter is to spread life in a responsible fashion throughout the solar system. A failure to take environmental considerations into account could lead to a scenario whereby civil, commercial, and military uses of space produce a new extraterrestrial environmental crisis. A useful way of ascertaining the evolution of environmental considerations in space is illustrated in figure 13–2. There is a continuous evolving system in which concepts of environmental protection beyond humans are extended to all animals, plants, entire ecosystems, the Earth, and finally to the entire cosmos. In this regard, three distinct views on planetary protection are identified and discussed: anthropocentric, biocentric, and cosmocentric.

In the anthropocentric view, humans are treated as ends in and of themselves and act as moral agents in relation to the environment. Nature is of instrumental value in that it contributes to human life. Anthropocentrism is rooted in the principle of nature as a utility for human ends. In this vein, the environment can be both exploited and protected to safeguard and further human interests and the persistence of human civilization.

The exploitation-of-nature argument is based on the exploitation of the environment to enhance human well being. This view allows humans to extract resources from space and planetary bodies and to create human-supported biospheres in space and on planetary surfaces and terraform celestial bodies. In the realm of national security, such a view suggests spacepower projection without regard for the contamination of the space environment. This is the unregulated view that can lead to a tragedy of the commons of space. The perpetuation of the human species that is linked to spacepower considerations suggests that extending a human presence in space takes place without regard for environmental protection.

**HUMANS HAVE A MORAL OBLIGATION TO TRANSCEND THE ANTHROPOCENTRIC VIEW WHEN WE EXPLORE-Sadeh '09**

[Eligar; Toward a Theory of Spacepower; 2011; http://www.ndu.edu/press/lib/pdf/spacepower/space-Ch13.pdf; retrieved 11 Aug 2011]

Both the biocentric and cosmocentric views are informative for what they may imply for the use of space. However, they are theoretical in that the anthropocentric view dominates space policy and spacepower projection calculations. This is due in part to the fact that the further one departs from anthropocentrism toward biocentrism and cosmocentrism, the greater is the constraint on human freedom of action within the space environment. 51 The biocentric dimension is based on maximizing the well being of the totality of living existence. With this approach, value is assigned to all of living biology. From this vantage point, humanity has a direct obligation to the welfare of that biology. By way of illustration, the need to maintain and value extraterrestrial indigenous life forms would take precedence over the right of life from Earth to exploit and destroy those life forms. This notion is rooted in the principle of the value of life. Humans have a responsibility to respect and support the interests of life whether animal, biota, or microbes. This is an extension of the aim to preserve the scientific integrity of planetary bodies discussed above, but with a value or ethical commitment to that end that transcends the anthropocentric view.

**EVEN THOUGH WE HAVE DESTROYED MUCH OF PRISTINE EARTH, THERE IS NO REASON TO BELIEVE THAT WE WON’T REPEAT OUR DESTRUCTIVE BEHAVIOR IN THE REST OF THE SOLAR SYSTEM-Lee ‘99**

[Keekok; Professor of Philosophy, Lancaster University*; The Natural and the Artefactual: The Implications of Deep Science and Deep Technology for Environmental Philosophy*; 1999; Google Books]

We should not delude ourselves that the humanization of nature will stop at biotic nature or indeed be confined only to planet Earth. Other planets in our solar system, too, may eventually be humanized; given the technological possibility of doing so, the temptation to do so appears difficult to resist on the part of those always on the lookout for new challenges and new excitement. To resist the ontological elimination of nature as 'the Other,' environmental philosophy must not merely be earthbound but, also, astronomically bounded (at least to the extent of our own solar system). We should bear in mind that while there may be little pristine nature left on Earth, this does not mean that nature is not pristine elsewhere in other planets. We should also be mindful that while other planets may not have life on them, this does not necessarily render them only of instrumental value to us. Above all, we should, therefore, bear in mind that nature, whether pristine or less than fully pristine, biotic or abiotic, is ontologically independent and autonomous of humankind--natural forms and natural processes are capable of undertaking their own .trajectories of existence. We should also remind ourselves that we are the controllers of our science and our technology, and not allow the products of our intellectual labor to dictate to us what we do to nature itself without pause or reflection. However, it is not the plea of this book that humankind should never transform the natural to become the artefactual, or to deny that artefacticity is not a matter of differing degrees or levels, as such claims would be silly and indefensible. Rather its remit is to argue that in systematically transforming the natural to become the artefactual through our science and our technology, we are at the same time systematically engaged in ontological simplification. Ontological impoverishment in this context is wrong primarily because we have so far failed to recognize that nature embodies its own fundamental ontological value. In other words, it is not true, as modernity alleges, that nature is devoid of all value and that values are simply humanly conferred or are the projections of human emotions or attitudes upon nature. Admittedly, it takes our unique type of human consciousness to recognize that nature possesses ontological value; however, from this it would be fallacious to conclude that human consciousness is at once the source of all values, or even the sole locus of axiologically-grounded intrinsic values. But most important of all, human consciousness does not generate the primary ontological value of independence in nature; nature's forms and processes embodying this value exist whether humankind is around or not.

**WE HAVE NOT DONE A GOOD ENOUGH JOB PRESERVING THE EARTH. WE DO NOT DESERVE TO EXPLORE RESOURCES ELSEWHERE-Crisp ‘09**

[John; professor of English, Del Mar College; Right to Go Back to the Moon; Korea Times; 30 Nov 2009; reprinted at <http://www.koreatimes.co.kr/www/news/opinon/2011/04/160_56399.html>; retrieved 01 Aug 2011]

Oversimplifying only slightly, the story of civilization can be reduced to a chronicle of the consumption of local resources ― lumber, land, water, petroleum ― and then moving on to fresh abundance elsewhere.

The examples are practically countless, but consider our own petroleum production, which reached a peak in 1970 and has gone downhill ever since.

We've had to move on to fresh abundance, depending more and more on places like Saudi Arabia and Nigeria. To a great extent modern American foreign policy has been driven by the impending dearth of local petroleum. Why else would we be so interested in Iraq?

Common sense tells us that no non-renewable resource can be infinite, but this is a lesson we've yet to learn in practical terms. We imagine that more resources will always lie over the horizon, and the moon and Mars may represent for us, at some conscious or subconscious level, a fanciful safety valve for our overburdened earth.

Who knows what resources are on Mars? We never thought there was water on the moon. Maybe more resources are out there, and our natural instinct is to go and get them.

But there's something vaguely unseemly about failing to live within our means here, and then hoping at some level to bail ourselves out by moving on to other worlds.

I'm wondering if we have done a good enough job of husbanding the abundance of this planet to have earned the right to begin exploiting resources elsewhere.

LINK: ANIMAL TESTING

**NASA RELIES ON ANIMAL TEST SUBJECTS FOR SPACE EXPLORATION-Marshall ‘10**

[Chasen; staff writer; Intelligent Life: When NASA employee April Evans questioned animal experiments, her career fell apart; Houston Press; 07 Oct 2010]

Animals often served as test subjects as humans tried to get a grasp of what to expect in space and how best to respond to its challenges. On June 11, 1948, a rhesus macaque monkey named Albert was launched into space aboard a V2 rocket from a base in New Mexico. Albert suffocated and died during the journey.

Albert IV survived his space flight in 1949, but died when his rocket landed. Over the years, NASA has also experimented with sending mice, fish and snails into space - species NASA calls "the lowest form of life."

In 1957, the Russians sent Laika, a stray dog, into space. Laika was the first animal to orbit the Earth, but also the first orbital death. Unfortunately for Laika, she had been handed a one-way ticket - the technology to de-orbit had not yet been developed; and there had never been an expectation of survival.

The idea, of course, is that it's better that an animal die rather than a human in the pursuit of knowledge of the universe.

Most of what NASA deemed "necessary sacrifices" occurred decades ago. After years without any known NASA animal testing, the U.S. space agency is considering resuming tests on animals; in October 2009 it selected a research experiment proposed by Dr. Jack Bergman as a possibility. A behavior pharmacologist at Harvard Medical School's McLean Hospital, Dr. Bergman has done research studies on the medical strategies for beating drug addiction, including methamphetamines, cocaine and cannabis. He's been using primates as his test subjects for nearly 15 years.

**DEEP SPACE TRAVEL AND EXPEDITIONS TO MARS WILL DEPEND ON ANIMAL EXPERIMENTATION AND EXPOSURE TO RADIATION-Marshall ‘10**

[Chasen; staff writer; Intelligent Life: When NASA employee April Evans questioned animal experiments, her career fell apart; Houston Press; 07 Oct 2010]

Some time in the coming decades, a manned spaceship will head to Mars. It may be American or Russian or some agency out of Asia. The race is on to be the first. Figuring out how best to protect astronauts from excess exposure to high-energy cosmic rays and other (possibly unknown) ionizing radiation is one of the biggest challenges.

Best estimates put a flight to Mars at five months each way. Tack on however much time a crew spends in orbit or on the surface and a Mars mission would likely take well over a year.

Humans have spent prolonged periods in space. The American record holder, Michael López-Alegría, spent 215 days aboard the International Space Station. But ISS is "within the fuzz," as Evans explains it. The peach fuzz analogy: If the Earth were a peach, the ISS would be within the fuzz, or within the Earth's magnetic field - meaning not deep in space and susceptible to harmful cosmic rays.

According to the documents for the proposed tests, NASA aims "to evaluate the neurobehavioral and neuropharmacological effects of different types of ionizing radiation encountered during deep space travel." Meaning, after X amount of time, however many months or years into the mission, and all that exposure to varying levels of radiation, will a crew still be able to do what it's supposed to do out there?

Which is supposedly why these tests have been proposed - understanding and being able to prepare for extended exposure to radiation for deep space travel. Not how to protect against it, just how to deal with it. But there isn't much known about the $1.75 million primate tests because no one familiar with them is willing or able to talk. All there is to go by are 13 pages of test procedure.

There are to be 36 squirrel monkeys included in the test. Twenty-four will undergo radiation exposure. Six will serve as controls. And six will serve as alternates, in the event that something happens to one of the initial 30. The 24 will undergo a single dosage of radiation, which is supposed to simulate the amount of radiation a crew would be exposed to in deep space travel.

**NASA ENGAGES IN DUPLICATIVE, CRUEL RESEARCH ON MONKEYS-Marshall ‘10**

[Chasen; staff writer; Intelligent Life: When NASA employee April Evans questioned animal experiments, her career fell apart; Houston Press; 07 Oct 2010]

When the Press contacted the three parties about the tests, the response from Brookhaven and McLean was to talk to NASA; NASA said talk to Brookhaven or McLean.

The primate tests conducted by Dr. Barnes were done more than 40 years ago. When Bates heard about the proposed testing and Evans's decision to resign, he supported her. His thinking was, "We've already done this, we've got a big database of that type of data, why don't we just go back and look at it after 40 years of more knowledge and learning and experience and see what that data gives us?

"I have no problem with research," he continued," but I have a problem with doing duplicate research that has already been done, but maybe not clearly analyzed."

**OUR EXPLORATION OF NEW FRONTIERS IN SPACE DEPENDS ON CRUEL TREATMENT OF ANIMALS-Marshall ‘10**

[Chasen; staff writer; Intelligent Life: When NASA employee April Evans questioned animal experiments, her career fell apart; Houston Press; 07 Oct 2010]

The European Space Agency had an answer, just a week later. In a letter to Animal Defenders International (ADI), Jean-Jacques Dordain, the acting director general of the ESA, wrote, "there is absolutely no research interest or planning for experiments with primates."

NASA administrator Charles F. Bolden had a response to Dordain's announcement. Attending the California Institute of Technology graduation to deliver the commencement speech, he told Pasadena Weekly that experimentation by NASA is "very strongly peer-reviewed" and that the particular tests are "very humane."

In a letter to ADI, dated June 28, 2010, retired Russian cosmonaut Valentin Lebedev also publicly opposed the tests. Lebedev once held the world record for the longest single spaceflight, along with a fellow Russian cosmonaut. Lebedev noted the tests were unnecessary because "the existing knowledge received from past experience of long time space flights is quite enough right now to predict their influence on people even regarding radiation issues."

Weeks later, Paul McCartney, an outspoken supporter of NASA and future space flight, wrote Bolden to express his disapproval: "I believe NASA has the ingenuity to investigate the health effects of space travel without confining and experimenting on animals as was done in the old days. It would be terribly disappointing if in our zeal to explore new frontiers and to learn about the fascinating universe where we live we began to regress in our treatment of the animals with whom we share this planet. May I appeal to you to cancel this experiment?"

**NASA VIOLATES ITS OWN ETHICS ABOUT THE TREATMENT OF PRIMATES-Marshall ‘10**

[Chasen; staff writer; Intelligent Life: When NASA employee April Evans questioned animal experiments, her career fell apart; Houston Press; 07 Oct 2010]

The Physicians Committee for Responsible Medicine expressed similar concerns. PCRM referred to the tests as "piling bad science on top of bad science," claiming that the initial decades-old primate research failed to produce any data that applies to humans. Members of the physicians group also pointed out that the research would violate NASA's stated principles regarding animal ethics. The policy says that "the minimization of distress, pain and suffering is a moral imperative" and makes the point that any research or experiments should be done after weighing the abuse or burden of non-human subjects against the potential benefits.

**NASA’S RELIANCE ON CRUEL ANIMAL EXPERIMENTATION JEOPARDIZES COOPERATIVE SPACE EXPLORATION-Save the Primates ‘10**

[ADI and European Space Agency Strongly Oppose NASA Primate Experiments; Save the Primates; <http://www.savetheprimates.org/news/adi-and-european-space-agency-strongly-oppose-nasa-primate-experiments;> 2010; retrieved 07 Jul 2011]

While NASA has plans to submit squirrel monkeys to radiations in an attempt to study their adverse effects despite vast differences between the species, ESA’s letter states that it “declines any interest in monkey research and does not consider any need or use for such result.” It demonstrates an indirect yet unambiguous criticism of NASA’s plans to use non-human primates in radiation experiments.

This is the first time a space agency has so clearly voiced its opposition to primate testing. The statement confirms the unnecessary character of NASA’s tests and reveals the uneasiness of a large segment of the scientific community involved in space research about the use of monkeys in experiments. As early as July 2008, former NASA and ESA astronaut Umberto Guidoni asked the Russians not to use monkeys in these tests but instead to carry out studies aboard the International Space Station.

This rift casts serious doubts on the ability of major space agencies to work together on deep-space exploration in the future. ESA is already officially opposing its Russian partners. Moscow’s Institute for Biomedical Problems also has plans to use monkeys in painful experiments in the context Mars500.

**NASA SHOULD FOLLOW EUROPE’S LEAD AND END ANIMAL CRUELTY-Save the Primates ‘10**

[ADI and European Space Agency Strongly Oppose NASA Primate Experiments; Save the Primates; <http://www.savetheprimates.org/news/adi-and-european-space-agency-strongly-oppose-nasa-primate-experiments;> 2010; retrieved 07 Jul 2011]

In his letter, Dordain criticizes this move stating, “ESA is even opposing the necessity of complementary experiments with monkeys in combination with the human research objectives in Mars500.”

ADI’s President Jan Creamer said, “We welcome ESA’s statement against the use of primates in experiments, supporting that there is absolutely no scientific need for such tests. We ask that NASA follow ESA’s lead and put an end to these senseless projects to make monkeys suffer in experiments that will be irrelevant to humans.”

**NASA IS ENGAGING IN A CYNICAL EXPLOITATION OF ANIMAL SUBJECTS-Matson ‘09**

[John; science reporter; NASA-Funded Monkey-Radiation Experiment Raises Hackles;Scientific American; 06 Nov 2009; <http://www.scientificamerican.com/blog/post.cfm?id=nasa-funded-monkey-radiation-experi-2009-11-06;> retrieved 07 Jul 2011]

The research project, led by Jack Bergman of McLean Hospital, a Harvard Medical School affiliate in Belmont, Mass., was one of 12 awarded radiobiology research grants through NASA's Human Research Program, the space agency announced October 27. In Bergman's study, according to Discovery News, 18 to 28 squirrel monkeys would be subjected to radiation and periodically tested to gauge how exposure affects performance in a variety of learned tasks. Stellar and galactic radiation would bombard astronauts on missions to Mars, but the health effects of such a trip are not well known.

Such an experiment, the PCRM quipped in the petition to Bolden, "would be one giant leap backward for NASA." Calling the proposal "unnecessary" and "cruel," the organization maintains that Bergman's research would violate NASA's stated principles regarding animal ethics. That policy, established in 1996, asserts that "the minimization of distress, pain and suffering is a moral imperative" and emphasizes that experimenters must weigh the burdens of animal subjects against potential societal benefits.

**NASA JUSTIFIES EXPERIMENTATION TO LEARN ABOUT DEEP SPACE EXPLORATION-Matson ‘09**

[John; science reporter; NASA-Funded Monkey-Radiation Experiment Raises Hackles;Scientific American; 06 Nov 2009; <http://www.scientificamerican.com/blog/post.cfm?id=nasa-funded-monkey-radiation-experi-2009-11-06;> retrieved 07 Jul 2011]

The PCRM sees little benefit to humankind in an environment where lofty spaceflight goals are banging against harsh economic and political realities. "Interplanetary human travel is, at best, a highly speculative aim for the foreseeable future," the organization's appeal states. "To put animals through radiation tests now in anticipation of such an enterprise is in no way justified."

Bergman, for his part, begs to differ. "There's a long-standing commitment on the part of NASA to deep space travel, and with that commitment comes a need for knowing what kinds of adverse effects deep space travel might have, what are the risks to astronauts," Bergman told Discovery News. "That's not been well assessed."

**NASA’S CRUEL TREATMENT OF ANIMALS UNDERMINES SCIENTIFIC AND ETHICAL PROGRESS-Physicians Committee for Responsible Medicine ‘09**

[Doctors File Federal Petition to Stop NASA’s Monkey Radiation Experiments; 05 Nov 2009; <http://www.pcrm.org/news/release091105.html;> retrieved 07 Jul 2011]

A nonprofit physicians organization is confronting NASA over the space agency’s plan to expose squirrel monkeys to radiation in an attempt to understand the effects of interplanetary travel. In a federal petition for administrative action filed Nov. 5, the Physicians Committee for Responsible Medicine (PCRM) seeks to compel the government to halt the monkey experiments because they violate the NASA Principles for the Ethical Care and Use of Animals, also known as the Sundowner Report. The space agency has not used monkeys for radiobiology research in decades.

“Irradiating monkeys would be one giant leap backward for NASA,” says Hope Ferdowsian, M.D., M.P.H., PCRM’s director of research policy. “The proposed experiments are cruel, unnecessary, and lack scientific merit. There are better, more humane ways of understanding the potential dangers of interplanetary travel to humans. Scientific progress can only proceed with a strong ethical foundation.”

**NASA IS USING UNNECESSARY, DUPLICATIVE ANIMAL RESEARCH-Physicians Committee for Responsible Medicine ‘09**

[Doctors File Federal Petition to Stop NASA’s Monkey Radiation Experiments; 05 Nov 2009; <http://www.pcrm.org/news/release091105.html;> retrieved 07 Jul 2011]

Radiation experiments involving nonhuman primates commonly involve restraint and other inhumane procedures. PCRM’s petition for administrative action points out that Bergman’s radiation experiments will violate the standards of the Sundowner Report, a landmark 1996 NASA document that requires researchers to respect living creatures and to consider the full range of societal good that may come from an experiment. Additionally, nonanimal methods should be used whenever possible.

PCRM’s petition for administrative action states, “Genetic, physiological, and anatomical differences between humans and monkeys dramatically limit the conclusions that can be drawn from the planned experiments. Ongoing studies, including those funded by NASA and the U.S. Department of Energy, already use nonanimal methods to determine the effects of low-dose radiation on human tissues.”

**SPACEFLIGHT IS DEPENDENT ON ANIMAL RESEARCH-Jennings and Souza ‘04**

[Diana, Marine Biological Laboratory, and Kenneth, NASA Ames Research Center; Meeting Report: Animal Research in Support of Human Space Exploration; 16 April 2004; <http://www.dsls.usra.edu/niac/animal_research.pdf;> retrieved 07 Jul 2011]

The overall conclusion reached by the group is that animal research is an integral tool for understanding and ameliorating the known and yet-to-be-discovered impacts of spaceflight upon the human body. This tool needs to be deployed in the context of a long-term, multi-disciplinary, team-based research program including groundbased and flight-based platforms. Science, and the relevance of a given model system to human physiology, must drive the choice of the research platform and the animal model system to be used.

**THERE IS NO JUSTIFICATION TO INFLICT CRUELTY ON ANIMALS FOR SPECULATIVE DEEP SPACE EXPLORATION-Physicians Committee for Responsible Medicine ‘09**

[Doctors File Federal Petition to Stop NASA’s Monkey Radiation Experiments; 05 Nov 2009; <http://www.pcrm.org/news/release091105.html;> retrieved 07 Jul 2011]

The petition continues: “Interplanetary human travel is, at best, a highly speculative aim for the foreseeable future. It is obviously fraught with many dangers and enormous expense, while serving goals that are not at all clear. To put animals through radiation tests now in anticipation of such an enterprise is in no way justified.”

**ANIMAL RESEARCH IS AN ESSENTIAL PART OF NASA’S RESEARCH PROGRAM-Jennings and Souza ‘04**

[Diana, Marine Biological Laboratory, and Kenneth, NASA Ames Research Center; Meeting Report: Animal Research in Support of Human Space Exploration; 16 April 2004; <http://www.dsls.usra.edu/niac/animal_research.pdf;> retrieved 07 Jul 2011]

Based on the presentations and discussions of this group of participants, animal research is an essential part of the program of life sciences research that will be required to enhance the safety of humans as they venture off-world to extended stays, on the ISS, the Moon and extended travel to Mars. All areas of inquiry would benefit from the tools that have already been developed for the study of life processes in animals. All areas of inquiry will benefit from the scientific rigor that can be imposed on studies involving animal, as opposed to human, subjects in both the spaceflight and ground-based environments. Moreover, this workshop clearly demonstrated the value of meetings in which representatives of NASA’s full life sciences program, including operational

medicine, share their knowledge and experience, their research data, and their opinions. NASA is encouraged to continue to sponsor focused multidisciplinary workshops like this one and to initiate regular full program meetings in order to promote communication throughout the space biology and biomedical communities.

**NASA BELIEVES THAT ANIMAL STUDIES ARE ESSENTIAL FOR UNDERSTANDING SPACE EXPLORATION-Jennings and Souza ‘04**

[Diana, Marine Biological Laboratory, and Kenneth, NASA Ames Research Center; Meeting Report: Animal Research in Support of Human Space Exploration; 16 April 2004; <http://www.dsls.usra.edu/niac/animal_research.pdf;> retrieved 07 Jul 2011]

Dan Feeback reviewed for the group historical and recent data involving measurements of human muscle capacity in astronauts in shuttle sorties and long duration missions on Mir and ISS. Many of the muscle deficits seen in flight are observed also in the bedrest model. Feeback outlined numerous exercise or “loading” countermeasures developed by both Russian and US scientists. Feeback also raised the specter of loss of neuromuscular control accompanying muscle atrophy, and described an experimental apparatus that will test motor control in humans.

In his abstract, Feeback states:

Development of truly novel approaches to countering the effects of microgravity on human physiology will require a more complete understanding of the processes that underlie them. Hypothesis driven research using mechanistic approaches will be required to advance the state of knowledge and to provide answers to many of the enabling questions contained within the BCPR. To this end, both animal studies using models of skeletal muscle unloading and cellular/molecular paradigms are fertile ground.

LINK: CRUELTY TO ANIMALS RESTS ON ANTHROPOCENTRISM

**ORDINARY PEOPLE TOLERATE AND PARTICIPATE IN THE SYSTEMIC, HORRIFIC OPPRESSION OF ANIMALS. WE MUST REJECT IT AT ALL OPPORTUNITIES-Bartlett ‘02**

[Steven; Research Professor of Philosophy, Oregon State University; “ROOTS OF HUMAN RESISTANCE TO ANIMAL RIGHTS: PSYCHOLOGICAL AND CONCEPTUAL BLOCKS”; Animal Law; 2002]

Hannah Arendt called the response of ordinary people to moral atrocity "the banality of human evil." n70 Ordinary people do in fact tolerate, avert their eyes, comply with, or deny atrocities of which they are aware. Psychologically oriented Holocaust studies make this normal though morally repugnant human characteristic compellingly evident. n71 Similarly, and without recourse to metaphor, there is an unmistakable banality of human evil in the relationship of the human species toward other species. Even the most morally thick-skinned will find it hard to read firsthand accounts of the meat industry's treatment of animals. n72

The whole creation groans under the weight of the evil we humans visit upon these mute, powerless creatures. It is our hearts, not just our heads, that call for an end to it all, that demand of us that we overcome, for them, the habits and forces behind their systematic oppression.

**ANIMALS HAVE A RIGHT NOT TO SUFFER FOR HUMAN NEEDS-Singer and Mason ‘06**

[Pete, professor of bioethics, Princeton and Jim, attorney; The Way We Eat: Why Our Food Choices Matter; 2006; pg. 246]

The prevailing Western ethic assumes that human interests must always prevail over the comparable interests of members of other species. Since the rise of the modern animal movement in the 1970s, however, this ethic has been on the defensive. The argument is that, despite obvious differences between human and nonhuman animals, we share a capacity to suffer, and this means that they, like us, have interests. If we ignore or discount their interests simply on the grounds that they are not members of our species, the logic of our position is similar to that of the most blatant racists or sexists—those who think that to be white, or male, is to be inherently superior in moral status, irrespective of other characteristics or qualities.

**OUR BELIEF IN THE SPECIALNESS OF HUMANS CONDEMNS ANIMALS TO ETERNAL HOLOCAUST-Bartlett ‘02**

[Steven; Research Professor of Philosophy, Oregon State University; “ROOTS OF HUMAN RESISTANCE TO ANIMAL RIGHTS: PSYCHOLOGICAL AND CONCEPTUAL BLOCKS”; Animal Law; 2002]

The utilitarian valuation of nonhuman animals, built on what one author calls "the rhetoric of human specialness," n67 characteristically leads to moral atrocities toward those animals to whom there is generally [\*155] little to no empathetic human response. Some authors have found parallels to this psychically numbed outlook in the unaffected emotional response of bystanders to the Holocaust. One author has suggested, "our treatment of animals is, in disturbing ways, like the treatment of Jews in the Holocaust, particularly with respect to the capacity of normal, good people to rationalize and deny that suffering is taking place." n68 Another author has likewise remarked:

What do they know - all these scholars, all these philosophers, all the leaders of the world - about such as you? They have convinced themselves that man, the worst transgressor of all the species, is the crown of creation. All other creatures were created merely to provide him with goods, pelts, to be tormented, exterminated. In relation to them, all people are Nazis; for the animals it is an eternal Treblinka.

**HUMAN FRAME OF REFERENCE IS CENTERED ON VALUES THAT EMPHASIZE HUMAN TRAITS-Bartlett ‘02**

[Steven; Research Professor of Philosophy, Oregon State University; “ROOTS OF HUMAN RESISTANCE TO ANIMAL RIGHTS: PSYCHOLOGICAL AND CONCEPTUAL BLOCKS”; Animal Law; 2002]

We may now bring this abstract reasoning to bear on the issues confronting advocates of animal rights. Characteristically, as we have noted, opponents of animal rights assert human priority over nonhuman animals by denying to animals traits that are believed to ennoble the human species and entitle its members to preferential treatment. In addition, opponents of animal rights often assert the transcendent - that is, epistemologically independent - existence of a source of human goodness, usually in the form of a deity, sometimes in the form of an overarching ideology. In the first instance, a denial is made of the existence of certain objects of reference (for example, conscious states, felt pain, reasoning, symbolism, and claimed not to exist within nonhuman [\*175] animals), and this denial is by intention "projected" outside the human frame of reference that makes such reference possible. After all, the proponent of such a reference intends to make a claim about the real inner life, the deficient inner experience, of nonhuman animals. The result of these projective references is a denial, one that typically claims that nonhuman animals have no consciousness, do not feel pain, and so forth. n167 In the second instance, the existence of certain constructs (such as human goodness, or a god) is asserted to transcend the frame of reference that is required to refer to them.

**OUR SPECIES SELFISHNESS JUSTIFIES THE EXTERMINATION OF OTHER LIVES-Bartlett ‘02**

[Steven; Research Professor of Philosophy, Oregon State University; “ROOTS OF HUMAN RESISTANCE TO ANIMAL RIGHTS: PSYCHOLOGICAL AND CONCEPTUAL BLOCKS”; Animal Law; 2002]

To see the human species in this way is to see mankind in a new light. We see the human species as one parasite species among many, recognizing that parasitism is the most pervasive way in which forms of life - from viruses to bacteria to protozoa to plants and animals - meet the exigencies of living. Among the defining characteristics of parasitism that apply to the human species, one in particular stands out as we consider the massive extinction of species for which mankind is currently responsible. n147 It is genetic selfishness. In the human species, the genetic selfishness of the parasite has taken the form of our species' centrism, our opportunistic exploitation of environmental resources, and our species' disregard for the degree to which human activity and reproduction displace and exterminate other forms of life.

**HOMOCENTRIST THINKING IS CENTERED IN MAKING DECISIONS FOR THE SAKE OF HUMANS-Bartlett ‘02**

[Steven; Research Professor of Philosophy, Oregon State University; “ROOTS OF HUMAN RESISTANCE TO ANIMAL RIGHTS: PSYCHOLOGICAL AND CONCEPTUAL BLOCKS”; Animal Law; 2002]

Homocentrism, as we have seen, seeks to exalt the human species by directing attention to characteristics that identify the putative uniqueness of man. n86 One author, arguing for the need for homocentrism, quotes the following species-chauvinist passage with apparent satisfaction: "Screw the rights of nature. Nature will have rights as soon as it gets duties. The minute we see birds, trees, bugs and squirrels picking [\*159] up litter, giving money to charity, and keeping an eye on our kids at the park, we'll let them vote." n87

The human superiority movement is well entrenched and flourishing. Possessed with, or by, this mindset and the emotions associated with it, it makes perfect sense to believe that "the world was created for the benefit of humans who crown the natural hierarchy. Humans, being endowed with reason, are in an exalted place in the natural order and, thus, can without moral compunction, tyrannize the whole of nature." n88 Hence, the common assertion that "everything exists for the benefit of those who have reason - that is, humans."

LINK: SPACE EXPLORATION

**SPACE EXPLORATION RESTS ON THE SCIENTIFIC AND TECHNOLOGICAL MODEL RESPONSIBLE FOR OUR CURRENT ECOLOGICAL CATASTROPHE-Fox ‘89**

[Warwick; senior lecturer of philosophy; U. of Central Lancashire; “The Deep Ecology-Ecofeminism Debate and its Parallels”; Environmental Philosophy: From Animal Rights to Radical Ecology; 2001; pg. 229-30]

Approximately three and a half centuries later, Neil Armstrong's moon walk-the culmination of a massive, politically directed, scientific and technological development effort-epitomized both the literal acting out of this vision of "enlarging the bounds of Human Empire" and the literal expression of its anthropocentric spirit: Armstrong's moon walk was, in his own words at the time, a "small step" for him, but a "giant leap for mankind." Here on Earth, not only do examples abound of environmental exploitation being undertaken in the name of humanity, but this also constitutes the fundamental kind of legitimation that is still most often employed for environmental conservation and preservation-it is implicit in every argument for the conservation or preservation of the nonhuman world on account of its use value to humans (e.g., its scientific, recreational, or aesthetic value) rather than for its own sake or its use value to nonhuman beings.

**CONQUERING SPACE WILL ONLY DELAY THE INEVITABLE; WE CANNOT USE SPACE AS AN ESCAPE POD FROM OUR ENVIRONMENTAL DESTRUCTION-Polk ‘07**

[Kevin Scott; M.S. in astronomy from the University of Washington; *Gaiome: Notes on Ecology, Space Travel and Becoming Cosmic Species*; 2007; pg. 34]

For the many who struggle somewhere between poverty and wealth, the relentless pressure toward ever-greater visible prosperity increases competition, toil and hoarding to the point where these traits are lauded as innate social good. As resources and time dwindle, the incentive to try and rig the game in one’s own favor becomes overwhelming. From the poorest sweatshop to the richest multinational, growth begets greed; greed begets corruption; corruption breeds violence.

There is no outrunning exponential growth. It will buck up against hard limits of resources and energy infinite time, no matter how boldly we go about extracting resources from the cosmos. As surely as tomorrow, the day will come when we cannot expect more wealth, power or children than yesterday. Conquering the space frontier would, at most, forestall that day, magnifying the cost to the majority of people who will be losers in the competitive economy along the way.

**SPACE DISTRACTS US FROM THE REGENERATIVE ECONOMY AND CONNECTION WE NEED TO CARE FOR THE ECOSYSTEM-Polk ‘07**

[Kevin Scott; M.S. in astronomy from the University of Washington; *Gaiome: Notes on Ecology, Space Travel and Becoming Cosmic Species*; 2007; pg. 43-44]

Building artificial bodies for ourselves in space would set us on the most lonely, arduous path imaginable. Not only would we have to re-invent a solar economy that took nature billions of years to develop, we would literally have to chop off the larger parts of ourselves and abandon them forever. I’m not merely talking about our bodies. Even a cursory study of living nature shows that our identity does not end at our skin. Life evolved simultaneously on all scales, from the sub-cellular to the largest ecosystems. Thus our being encompasses the taste of ripe berries, the warming rays of dawn, the brush of a breeze, the blue sky, the quenching downpour, the scent of wildflowers, the voices of crickets and birds, the lay of the land and the regenerative services of the soil microbes. All these parts of us preceded our hands and intellects by millions of years into every Earthly frontier.

The regenerative economy, the community of life, the truest friends we ever had: none of these await us in space. What’s left of us once we transcend them?

**SPACE IS NOT AN ANSWER FOR OUR ENVIRONMENTAL CRISIS—ITS ANSWERS ARE FAR IN THE FUTURE AND WILL OFFER NO MORE THAN A DISTRACTION FROM THE ENVIRONMENTAL CRISIS-Polk ‘07**

[Kevin Scott; M.S. in astronomy from the University of Washington; *Gaiome: Notes on Ecology, Space Travel and Becoming Cosmic Species*; 2007; pg. 38-39]

From deep oceans to marshes to alpine forests, biomes are complex, detailed, interconnected, creative, non-linear and resistant to partitioning. This makes them poor candidates for the tools of engineering, which depend on lin- earity, predictability, simplicity and modularity. If, in the aggregate, we are not in a sustainable relationship with living ecosystems now, there is no definitive way to tell how much effort it will take to make them sustain us in space.

Indeed, the latest Earth escape club, the Alliance to Rescue Civilization (ARC; www.arc-space.org), acknowledges that any such project would be “very long-term.”

Space lacks air, water, food and the ecosystems that regenerate and purify these essentials for us on Earth. We will never have a better opportunity to learn how to sustain ourselves through natural ecology than we have here and now on the home planet.

Since the dawn of civilization, our dreams of growth have put us at war with nature. The easy victories have ended; it’s now a losing battle. Irrigated monocrop agriculture sows deserts, bacteria have evolved resistance to antibiotics, and if we don’t change course now, up to half of all species will go extinct by mid-century—life’s sixth and fastest major extinction. 17,54–56 Given the destruction we’ve wrought on Earth, our odds of preserving life meaningfully in a radioactive vacuum on a first attempt are vanishingly small. We have shown life so little regard for so long that we never learned the skills of life support. If we wreck the Earth, space offers no escape.

**THE MYTH OF “AWAY” IN SPACE WILL INCREASE TENSION AND CONFLICT OVER RESOURCES ON EARTH WITHOUT PROVIDING A SUSTAINABLE PATH-Polk ‘07**

[Kevin Scott; M.S. in astronomy from the University of Washington; *Gaiome: Notes on Ecology, Space Travel and Becoming Cosmic Species*; 2007; pg. 44-45]

If space is ever to achieve any tangible meaning for the rest of us, we must find a way to make it much easier and less perilous to reach. I discuss how this might be accomplished in the next chapter. Even then, though, space won’t be a frontier and we would be foolish to try to make it one.

The world’s heroic government space programs, built on the myth of “away,” have fallen far short of our hopes for expansion, escape and transcendence, and always will. The hopes themselves are wrong. If we try to propagate our pat- tern of obligate growth throughout the cosmos, we would succeed, at most, in greatly expanding the anxiety and misery it already exports. If our extractive economy wrecks Earth for us via resource wars or environmental crises, it also leaves us even less prepared to survive anywhere else. If we surgically sever all relations with our world and our bodies, we’ll find ourselves friendless, estranged and hollow.

**WE MUST REJECT SPACE AS THE ANSWER AND EMBRACE LOCALITY-Polk ‘07**

[Kevin Scott; M.S. in astronomy from the University of Washington; *Gaiome: Notes on Ecology, Space Travel and Becoming Cosmic Species*; 2007; pg. 45]

Alternatively, we could bring as much Earth life as we can along with us into space and do all we can to help it thrive. But first we have a lot to do and a lot to learn. We need to let life become a circle again here on Earth. We need to do away with “away.” We need to re-learn the art of locality, of being native to a place and aware of its cycles. Nowhere will we need these vital skills more than in the deep vacuum of space, where, as Bernal said, “nothing can afford to be permanently wasted.“ Only when our relationship with Earth and all its species is mutually secure, abundant and joyous will we find ourselves—our larger, ecological selves—able to experiment meaningfully with living beyond.

**EVENTUALLY WE WILL BE READY FOR SPACE, BUT ONLY AFTER WE LEARN HOW TO LIVE SUSTAINABLY-Polk ‘07**

[Kevin Scott; M.S. in astronomy from the University of Washington; *Gaiome: Notes on Ecology, Space Travel and Becoming Cosmic Species*; 2007; pg. 46]

Eventually we will know enough about living sustainably on Earth to try living in space. When that day comes, people will attempt it, just as our ancestors back to the first prokaryota tried to live beyond their immediate horizons.

In the meantime, we should continue to explore the solar system using such modest instruments as telescopes and robot probes. Judging by their relatively small budgets, these investigations were a mere afterthought in the von Braun plan. But they remain the most enduring scientific achievements of NASA and the world’s other space programs. They have mapped many new worlds over the past few decades, making ours by far the greatest age of exploration in history. Yet untold millions of minor planets remain uncharted.

**ARGUMENT THAT WE NEED TO GET OFF THE PLANET TO SAVE HUMANITY RESTS ON AN UNDERLYING BELIEF THAT THE ENTIRE PLANET IS NOTHING MORE THAN A DISPOSABLE RESOURCE-Monbiot ‘10**

[George; After this 60-year feeding frenzy, Earth itself has become disposable; The Guardian; 04 Jan 2010; <http://www.guardian.co.uk/commentisfree/2010/jan/04/standard-of-living-spending-consumerism>; retrieved 15 Aug 2011]

George Orwell and Aldous Huxley proposed different totalitarianisms: one sustained by fear, the other in part by greed. Huxley's nightmare has come closer to realisation. In the nurseries of the Brave New World, "the voices were adapting future demand to future industrial supply. 'I do love flying,' they whispered, 'I do love flying, I do love having new clothes … old clothes are beastly … We always throw away old clothes. Ending is better than mending, ending is better than mending'". Underconsumption was considered "positively a crime against society". But there was no need to punish it. At first the authorities machine-gunned the Simple Lifers who tried to opt out, but that didn't work. Instead they used "the slower but infinitely surer methods" of conditioning: immersing people in advertising slogans from childhood. A totalitarianism driven by greed eventually becomes self-enforced.

Let me give you an example of how far this self-enforcement has progressed. In a recent comment thread, a poster expressed an idea that I have now heard a few times. "We need to get off this tiny little world and out into the wider universe … if it takes the resources of the planet to get us out there, so be it. However we use them, however we utilise the energy of the sun and the mineral wealth of this world and the others of our planetary system, either we do use them to expand and explore other worlds, and become something greater than a mud-grubbing semi-sentient animal, or we die as a species."

This is the consumer society taken to its logical extreme: the Earth itself becomes disposable. This idea appears to be more acceptable in some circles than any restraint on pointless spending. That we might hop, like the aliens in the film Independence Day, from one planet to another, consuming their resources then moving on, is considered by these people a more realistic and desirable prospect than changing the way in which we measure wealth.

**FAITH THAT SPACE EXPLORATION TECHNOLOGY WILL SAVE US PREVENTS CRITICAL REFLECTION ABOUT HOW HUMANS MUST ACT TO PRESERVE THEIR ENVIRONMENTS-Kochi and Ordan ‘08**

[Tarik and Noam; An Argument for the Global Suicide of Humanity; Borderlands; Dec 2008; available at <http://findarticles.com/p/articles/mi_6981/is_3_7/ai_n31524968/>; retrieved 03 Aug 2011]

Hawking's approach to environmental catastrophe is an example of a certain modern faith in technological and social progress. One version of such an approach goes as follows: As our knowledge of the world and ourselves increases humans are able to create forms of technology and social organisation that act upon the world and change it for our benefit. However, just as there are many theories of 'progress' [2] there are also many modes of reflection upon the role of human action and its relationship to negative or destructive consequences. The version of progress enunciated in Hawking's story of cosmic colonisation presents a view whereby the solution to the negative consequences of technological action is to create new forms of technology, new forms of action. New action and innovation solve the dilemmas and consequences of previous action. Indeed, the very act of moving away, or rather evacuating, an ecologically devastated Earth is an example at hand. Such an approach involves a moment of reflection--previous errors and consequences are examined and taken into account and efforts are made to make things better. The idea of a better future informs reflection, technological innovation and action.

However, is the form of reflection offered by Hawking broad or critical enough? Does his mode of reflection pay enough attention to the irredeemable moments of destruction, harm, pain and suffering inflicted historically by human action upon the non-human world? There are, after all, a variety of negative consequences of human action, moments of destruction, moments of suffering, which may not be redeemable or ever made better. Conversely there are a number of conceptions of the good in which humans do not take centre stage at the expense of others. What we try to do in this paper is to draw out some of the consequences of reflecting more broadly upon the negative costs of human activity in the context of environmental catastrophe. This involves re-thinking a general idea of progress through the historical and conceptual lenses of speciesism, colonialism, survival and complicity. Our proposed conclusion is that the only appropriate moral response to a history of human destructive action is to give up our claims to biological supremacy and to sacrifice our form of life so as to give an eternal gift to others.

From the outset it is important to make clear that the argument for the global suicide of humanity is presented as a thought experiment. The purpose of such a proposal in response to Hawking is to help show how a certain conception of modernity, of which his approach is representative, is problematic. Taking seriously the idea of global suicide is one way of throwing into question an ideology or dominant discourse of modernist-humanist action. [3] By imagining an alternative to the existing state of affairs, absurd as it may seem to some readers by its nihilistic and radical 'solution', we wish to open up a ground for a critical discussion of modernity and its negative impacts on both human and non-human animals, as well as on the environment. [4] In this respect, by giving voice to the idea of a human-free world, we attempt to draw attention to some of the asymmetries of environmental reality and to give cause to question why attempts to build bridges from the human to the non-human have, so far, been unavailing.

**COLONIZATION OF SPACE WILL REST ON THE SAME HEGEMONIC, DESTRUCTIVE VALUES AS COLONIALISM ON EARTH-Kochi and Ordan ‘08**

[Tarik and Noam; An Argument for the Global Suicide of Humanity; Borderlands; Dec 2008; available at <http://findarticles.com/p/articles/mi_6981/is_3_7/ai_n31524968/>; retrieved 03 Aug 2011]

The possibility of the destruction of our habitable environment on earth through global warming and Hawking's suggestion that we respond by colonising other planets forces us to ask a serious question about how we value human life in relation to our environment. The use of the term 'colonisation' is significant here as it draws to mind the recent history of the colonisation of much of the globe by white, European peoples. Such actions were often justified by valuing European civilisation higher than civilisations of non-white peoples, especially that of indigenous peoples. For scholars such as Edward Said (1978), however, the practice of colonialism is intimately bound up with racism. That is, colonisation is often justified, legitimated and driven by a view in which the right to possess territory and govern human life is grounded upon an assumption of racial superiority. If we were to colonise other planets, what form of 'racism' would underlie our actions? What higher value would we place upon human life, upon the human race, at the expense of other forms of life which would justify our taking over a new habitat and altering it to suit our prosperity and desired living conditions?

**THE LURE OF SPACE TRAVEL IS THE LURE OF CONSTANT MOVEMENT AWAY FROM HOME WHICH HAS CHARACTERIZED HUMANS FROM THEIR FOUNDING MYTHS. IT DRIVES OUR BELIEF THAT WE CAN EXPLOIT ONE AREA BEFORE MOVING TO ANOTHER TO EXPLOIT-Mander ‘95**

[Jerry; program director for Megatechnology and Globalization at the Foundation for Deep Ecology; *Deep Ecology for the 21st Century*; Ed. By George Sessions; pgs. 311-312]

Over the years, I have wondered about the apparently strong appeal of space travel and development to the public mind. I can understand why corporations, militaries, and governments want to promote departing from the planet, and I have mentioned its appeal to the New Age collective ego. But it hasn’t been easy for me to grasp why the idea is so attractive to others. I finally realized that space travel is not new; it is only the final stage of a departure process that actually began long ago. Our society really “left home” when we placed boundaries between ourselves and the earth, when we moved en masse inside totally artificial, reconstructed, “mediated” worlds—huge concrete cities and suburbs—and we aggressively ripped up and redesigned the natural world. By now, nature has literally receded from our view and diminished in size. We have lost contact with our roots. As a culture, we don’t know where we came from; we’re not aware we are part of something larger than ourselves. Nor can we easily find places that reveal natural processes still at work.

… As a corporate culture, we have begun to feel that one place is as good as the next; that it’s okay to sacrifice this place for that one, even when the new place is not even on Earth. In the end, this leaves us all in a position similar to the millions of homeless people on our streets. In truth, we are all homeless, though we long to return.

My friend Gary Coates, an architecture professor at Kansas State University … has argued provocatively that our quest for space is actually a distorted expression of a desire to return home to Eden, the place we abandoned. He sees our whole culture as caught in a replay of the Adam-and-Eve story.

In a recent conversation, Coates put it to me this way:

“Like all creation myths, the story of the Garden of Eden is not something that never happened or only happened long ago; it is something that is happening in every moment . . . It was the murder of Abel, who represented a state of oneness with the earth, that set Cain off wandering in a never-satisfied quest for the return to, or re-creation of, paradise. Within the confines of our totally artificial environments on Earth, as they will soon also be in heaven, we also seek to re-enter Eden. In particular, the creation of Leisureworlds, Disney Worlds, megamalls, Air Stream mobile home cities, lifestyle-segregated condominium communities, and especially genetic engineering, space colonization, and terraforming of planets, are all updated forms of Cain’s desire to return home by remaking the original creation. The tragedy is that in attempting to recover paradise we accelerate the murder of nature. It’s yet another repeat of the story of Cain and Abel, another acting out of the founding myth of Western history.

LINK: SPACE COLONIZATION

**THE IDEA THAT HUMANS CAN EXPLORE SPACE TO FIND A NEW HOME RESTS ON DEEPLY ANTHROPOCENTRIC IDEAS WHICH DIMINISH THE VALUE OF ALL NON-HUMAN LIFE AND EVEN THE PLANET ITSELF-Spicer ‘05**

[Arwen; PhD Candidate, Philosophy @ University of Utah; Toward Sustainable Change: the Legacy of William Morris, George Bernard Shaw, and H. G Wells in the Ecological Discourse of Contemporary Science Fiction; 2005; <https://scholarsbank.uoregon.edu/xmlui/bitstream/handle/1794/3932/Sustainable_Change.doc?sequence=2>; retrieved 02 Aug 2011] ***[CARD CONTINUES OVER TWO PAGES]***

As if echoing Wells's "seed-bed" metaphor, ()lamina teaches that "the Destiny of Earthseed is to take root among the stars" (Sower 68). One of her central creeds, repeated in several of her Earthseed verses, this avowal of self-designed Destiny recalls Wells's Utopian, Urthred, who asserts in Men Like Gods, "Every day our thoughts go out more surely to our inheritance, the stars" (83). Thus, the concept of "Destiny," like "inheritance," frames humanity as a privileged species for whom interstellar expansion is an unproblematic inevitability. ()lamina and Wells figure interstellar colonization as part of a natural progression, like growing up and leaving home. Indeed, both invoke the metaphor of a grown child leaving its mother to frame this colonization as a sign of the human species's achieving adulthood. When Wells's Urthred speaks of reaching out to the stars, he does so in the context of proclaiming humanity to be "no longer the beaten and starved children of Nature, but her free and adolescent sons" (Men 83). Using a somewhat different rhetoric to a similar purpose, Olamina, too, writes of weaning humanity from Mother Earth: Earthseed is adulthood. It's trying our wings, Leaving our mother, Becoming men and women. We've been children, Fighting for the full breasts, The protective embrace, The soft lap\_ Children do this. But Earthseed is adulthood. (Talents 394) Certainly, ()lamina frames the relationship between humanity and the biosphere more positively than Urthred. She characterizes nature/Earth as a loving mother, not a cruel one. For her, humanity comprises both men and women, not merely "sons." In Olamina's language, too, the "blame" for humanity's problems is shifted from Nature, "beating and starving her sons," to Earth's children, "fighting for the full breasts." On the whole, Olamina's tone is less hostile to the world humanity has evolved in. And being less hostile to nature, her teachings are likely to be more amenable to the development of a harmonious, sustainable ecological praxis than Wells's more conquest-oriented philosophy. Despite these significant differences, however, Olamina's and Wells's common metaphor of grown children leaving Mother Earth supports a similar disregard for ecological relationality. Both Olamina and Wells use the fundamental progressionist metaphor of "leaving behind" that I discuss in chapter 1. Being tied to the Earth is associated with childhood. The natural progression for the human species is to leave the Earth, to leave Mother. A problem with this image, in both Wells's and Olamina's writings, is that, superficially, it suggests that it is our natural "destiny" to exist outside of a biosphere. It is natural to leave behind the system that gives us the water, food, light, gravity, and so on that we need to survive. Now, neither ()lamina nor Wells suggests that living without a planet to support us should be an immediate aim. Both understand that humans require a web of ecological relations to survive. The purpose of leaving Earth is to gain greater agency in our own survival. On other planets, we will not be protected by our "Mother" but, like adults, will protect ourselves: we will construct our own relations to the environment more methodically than we have on Earth. Indeed, we must be able to do this if we are to survive in an alien biosphere. An "adult" humanity can shape its environment for itself The dubious assumption, here, is that a non-Earth biosphere could readily be found (or made) to accommodate us. According to this view, the Earth is ultimately unnecessary. In this dichotomization of humanity and the Earth, humanity becomes the force with significant agency. Both ()lamina and Wells emphasize that humanity is the only species (on Earth at least) with the power to rationally choose its destiny. In The Science of Life, Wells (with Julian Huxley and G. P. Wells) argues that with humanity, evolution "has at least the possibility of becoming purposeful, because man is the first product of Evolution who has the capacity for long-range purpose, the first to be capable of controlling evolutionary destiny" (642). Similarly, Olamina explains, "The human species is a kind of animal, of course. But we can do something no other animal species has ever had the option to do. We can choose: We can go on building and destroying [. . . Or we can make something more of ourselves. We can grow up" (Talents 358). It is, indeed, probable that humanity is the only species on Earth capable of consciously planning for its future as a species. Yet in stressing humanity's ability to do what "no other species has ever had the option to do," Olamina, like Wells, does more than simply state a fact She emphasizes humanity's responsibility to seize and use this power. She also supports a dichotomy between humans and all other life forms. For both ()lamina and Wells, the focus remains squarely on the human species as a unit. ()lamina repeats this emphasis at several points: "[The Destiny] offers us a kind of species adulthood and species immortality" (Talents 156); "We need to become the adult species that the Destiny can help us become!" Talents 179); "[Earthseed] will offer us a kind of species 172 life insurance" (Talents 393; all emphasis mine). For both Wells and Olamina, humanity is chiefly what matters. Other species, forces, and webs of relation are relevant but mainly as ancillary factors that must be taken into account as humanity shapes a destiny for itself. When Olamina speaks of humanity as "Earth's seed," the embodiment of the potential of the entire Earth, she risks replacing her principle of "partnership" among forces with an anthropocentrism that figures humanity as the only term of interest. Unquestionably, the singleness of this human focus is more absolute for Wells than Olamina. As I argue in chapter 4, Wells's radical anthropocentrism almost completely rejects intrinsic rights for other species, the notable exception being his condemnation of the senseless suffering of any creature. Olamina's anthropocentrism is more moderate. Like Wells, she does not condone the suffering of animals. Unlike Wells, she seems to accept a species's intrinsic right to exist, at least as long as its existence does not immediately imperil humanity.

**WE ARE NOT YET THE KIND OF CIVILIZATION THAT CAN LIVE ANYWHERE IN THE COSMOS. WE MUST FIRST CHANGE OUR VALUES AND BEHAVIOR HERE ON EARTH-Polk ‘07**

[Kevin Scott; M.S. in astronomy from the University of Washington; *Gaiome: Notes on Ecology, Space Travel and Becoming Cosmic Species*; 2007; pg. 264]

We are not yet the kind of civilization that can live for long anywhere in the cosmos, not even here on Earth. By embracing conquest, growth and waste, we have decimated the ecosystems that support us and millions of other species. By relying on extraction and consumption rather than regeneration, we never developed the skills it would take to build space-arks, nor the habits it would take to make them succeed.

To contribute to our survival rather than our destruction, your ecological footprint and mine must drop below a renewable 1.8 hectares. If you’re an American, that’s six times less than your neighbors: a hard number to achieve. If you have two or more children, your footprint needs to be smaller still. 4 Anything more than this leads directly to the resource wars that are engulfing our planet.

**OUR DESTRUCTIVE RELIANCE ON TECHNOLOGY CULMINATES IN THE TECHNOLOGIST AS HERO, EXPLORING AND SETTLING THE SOLAR SYSTEM-Sessions 85**

**[**George, Professor of Philosophy, Sierra College, *Deep Ecology*, 1985]

A third scenario would be that the environmental/ecology movement would be coopted and incorporated into the New Age Aquarian Conspiracy, which views the Earth as primarily a resource for human use. The popularity of Jesuit scholar Pierre Eilhard de Chardin and technologist R. Buckminster Fuller is testimony to the continuing appeal of anthropocentrism (human-centeredness) and to a teleological vision of humans as God's chosen instruments of progress and evolution. Teilhard is criticized in our discussion of the management of natural resources, but he is an inspiration for many people in industries such as genetic engineering, computer technology, and mass media. California's famed Silicon Valley south of San Francisco has thousands of liberal, articulate, upscale, youngish professionals who are "turned on" by high technology, visions of human colonies on Mars, space travel, and humans as copilots of "spaceship Earth." Ecologist James Lovelock, in Gaia: A New Look at Life on Earth, states the New Age vision: "In a Gaian world our species with its technology is simply an inevitable part of the natural scene. Yet our relationship with our technology releases ever-increasing amounts of energy and provides us with a similarly increasing capacity to channel and process information. Cybernetics tells us that we might safely pass through these turbulent times if our skills in handling information develop faster than our capacity to produce more energy. In other words, if we can always control the genie we have let out of the bottle. " Many New Age thinkers conclude that humans' role as partner with Earth's natural processes "need not be vile" but coequal.5 The ultimate New Age fantasy is the metaphor of the spaceship Earth. Humans from spaceship Earth will move to totally man-made and manipulated spaceships carrying colonies of humans to Mars, and the expert - the technologist - will be the hero.

LINK: TECHNOLOGY

**OUR METAPHORS OF PROGRESS AND DOMINANCE SIMPLY UNDERSCORE OUR EVOLUTIONARY PATH TOWARDS EXTINCTION-Bender ‘03**

[Frederick; Professor of Philosophy; University of Colorado; The Culture of Extinction: Toward a Philosophy of Deep Ecology; 2003; pg. 94]

Nor, moreover, should we imagine ourselves evolution's apex or goal. Metaphors of height or progress have no place in a scientific conception of nature. Darwin took great care, unlike many who popularize his ideas, to claim only that natural selection produces descent with modification-not evolution. The latter term is loaded with teleological connotations, while the former displays no telos toward humans. Nor does comparatively recent arrival signify superiority. Just as cogently, Homo colossus's impending self-extinction, along with our anthrogenic destruction of the Holocene ecosphere, marks humans as an evolutionary dead end. Natural selection favors no single set of traits, nor does it ordain any single scale-whether of reason, virtue, or anything else-for judging species' relative merits. Nor is natural selection a ladder-climbing contest toward human intelligence. Species are neither higher nor lower than, nor superior or inferior to, one another. Each simply is what it is: a life form adapted to its ecospheric niche and valuable to the extent it contributes to ecospheric integrity.

**RELIANCE ON TECHNOLOGY DRIVES A RESTLESS, BORED SPIRIT OF EXPLOITATION. WE CAN ONLY SAVE HUMANITY AND THE ENVIRONMENT BY “NOT DOING” AND EMBRACING A NEW BEGINNING THAT GOES BEYOND RELIANCE ON TECHNOLOGY-Zimmerman ‘02**

[Michael; professor of philosophy, Tulane; “Deep ecology, ecoactivism, and human evolution”; ReVision; Spring 2002; Infotrac]

Heidegger's account has been particularly attractive to many deep ecologists, in part because his view of Western history as a history of decline from a great beginning corresponds in certain ways to the view that alienated, self-destructive Western humankind has lost its original sense of unity and harmony with nature. (5) According to Heidegger, the exploitative and domineering disclosure of things in the technological era is the culmination of the 2,500-year "history of being." Since the beginning of the West, a beginning connected with the wonder that the ancient Greeks displayed at the sheer presence of things, the Western understanding of the being of entities gradually degenerated. In the final stage of the history of being, that is, in the technological stage, there is no wonder but rather only boredom and terror: boredom in the face of the one-dimensional character of a world in which everything has been reduced to raw material for production; terrified in the face of a world that has lost its ontological depth and spiritual meaning. For Heidegger, humanity can be saved only if it steps back from the compulsive activism associated with the Will to Power of technological modernity. Only by learning "not-doing," only by "letting things be" can we take part in a "new beginning" that goes beyond the nihilism of the technological age.

**MODERN TECHNOCRATIC CULTURE CAN NEVER ADDRESS THE CRISIS RESPONSIBLE FOR HUMAN DEVASTATION OF THE ENVIRONMENT-Zimmerman ‘97**

[Michael; Contesting Earth's Future : Radical Ecology and Postmodernity; 1997; p. 31-32]

Naess says that reform environmentalism is limited "not due to a weak or unethical philosophy, but due to a lack of explicit concern with ultimate aims, goals, and norms."30 Guided by such concerns, deep ecology challenges the political, economic, and metaphysical presuppositions of technological modernity. Insofar as the ecological crisis is a crisis of character and culture, reforming existing practices without changing self and culture will not suffice in the long run, since such reforms only address certain symptoms (e.g., health-threatening pollution), and not the roots of ecological devastation. George Sessions says that "an ecologically harmonious social paradigm shift is going to require a total reorientation of the thrust of Western culture."31 Maintaining that "progress" purchased at the expense of the natural world is "unequivocal regress," Devall and Sessions take "an uncompromising stand against the main thrust of modern, technocratic culture.''32 They call for a spiritual transformation that will give rise to an "ecological sensibility," which will make possible joyful relationships among people and with nonhuman beings. Such relationships will in turn lead to life-enhancing social and political changes. Faced with the inertia of technological modernity, deep ecologists are at times skeptical about making the transition to an ecological society. Naess once wrote that "the most probable course of events is continued devastation of conditions of life on this planet, combined with a powerless upsurge of sorrow and lamentation."33 But deep ecologists are often more upbeat about the future.34 Retaining countercultural optimism, they envision the possibility that a mature humankind will generate "a new metaphysics, epistemology, cosmology, and environmental ethics of person/ planet.

**PUTTING FAITH IN TECHNOLOGY TO SAVE HUMANITY PREVENTS CRITICAL REFLECTION ABOUT HUMAN BEHAVIOR THAT IS RESPONSIBLE FOR OUR PROFOUNDLY DESTRUCTIVE BEHAVIOR-Kochi and Ordan ‘08**

[Tarik and Noam; An Argument for the Global Suicide of Humanity; Borderlands; Dec 2008; available at <http://findarticles.com/p/articles/mi_6981/is_3_7/ai_n31524968/>; retrieved 03 Aug 2011]

In 2006 on an Internet forum called Yahoo! Answers a question was posted which read: "In a world that is in chaos politically, socially and environmentally, how can the human race sustain another 100 years?" The question was asked by prominent physicist Stephen Hawking (Hawking, 2007a). While Hawking claimed not to know 'the solution' he did suggest something of an answer (Hawking, 2007b). For Hawking the only way for the human race to survive in the future is to develop the technologies that would allow humans to colonise other planets in space beyond our own solar system. While Hawking's claim walks a path often trodden by science fiction, his suggestion is not untypical of the way humans have historically responded to social, material and environmental pressures and crises. By coupling an imagination of a new world or a better place with the production and harnessing of new technologies, humans have for a long time left old habitats and have created a home in others. The history of our species, homo sapiens, is marked by population movement aided by technological innovation: when life becomes too precarious in one habitat, members of the species take a risk and move to a new one.

Along with his call for us to go forward and colonise other planets, Hawking does list a number of the human actions which have made this seem necessary. [1] What is at issue, however, is his failure to reflect upon the relationship between environmental destruction, scientific faith in the powers of technology and the attitude of speciesism. That is, it must be asked whether population movement really is the answer. After all, Hawking's suggestion to colonise other planets does little to address the central problem of human action which has destroyed, and continues to destroy, our habitat on the earth. While the notion of cosmic colonisation places faith in the saviour of humanity by technology as a solution, it lacks a crucial moment of reflection upon the manner in which human action and human technology has been and continues to be profoundly destructive. Indeed, the colonisation of other planets would in no way solve the problem of environmental destruction; rather, it would merely introduce this problem into a new habitat. The destruction of one planetary habitat is enough--we should not naively endorse the future destruction of others.

LINK: DEVELOPMENT/CONSUMPTION

**OUR FAILURE TO ENVISION A WORLD WITHOUT OUR RAPACIOUS CONSUMPTION MEANS WE MAY BE THE LAST GENERATION WITH THE CHANCE TO END OUR COMING EXTINCTION- Bender ‘03**

[Frederick; Professor of Philosophy; University of Colorado; The Culture of Extinction: Toward a Philosophy of Deep Ecology; 2003; pg. 107]

Physically and psychologically the old ways suit us best, since genetically we remain virtually identical to our Paleolithic forbears. This, incidentally, is why contemporary hunter-gatherers, direct heirs of the old ways, remain remarkably alike around the globe. We fear that if modern society reconstructed itself for ecological sustainability, then we would have to regress to intolerably primitive and impoverished hunting-foraging. Such a simplistic, all-or-nothing approach in fact describes the consequences we should expect from overshoot and collapse if we do not otherwise change proactively. If not, our none-too-numerous descendants will return to hunting-gathering by default. Business-as-usual portends just such a dismal future. We are perhaps the last generation of Homo colossus with the opportunity and responsibility to prevent the default scenario.

**CORPORATE EXPLOITATION AND DEVELOPMENT ARE AT THE ROOT OF OUR DESTRUCTIVE BEHAVIOR-Zimmerman ‘97**

[Michael; Contesting Earth's Future : Radical Ecology and Postmodernity; 1997; p. 28]

In addition to lifestyle changes, deep ecologists call for structural changes in social, economic, and political institutions. Sessions proposes that the United Nation establish an Environment Council, analogous to the Security Council, which would provide an integrated ecospheric-protection approach to population issues, Third World economic development, and wildlife habitat preservation.19 Unfortunately, Sessions notes, many Third World countries are now embracing American-style capitalism's gospel of growth, which deep ecologists regard as incompatible with an ecologically sustainable, long-range future. He describes the "new world order" as an "octopus" intertwined with multinational corporations and markets, and lacking any allegiance to any country, "as the working classes of America and the world are now beginning to realize to their dismay."

**DEEP ECOLOGY DOES NOT REJECT HUMANITY, BUT THE INDUSTRIAL ELITES WHO EXPLOIT RESOURCES FOR THEIR BENEFIT-Zimmerman ‘97**

[Michael; Contesting Earth's Future : Radical Ecology and Postmodernity; 1997; p. 32-33]

But critics like Charles Kruathammer, charging deep ecologists with being immature and, worse, with engaging "in earth worship to the point of idolatry," assert that a "sane" environmentalism must be "entirely anthropocentric" and must declare "unashamedly" that " nature is here to serve man." Deep ecologists retort that it is usually not "man" in general, but industrial elites who benefit most from ecologically devastating technologies. Further, unless people respect life for its own sake, not merely for its utility, technological civilization will ultimately destroy itself. Some say the choices facing us are limited: either retain the industrialism model and watch the planet die, or hope that model collapses so that the earth may live. David Ehrenfeld asks: "What is the gentlest Gollum [sic]—one that in the final act of self-destruction will take with it merely a finger of civilization, not the whole body?" His answer: "[G]lobal economic depression, coming soon, without war if that is possible, and resulting in a collapse of the present world economic system and along with it the collapse of exploitative industry." Though his hope is that economic collapse would allow earth's ecosystems to recover, such a social calamity might not foster ecological well-being, but might well pave the way for authoritarian leaders who would wreak even greater ecological havoc. Since total economic collapse would probably trigger off war, starvation, and disease that would kill hundreds of millions of people, one may detect a hint of misanthropy in the hope that industrial collapse would save life on earth. Tending to agree with Ehrenfeld that "the true misanthropists are those who are struggling to hold to the mad course that we are now pursuing with such relentless enthusiasm and such little heed for the ultimate cost," however, many deep ecologists would say that a measure of human suffering in the short term must be weighed against the possibility of tremendous long-term suffering if present practices are not changed. Of course, deep ecologists hope that the transition to an ecological age will minimize suffering for all concerned. Hence, they envision what Theodore Roszak has called the "creative disintegration of industrial society."

LINK: RESOURCISM

**AS LONG RESOURCISM DRIVES DISCOURSE AND THINKING, WE CAN NEVER ABANDON THE DESTRUCTIVE MINDSET THAT MAKES ENVIRONMENTAL DEGRADATION INEVITABLE-Smith ‘08**

[Mick; Professor of Philosophy and Social Theory; Queen’s College; Suspended Animation: Radical Ecology, Sovereign Powers, and Saving the (Natural) World; Journal for the Study of Radicalism; 2.1; 2008; Project Muse]

Of course, speaking the language of resource economics may, on occasion, persuade sovereign powers to grant this or that aspect of the natural world a temporary stay of execution. But, as Neil Evernden1 argues, it also, wittingly or unwittingly, accepts the original terms on which nature's death warrant has already been signed. It concedes everything to an understanding of the world as no more than what Heidegger (1993) refers to as a "standing reserve" of lifeless, that is, de-animated and nonautonomous, "matter" systematically ordered according to a technological enframing (Gestell).2 The forests and their myriad inhabitants are thus conceptually reduced to so many board feet of timber, the once roaring rivers to so many kilowatt hours of hydroelectricity. From more radical perspectives, and at the risk of seeming ungrateful for small mercies, we might regard even those patches of the world momentarily set aside from more corrosive forms of technologically mediated commodification as beings left in a state of suspended animation, as hanging dearly onto bare life above the gallows-drop of global capitalism. The fate of the world's whales is only one case in point—though "fate" is not [End Page 2] the right word here, since their salvation or extinction is, for the moment at least, in human hands and not an issue predetermined by irresistible (super)natural forces.

We should bear in mind then that, like realpolitik, fate too provides a rubric that falsely naturalizes worldly apathy. Both terms imply that ethico-political action is irretrievably subservient to sovereign powers, powers envisaged as progress or the invisible hand of the market, which we must accept since they cannot be resisted. But neither term has a place in a politics for the real (natural) world precisely because, at least from the perspective of radical ecology, this naturalization is indeed false. Nature is not the source of the short-term, calculating, self-interested individualism that constitutes the (a)social world envisaged by contemporary advocates of realpolitik, nor should it be made subject to it. Nor is nature a synonym for, or ruled by, fate's decree; it is not governed by powers that impose a predetermined order on the world's unfolding. The radical ecologist doesn't want to save whales from realpolitik only to make them subject to some other predetermined fate (as those who reject all interference in natural processes might do), nor do they want to preserve them in timeless aspic in a museum or a dolphinarium. To save the whales is to free them from all claims of human sovereignty, to release them into the flows of evolutionary time, of natural history, just as they release themselves into the flows of the world's oceans. This saving is an ethico-political action.

**THE FRAMING OF NATURE AS RESOURCE MUST BE REJECTED-Bender ‘03**

[Frederick; Professor of Philosophy; University of Colorado; The Culture of Extinction: Toward a Philosophy of Deep Ecology; 2003; pg. 400-01]

In his second point, Naess called for an ethic of minimal human destructiveness, based on the principle of biospheric egalitarianism, in place of our customary anthropocentric, master-thing relation to nature. Biospheric egalitarianism, undefined in the speech itself, evidently entails that we embrace all things equally. To "embrace all things," as Lao Tzu says, "means one rids onself of any concept of separation."9 Of course, human survival requires some killing or exploitation of nonhuman organisms, commensurate with genuine needs, like what was practiced among old-ways peoples. Thus, we should do as little harm as possible, recognizing other beings' right to live and flourish (Spinoza's conatus, or Naess's self-realization, principle). Since we are all connected, we harm ourselves whenever we unduly harm our fellow beings. Far from being idealistic or impractical, causing no unnecessary ecospheric harm becomes increasingly urgent the closer we approach overshoot. Hunter-gatherers long have known the taking of nonhuman life can be ethical only if grounded in a nondualist ethic of gratitude, care, and minimal impact. As Gary Snyder says, "nature is a gift exchange, . . And there is no death that is not somebody's food, no life that is not somebody's death.10)

In practice, any ethic requires the prior development of the appropriate sensibilities, as Aldo Leopold argued. Accordingly, Naess's third nondualist principle-that diversity and symbiosis in intrahuman and human-natural relationships are intrinsic goods-is steeped in ecological awareness. The framing of nature as resources, even as resources we should conserve, must be rejected and customary human systems changed, if necessary, to sustain diversity and ecospheric integrity. For example, we must repudiate cornucopianism, the false belief that Earth offers resources sufficient for every imaginable human desire. If we recognized diversity and symbiosis as intrinsic goods, then we would have reason to redesign our economy in accord with frugality, elegant simplicity, minimal throughput, and "doing more with less."

**WE MUST REJECT TENDENCY TO VIEW NATURE AS A RESOURCE SEPARATE FROM HUMANITY-Zavestoski ‘03**

[Steve; Professor of Sociology, University of San Francisco; Identity and the Natural Environment : the Psychological Significance of Nature; 2003; pg. 299]

If the self-concept is shaped by social interaction, and if identities link individuals to a role in society, what exactly is an "ecological identity?" And how can ecological identities emerge unless we can interact socially with aspects of the natural world? I conceptualize ecological identity as that part of the self that allows individuals to anticipate the reactions of the environment to their behavior.

The deep ecology philosophy, which advocates a broadening of the self to include nature (Naess, 1989), helps to illustrate ecological identities. John Seed's description of his motivation for protecting the rainforest captures such a broadening of the self: "I try to remember that it's not me, John Seed, trying to protect the rainforest. Rather, I am part of the rainforest protecting itself. I am that part of the rainforest recently emerged into human thinking" (Seed, Macy, Fleming, & Naess, 1988, p. 36). Zimmerman's understanding of deep ecology argues that "intellectual conclusions alone are not sufficient to bring about a basic shift in one's attitude toward nature. . . . Such a shift requires a change of consciousness, an intuitive sense of identification with all things" (1993, p. 199).

Although deep ecologists such as Naess speak of an ecological self, others have referred to an ecological identity (Thomashow, 1995). For Thomashow, "ecological identity refers to all the different ways people construe themselves in relationship to the earth as manifested in personality, values, actions, and sense of self;" which results in "nature becom[ing] an object of identification" (1995, p. 3).

LINK: POLICY

**CIVILIZED ELITES USE POLICY TO PREVENT TRUE FREEDOM, BLOCKING THE SPIRIT NECESSARY TO SOLVE THE ENVIRONMENTAL CRISIS-Kowalewski ‘00**

[David; Deep Power: The Political Ecology Of Wilderness And Civilization; 2000; pg. 105-06]

Political elites have told us that their rule is based on some kind of implicit or explicit consent. But the truth is, of course, that political power in civilization is rarely if ever based on love and instead is based on fear. The foundation of civilized rule, whether dictatorial or democratic, is the fear of the rulers by the ruled.

All civilized humans are unfree in their political systems, because to survive in civilization they have to disown their wild-within. Domination over humans flows directly from domination of the land; agriculture was the first human-rights violation. In civilization, the wild citizen is quickly dealt with by parents, school-superintendents, police, psychologists, and neighbors. Civilizational elites ensure their rule by stifling the desire to be wild, to be out of control. Humans can only be free from political tyranny when they reclaim their wild- within. The wild-within, of course, is the spirit-that-moves- within¬all-things. Elites thrive, however, by blocking the spirit--this is precisely why the U.S. government outlawed spirit-dancing in the Pacific Northwest, ghost-dancing in the Dakotas, and so on. Elites promise freedom, but they are all the time restricting it.

Elites also say that nonelites need them for protection from the uncivilized barbarism of the wild. Yet their refusal to teach nonelites to survive in the wild outside of civilization engenders the very fear of nature that elites base their rule upon. At the bottom of nonelites' fear of elites is their fear of nature. A fearful populace, as all political philosophers know, is ripe fodder for the tyrant.

Further, the freedom promised by elites is illusory, since one can only be free when able survive comfortably in the wild. Without primitive skills, it is a myth that civilized humans can leave their dependence on elites.

Humans are free when they georesonate. They know this especially at those times when they feel "in the flow." Then they feel totally free. Athletes occasionally recognize this feeling. When they enter the flow, the zone, they feel no stress at all.

ALTERNATIVE: TREATMENT OF ANIMALS

**MUST END BELIEF THAT ANIMALS ARE PROPERTY BEFORE WE CAN SOLVE-Bartlett ‘02**

[Steven; Research Professor of Philosophy, Oregon State University; “ROOTS OF HUMAN RESISTANCE TO ANIMAL RIGHTS: PSYCHOLOGICAL AND CONCEPTUAL BLOCKS”; Animal Law; 2002]

Animals are property. These three words - and their legal implications and practical ramifications - define the most significant doctrines and cases ... and the realities for current practitioners of animal law. n1

For many people in our society, the concept of legal rights for other animals is quite "unthinkable." That is because our relationship with the [\*144] majority of animals is one in which we exploit them: we eat them, hunt them and use them in a variety of ways that are harmful to the animals. The idea that these animals feel pain and that they have interests which call out for recognition is too close for comfort.

... As long as animals are property, we will face severe limitations in our ability to protect them and their interests.

... In all legally relevant ways, other animals possess the qualities that compel us to put aside convention and convenience, and realize that we have ignored and violated their rights for far too long. Animals are not "things" and a legal system which treats them as mere property is intrinsically flawed. (ellipsis in original) pathogen. n146 The psychology of parasite selfishness shares much with the psychology of narcissism, for in both parasitism and narcissism attention is confined to the immediacy of self-interest.

**WE CAN MAKE AN ETHICAL DISTINCTION BETWEEN SENTIENT ANIMALS AND THOSE THAT ARE NOT-Degrazia ‘02**

[Daniel; Animal Rights: A Very Short Introduction; 2002; [www.questia.com](http://www.questia.com/); retrieved 28 May 2006]

A claim of moral equality on behalf of animals is surely not plausible if one means literally all animals, including centipedes, slugs, and amoebas. For it is extremely doubtful that such creatures are sentient. Sentience is more than the capacity to respond to stimuli; it is the capacity to have at least some feelings. Feelings include (conscious) sensations such as pain — where ‘pain’ refers to something felt and not merely the nervous system's detection of noxious stimuli — and emotional states such as fear. We do not know at what point on the phylogenetic scale, or evolutionary tree, sentience disappears, being replaced by more primitive, non-conscious neural mechanisms. But, as we will see in Chapter 3, there is strong evidence that at least vertebrate animals are sentient and little or no evidence that the most primitive invertebrates are sentient. The reason for emphasizing sentience is that non-sentient beings — lacking any capacity to feel, think, or have any other mental states — are incapable of ever caring about how they are treated. It is therefore doubtful that they can be harmed or benefited in any morally important way.

**THE CLAIM THAT SENTIENT ANIMALS DESERVE EQUAL CONSIDERATION AND PROTECTION FROM HARM IS DEFENSIBLE-Degrazia ‘02**

[Daniel; Animal Rights: A Very Short Introduction; 2002; [www.questia.com](http://www.questia.com/); retrieved 28 May 2006]

On the other hand, the claim that sentient animals deserve equal consideration is within reason. This claim entails that wherever a human and an animal have a comparable interest, we should regard the animal's interest and the human's interest as equally morally important. To apply this idea, first we need to determine whether we have a case of comparable interests between humans and animals: do the human and animal have roughly the same thing at stake? Consider the interest in avoiding suffering. A defining feature of suffering is that it is highly unpleasant, aversive, or ‘negative’ from the standpoint of the subject who suffers. Suffering lowers one's experiential well-being or quality of life while one suffers. It seems plausible, then, that all beings capable of suffering have a comparable interest in not suffering. If sentient animals deserve equal consideration, then a cow's interest in not suffering is as morally important as a human's interest in not suffering — though different equal-consideration theories, such as utilitarianism and strong animalrights views, will interpret this judgement in slightly different ways. If equal consideration should not extend to sentient animals, then a cow's suffering matters less than a human's suffering. (Unless otherwise indicated, the word ‘animals’ will hereafter refer to sentient animals in particular.)

**PAIN OF EVERY SPECIES IS EQUALLY IMPORTANT TO AVOID-Singe and Mason ‘06**

[Pete, professor of bioethics, Princeton and Jim, attorney; The Way We Eat: Why Our Food Choices Matter; 2006; pg. 247-8]

Those who defend our present treatment of animals often say that the animal rights movement would have us give animals the same rights as humans. This is obviously absurd—animals can't have equal rights to an education, to vote, or to exercise free speech. The kind of parity that most animal advocates want to extend to animals is not equal rights, but equal consideration of comparable interests. If an animal feels pain, the pain matters as much as it does when a human feels pain. Granted, the mental capacities of different beings will affect how they experience pain, how they remember it, and whether they anticipate further pain—and these differences can be important. But the pain felt by a baby is a bad thing, even if the baby is no more self-aware than, say, a pig, and has no greater capacities for memory or anticipation. Pain can be a useful warning of danger, so it is sometimes valuable, all things considered. But taken in themselves, unless there is some compensating benefit, we should consider similar experiences of pain to be equally undesirable, whatever the species of the being who feels the pain.

**MUST AVOID SEEING ANIMALS AS PROPERTY-Lin ‘10**

[Doris; Animal Rights Attorney; Animals as Property; <http://animalrights.about.com/od/animallaw/a/AnimalsProperty.htm>; retrieved 23 August 2011]

One of the basic tenets of animal rights is that animals should be free from human use and abuse. On a philosophical level, abolishing the property status of all animals would be a great step forward in animal rights, because it would make it more difficult, if not impossible, for animal exploiters to continue using animals. On a more practical level, there are important legal reasons, right now, why pets should not be treated as property, so the debate over the property status of animals usually centers around pets.

Animal ownership is the right to possess and control an animal, as well as the right to sell the animal. Humans currently have those legal rights. Breeders can sell rats to laboratories to endure all kinds of torturous experiments before being killed. In most states, factory farms can keep veal calves chained by the neck in wooden crates and then send them to slaughter while they are still very young. If someone takes or kills your dog or cat, courts are reluctant to award more than “fair market value” to compensate you for the loss of your animal, even if Fluffy was a beloved family member. Even wild animals are treated as property. As soon as a wild animal is legally killed by a hunter, that animal’s body becomes the property of the hunter.

**ALTERNATIVE: RECOGNITION OF THE RIGHTS OF ANIMALS TO LIVE FREE OFBartlett ‘02**

[Steven; Research Professor of Philosophy, Oregon State University; “ROOTS OF HUMAN RESISTANCE TO ANIMAL RIGHTS: PSYCHOLOGICAL AND CONCEPTUAL BLOCKS”; Animal Law; 2002]

For advocates of animal rights, the desired goal state is articulately expressed by Joyce Tischler, Executive Director of the Animal Legal Defense Fund, writing:

Those of us at the heart of the animal law movement envision a world in which the lives and interests of all sentient beings are respected within the legal system, where companion animals have good, loving homes for a lifetime, where wild animals can live out their natural lives according to their instincts in an environment that supports their needs - a world in which animals are not exploited, terrorized, tortured or controlled to serve frivolous or greedy human purposes.

ALTERNATIVE: INDIVIDUAL ACTION

**GRASS ROOTS ACTIVISM IS THE KEY TO SOLVE OUR DESTRUCTIVE WAYS-Cramer ‘98**

[Phillip; Deep Environmental Politics: The Role of Radical Environmentalism in Crafting American Environmental Policy; 1998; p. 10]

Many deep ecologists have formed loose associations, the largest one being Earth First! They have become disenchanted with the current pace and progress of environ­mental policy as guided by many mainstream (and shallow ecological) environmental groups. As David Foreman, a co-founder of the group Earth First!, stated:

Too many environmentalists have grown to resemble bureaucrats-pale from too much indoor light; weak from sitting too long behind desks; co-opted by too many politicians.... By playing a "professional" role in the economic rational game, we, too, acquiesce in the destruction of the Earth. Instead, we must redefine the battle. We must stop playing the games of political compromise the industrial power brokers have designed for us.... The time has come to translate the non-violent methods of Gandhi and Martin Luther King to the environmental movement. We must place our bodies between the bulldozers and the rain-forest; stand as part of the wilderness in defense of herself; clog the gears of the polluting machine, and with courage, oppose the destruction of life."

Deep ecology gains its strength through grass-roots activism.

**ENVIRONMENTAL TRANSFORMATION DEPENDS ON INDIVIDUAL ACTION-Brown ‘97**

[Kirk; grad student, McGill University; “From the Inside Out: Building A Sustainable Environmental Movement”; The Trumpeter; 1997; <http://trumpeter.athabascau.ca/content/v14.2/brown.html>; retrieved 11 Aug 2003]

The environmental movement is, at its core, a healing profession bent on restoring eco-system, community, and ultimately, personal well-being. But its drive for a life-affirming sustainability is focused upon the world out there, while its collective, task-driven psyche is burdened with emotions that counsel life's end. We cannot implement a sustainable society unless we learn how to cultivate sustainable psyches; these are parallel healing processes.14 Inner nature and outer nature, both are faces of the same Nature.

Articulation of a vision for a sustainable environmentalism and for a sustainable world cannot be accomplished by issuing a joint call to arms and a few apocalyptic press releases.20 Transformation begins in the hearts and minds of those whose vision is clear enough to create what can be, not simply react against, and thus remain stuck to, what isn't. Vision-making is optimistic (though not unrealistic) and joyful work, embodying the vital energy needed to move forward with the myriad patient acts of creation.7 The attracting potential of a desirable world is what human nature finds it easy to say yes to. And ultimately, as Wendell Berry wisely observes, pleasure is what gets the job done.

**INDIVIDUAL ACTION IS KEY TO CHANGE OUR RELATIONSHIP TO NATURE-Polk ‘07**

[Kevin Scott; M.S. in astronomy from the University of Washington; *Gaiome: Notes on Ecology, Space Travel and Becoming Cosmic Species*; 2007; pg. 241]

There is, however, a place where the problem of consumption is most severe. Happily, it is also where change can begin immediately, without waiting for large political constituencies to meet, debate, align, vote, ratify, fund and phase in. That place of desperate need, immediate action and rapid results is, of course, your home.

If the engines of commerce and politics are the levers that move the world, their fulcrum is your own life. How you choose to make and spend your money has everything to do with how the world is configured today. You probably work at a job that pays many times the world average. The most competitive among the developing nations may hate to admit it, but it is how you define success that they seek to surpass. You are a world leader and you cannot resign.

This chapter distills some lessons from gaiome design into strategies that you can use to leave the extractive economy, embrace the solar economy and so lead the world. You do not have to sign a pledge, join an organization, go to conferences, move to the country or give up all worldly possessions. Far from it. Life is everywhere connected and bounteous. There’s still a regenerative ecology all around you. Here’s how to rejoin it.

ALTERNATIVE: REJECT ANTHROPOCENTRISM

**ONLY BY REJECTING THE METAPHOR OF HUMANS AS CONQUERORS CAN WE MOVE TOWARDS AN ETHIC OF RESPECT FOR THE NATURAL WORLD- Bender ‘03**

[Frederick; Professor of Philosophy; University of Colorado; The Culture of Extinction: Toward a Philosophy of Deep Ecology; 2003; pg. 317-18]

Odysseus's story also illustrates how deeply rooted cultural prejudices blind us to our responsibilities. Formerly, arguing that slaves deserved moral standing because they were human seemed absurd. Today we balk at the Land Ethic because our worldviews are dualistic (nature is an object; only humans are subjects) and anthropocentric ("be fruitful, multiply and subdue the earth"). We are as misinformed about our place in nature as Odysseus was about human rights. For the Land Ethic to become effective we need to revolutionize our basic assumptions or worldview. To this end, Leopold calls for broad educational reform, to enhance biological literacy through formal instruction and firsthand experience. The goal is not merely to increase knowledge, but to promote the development of moral and aesthetic sensibilities concerning humans' need of, and proper place in, a healthy landscape. Leopold calls this the development of ecological perception. It includes becoming aware of "the natural processes by which the land and the living things upon it have achieved their characteristic forms (evolution) and by which they maintain their existence (ecology) (290). Properly guided and starting from the conviction of personal responsibility for the land's health, one might develop an ecological conscience that would make possible the internalization of the Land Ethic.

Leopold spoke of such a conversion, from our accustomed dualistic standpoint to its holistic opposite, in the cryptic terminology of the A-B cleavage (258-59). The standpoint he labeled A is that of viewing the land as commodity or resource, corresponding to exploitationism and conservationism. In contrast, the B standpoint-that of ecological thinking-frames land as biota. Only from the B perspective, for example, can we see that farming, logging, and other extractive processes radically alter the biota; the biota does not register conceptually under the A perspective. Correspondingly, we can frame ourselves conceptually either as man-the-conqueror (Lord Man, Homo colossus), or as "plain citizen of the biotic community" (260). Only with the latter can the land ethic register and behavior significantly change.

**ADDRESSING THE COLLAPSE OF THE ECOSPHERE WILL DEPEND ON A DEEP, HOLISTIC LOOK AT THE ENVIRONMENT-Bender ‘03**

[Frederick; Professor of Philosophy; University of Colorado; The Culture of Extinction: Toward a Philosophy of Deep Ecology; 2003; pg. 404]

Depth, in sum, metaphorically means nondualism. Temporal depth stands for the deeply archaic, long-repressed hunter-gatherer, even hominid or primate sensitivities and lifeways, or deep mind. Depth also connotes rootedness in place, for example, in local ecosystems, food webs, and the ecosphere as a whole. It symbolizes right-brained, intuitive, holistic understanding, in tandem with abstract, logical, left-brained thinking. Depth connotes also an aesthetic of joyful finitude, heightened sensibilities associated with experiencing and affirming ourselves as parts of the Great Round of life and death. Attaining depth connotes spiritual transformation17 or enlightenment. It refers also to depth of commitment to bringing nondualist insight to bear on philosophical and practical issues. Finally, as the movement to change "everything," deep ecology also overlaps with bioregionalism, ecodefense, social ecology, and ecofeminism, wherever, as in Naess's 1972 speech, these movements are compatible with nondualism. In sum, deep ecology combines Paleolithic sensibility, nondualist metaphysics and spirituality, ecology, and recognition of the need for struggle.

**THE MOST URGENT PROBLEM FACING HUMANITY IS ENDING THE VALUE STRUCTURES THAT UNDERLIE OUR DESTRUCTION OF THE PLANET-Kowalewski ‘00**

[David; Deep Power: The Political Ecology Of Wilderness And Civilization; 2000; pg. 110]

The most urgent political project today is to get civilization off the earth's back, and this can only be done by jettisoning the cognitive energy-forms that keeps it there: nationalism, humanism, and contempocentrism.

Humans first need to abandon the disastrous nationalist, or nation-state, system based on ethnarchy, namely the unbalanced power-system of nations. The consequences of this imbalance are especially seen in war. The best predictor of the number of wars a country gets into is the amount of material power it has accumulated: the greater the power, the more wars (Cashman, 1993). This scientific law testifies to the notion that power unbalanced becomes power distorted.

**WE HAVE TIME TO PREVENT AN ECOLOGICAL HOLOCAUST, BUT ONLY ONCE WE ABANDON OUR ANTHROPOCENTRIC VALUES-Gottlieb ‘94**

[Roger; professor of humanities at Worcester Polytechnic Institute; Cross Currents, Summer 1994; available at <http://www.crosscurrents.org/feministecology.htm>; retrieved 01 Aug 2011]

In this context, the knowing ego is not set against a world it seeks to control, but one of which it is a part. To continue the feminist perspective, the mother knows or seeks to know the child's needs. Does it make sense to think of her answering the call of the child in abstraction from such knowledge? Is such knowledge necessarily domination? Or is it essential to a project of care, respect and love, precisely because the knower has an intimate, emotional connection with the known?(30) Our ecological vision locates us in such close relation with our natural home that knowledge of it is knowledge of ourselves. And this is not, contrary to Levinas's fear, reducing the other to the same, but a celebration of a larger, more inclusive, and still complex and articulated self.(31) The noble and terrible burden of Levinas's individuated responsibility for sheer existence gives way to a different dream, a different prayer:

Being rock, being gas, being mist, being Mind,

Being the mesons traveling among the galaxies with the speed of light,

You have come here, my beloved one. . . .

You have manifested yourself as trees, as grass, as butterflies, as single-celled beings, and as chrysanthemums;

but the eyes with which you looked at me this morning tell me you have never died.(32)

In this prayer, we are, quite simply, all in it together. And, although this new ecological Holocaust -- this creation of planet Auschwitz -- is under way, it is not yet final. We have time to step back from the brink, to repair our world. But only if we see that world not as another across an irreducible gap of loneliness and unchosen obligation, but as a part of ourselves as we are part of it, to be redeemed not out of duty, but out of love; neither for ourselves nor for the other, but for us all.

**TO ADDRESS ECOCIDE WE MUST REFRAME OUR ANTHROPOCENTRIC WORLDVIEW-Bender ‘03**

[Frederick; Professor of Philosophy; University of Colorado; The Culture of Extinction: Toward a Philosophy of Deep Ecology; 2003; pg. 69]

Ecocide is the result of human-chauvinist behaviors, long legitimated by religious and philosophical errors-chief among them the anthropocentrism and human chauvinism embedded in the culture of extinction. If so, then really to reframe the debate about the human role on the planet requires a prior critique of anthropocentrism and the human-chauvinist attitudes it supports. Human chauvinism is the deeply ingrained assumption that humans have the right to draw down ecospheric integrity-without concern for limits-to satisfy even the most peripheral human desires. I wish to show analytically that the arguments most commonly cited in support of human chauvinism-arguments that generally carry the day in conventional discourse-are unsound. Such arguments appeal to human needs, to putative human superiority, to the supposed anthropocentric predicament, or to the alleged demands of progress. None withstands logical criticism.

**WE MUST HAVE A PARADIGM SHIFT FROM ANTHROPOCENTRISM TO A RECOGNITION OF THE VALUE OF WILD SPACES-Sessions ‘95**

[George; chairman of the philosophy department at Sierra College; “Ecological State of the World”; excerpt from Deep Ecology for the 21st Century; reprinted at <http://www.innerself.com/Environmental/ecological.htm>; retrieved 21 Jul 2008]

The major reform environmental organizations have in some cases performed brilliantly, and in other cases they have compromised miserably, in their piecemeal political / economic / legal / technological approaches to protecting the environment. By failing to take an ecocentric integrated long-range perspective, by failing to be guided by realistic visions of ecological sustainable societies, and by failing to adequately address the root causes of the eco-crisis, they have managed only to delay some of the worst of the environmental degradation. Overall their strategies and efforts are failing to stem the tide of global environmental destruction.

The crucial paradigm shift the Deep Ecology movement envisions as necessary to protect the planet from ecological destruction involves the move from an anthropocentric to a spiritual/ecocentric value orientation. The wild ecosystems and species on the earth have intrinsic value and the right to exist and flourish, and are also necessary for the ecological health of the planet and the ultimate well-being of humans.

**DEEP ECOLOGY IS ALSO MORE EFFECTIVE TACTICALLY-Naess ‘86**

[Arne; professor of philosophy, University of Oslo; “The Deep Ecological Movement: Some Philosophic Aspects”; Environmental Philosophy: From Animal Rights to Radical Ecology; 2001; pg. 187-88]

A more ecocentric environmental ethic is also recommended apparently for tactical reasons: "A new ethic, embracing plants and animals as well as people, is required for human societies to live in harmony with the natural world on which they depend for survival and well-being." But such an ethic would surely be more effective if it were acted upon by people who believe in its validity, rather than merely its usefulness. This, I think, will come to be understood more and more by those in charge of educational policies. Quite simply, it is indecent for a teacher to proclaim an ethic for tactical reasons only.

**WE MUST MOVE PAST ANTHROPOCENTRIC AIMS TO ADDRESS THE ROOT CAUSES OF ENVIRONMENTAL DEGRADATION-Cramer ‘98**

[Phillip; Deep Environmental Politics: The Role of Radical Environmentalism in Crafting American Environmental Policy; 1998; p.4]

Neverthe­less, it is a philosophy based on the inherent worth of all life (and many would include all that is nonliving as well) and is a local and international movement for social change with deep ecologists sprinkled on both sides of the Atlantic and the Pacific. To those involved in the movement, deep ecology is about transforming the human way of life. It encourages a fundamental shift in the way people experience nature while changing how individuals, localities, and states respond to the environmental crisis. Caused by the anthropocentric nature of human life on this planet, this environmental crisis is imminent, according to the deep ecologists. They seek the healing of alienation from self, community, and the Earth that shallow ecology has caused. These environ­mentalists do not see problems such as oil availability as a problem of shortage; rather, they see it as a problem of consumption. Deep ecologists look to the root causes of society's degradation of nature and the subsequent degradation of peoples throughout the world.

A/T: PERM

**NO PERM: WE CANNOT MEDIATE BETWEEN THE EXISTING VALUE / ECONOMIC STRUCTURE AND THE CHANGES NECESSARY TO PREVENT CATASTROPHE--Sessions ‘95**

[George; chairman of the philosophy department at Sierra College; “Ecological State of the World”; excerpt from Deep Ecology for the 21st Century; reprinted at <http://www.innerself.com/Environmental/ecological.htm>; retrieved 21 Jul 2008]

The leading ecotheologian Thomas Berry recently claimed that modern people "just don't get it. They don't comprehend how deeply rooted it is, the crisis that confronts us!... the order and magnitude of the present catastrophic situation is... so enormous, so widespread, and we don't know what we are doing." Berry further claims that

reconciliation between [the developers and the ecologists] is especially difficult because the commercial-industrial powers have so overwhelmed the natural world in these past two centuries that there is, to the ecologist, no question of further adaptation of natural systems to the human. The oppression of the natural world by the plundering of the industrial powers has so endangered the basic functioning of natural forces that we are already on the verge of total dysfunctioning of the planet. We cannot mediate the situation as though there were presently some minimal balance already existing that could be slightly modified so that a general balance could come into being. The violence already done to the earth is on a scale beyond all understanding.... The change required by the ecologist is a drastic reduction in the plundering processes of the commercial industrial economy.... Never before has the human community been confronted with a situation that required such a sudden and total change in life style under the threat of a comprehensive degradation of the planet."

**NO PERM: CANNOT SAVE THE ENVIRONMENT WHILE CONTINUING TO EMBRACE THE WORLDVIEW THAT WE NEED TO VIEW THE ENVIRONMENT IN TERMS OF RESOURCES- Smith ‘08**

[Mick; Professor of Philosophy and Social Theory; Queen’s College; Suspended Animation: Radical Ecology, Sovereign Powers, and Saving the (Natural) World; Journal for the Study of Radicalism; 2.1; 2008; Project Muse]

The idea of saving the (natural) world has about it an air of ridiculous naivety. Indeed it openly invites ridicule. First, it seems unrealistically grandiose in the scope of its ambition. How could one hope to save a whole world or to keep all of nature safe? Second, it appears too close to the patronizing and dangerous religiosity of those who want to save "America" or our souls for Jesus and free-enterprise (a somewhat strange combination), whether or not we want to be so saved. Does the natural world really want or need saving, and for whom? Third, it is all too readily compared, and all too rarely contrasted, with the kind of mindless fundamentalisms that, with proselytizing fervor, posit single, simple, but mutually contradictory ends for humankind. After all, aren't there many world-views, and correspondingly many understandings of what saving the natural world might entail? And of course, there are. And yet it might still be suggested that, deep down, radical ecologists strive to save what they can of the natural world, that this is their fundamental ethical and political concern.

What is more, this ethical and political concern separates radical ecologists, those who would go to the root of that which threatens the world, from the purveyors of environmental expediency, from the "shallow" (to use Arne Naess's term) environmentalists who formulate all concerns for the natural world within the globally dominant language of resource economics [End Page 1] and management. It expresses the difference between those who regard the natural world as a "realm of ends" (to adopt a Kantian idiom) and those who account it merely a "storehouse of means" of value only because of its potential usefulness toward humanly determined ends. On this latter view the world is worth saving only in the sense that one might prudently save money for a rainy day, only as natural capital that earns us interest, rather than as that which is deserving of our interest, our concerns.

**EVEN AN AFFIRMATIVE PROJECT TO “DO GOOD” COULD RESULT IN THE SAME KIND OF DESTRUCTIVE, EXPLOITATIVE BEHAVIOR THAT HAS CHARACTERIZED HUMAN HISTORY-Kochi and Ordan ‘08**

[Tarik and Noam; An Argument for the Global Suicide of Humanity; Borderlands; Dec 2008; available at <http://findarticles.com/p/articles/mi_6981/is_3_7/ai_n31524968/>; retrieved 03 Aug 2011]

Thinkers like Hawking, who place their faith in technology, also place a great deal of faith in a particular view of a human heritage which they think is worth saving. When considering the question of survival, such thinkers typically project a one-sided image of humanity into the future. Such a view presents a picture of only the good aspects of humanity climbing aboard a space-craft and spreading out over the universe. This presumes that only the 'good aspects' of the human heritage would survive, elements such as 'reason', creativity, playfulness, compassion, love, fortitude, hope. What however happens to the 'bad' aspects of the human heritage, the drives, motivations and thoughts that led to the Holocaust for example?

When thinking about whether the human species is worth saving the naive view sees these good and bad aspects as distinct. However, when thinking about 'human nature' as a whole, or even the operation of human reason as a characteristic of the Enlightenment and modernity, it is not so easy to draw clear lines of separation. As suggested by Theodor Adorno and Max Horkheimer (1997), within what they call the 'dialectic of enlightenment', it is sometimes the very things which we draw upon to escape from evil, poverty and harm (reason, science, technology) which bring about a situation which is infinitely more destructive (for example the atom bomb). Indeed, it has often been precisely those actions motivated by a desire to do 'good' that have created profound degrees of destruction and harm. One just has to think of all the genocides, massacres and wars within history justified by moral notions such as 'civilisation', 'progress' and 'freedom', and carried out by numerous peoples acting with misguided, but genuine intentions. When considering whether humanity is worth saving, one cannot turn a blind eye to the violence of human history.

**NO PERM: NOTHING SHORT OF FUNDAMENTAL CHANGE FROM INDUSTRIAL SOCIETY HAS ANY CHANCE OF ENDING THE LONG PROCESS OF HUMAN VIOLENCE AGAINST THE NATURAL WORLD-Kochi and Ordan ‘08**

[Tarik and Noam; An Argument for the Global Suicide of Humanity; Borderlands; Dec 2008; available at <http://findarticles.com/p/articles/mi_6981/is_3_7/ai_n31524968/>; retrieved 03 Aug 2011]

The move towards critical historical reflection, the assuming of responsibility, and action guided by such an attitude, is certainly a better approach than shutting one's eyes to the violence and errors of human history or placing blind faith in technology. Indeed, criticism of these latter views is heard from within eco-ethics circles themselves, either by labelling such endeavours as 'technofix' or 'technocentric' (Smith, 1998), or by criticizing the modes of action of green-politics as 'eco-bureaucracy' and 'men-politics' (Seager, 1993). However, even if we try to avoid falling into the above patterns, maybe it is actually too late to change the course of the events and forces that are of our own making. Perhaps a modern discourse or belief in the possibilities of human action has run aground, hamstrung by its own success. Perhaps the only forms of action available are attempts to revert to a pre-industrial lifestyle, or a new radical form of action, an action that lets go of action itself and the human claim to continued habitation within the world. In this case, the action of cosmic colonisation envisaged by Hawking would not be enough. It would merely perpetuate a cycle of destructive speciesist violence. Further, general humanist action, guided by some obligation of 'care' for the environment, would also not be enough as it could not overcome an individual's complicity in systematic and institutional speciesist violence.

The question here is open. Could a modern discourse of reflection, responsibility and action be strong enough to fundamentally reorientate the relationship between humans and other species and the natural environment? If so, then maybe a truly revolutionary change in how humans, and specifically humans in the West, conceive of and interact with the natural world might be enough to counter environmental disaster and redeem humanity. Nonetheless, anything short of fundamental change--for instance, the transformation of modern, industrial society into something completely different--would merely perpetuate in a less exaggerated fashion the long process of human violence against the non-human world.

Answers

PERM

**REFORMIST VIEWS CAN BE ACCOMMODATED WITHIN DEEP ECOLOGICAL FRAMEWORK-Zimmerman ‘97**

[Michael; professor of philosophy, Tulane; Contesting Earth's Future : Radical Ecology and Postmodernity; 1997; p. 33-34]

Yet friendly critics like Martin W. Lewis argue that in calling for the end of industrial civilization, deep ecologists "reduce their own potential bases for political power to ever more minuscule, and powerless, groups."41 Similarly, Robert Paehlke holds that real progress can be made in dealing with ecological problems only by working within existing political arrangements. Despite their own rhetoric to the contrary, deep ecologists in fact often recommend working from within to change the system, while simultaneously working for personal and social transformation. Increasingly, moreover, deep ecological attitudes are being embraced by people who once scoffed at saving forests for reasons other than prudential ones. Reformist views may fade into deep ecological views. For example, anthropocentric reformers want to preserve rainforests because they are: a silo (a source of genetic diversity for medicine agriculture); a *laboratory* (for biologists and ecologists); a *gymnasium* (for human recreation and refreshment); a *life-support system* (sustaining the human species); a *cathedral* (a source of religious awe and inspiration); and an *art gallery* (source of aesthetic pleasure).Though the silo and laboratory arguments seem plainly anthropocentric, the life-support, cathedral, and art gallery arguments can be read either in anthropocentric terms or in deep ecological terms. If Earth is viewed as a kind of human spaceship in need of oxygen, one could offer anthropocentric reasons for saving oxygen-producing rainforests. But if Earth is viewed in terms of the Gaia hypothesis, as the self-organizing home for *all* life, and if life itself is intrinsically valuable, one could argue that rainforests should be saved both as ends in themselves and because they help sustain the interconnected web of life.

**THE VALUES OF WEAK ANTHROPOCENTRISTS AND THOSE WHO REJECT IT OVERLAP; ENVIRONMENTAL POLICY CAN COME FROM THIS CONVERGENCE-Minteer ‘00**

[Ben; Convergence in Environmental Values: an Empirical and Conceptual Defense; Ethics, Place & Environment; Mar 2000; pg. 47-60]

Must our disagreements about the moral status of nature prevent us from supporting the same environmental policies? This question is at the core of Bryan Norton's convergence hypothesis, first discussed in an early paper in Environmental Ethics and later developed in his book Toward Unity among Environmentalists as well as in several more recent publications (Norton, 1986; 1991; 1995a, b; 1996; 1997). Stated simply, Norton's claim is that individuals who rely on a sufficiently broad and temporally extended range of human values (a position he originally termed 'weak anthropocentrism'), and nonanthropocentrists who embrace a consistent notion of the intrinsic value of nature, will both tend to endorse similar policies in particular situations. This overlapping of human and nonhuman concerns is to be expected, since in order adequately to sustain a broad range of human values over time, the ecological contexts on which these goods depend must also be sustained--a goal accomplished through the formulation of long-sighted, multivalue environmental policy. If this sort of common ground exists among individuals of varying ethical stripes, then Norton believes environmental philosophers (and environmentalists generally) might consequently agree to set aside many of our increasingly worn contests over the philosophical bearing of various environmental commitments. Once this happens, attention could then be turned toward more concrete (and therefore more useful) analyses of the location and character of environmental values in actual policy discussions. The theory of convergence thus comports well with Norton's general pragmatic approach to environmental ethics, a stance which has found him calling for a practical environmental philosophy focused not on speculative metaphysical arguments about nonhuman nature, but on the complex and interpenetrating moral underpinnings of actual environmental policies and practices (Norton, 1995a).

**THE DISTINCTION BETWEEN REFORM AND DEEP ECOLOGY IS AN UNHELPFUL DUALISM-Zimmerman ‘97**

[Michael; Contesting Earth's Future : Radical Ecology and Postmodernity; 1997; p. 35]

Although useful in some ways, the reform versus deep ecology distinction seems inconsistent with deep ecology's nondualism and often generates needless controversies between deep ecologists and reformists.50 Furthermore, deep ecology's anti-anthropocentrism has encouraged the rise of radically anthropocentric groups, such as the "Wise-Use Movement," which condemns deep ecology as a pagan ecofascism that calls for outright appropriation of private land. Insisting that national security rests on easy access to natural resources, Wise-Use members call for dismantling legislation that established wilderness areas and forbade practices such mining in national parks.

**PERM: THE INTERESTS OF DEEP ECOLOGISTS CAN BE SERVED BY CONVERGENCE WITH POLICY MAKERS-Norton ‘97**

[Bryan; professor of environmental ethics and environmental policy; Georgia Institute of Technology; Convergence and Contextualism: Some Clarifications and a Reply to Steverson; Environmental Ethics; Volume 19; 1997; reprinted at <http://www.umweltethik.at/download.php?id=444>; retrieved 21 Aug 2011]

I now turn to some clarifications regarding the convergence hypothesis. I would not be surprised if a deep ecologist who persists in the views that (a) all and only species have intrinsic value and that (b) he or she knows this intuitively (without empirical evidence or support) defended policies that in some instances diverge from contextualism. Contextualism seeks relevant scientific and other empirical information to guide policy. Anyone who insists that general policy goals (such as placing higher priority on species than processes in every situation) are intuitive and beyond evidence, would eventually hold divergent policy recommendations from the contextualist who advocates an experimental, open, and adaptive approach to setting management goals. Nevertheless, this situation does not call convergence into question; rather, it provides a perfect example of what the convergence hypothesis is intended to avoid. Reliance on intuitions and ideology in setting conservation goals narrows the range of policy actions that are examined, and opportunities for unification behind specific policies are lost. The convergence hypothesis is about what would happen if intuitionists and ideologues shifted their attention from abstractions to how we can resolve real and difficult cases.

The convergence hypothesis is a general, empirical hypothesis about policy— it claims that policies designed to protect the biological bequest to future generations will overlap significantly with policies that would follow from a clearly specified and coherent belief that nonhuman nature has intrinsic value. In a stronger version of the hypothesis, defended in Toward Unity among Environmentalists, I have claimed that, given the present state of knowledge and concerns for other species, policies that score high on the safe minimum standard criterion, applied from an anthropocentric, contextualist perspective, will do as much good in protecting the moral commitment of deep ecologists as any other possible policy that could be undertaken given what we know now. Again, it is taken as a given that the current situation includes both uncertainty and ignorance, and that management is based on a sincere interest in saving important aspects of nature. One of the constraints on achieving “rational” policy, from any perspective, is lack of knowledge. The point is to move toward better policy given that we act in ignorance and uncertainty, not to intuit what we would do in imaginary worlds, in which uncertainty and ignorance are somehow conquered.

**IT IS POSSIBLE TO PURSUE BIOCENTRIC VIEW AND WORK WITHIN THE SYSTEM-Cramer ‘98**

[Phillip; Deep Environmental Politics: The Role of Radical Environmentalism in Crafting American Environmental Policy; 1998; p. 56]

The phrase "under existing law" indicates an effort to change environmental policy without a radical shift to a new political arena. In their book Deep Ecology: Living as If Nature Mattered, Bill Devall and George Sessions give some practical advice to the deep ecologists who try to influence environmental policy. They argue it is possible to work within the present political system, for "we can change the conventional political process by using it for deeper purposes.""

NON-ANTHROPOCENTRIC WORLDVIEW LEADS TO BAD POLICY

**THOSE WHO REJECT ANTHROPOCENTRISM UNDERCUT DEMOCRATIC DEBATE AND GOOD POLICY IN THEIR PURSUIT OF A PURELY NON-ANTHROPOCENTRIC AGENDA-Minteer ‘00**

[Ben; professor of Life Sciences, Arizona State; Convergence in Environmental Values: an Empirical and Conceptual Defense; Ethics, Place & Environment; Mar 2000; pg. 47-60]

By taking aim at Norton's anthropocentrism rather than attempting to refute the empirical claims of the convergence hypothesis through falsification, we feel that his critics have essentially backed away from the real-world problems and questions to which environmental philosophy was originally intended to speak. Callicott, Westra and Steverson seem to be saying that Norton's understanding of convergence is somehow philosophically wrong and should therefore be swept aside, regardless of whether it might actually hold in particular cases. For Norton's critics, the moral justification of environmental practice and policy is delivered through their universal nonanthropocentric principles (i.e. Callicott's ecocentric reading of Leopold's 'land ethic' and Westra's 'principle of integrity'), under which all cases and situations must ultimately be subsumed. What concerns us here is that the biophysical and cultural settings in which actual public moral inquiry occurs is, for these theorists, essentially deemed irrelevant to ethical judgement. As Callicott (1995b, p. 9, emphasis added) puts it, 'providing theoretical grounds for according intrinsic value to nature ... .[is] the principle, the defining project of environmental ethics'. Once this philosophical foundation is laid, the task is then to "institutionalize" this ecocentric ethic in natural resource management and policy arenas (Callicott, 1995a). Our fear is that Callicott's move threatens to undercut real democratic debate about the appropriateness of such foundations as universal ethical prescriptions for human-nature relationships, and that the turn to ontological arguments (i.e. the single-minded desire to fashion a 'master principle' that supports the moral standing of nonhuman nature) draws attention away from the empirical contexts of specific environmental problems. In taking this route, we believe Norton's critics miss the potential resources located within normatively diverse human value experiences that might be up to the task of promoting strong environmental protection. Westra (1997,p. 293), for example, also appears to subscribe to a foundational view of moral judgement and decision making, as evidenced by her remark that 'Even reaching a right decision on wrong principles may not be sufficient, if the principles are such that they would permit a morally bad decision on another occasion'. Implicit here is that only those justifications that rely on a narrow set of nonanthropocentric claims articulated prior to moral deliberation will be able to meet the demands of protective environmental attitudes. In other words, to the extent that ethical debate over the multiple values at play in specific decision making contexts does not reduce these goods to a nonanthropocentric principle defined in advance, it can produce only second rate, weedy justifications for environmental policy, or possibly the philosophical equivalent of 'dumb luck'.

**BLANKET CONDEMNATIONS OF ANTHROPOCENTRISM UNDERMINE THE EFFICACY OF THE CRITIQUE-Hayward ‘97**

[Tim; Professor of Politics, University of Edinburgh; Anthropocentrism: A Misunderstood Problem; Environmental Values; February 1997; pgs. 49-63]

Anthropocentrism, widely used as a term of criticism in environmental ethics and politics, is something of a misnomer: for while anthropocentrism can intelligibly be criticised as an ontological error, attempts to conceive of it as an ethical error often involve conceptual confusion. I point out that there is no need for this confusion because a more appropriate vocabulary to refer to the defects the ethical ‘anti-anthropocentrists’ have in mind already exists. My argument is not just about semantics, though, but engages directly with the politics of environmental concern: blanket condemnations of ‘anthropocentrism’ not only condemn some legitimate human concerns, they also allow ideological retorts to the effect that criticisms of anthropocentrism amount to misanthropy. My argument, therefore, is that a more nuanced understanding of the problem of anthropocentrism allows not only a more coherent conceptualisation of environmental ethics but also a more effective politics.

**ABSOLUTE COMMITMENT TO REJECTING ANTHROPOCENTRISM PREVENTS FULLY DEMOCRATIC DEBATE ABOUT THE ENVIRONMENT AND WIDER ACCEPTANCE OF THE NEED TO PROTECT IT-Minteer ‘00**

[Ben; professor of Life Sciences, Arizona State; Convergence in Environmental Values: an Empirical and Conceptual Defense; Ethics, Place & Environment; Mar 2000; pg. 47-60]

Finally, our findings lead us to draw a few conclusions about the practice of environmental philosophy and its relationship to public life. Specifically, we would argue that our study's support of the convergence hypothesis underscores the nonideological character of most citizens' environmental commitments. In the main, despite holding a number of dramatically different moral commitments about the philosophical value of nature, the sample of the Vermont public queried in this study arrived at policy-oriented common ground in their goal of managing the Green Mountain National Forest in a sustainable, multi-value manner. This makes us question some of the assumptions prevalent in environmental philosophy, especially the notion that adequate environmental protection is unattainable absent the guarantees provided by some sort of universal, nonanthropocentric master principle. For example, as his remarks excerpted earlier illustrate, Callicott is worried that the convergence argument will force a 'head to head' competition between economic and environmental values, a contest he seeks to avoid through an appeal to ecocentric considerations--values he presumably feels are able to trump all other goods in discussions about environmental policy.

What concerns us in this sort of pessimism toward the virtues of citizen environmental debate is the extent to which such an attitude acts to forestall the development of a truly public philosophy of the environment, one characterized by an open interchange between professional philosophical argument and everyday public discourse. Instead, since Callicott states that he is interested in giving the 'right' reasons for environmental protection--those foundational intrinsic value arguments that get their moral weight from philosophical purity rather than from public debate and discussion--the citizenry is effectively left out of the serious moral project of environmentalism (Callicott, 1995b).

**FAILURE TO ADDRESS ENVIRONMENTAL PROBLEMS ON A LOCAL, REAL-WORLD LEVEL WILL MEAN THERE IS NO CHANCE FOR NATURE TO SURVIVE- Norton '97**

[Bryan; professor of environmental ethics and environmental policy; Georgia Institute of Technology; Convergence and Contextualism: Some Clarifications and a Reply to Steverson; Environmental Ethics; Volume 19; 1997; reprinted at http://www.umweltethik.at/download.php?id=444; retrieved 21 Aug 2011]

The convergence hypothesis does not, of course, claim that the interests of humans and interests of other species never diverge, but only that they usually converge. Hence, the presumption—if our knowledge base regarding a given species and its interactions with other species is weak, as it usually is, then we assume that the species should be saved. The burden is shifted under the safe minimum standard criterion to anyone who argues that the costs of saving any species are unbearable—and this shift brings us back to the difficult question: what counts as “prohibitive social costs” of saving a species? How are we to set conservation priorities? I challenge Steverson, the deep ecologists, and everyone else in environmental ethics to address these real-world problems on a local, contextual basis and join the search for adaptive solutions and sustainable human institutions, cultures, and life styles in each local area. If we do not accomplish that task, nature has no chance; if we do, however, I doubt we will find the path by general intuitions from beyond experience, but rather from experience, respect for diversity, and social learning through participation in the decentralization of institutions, and the reversal of landscape homogenization. What is needed are many local sciences of the integrity of many places, of the particularity of their species, of their natural history, etc. In the process of many experiments, given a management approach guided by the overall goal of minimizing human impacts on important processes and to save species whenever possible, we may learn how important species really are, and what are the costs of losing a species as compared with losing an important process. By pursuing convergent goals and experimenting in areas where local viewpoints differ, we can learn which strategies to choose in various situations and therefore to improve our ability to minimize anthropogenic impacts at all levels and scales. As Dewey argued, this sort of social learning is more likely to occur in an open and democratic process, in which science works for the public good. 19 But I doubt that intuitive pronouncements, asserted to be known without empirical evidence, will have a significant role in this process.

**RIGID ADHERENCE TO REJECTING ANTHROPOCENTRISM PREVENTS DEVELOPMENT OF DEMOCRATIC COMMUNITIES COMMITTED TO THE ENVIRONMENT-Minteer ‘00**

[Ben; professor of Life Sciences, Arizona State; Convergence in Environmental Values: an Empirical and Conceptual Defense; Ethics, Place & Environment; Mar 2000; pg. 47-60]

As the political theorist Benjamin Barber (1998,p. 42) observes, the consequence of such positions is often the construction of a barrier to a fully democratic conversation about the environment as a fount of common values:

Nowadays, rather than developing a discussion on behalf of the civic good, environmentalists often feel compelled to engage defensively in strident, unlistening polemics focused as much on their own moral self-righteousness as on the common good, or on, say, the rights of hikers and bird-watchers deployed as counterweight to the rights of snowmobilers and loggers. In the face of adversarial interest politics, the public good that might bring together loggers and bird-watchers in a community of concern about sustainable environments goes missing.

We see Norton's convergence hypothesis, in its quest for 'unity among environmentalists', as an attempt to avoid these ideological tendencies in debates over the appropriate course of human-nature relationships. Further, his thesis properly turns philosophical attention to the interpretation and evaluation of specific matters of environmental policy, the domain in which environmental values are effectively harnessed and administered through the institutional realm. In light of this, it seems clear that rather than dispelling the value diversity in public environmentalism through appeals to a priori or intuitively defended moral foundations, environmental philosophers might better draw upon citizens' value pluralism in a practical engagement of the alternatives available within policy and problem-solving discussions. It is our belief that this sort of pragmatic approach will go a long way toward building strong and lasting public constituencies for meaningful environmental stewardship. If, on the other hand, a majority of ethicists prefer to vociferously defend some version of nonanthropocentrism as the only valid mission of moral inquiry into human-nature relationships, and therefore the only correct ethical stance when it comes to environmental protection, then we are unfortunately less sanguine about the likelihood that Barber's discussion of the environment as a common good will be realized. Regardless, we hope that the results of our study have demonstrated the relevance of public attitudes research for discussions in environmental philosophy, and that they will encourage further empirical investigations into the thick moral context of human-nature relationships.

**CALLS TO REJECT ANTHROPOCENTRISM MASK THE REAL PROBLEMS THEY CLAIM TO ADDRESS-Hayward ‘97**

[Tim; Professor of Politics, University of Edinburgh; Anthropocentrism: A Misunderstood Problem; Environmental Values; February 1997; pgs. 49-63]

Proposals for the ‘rejection’ of anthropocentrism are unhelpful because they cloud the real problem they think to address. The problem has to do with a lack of concern with nonhumans but the term anthropocentrism can all too plausibly be understood as meaning an excessive concern with humans. 4 The latter, however, is not the problem at all. On the contrary, a cursory glance around the world would confirm that humans show a lamentable lack of interest in the wellbeing of other humans. Moreover, even when it is not other humans whose interests are being harmed, but other species or the environment, it would generally be implausible to suggest that those doing the harm are being ‘humancentred’. To see this, one only has to consider some typical practices which are appropriately criticised. Some examples would be: hunting a species to extinction; destroying a forest to build a road and factories; animal experimentation. In the case of hunting a species to extinction, this is not helpfully or appropriately seen as ‘anthropocentrism’ since it typically involves one group of humans who are actually condemned by (probably a majority of) other humans who see the practice not as serving human interests in general, but the interests of one quite narrowly-defined group, such as poachers or whalers. A similar point can be made regarding the destruction of the forest – for those who derive economic benefit from the destruction oppose not only the human interests of indigenous peoples whose environment is thereby destroyed, but also the interests of all humans who depend on the oxygen such forests produce. The case of animal experimentation, however, brings to the fore a feature which looks as if it could more plausibly be said to be anthropocentric: for if we suppose that the benefits of the experimentation are intended to accrue to any and all humans who might need the medicine or technique experimented, then there would seem to be a clear case of humans benefiting as a species from the use and abuse of other species. But the ‘if’ is important here. A reason why I am inclined to resist calling this anthropocentrism is that the benefits may in fact not be intended or destined for humans generally, but only for those who can afford to pay to keep the drug company in profit. As in the other two cases, it is unhelpful to cover over this fundamental point and criticise humanity in general for practices carried out by a limited number of humans when many others may in fact oppose them. There is in any case no need to describe the practice as anthropocentric when it is quite clearly speciesist – it is not the concern with human welfare per se that is the problem here, but the arbitrary privileging of that welfare over the welfare of members of other species. So a reason why critiques of anthropocentrism are unhelpful is that the problems the term is used to highlight do not arise out of a concern of humans with humans, but from a lack of concern for non-humans. I earlier explained why this lack of concern is not appropriately termed anthropocentrism; I now add the further consideration that practices manifesting a lack of concern for nonhumans very often go hand in hand with a lack of concern for other humans too.

**CALLS TO ABANDON ANTHROPOCENTRISM PLAY INTO THE HANDS OF THOSE WHO BENEFIT FROM ENVIRONMENTAL DESTRUCTION-Hayward ‘97**

[Tim; Professor of Politics, University of Edinburgh; Anthropocentrism: A Misunderstood Problem; Environmental Values; February 1997; pgs. 49-63]

Taking this line of argument a step further it becomes evident that antianthropocentric rhetoric is not only unhelpful, but positively counterproductive. It is not only conceptually mistaken, but also a practical and strategic mistake, to criticise humanity in general for practices of specific groups of humans. If the point of anti-anthropocentric rhetoric is to highlight problems, to make them vivid in order to get action, then misrepresenting the problem is liable to make solutions all the harder. Something particularly to emphasise is that when radical critics of anthropocentrism see themselves as opposed to defenders of human interests they are seriously in error. From what has just been said about the specificity of environmental, ecological or animal harms merely being disguised by putting the blame on humans in general, it should be evident that those who are concerned about such harms in fact make common cause with those concerned with issues of social justice. The real opponents of both sorts of concern are the ideologists who, in defending harmful practices in the name of ‘humans in general’, obscure the real causes of the harms as much as the real incidence of benefits: the harms seldom affect all and only nonhumans; the benefits seldom accrue to all humans. 5 Yet by appearing to accept the ideologists’ own premises, anti-anthropocentric rhetoric plays right into their hands: by appearing to endorse the ideological view that ‘humans in general’ benefit from the exploitative activities of some, the anti-anthropocentrists are left vulnerable to ideological rejoinders to the effect that challenging those activities is merely misanthropic. The opposite is in fact nearer the truth, I believe, because it will more often be the case that challenging such practices is in the interests of humans more generally.

**THE CALL TO ABANDON ANTHROPOCENTRIC THINKING IS INCOHERENT AND PREVENTS DEVELOPING THE VALUES NECESSARY TO IMPROVE THE ENVIRONMENT- Grey ‘93**

[William; Professor of Philosophy; Queensland University; Anthropocentrism and Deep Ecology; Australiasian Journal of Philosophy; pgs. 463-475]

The attempt to provide a genuinely non-anthropocentric set of values, or preferences seems to be a hopeless quest. Once we eschew all human values, interests and preferences we are confronted with just too many alternatives, as we can see when we consider biological history over a billion year time scale. The problem with the various non-anthropocentric bases for value which have been proposed is that they permit too many different possibilities, not all of which are at all congenial to us. And that matters. We should be concerned to promote a rich, diverse and vibrant biosphere. Human flourishing may certainly be included as a legitimate part of such a flourishing.

The preoccupations of deep ecology arise as a result of human activities which impoverish and degrade the quality of the planet's living systems. But these judgements are possible only if we assume a set of values (that is, preference rankings), based on human preferences. We need to reject not anthropocentrism, but a particularly short term and narrow conception of human interests and concerns. What's wrong with shallow views is not their concern about the well-being of humans, but that they do not really consider enough in what that well-being consists. We need to develop an enriched, fortified anthropocentric notion of human interest to replace the dominant short-term, sectional and self-regarding conception.

NON-ANTHROPOCENTRIC WORLDVIEW IS IMPOSSIBLE

**ANTHROPOCENTRISM IS BOTH UNAVOIDABLE AND ESSENTIAL FOR LOVING TREATMENT OF OTHER SPECIES- Hayward ‘97**

[Tim; Professor of Politics, University of Edinburgh; Anthropocentrism: A Misunderstood Problem; Environmental Values; February 1997; pgs. 49-63]

To begin with, there are some ways in which humans cannot help being human-centred. Anyone’s view of the world is shaped and limited by their position and way of being within it: from the perspective of any particular being or species there are real respects in which they are at the centre of it. Thus, as Ferré for instance points out, to the extent that humans ‘have no choice but to think as humans’ what he calls ‘perspectival anthropocentrism’ would appear to be inescapable (Ferré, 1994, p.72). It would also appear to be unavoidable that we should be interested in ourselves and our own kind. There may indeed be respects in which human-centredness is unobjectionable – for humans, like any other beings, have legitimate interests which there is no reason for them not to pursue. As Mary Midgley (1994, p.111) observes, ‘people do right, not wrong, to have a particular regard for their own kin and their own species’. She points out, moreover, that human-centredness may in some respects be positively desirable: for just as the term ‘self-centred’ has been used figuratively in the past to describe well-organised, balanced people, (Midgley, 1994, p.103) so being human-centred can mean having a well-balanced conception of what it means to be a human, and of how humans take their place in the world – the sort of conception bound up with normative ideas of ‘humanity’ and ‘humaneness’. Furthermore, human-centredness may be positively desirable: if, as various philosophers and psychologists have pointed out, (Cf. Hayward, 1995, pp.54-62) self-love, properly understood, can be considered a precondition of loving others, so, by analogy, it could be maintained that only if humans know how to treat their fellow humans decently will they begin to be able to treat other species decently. In sum, a positive concern for human well-being need not automatically preclude a concern for the well-being of non-humans, and may even serve to promote it.

**ALL ETHICAL SYSTEMS AND APPROACHES DEPEND ON HUMAN-CENTERED THINKING-Cramer ‘98**

[Phillip; Deep Environmental Politics: The Role of Radical Environmentalism in Crafting American Environmental Policy; 1998; p. 22]

Murray Bookchin, one of deep ecology's foremost critics, argues that

the entire conceptual framework of deep ecology is entirely a product of human agency-a fact that imparts to the human species a unique status in the natural world. All ethical systems (including those that can be grounded in biotic evolution) are formulated by human beings in distinctly cultural situations. Remove human agency from the scene, and there is not the least evidence that animals exhibit behaviour that can be regarded as discursive, meaningful, or moral."

DEEP ECOLOGY IS AN INCOHERENT IDEOLOGY

**THE EFFORT TO CRITIQUE ANTHROPOCENTRISM RESTS ON A PARADOX ABOUT HUMAN INTELLECT AND DEVELOPMENT- Hayward ‘97**

[Tim; Professor of Politics, University of Edinburgh; Anthropocentrism: A Misunderstood Problem; Environmental Values; February 1997; pgs. 49-63]

Overcoming anthropocentrism has meant appreciating that ‘Man’ is not the centre of the universe or the measure of all things; that it is less tenable to think of humans as made in the image of God, as the purpose of creation, than as one of the products of natural evolution. Humans are just a part of the natural order. This cognitive displacement of human beings from centre stage in the greater scheme of things has been made possible, above all, by developments in modern science. This detached view of humans has been made possible by just that kind of objectivating knowledge which more recently has been held to lie at the root of an attitude toward the natural world to be condemned as anthropocentric. For what the rise of objectivating science has done is bring with it the idea that humans can in some ways stand apart from the rest of nature: the achievement of objectivity carries with it an enhanced view of the power and autonomy of subjectivity; and this is at the heart of a set of attitudes which privilege human faculties, capacities and interests over those of nonhuman entities.

There thus appears to be a paradox: the overcoming of anthropocentrism so far has been brought about by just those developments which are now seen by many as lying at the root of unacceptably anthropocentric attitudes and values. 1 If the overcoming of anthropocentrism is to be deemed a good thing, therefore, this paradox should alert us to how it is also a rather complex thing.

**DEEP CRITIQUE OF ANTHROPOCENTRISM RESTS ON AN ILLOGICAL DUALISM ABOUT HUMAN RELATIONSHIP TO NATURE**-**- Grey ‘93**

[William; Professor of Philosophy; Queensland University; Anthropocentrism and Deep Ecology; Australiasian Journal of Philosophy; pgs. 463-475]

There is an obvious tension which arises when attempting to rectify the first two worries at the same time. For extolling the virtues of the natural, while at the same time vilifying the man-made or artificial, depends on a distinction between the natural and the artificial which the stress on a continuity between human and nonhuman (the focus of the second worry) undermines. On the one side there is emphasis on continuity and dependency, and on the other on distinctness and separation. It seems that, while we are a part of nature, our actions are nevertheless unnatural.

This is one of the points where deep ecologists often risk lapsing into an incoherence, from which they are able to save themselves (as I will illustrate) with the help of a little covert anthropocentrism. Or putting the point another way, a suitably enriched (non-atomistic) conception of humans as an integral part of larger systems—that is, correcting the misconception of humanity as distinct and separate from the natural world—means that anthropocentric concern for our own well-being naturally flows on to concern for the nonhuman world. If we value ourselves and our projects, and part of us is constituted by the natural world, then these evaluations will be transmitted to the world.

**ADOPTING A NON-ANTHROPOCENTRIC VIEW IS ONLY A RECIPE FOR CONFUSION; WE CAN SOLVE THE ENVIRONMENTAL CRISIS WITHOUT THIS CHANGE- Grey ‘93**

[William; Professor of Philosophy; Queensland University; Anthropocentrism and Deep Ecology; Australiasian Journal of Philosophy; pgs. 463-475]

That we habitually assume characteristically anthropocentric perspectives and values is claimed by deep ecologists to be a defect. And as a corrective to this parochialism, we are invited to assume an "ecocentric" (Rolston 1986, Callicott 1989) or "biocentric" (Taylor 1986) perspective. I am not persuaded, however, that it is intelligible to abandon our anthropocentric perspective in favour of one which is more inclusive or expansive. We should certainly abandon a crude conception of human needs which equates them (roughly) with the sort of needs which are satisfied by extravagant resource use. But the problem with so-called "shallow" views lies not in their anthropocentrism, but rather with the fact that they are characteristically short-term, sectional, and self-regarding. A suitably enriched and enlightened anthropocentrism provides the wherewithal for a satisfactory ethic of obligation and concern for the nonhuman world. And a genuinely non-anthropocentric view delivers only confusion.

**THE IDEA THAT HUMANS CAN REJECT ANTHROPOCENTRISM RENDERS THINKING A MEANINGLESS ABSURDITY- Grey ‘93**

[William; Professor of Philosophy; Queensland University; Anthropocentrism and Deep Ecology; Australiasian Journal of Philosophy; pgs. 463-475]

One strand of environmental thinking provides a challenge to a further alleged bastion of anthropocentric parochialism—anthropocentrism or human chauvinism. Just as we have abandoned our geocentric cosmology, our anthropocentric biology, and related conceits; so, it is claimed, we should give up our anthropocentric morality. Indeed the search for a credible non-anthropocentric basis for value in nature has been the central preoccupation of environmental philosophy. Anthropocentrism is the focal issue of this paper. Part of the challenge is to find an appropriate scale for concern about our biotic fellow citizens, a concern which extends across species and across time.

My aim however is not to bury anthropocentrism, but to defend it, at least in a qualified form. My claim is that if we attempt to step too far outside the scale of the recognizably human, rather than expanding and enriching our moral horizons we render them meaningless, or at least almost unrecognizable. The grand perspective of evolutionary biology provides a reductio ad absurdum of the cluster of non-anthropocentric ethics which can be found under the label "deep ecology". What deep ecology seeks to promote, and what deep ecologists seek to condemn, needs to be articulated from a distinctively human perspective. And this is more than the trivial claim that our perspectives, values and judgements are necessarily human perspectives, values and judgements. Within the moral world we do occupy a privileged position.

DEEP ECOLOGY IS A DANGEROUS IDEOLOGY

**DEEP ECOLOGY LEGITIMIZES HUMAN SUFFERING AND DEATH-Zimmerman ‘97**

[Michael; professor of philosophy, Tulane; Contesting Earth's Future : Radical Ecology and Postmodernity; 1997; p. 167-68]

Bookchin justifies his harsh criticism of deep ecology in part because, in interviewing Dave Foreman in the mid-1980s, Bill Devall did not challenge the following remarks: When I tell people how the worst thing we could do in Ethiopia is to give aid—the best thing would be to just let nature seek its own balance, to let the people there just starve ... they think this is monstrous. But the alternative is that you go in and save these half-dead children who never will have a whole life. Their development will be stunted. And what's going to happen in ten year's time is that twice as many people will suffer and die. Likewise, letting the USA be an overflow valve for problems in Latin America is not solving a thing. It's just putting more pressure on resources in the USA. It is just causing more destruction of our wilderness, more poisoning of water and air, and it isn't helping the problems of Latin America.

**DEEP ECOLOGY CONTAINS DANGEROUS FASCISTIC ELEMENTS--Zimmerman ‘02**

[Michael; professor of philosophy, Tulane; “Deep ecology, ecoactivism, and human evolution”; ReVision; Spring 2002; Infotrac]

The possible link between Heidegger's thought and deep ecology has raised the hackles of those who fear that deep ecology may harbor ecofascist potential. Murray Bookchin (1990), the social ecologist who has developed an evolutionary and progressive conception of life on Earth, has attacked deep ecology for this potential, on the basis of statements made by certain Earth First! members who sometimes seem to risk ecofascism in their passion to defend Mother Earth. While I do not condone the vituperative character of some of Bookchin's remarks, and while I believe he should distinguish more carefully between statements made by deep ecology theorists and those made by ecoactivists, I believe that his concern about ecofascism should be taken seriously by deep ecologists.

**DEEP ECOLOGY THREATENS ECO-TERRORISM-Kurtz ‘01**

[Stanley; fellow at the Hudson Institute; “Two Americas”; National Review; 22 Jul 2001]

The physical destruction of university research is perhaps the clearest example we have of the implications of "political correctness" for academic freedom. But the threat of eco-terrorism goes deeper. Intelligence analysts worry that the history of violence combined with the ideology of "deep ecology," which holds that human civilization has to be rolled back until the earth's natural environment is fully restored, may lead to the use of large-scale weapons of mass destruction (especially biological warfare) by eco-terrorists. Ironically, those who seek to prevent holocausts create a rationalization for perpetrating holocausts of their own.

DEEP ECOLOGY IS SEXIST

**DEEP ECOLOGY RESTS ON DOMINANT IDEOLOGY THAT LEGITIMIZES PATRIARCHAL VIEW-Plumwood ‘02**

[Val; Australian Research Council Fellow, U. of Sydney; Environmental Culture: The Crisis of Reason; 2002; pg. 204]

Now I am not saying here, as some supporters of deep ecology seem to think, that all deep ecologists or others who have theorised the basis of solidarity in terms of unity are selfish male chauvinist pigs, that they all wish to incorporate nature into the self, or are all megalomaniacs aiming at control who take their own interests to be those of nature or the universe at large. Nor am I insisting that we must treat deep ecology according to its worst possible interpretation, as the incorporative self. What I am saying is that assumptions of unity of interest are especially liable to hegemonic interpretations, and that in the absence of a critical analysis of power are open to cooption by existing dominance orders and by the dominant Lockean account of the incorporative self upon which capitalism is based. I think the wish to stand in solidarity with nature can be given an alternative theoretical development in terms of elaborating more carefully a concept of solidarity that does not confuse solidarity with unity, the relational with the incorporative self.

**DEEP ECOLOGY IS DEEPLY FLAWED BY PATRIARCHAL THINKING-Zimmerman ‘97**

[Michael; professor of philosophy, Tulane; Contesting Earth's Future : Radical Ecology and Postmodernity; 1997; p. 277]

Deep ecologists talk in one breath about "letting things be," while in the next breath they call for controlling the human birthrate and for zoning entire bioregions. Because the "ideological pollution" of patriarchy estranges men from their own "androgynous natural unity," the spiritual quest undertaken by deep ecologists is inevitably flawed by ego and will. Salleh concludes that the deep ecologists' abstract search for self-realization may be

sabotaged by the ancient compulsion to fabricate perfectibility. Men's ungrounded restless search for the alienated Other part of themselves has led to a society where not life itself, but "change," bigger and better, whiter than white, has become the consumptive end But the deep ecology movement will not truly happen until men are brave enough to rediscover and to love the woman inside themselves. And we women, too, have to be allowed to love what we are, if we are to make a better world.

**DEEP ECOLOGY FAILS TO RECOGNIZE THE OPPRESSION OF WOMEN-Zimmerman ‘97**

[Michael; professor of philosophy, Tulane; Contesting Earth's Future : Radical Ecology and Postmodernity; 1997; p. 284-85]

Despite a growing interest on the part of some deep ecologists in cultural ecofeminism, many ecofeminists continue to note in deep ecology not only an "abstract" concern with wild nature, but an unexamined masculinist voice. Jim Cheney argues that even though male deep ecologists generally criticize sexism, their views may be so (unconsciously) structured by patriarchal attitudes that they inevitably express and reinforce such attitudes. Minority and Third World women leveled a similar charge against white cultural feminists: their supposedly universal conception of woman revealed class and racial bias. Chastened by such charges, ecofeminists understandably expect deep ecologists to submit themselves to the same painful self-scrutiny and self-criticism. Renate Hof has observed that in feminism "the supposedly outside-perspective of women becomes problematized, one's own participation in the role of victim becomes discussed. On the side of *deep ecology,* such a self-critical reflection is not to be found.

Budget Tradeoff Disadvantage

[Editor’s Note: This tradeoff scenario involved the Earth Science cut scenario. The shell specifically names several large impacts of cutting Earth science. Also included are extensions that deal with climate change to use with your favorite climate change broad impacts.]

**A. UNIQUENESS: NASA TRENDING TOWARDS SPENDING MONEY ON EARTH SCIENCE OVER SPACE SCIENCE-Space Travel '11**

[NASA Spending Shift to Benefit Centers Focused on Science and Technology; Space Travel; 8 June 2011; <http://www.space-travel.com/reports/NASA_Spending_Shift_to_Benefit_Centers_Focused_on_Science_and_Technology_999.html>; retrieved 5 August 2011]

Euroconsult along with the consulting firm Omnis have announced the findings of a study foreseeing a significant shift in NASA spending toward Earth science and R and D programs and away from legacy spaceflight activities.

According to the report "NASA Spending Outlook: Trends to 2016," NASA's budget, which will remain flat at around $18.7 billion for the next five years, will also be characterized by significant shifts from space operations to technology development and science.

With the shift in budget authority, NASA Centers focused on Earth observation, space technology, and aeronautics will see increases in funding, while those involved in human spaceflight will see major funding reductions. Indeed, the termination of the Space Shuttle program will lead to a budget cut over $1 billion for Space Operations, resulting in a 21% budget cut for the Johnson Space Center. Overall, the agency's budget for R and D will account for about 50% of all NASA spending.

**B. MASSIVE AFFIRMATIVE SPENDING TRADES OFF WITH EARTH SCIENCE SPENDING.**

**1. EXPENSIVE, LARGE HUMAN-BASED MISSIONS TRADE OFF WITH LESSER KNOWN SCIENCE GOALS OF NASA-Chameides '09**

[Bill; Dean of the Duke University Nicholas School of the Environment; Is NASA Spacing Out?; The Green Gork Blog; 20 July 2009; <http://www.nicholas.duke.edu/thegreengrok/moonwalk>; retrieved 5 August 2011]

Cool, just like landing men on the moon was cool back in the ‘60s and ‘70s, even to a long-haired college student crisscrossing Europe. But I have to ask, given today’s budget crunch and the advancements in robotics, is cool enough of a reason to send humans to the moon and beyond?

Don’t get me wrong; learning about the planets and stars, dark matter and dark forces is one of humanity’s greatest intellectual endeavors. Not only should we fix our gaze on space; we must. But manned missions are not the only way to learn about our world. Virtually all of the aforementioned information about the Earth was obtained using unmanned space-borne platforms. And unmanned missions to the planets have provided us with a wealth of information (at a fraction of the cost) — for example we've been able to do detailed, complex analyses of soil from Mars without the benefit of a human hand.

Deciding what NASA does with its funds has always been somewhat of a zero sum game. Doing more of one thing generally means doing less of another. And there's a clear trade-off between high-visibility, manned, space exploration and unmanned missions that are able to bring home the scientific bacon without all the hoopla.

**2. INSERT SPECIFIC LINK**

**3. MEMBERS OF CONGRESS SPECIFICALLY TARGET CLIMATE CHANGE RESEARCH AND OTHER EARTH SCIENCES FOR NASA BUDGET INCREASES-Space Politics '11**

[Human spaceflight versus Earth sciences?; Space Politics; 9 February 2011; <http://www.spacepolitics.com/2011/02/09/human-spaceflight-versus-earth-sciences/>; retrieved 15 August 2011]

A letter signed by several members of Congress is the latest evidence that a new battle line is forming over NASA funding: human spaceflight versus Earth sciences. In a letter to House Appropriations committee chairman Rep. Hal Rogers and CJS subcommittee chairman Frank Wolf, six Republican members of Congress asked the appropriators to prioritize NASA funding on what they consider to be the agency’s primary mission, human spaceflight. To do that, they argue that funding for NASA’s climate change research be redirected to human spaceflight accounts. “With your help, we can reorient NASA’s mission back toward human spaceflight by reducing funding for climate change research and reallocating those funds to NASA’s human spaceflight accounts, all while moving overall discretionary spending towards FY2008 levels,” the letter’s authors—Reps. Bill Posey (R-FL), Pete Olson (R-TX), Rob Bishop (R-UT), Jason Chaffetz (R-UT), Sandy Adams (R-FL), and Mo Brooks (R-AL)—argue.

**C. IMPACTS**

**1. EVEN SMALL TRADEOFFS FROM NASA'S EARTH SCIENCE BUDGETS COULD HAVE SUBSTANTIAL IMPACTS-Killeen '05**

[Timothy L.; Director of the National Center for Atmospheric Research; Prepared Statement; House Committee on Science, Space and Technology; 28 April 2005; <http://www.spaceref.com/news/viewsr.html?pid=16382>; retrieved 12 August 2011]

In fact, leaving spacecraft and data system costs aside, AAAS analyses show that NASA was the third largest provider of competitively awarded extramural funding for the university environmental science community in 2004, trailing only the National Science Foundation and the National Institutes of Health. Even small reductions in the NASA program have large effects in the university community. This matters both because research and analysis is the process by which useful information is derived from remote sensing systems, and because university-based research activities provide the human capital (undergraduates, graduate students, young researchers and engineers) that underpins the entire space program. The effects of funding perturbations reach far beyond the year in which they occur. The design and development of an Earth observation satellite takes a decade or more, and keeping young scientists and engineers engaged in such work requires some degree of steady ongoing support.

**2. EARTH SCIENCE CRITICAL TO NATIONAL SECURITY, WEATHER FORECASTING, CLIMATE CHANGE AND DEALING WITH NATURAL DISASTERS-Killeen '05**

[Timothy L.; Director of the National Center for Atmospheric Research; Prepared Statement; House Committee on Science, Space and Technology; 28 April 2005; <http://www.spaceref.com/news/viewsr.html?pid=16382>; retrieved 12 August 2011]

Second, rapid advances in NASA Earth observing capabilities, coupled with revolutionary advances in information technology, have positioned us for an extraordinary new era in Earth science research; one in which we can quantitatively understand and predict the Earth as a system, with the temporal and spatial fidelity needed by decision makers at many levels of our society: local, regional, and global. This will lead directly to major societal benefits including:

improved national security

better weather forecasts and warnings

more targeted climate outlooks

better management of natural resources including water, agriculture, and energy

more effective mitigation of natural disasters such as drought, floods, landslides, and volcanic eruptions.

UNIQUENESS: EARTH SCIENCE SPENDING IS INCREASING/STABLE

**NASA SHIFTING PRIORITIES FROM SPACE TO EARTH SCIENCE-Space Travel '11**

[NASA Spending Shift to Benefit Centers Focused on Science and Technology; Space Travel; 8 June 2011; <http://www.space-travel.com/reports/NASA_Spending_Shift_to_Benefit_Centers_Focused_on_Science_and_Technology_999.html>; retrieved 5 August 2011]

"Budget allocation across Centers will vary greatly," said Steve Bochinger, President of Euroconsult North America. "As NASA shifts priorities for human spaceflight from Shuttle operations to Human Exploration Capabilities and commercial spaceflight, the budget will be redirected to a range of technology development programs. Likewise, as NASA shifts its science mission focus away from space science to Earth science, the science budget will be redistributed among centers."

This shift in NASA's priorities will also affect the agency's contract spending. As large legacy programs end, new research and development programs will be initiated. This turnover of programs should provide many new contracting opportunities over the next five years, especially at Research Centers. The Euroconsult/Omnis report details these changes.

"The uniqueness of this report is that it brings together in one picture NASA's budget, spending and contracting, providing insights into opportunities created by the new NASA direction," said Bretton Alexander, Senior Consultant for Omnis.

**NASA PRIORITIES PUT EARTH SCIENCE PROJECTS IN THE PRIORITY CATEGORY-Wakeman '11**

[Nick; NASA shifts funds to new priorities; Federal Computer Week; 8 June 2011; <http://fcw.com/articles/2011/06/08/nasa-budget-priorities-shift.aspx>; retrieved 10 August 2011]

As budgets tighten and priorities shift, NASA is cutting $1 billion from its pace operations budget, but spending more on other science and technology areas that will reshape the agency's mission, a new study shows.

“As NASA shifts priorities for human spaceflight from shuttle operations to human exploration capabilities and commercial spaceflight, the budget will be redirected to a range of technology development programs,” said Steve Bochinger, president of Euroconsult North America.

The firm and its partner Omnis Inc. have released a new study, NASA Spending Outlook: Trends to 2016, which analyzes NASA’s budget.

As space operations shrink, the science budget will be redistributed among NASA centers, Bochinger said.

Among the findings:

The Science Mission Directorate saw an 11 percent bump in 2011 and will have a $5 billion through 2016. Goddard Space Flight Center and Langley Research Center will benefit because of the work on Earth science projects.

The Exploration Systems Mission Directorate will hold steady at about $3.9 billion but funds will shift away from human exploration activities.

The new Space Technology Directorate will get $1 billion a year from 2012 to 2016. Langley, Glenn and Ames research centers will benefit because of their work on new technologies for exploration and robotic spaceflight.

NASA is restructuring the Aeronautics Research Mission Directorate to focus on fundamental aeronautics and development of technologies for the Next Generation Air Transportation System.

The study also predicts that NASA’s business practices will have to change with a shift from cost-plus contracting to more fixed-price contracting.

**EARTH SCIENCE AND EXPLORATION INITIATIVES ARE CURRENT SPARED IN BUDGET TALKS-Bhattacharjee ‘11**

[Yudhijit; NASA Science Budget Holds Steady; Science Magazine; 12 April 2011; <http://news.sciencemag.org/scienceinsider/2011/04/nasa-science-budget-holds-steady.html>; retrieved 15 August 2011]

In Congressional hearings over the past few weeks, NASA Administrator Charles Bolden has warned lawmakers that the space agency would have to scale back its plans for exploration and science if Congress funded NASA at a level considerably lower than the Administration's request of $19 billion for 2011. Congress appears to have been listening.

The deal struck by Democrats and Republicans late on 8 April grants $18.5 billion to NASA, just $200 million less than the 2010 level and $500 million below the President's 2011 request. Both science and space exploration have been spared any disastrous cuts.

There is $3.8 billion for the exploration directorate, which includes $1.8 billion for the development of a heavy-lift vehicle and $1.2 billion for building a multipurpose crew capsule to go into low-Earth orbit. The bill, H.R. 1473, also gives NASA permission to cancel the Constellation Program. Until now, NASA had been prevented from terminating Constellation, which was keeping it from starting on the new initiatives.

The Science Mission Directorate will get $4.945 billion, just $60 million short of what the President requested, and $452 million more than what it got in 2010. However, that amount seems unlikely to be enough to solve some of the science mission's financial difficulties, which includes an over-budget and behind-schedule James Webb Space Telescope.

**CURRENT EARTH SCIENCE SPENDING IS EVERYTHING REQUESTED BY THE EARTH SCIENCE DIVISION OF NASA-Morello '11**

[Lauren; Climate Satellite Programs Scarred in Budget Fight; Climate Wire via the New York Times; 4 May 2011; <http://www.nytimes.com/cwire/2011/05/04/04climatewire-climate-satellite-programs-scarred-in-budget-76532.html>; retrieved 10 August 2011]

Still, Michael Freilich, who directs NASA's Earth Science Division, said his agency "got almost everything we requested" in 2011. "What's left in the program is indeed rather robust," he said.

But with fiscal austerity expected to be the watchword for the next few years, Freilich said that scientists and federal agencies should adopt a more pragmatic mindset.

"I think the key to get out of the fix in which we landed ourselves is to be relentlessly objective and realistic about what our budget prospects actually are," he said. "We haven't spent nearly enough time developing the consensuses that say, 'If we only have this amount of resources, here is what we should do.'"

**EARTH SCIENCE IS THE CURRENT WINNER IN NASA BUDGET VISIONS-Lawler and Rearson ‘11**

[Andrew and Sara; Climate Science, Asteroid Detection Big Winners in NASA Budget; Science Magazine; 14 February 2011; <http://news.sciencemag.org/scienceinsider/2011/02/climate-science-asteroid-detection.html?ref=ra>; retrieved 15 August 2011]

NASA will have to live with a stagnant budget—again. The $18.7 billion proposed by the Administration is the same amount as 2010 and 2011, and science funding would continue to hover at about $5 billion. But in the details are significant winners and losers. Earth science would grow from $1.439 billion to $1.797 billion in 2012, though House of Representatives Republicans are sure to attack a program focused on understanding global change. Meanwhile, Mars exploration—which this year stands at $438 million—would spike at $602 million next year, but plummet to less than half that amount by 2016. Funds for near-Earth object observations would quadruple to $20.4 million. And NASA Chief Financial Officer Elizabeth Robinson said the agency will kill a dark-energy mission in the hope that it can collaborate more cheaply with the European Space Agency. She added that details on how the agency will fund a massive cost overrun in the James Webb Space Telescope won't be ready until this summer.

NASA Administrator Charles Bolden acknowledged that "tough choices had to be made," adding that these are "really difficult fiscal times."

UNIQUENESS: NASA SPENDING MOVING AWAY FROM LARGE, SPACE EXPLORATION-BASED PROJECTS

**NASA MOVING AWAY FROM SPACE EXPLORATION SYSTEM DIRECTIVES-Space Travel '11**

[NASA Spending Shift to Benefit Centers Focused on Science and Technology; Space Travel; 8 June 2011; <http://www.space-travel.com/reports/NASA_Spending_Shift_to_Benefit_Centers_Focused_on_Science_and_Technology_999.html>; retrieved 5 August 2011]

Spending in the Exploration Systems Mission Directorate has been impacted by the cancellation of Constellation and repositioning of exploration policy. But it will hold steady at around $3.9 billion between 2011 and 2016, funds will shift away from human exploration activities at the Johnson Space Center in Texas and the Marshall Space Flight Center in Alabama. The Kennedy Space Center in Florida will escape some of the pain of reduced funding with the development of the new Commercial Crew Development program. However, much of the work will be done by companies spread around the United States, rather than those based at Kennedy, creating an opportunity for new contractors.

The newly created Space Technology Directorate, is set to receive an average of $1 billion annually between 2012 and 2016. The programs here are designed to revitalize the agency's ability to develop revolutionary technologies and innovations for exploration and robotic spaceflight This substantial budget will benefit Langley, Glenn and Ames Research Centers, which in the past supported research and test programs in aeronautics, science and human spaceflight missions.

NASA's restructuring of the Aeronautics Research Mission Directorate (ARMD) will be focused on long-term investment in fundamental aeronautics and development of technologies required for the Next Generation Air Transportation System (NextGen). Funding for the 2011-2016 period is expected to increase to a total of $570 million per year.

With these shifts in funding and priorities, NASA's business practices will also adapt. The Euroconsult/Omnis report analyzes how NASA's shift from cost-plus contracting, currently used in many legacy programs, to fixed-price contracts will impact various programs throughout the agency. The new Commercial Crew Development program undertaken as a public-private-partnership with the industry typifies the agency's new contract practices.

**LARGE, EXPENSIVE MISSIONS ARE NO LONGER PART OF NASA'S STRATEGIC PLANNING-Hsu '11**

[Jeremy; Space on a budget balances risk vs. innovation; MSNBC; 27 June 2011; [http://www.msnbc.msn.com/id/43555581/ns/technology\_and\_science-innovation/#](http://www.msnbc.msn.com/id/43555581/ns/technology_and_science-innovation/); retrieved 1 August 2011]

NASA managers might consider ways to allow "innovation to creep into costs and schedules" despite the low budgets, said Doug Stetson, a consultant with the Space Science and Exploration Group. He moderated a panel of experts at the International Academy of Astronautics' ninth Low-Cost Planetary Missions Conference held in Laurel, Md., last week.

"The planetary program is going to be dominated for the foreseeable future by smaller, competed missions," Stetson said. "Most of the large flagship missions are over."

UNIQUENESS: OBAMA ADMINISTRATION TRENDING TOWARDS EARTH SCIENCE SPENDING

**NASA IS ADOPTING THE OBAMA ADMINISTRATION'S FOCUS ON CLIMATE RESEARCH-Space Travel '11**

[NASA Spending Shift to Benefit Centers Focused on Science and Technology; Space Travel; 8 June 2011; <http://www.space-travel.com/reports/NASA_Spending_Shift_to_Benefit_Centers_Focused_on_Science_and_Technology_999.html>; retrieved 5 August 2011]

Following an 11% increase in 2011, the Science Mission Directorate budget will remain at the $5 billion level through 2016. This increase, however, is entirely within the Earth science theme, reflecting the Administration's priority on climate change research. Goddard Space Flight Center and Langley Research Center, which manage and implement Earth science projects, will thus benefit from this increase as will contractors who develop Earth observation spacecraft and instruments.

**OBAMA’S LONG TERM BUDGET GOALS BROADLY SUPPORT NASA EARTH AND CLIMATE STUDIES-Courtland ‘09**

[Rachel; Earth science gets boost in NASA budget; New Scientist; 8 May 2009; <http://www.newscientist.com/article/dn17097-earth-science-gets-boost-in-nasa-budget.html>; retrieved 15 August 2011]

Under the president's budget, NASA would receive $4.5 billion in 2010 for science, a $26 million decline from 2009 funding levels passed by Congress. But the agency's science directorate also received a $400 million boost in an economic stimulus package passed earlier this year.

The longer-term projections in the science budget also include an increase. "We're very pleased with this budget," Ed Weiler, the associate administrator for the agency's science mission directorate, told reporters on Thursday.

Between fiscal year 2009 and fiscal year 2013, the agency would get some $1.2 billion more for science, including stimulus money. "Over those five years, we're seeing an extra $1.2 billion over the budget we had last year. This increase is entirely in the earth science arena," Weiler told reporters.

According to the request, funding for NASA's earth science programme would increase to $1.65 billion beginning in late 2013. At that point the programme would outstrip NASA's planetary science programme in funding, receiving an extra $17 million in fiscal year 2014.

**CONGRESS AND THE OBAMA ADMINISTRATION COMMITTED TO FUNDING EARTH SCIENCE PROJECTS-Werner '10**

[Debra; Article: NASA Ramping Up in Earth Observation; Space.com; 28 December 2010; <http://www.space.com/10555-nasa-ramping-earth-observation.html>; retrieved 14 August 2011]

Strong support from the White House and U.S. Congress will allow NASA to lay the groundwork for a vigorous and extensive Earth science program that includes 16 major missions scheduled for launch between 2011 and 2021, an agency official said.

"What a difference a year makes," Michael Freilich, director of NASA's Earth Science Division, said this month at a meeting of the American Geophysical Union here. "Last year things were a little bit dicey. This year we are moving forward rather dramatically."

In contrast to late 2009 when NASA's Earth Science Division faced growing demands in spite of constrained funding, the current five-year spending plan provides the division with an additional $2.4 billion over the previous budget blueprint, Freilich said. If approved by Congress, that money will allow NASA "to go from flying one mission every couple of years to flying a couple of missions per year," he said.

NASA plans to launch three Earth science satellites in 2011: the Glory climate monitoring satellite in February, the joint U.S.-Argentina Aquarius sea-surface salinity mission in June and the National Polar-orbiting Operational Environment Satellite Preparatory Project (NPP) mission in October.

**PRESIDENT'S EXISTING NASA BUDGET FRAMEWORK PRIORITIZES EXPLORATION AND EARTH SCIENCE-Bolden '10**

[Charles; NASA Administrator; Statement before the House Subcommittee on Commerce, Justice, Science and Related Agencies; 24 March 2010; <http://www.spaceref.com/news/viewsr.rss.html?pid=33755>; retrieved 10 August 2011]

The President's FY 2011 budget request is good for NASA because it sets the Agency on a sustainable path that is tightly linked to our Nation's interests. One measure of this is that it increases the Agency's top-line, in a time when many agencies have been flat or taken a cut. Even more, it reconnects NASA to the Nation's priorities - creating new high-tech jobs, driving technological innovation, and advancing space and climate science research. It puts the Agency back on track to being the big-picture innovator that carries the Nation forward on a tide of technological development that creates our future growth. We should make no mistake that these are the drivers for NASA's proposed budget increase of $6 billion dollars over the next five years.

**OBAMA ADMINISTRATION FREEZING DEEP SPACE EXPLORATION EFFORTS WITH NEWEST BUDGETS-Harwood '11**

[William; Veteran Space Journalist and Writer; NASA 2012 budget reflects 'tough choices,' uncertain outlook; c|Net News; 14 February 2011; <http://news.cnet.com/8301-19514_3-20031912-239.html>; retrieved 8 August 2011]

Faced with reduced funding and an uncertain outlook, NASA's $18.7 billion fiscal 2012 budget prioritizes the Obama administration's major goals and objectives, focusing on maintaining the International Space Station, retiring the shuttle and ramping up efforts to spur development of commercial manned spacecraft.

The budget also reflects the administration's commitment to building a new heavy-lift rocket and a crew capsule that could be used for deep-space exploration.

But the budget follows the administration's proposal to freeze federal funding at 2010 levels for the next five years, resulting in a $276 million decrease for NASA compared to the agency's 2011 budget.

Until Congress weighs in with actual funding, it's not clear when a viable United States manned spacecraft will emerge to service the station or when eventual deep-space missions might occur.

In the meantime, with the shuttle's retirement looming after a final three missions, NASA will continue to rely on Russia to provide transportation to and from the space station aboard Soyuz spacecraft at about $55 million a seat.

"This budget requires us to live within our means so we can invest in our future," NASA Administrator Charlie Bolden told reporters. "It maintains our strong commitment to human spaceflight and new technologies. It establishes critical priorities and invests in excellent science, aeronautics research and education programs that will help us win the future."

**OBAMA BUDGETS COMMITTED TO INCREASING EARTH SCIENCE FUNDING OVER OTHER NASA PROGRAMS-Morrissey '11**

[Susan; NASA: Funding Is Flat, But Earth Science Programs Grow; Chemical & Engineering News; 28 February 2011; <http://pubs.acs.org/cen/coverstory/89/8909cover7.html>; retrieved 8 August 2011]

The President’s 2012 request holds the National Aeronautics & Space Administration’s budget flat at $18.7 billion. The agency is not reporting budget breakdowns for 2011. Instead, gains and losses are being measured against the 2010 budget.

The request provides continued support for the International Space Station (ISS), setting its 2012 budget at $2.8 billion, a 22.8% increase from 2010. The support would allow expanded use of the station’s research capabilities. The request also outlines a plan for research oversight by a nonprofit organization.

Earth science programs would also see growth—increasing 24.9% from 2010 to $1.8 billion in 2012. This boost would enable continued development of Earth-observing satellites such as the Orbiting Carbon Observatory-2, which would provide information about the planet’s carbon cycle, and the Ice, Cloud & Land Elevation Satellite-2, which is an orbiting laser altimeter.

**NASA'S CURRENT PRIORITIES INCLUDE BILLIONS FOR CLIMATE CHANGE RESEARCH-Bolden '10**

[Charles; NASA Administrator; Statement before the House Subcommittee on Commerce, Justice, Science and Related Agencies; 24 March 2010; <http://www.spaceref.com/news/viewsr.rss.html?pid=33755>; retrieved 10 August 2011]

The FY 2011 budget request for Science includes $1,801.7 million for Earth Science. This request increases investment in Earth Science by $1.8 billion from FY 2011 to FY 2014 compared to the FY 2010 budget, for a more aggressive response to the challenge of climate change. NASA will rapidly develop an Orbiting Carbon Observatory-2 mission for launch early in 2013 and a GRACE Follow-On mission for launch in late 2015, respectively, to initiate and extend key global climate data sets. This request accelerates several high-priority Decadal Survey missions that will advance climate research and monitoring. The increased funding accelerates launch of the Soil Moisture Active/Passive (SMAP) mission by six months from its estimated date at the recent Agency Key Decision Point (KDP)-B review, to November 2014. ICESAT-2 is advanced by five months relative to the estimated date at its recent Agency KDP-A review, to October 2015. The Climate Absolute Radiance and Refractivity Observatory (CLARREO) mission and the Deformation, Ecosystem Structure and Dynamics of Ice (DESDynI) mission are each accelerated by two years, with both launching in late 2017. Thus, the budget request allows all four Tier-1 Decadal Survey missions to be launched between 2014 and 2017. In addition, NASA--working with the U.S. Global Change Research Program--will be able to identify and begin development for accelerated launch of selected Tier-2 Decadal Survey missions focused on climate change. The budget supports critical continuity of climate observations, including a Stratospheric Aerosol and Gas Experiment III (SAGE III) instrument to be developed for deployment on the ISS, while also supporting an accelerated pace of smaller "Venture class" missions. Finally, increased resources for Earth Science will allow NASA to expand key mission-enabling activities, including carbon monitoring, technology development, modeling, geodetic ground network observations, and applications development including the highly successful SERVIR program.

**OBAMA'S NASA BUDGETS FUND EARTH SCIENCE PROGRAMS AT A HIGHER LEVEL THAN PAST BUDGET CYCLES-Svitak '11**

[Amy; President's Budget Freezes NASA at $18.7 Billion; Space News; 14 February 2011; <http://www.spacenews.com/civil/nasa-budget-frozen-presidents-request.html>; retrieved 9 August 2011]

Obama's proposal includes $1.78 billion for Earth science programs in 2012, some $160 million less than called for in the authorization act but still about $360 million more than the agency's current Earth science budget.

NASA's overall Science budget — which includes Earth science, astrophysics, heliophysics and planetary science —would top $5 billion in 2012, a roughly $500 million increase over the current budget but less than previously forecast.

These and other targeted increases would be funded by reducing NASA's Space Operations budget by $1.8 billion relative to the 2010 level. Those savings would be realized by retiring the space shuttle later this year.

**OBAMA ADMINISTRATION COMMITTED TO FUNDING EARTH SCIENCE DATA INITIATIVES-Huetteman '11**

[Emmarie; Blind to the threat; Global Warming/National Security Journalism Initiative; 25 January 2011; <http://global-warning.org/main/satellites/>; retrieved 10 August 2011]

The Obama administration has made its support for improved satellite observation of climate change known, taking steps toward restoring NASA’s earth sciences budget to its fiscal 2000 level, including $171 million to build OCO-2, after cuts by the Bush administration, and working to coordinate efforts among agencies. But the president’s 2011 budget hasn’t passed yet, and many congressional Republicans eager to cut federal spending are gunning for climate change programs.

BRINK: SPACE SPENDING IS TIGHT IN THE CURRENT BUDGET CLIMATE

**NEW, EXPENSIVE INITIATIVES MEAN MAKING BUDGET CHOICES-Hsu '11**

[Jeremy; Space on a budget balances risk vs. innovation; MSNBC; 27 June 2011; [http://www.msnbc.msn.com/id/43555581/ns/technology\_and\_science-innovation/#](http://www.msnbc.msn.com/id/43555581/ns/technology_and_science-innovation/); retrieved 1 August 2011]

Tightening NASA budgets in a cost-cutting era means that proposed space exploration missions to asteroids or Mars must make tough choices when it comes to risk versus innovation.

Many new mission ideas have tried to keep risks down by relying upon heritage technologies that have flown on past missions. But that also means innovative new technologies may get squeezed out of smaller NASA mission budgets, such as the next $425 million Discovery-class mission that may target Mars, Saturn's moon Titan, or a comet.

It's tough to develop and deploy new technology from scratch without the bigger budgets that allow for exhaustive testing, said Bruce Banerdt, a planetary scientist at the Jet Propulsion Laboratory in Pasadena, Calif. His proposed Discovery mission to Mars combines technologies Frankenstein-style from deceased and failed Mars missions.

"Inexpensive missions are low-cost, but are still half a billion a shot; it's not something you throw out casually," Banerdt told InnovationNewsDaily. "Doing tech development is really tough to do under a Discovery budget."

**ALL NASA PROGRAMS ARE VULNERABLE BECAUSE OF CURRENT BUDGET TENSIONS-Space Politics '11**

[Commercial space advocates sound the alert; Space Politics; 18 May 2011; <http://www.spacepolitics.com/2011/05/18/commercial-space-advocates-sound-the-alert/>; retrieved 10 August 2011]

Their concern is rooted in the the FY12 appropriations allocations released last week that could result in significant budget cuts for NASA in the coming year. “It’s going to get messy. Any item not strongly defended could be vulnerable,” the SAS alert warns. The alert continues that the leadership of the Commerce, Justice, and Science appropriations subcommittee, whose jurisdiction includes NASA, has decided to ask members of Congress this week what programs they believe should have their funding increased in decreased. A push now for programs like commercial crew and technology development—potentially vulnerable to cuts—could have “a considerable impact” on what the subcommittee decides in its markup in July. Previous lobbying efforts by SAS and others may have already had an effect: the alert notes that the subcommittee “is now definitely aware there’s opposition” to the Space Launch System, which the organization dismisses as an “earmark”.

**CURRENT BUDGETING SYSTEM IS ON THE BRINK OF NOT KEEPING UP WITH THE DEMANDS OF EARTH SCIENCE PROJECTS-Lawler '09**

[Andrew; Science Journalist and Editor; Trouble on the Final Frontier; 3 April 2009; <http://www.andrewlawler.com/science/sci2009/item/30-trouble-on-the-final-frontier.html>; retrieved 14 August 2011]

The community is anxiously awaiting word on who will be the next NASA administrator. Last year on the campaign trail, President Barack Obama promised to increase the monitoring of global climate from space and support a new generation of robotic probes to other planets without throttling back on preparations for returning humans to the moon. The president's preliminary 2010 budget request, released in February and lacking details, proposes a modest boost to funding for both science and human space flight efforts as part of the agency's overall $18.7 billion budget.

But those increases do not begin to cover what NASA's science program needs just to keep pace with the demands of researchers. The agency's science honcho, Edward Weiler, says he needs $900 million more every year just to keep up with current earth science projects. "There is no greater thing than starting a new, sexy science mission," he says. "We all love it. The thing that prevents me is I've also got new, sexy missions started 5 years ago that are costing more than they were supposed to."

**US SPACE SPENDING IS ALREADY TIGHT WITHOUT MOST NON-MAINSTREAM PROGRAMS BEING FUNDED-Los Angeles Times '11**

[Space: If you have the money, we have a program; Los Angeles Times; 9 May 2011; <http://opinion.latimes.com/opinionla/2011/05/money-for-space-programs.html>; retrieved 9 August 2011]

We can't do big things unless we think big. We can't think big unless we allow our imaginations go beyond the mundane. There's nothing less mundane than galaxies far, far away.

Well, yes.

There are, however, a couple of problems: One, money. And two, money.

Americans have always had a love-hate relationship with space and our space program. Supporters love the triumphs, the soaring inspiration of it all. Opponents argue: With so many problems here on Earth, why are we wasting money on space?

Now, throw in the worst economic downturn in decades and you get this: With so many problems here on Earth, and the fact we're so deeply in debt, why waste money on space?

Just how tight have things become?

Heck, we don't even have enough money to keep searching for ET.

Last week, in "SETI Institute's search for extraterrestrial life hits a budgetary black hole," Times staff writer Louis Sahagun reported that the guys sitting in Northern California listening for signals from other life in the universe are about out of money.

**MONEY IS TIGHT AT NASA AND PRIVATES ARE POISED TO TAKE OVER-Los Angeles Times '11**

[Space: If you have the money, we have a program; Los Angeles Times; 9 May 2011; <http://opinion.latimes.com/opinionla/2011/05/money-for-space-programs.html>; retrieved 9 August 2011]

In mid-April, [Tom] Pierson [the institute's chief executive officer] delivered the bad news to stakeholders, just as the array was being prepared to survey more than 50 recently discovered planets beyond our solar system that astronomers believe may be habitable.

Darn, just when we were this close.

So, 50 years after Alan Shepard put America back in the space race, we don't even have the $2.5 million a year it takes to listen for fellow inhabitants of the galaxy, much less travel there.

And Rodriguez thinks Americans are ready to spend really big bucks on space travel?

No, here's where we really are: Like so much of what's going on in the real world, space is about to become a playground for the rich.

BRINK: EARTH SCIENCE BUDGETS ARE ON THE BRINK

**THE SYSTEMS FOR MONITORING GLOBAL CLIMATE CHANGE ARE ON THE BRINK OF COLLAPSE-Lawler '09**

[Andrew; Science Journalist and Editor; Trouble on the Final Frontier; 3 April 2009; <http://www.andrewlawler.com/science/sci2009/item/30-trouble-on-the-final-frontier.html>; retrieved 14 August 2011]

In the past, human space flight often tapped science to pay for its own shortfalls. This time around, however, the problem is within the science program--too many missions costing too much money. For example, technical difficulties led to a $400 million cost overrun on the Mars Science Laboratory (MSL), which forced Weiler to postpone its launch by 2 years. The decision pushed back other planned Mars flights.

Mars wasn't the only trouble spot. Few missions in either the solar studies or the earth sciences program were on budget and schedule. The Solar Dynamic Observatory (SDO), a Goddard effort to investigate the sun's magnetic field, is close to 2 years behind schedule and its initial estimated budget has tripled. The Glory spacecraft being prepared to study aerosols and black carbon in Earth's atmosphere was more than 50% over its original $266 million price tag, and its 2008 launch has been postponed until at least the middle of 2009.

**NASA IS ON THE VERGE OF DEPLOYING SEVERAL EARTH SCIENCE PROJECTS BASED ON FUNDING AVAILABILITY-Werner '10**

[Debra; Article: NASA Ramping Up in Earth Observation; Space.com; 28 December 2010; <http://www.space.com/10555-nasa-ramping-earth-observation.html>; retrieved 14 August 2011]

The U.S. space agency also is planning to launch in December 2012 the Landsat Data Continuity Mission, which will shore up an aging land mapping fleet, followed in July 2013 by initial launch for the Global Precipitation Measurement mission, a joint effort with the Japanese Aerospace Exploration Agency to deploy a constellation of rainfall-measuring satellites.

A second Orbiting Carbon Observatory (OCO-2) is scheduled for launch in February 2013 to replace the satellite lost in a 2009 launch failure. NASA also is building a third Orbiting Carbon Observatory instrument with space parts acquired during construction of OCO-2 that will be ready to launch in 2015 on an available flight opportunity, Freilich said.

Meanwhile, the latest spending plan enables NASA to move ahead with the four missions given the highest priority in the Earth science decadal survey, the National Academy of Science's 10-year plan for space-based observations, and to accelerate all of the missions in the second tier of that survey, Freilich said.

The first-tier missions are: the Soil Moisture Active Passive mission scheduled for launch in November 2014, the second Ice Cloud and Land Elevation Satellite mission expected to fly in October 2015, the Climate Absolute Radiance and Refractivity Laboratory set for launch in 2017 and Deformation Ecosystems Structure and Dynamics of Ice mission scheduled to launch in 2018. By launching all four missions within four years as recommended in the decadal survey, scientists will benefit from being able to merge and compare the data acquired by the various space-based instruments, Freilich said.

The tier-two missions accelerated by the current budget plan include: Active Sensing of CO2 Emissions over Nights, Days and Seasons; Aerosol-Cloud-Ecosystems; Geostationary Coastal and Air Pollution Events; Hyperspectral Infrared Imager; and Surface Water Ocean Topography, Freilich said.

Increased funding for Earth sciences also is allowing NASA to expand its Venture-class program, which funds targeted, principal investigator-led science initiatives. In 2011, NASA plans to solicit Venture-class proposals for new space-based instruments as well as unique small-satellite projects, Freilich said.

The solicitation for new instruments will offer principal investigator-led teams approximately $65 million to $95 million for a five-year program to develop new scientific instruments. "We will be doing this solicitation every single year between now and time immemorial," Freilich said. "This will put us in a position where we always have instruments under development. That will allow us to respond to partnership opportunities in a more nimble way."

LINK: SPACE EXPLORATION IS EXPENSIVE/MEANS TRADEOFFS

**EVEN USING EXISTING OR LEGACY TECHNOLOGY IS EXPENSIVE WITH INNOVATIVE EXPLORATION MISSIONS-Hsu '11**

[Jeremy; Space on a budget balances risk vs. innovation; MSNBC; 27 June 2011; [http://www.msnbc.msn.com/id/43555581/ns/technology\_and\_science-innovation/#](http://www.msnbc.msn.com/id/43555581/ns/technology_and_science-innovation/); retrieved 1 August 2011]

Even tried-and-true tech from past missions doesn't always mean a cheap, easy solution for new planetary missions. Older technologies may require modifications that add to the costs, said Carlos Liceaga, an engineer at NASA Langley Research Center who oversees mission proposals.

"People get into trouble assuming it will be so easy and that you will reap so much benefit from the cost savings," Liceaga said during the panel. "The technical benefits are not hard to believe, but on cost benefits, they tend to give themselves too much credit, and sometimes that's where we disagree with them."

Banerdt also pointed to the case where NASA wanted to reuse the Mars Pathfinder mission's airbag landing system for the Mars rover twins Spirit and Opportunity. The increased mass for the twin rovers' mission caused the landing system to fail during testing, and so engineers scrambled to redesign and retest the system at the last minute.

"The problem with pushing a lot of heritage is that usually you're not doing exactly the same thing that your heritage stuff was doing before, so it's going off into what looks like benign territory but what is nonetheless untested territory," Banerdt said in a phone interview. "That's where a lot of heritage tech blows up in your face."

**SCIENCE BUDGETS WILL BE RAIDED IF THEY AREN'T PROTECTED FROM COST OVERRUNS IN THE EXPLORATION PROGRAM-Chyba '11**

[Christopher; US Human Spaceflight Plans Committee; Testimony in the Hearing on Contributions of Space to National Imperatives; Senate Committee on Commerce, Science, and Transportation; 19 May 2011; <http://www.spaceref.com/news/viewsr.html?pid=37102>; retrieved 8 August 2011]

Moreover, if NASA's space science budget is not protected, it could be raided to fund cost overruns in the human program. Human spaceflight, if it is to be justified and sustained, needs to be aligned with national priorities. Were key space-based research to be cut to fund human spaceflight, human spaceflight would be put into opposition with those priorities. This would serve neither science nor the future of human spaceflight well.

We live in a time of extraordinary discoveries about outer space. We have learned that early Mars had standing liquid water on its surface, and that the resulting sedimentary rocks are still accessible. These are the kind of rocks that can contain information about the early martian environment, or even microfossils should life ever have existed on that world. We've learned that there are many other ocean worlds in our Solar System--moons of the outer planets that host liquid water oceans beneath their ice covers that are as big as our own. We've learned that solar systems are common, and that the arrangement of planets in our own is but one of a vast array of possibilities. And we've learned that most of the mass-energy of the Universe is not made up of the kind of matter we are familiar with here on Earth--and that we don't quite know what this more exotic mass-energy is. Human spaceflight should be an ally in, and certainly not an opponent of, these momentous discoveries.

LINK: CONSTELLATION WOULD BE EXPENSIVE/MEANS TRADEOFFS

**CONSTELLATION PROGRAM MEANS DEEP BUDGET CUTS IN OTHER PRIORITIES-Bolden '10**

[Charles; NASA Administrator; Statement before the House Subcommittee on Commerce, Justice, Science and Related Agencies; 24 March 2010; <http://www.spaceref.com/news/viewsr.rss.html?pid=33755>; retrieved 10 August 2011]

At the highest level, the President and his staff, as well as my NASA senior leadership team, closely reviewed the Augustine Committee report, and we came to the same conclusion as the Committee: The Constellation program was on an unsustainable trajectory. And if we continue on that course, at best we would end up flying a handful of astronauts to the moon sometime after 2030. But to accomplish that task, we would have to make even deeper cuts to the other parts of NASA's budget, terminating support of the International Space Station (ISS) early and reducing our science and aeronautics efforts. Further, we would have no funding to advance the state of the art in any of the technology areas that we need to enable us to do new things in space, such as lowering the cost of access to space and developing closed loop life support, advanced propulsion technology, and radiation protection. The President recognized that what was truly needed for beyond LEO exploration was game-changing technologies; making the fundamental investments that will provide the foundation for the next half-century of American leadership in space exploration. In doing so, the President put forward what I believe to be the most authentically visionary policy for real human space exploration that we have ever had. At the same time, under the new plan, we will ensure continuous American presence in space on the ISS throughout this entire decade, re-establish a robust and competitive American launch industry, start a major heavy lift R&D program years earlier, and build a real technological foundation for sustainable beyond-LEO exploration of our moon, near-Earth asteroids, Lagrange points, and ultimately Mars.

**CONSTELLATION CAN'T BE COMPLETED IN CURRENT BUDGET SCENARIOS; FUNDING WILL NEED TO COME FROM SOMEWHERE-Chyba '11**

[Christopher; US Human Spaceflight Plans Committee; Testimony in the Hearing on Contributions of Space to National Imperatives; Senate Committee on Commerce, Science, and Transportation; 19 May 2011; <http://www.spaceref.com/news/viewsr.html?pid=37102>; retrieved 8 August 2011]

The Committee examined NASA's existing architecture for going beyond low- Earth orbit--the Constellation program--and concluded that Constellation could not be executed at planned budget levels. The reasons for this were primarily budgetary. These included that Constellation's Exploration Systems Architecture Study (ESAS) of 2005 assumed that human spaceflight funding would increase until reaching a steady state of about $10 billion per year. But the first post-ESAS budget, the FY 2007 budget, provided significantly lower funding for the Ares I rocket and the Orion crew vehicle than ESAS had anticipated. Pushing programs out into the future always increases costs. Differences between anticipated and actual budgets, plus technical problems in the Ares I and Orion programs, had significant impact. The FY 2009 budget was lower than that anticipated by ESAS by at first $1 billion per year, and then lower with a growing disparity that reached $2 billion per year in the steady state. The FY 2010 President's Budget Submittal was lower still, anticipating a final steady state level of funding of about $7 billion per year-- some $3 billion below the annual $10 billion against which ESAS had originally planned.

Moreover, it was intended that Shuttle would complete its final flight in 2010, and that the International Space Station (ISS) program would be terminated in early 2016, with corresponding savings becoming available for Constellation. But the ISS termination itself was not budgeted. Yet termination would have to entail the safe de- orbiting of this 350 metric ton structure, requiring either the design, construction and flight of a new de-orbit module to accomplish this task, or the piecemeal de-orbit of the structure via disassembly.3 Taking all this into account, the Human Spaceflight Committee concluded that under the FY 2010 funding profile, the Constellation program would at the least be greatly stretched out in time. The planned heavy-lift vehicle (Ares V) would not be available until the late 2020s, and lunar return could not occur until well into the 2030s, if at all. In short, the Constellation program was not executable at its existing budget.

LINK: ASTEROID MAPPING EXPENSIVE/MEANS TRADEOFFS

**ASTEROID MAPPING WOULD COST HUNDREDS OF MILLIONS OF DOLLARS-Associated Press '09**

[Report: NASA lacks funding to track asteroids; Associated Press via Minnesota Public Radio News; 12 August 2009; <http://minnesota.publicradio.org/display/web/2009/08/12/nasa-asteroid-watch/>; retrieved 4 August 2011]

And the U.S. government is practically the only government doing anything at all, the report found.

"It shows we have a problem we're not addressing," said Louis Friedman, executive director of the Planetary Society, an advocacy group.

NASA calculated that to spot the asteroids as required by law would cost about $800 million between now and 2020, either with a new ground-based telescope or a space observation system, Johnson said. If NASA got only $300 million it could find most asteroids bigger than 1,000 feet across, he said.

But so far NASA has gotten neither sum.

**PLANETARY DEFENSE WOULD COST AT LEAST HUNDREDS OF MILLIONS OF DOLLARS OVER THE NEXT DECADE-David ‘10**

[Leonard; Article: Planetary Defense Coordination Office Proposed to Fight Asteroids; Space.com; 19 October 2010; <http://www.space.com/9356-planetary-defense-coordination-office-proposed-fight-asteroids.html>; 12 August 2011]

by Leonard David, SPACE.com's Space Insider ColumnistDate: 19 October 2010 Time: 01:58 PM ET

The seven-person Ad Hoc Task Force on Planetary Defense was established in April and reported to the NASA Advisory Council. The NAC provides the NASA Administrator with counsel and advice on programs and issues of importance to the space agency.

The NASA Advisory Council has approved the task force report. However, there?s still a long way to go in the sense that there is no obligation on the part of the NASA Administrator to follow the recommendations.

Still, the seven-person team writing the report has elevated the NEO issue, helping to better identify how NASA should further address planetary defense.

The task force was chaired by Schweickart and fellow former astronaut Thomas Jones, with other members representing academia, a space research institute, and NASA itself.

In the final report, the task force found that a planetary defense program plan is likely to require an annual budget of approximately $250 million to $300 million per year during the next decade.

That funding would be needed to meet the Congress-mandated search goal of spotting 460-feet (140-meter) wide NEOs, as well as to execute selected NEO characterization missions; develop and demonstrate NEO deflection capabilities; and develop the analytic and simulation capacity necessary for NASA?s planetary defense role.

"Once the search for potentially hazardous objects is substantially complete, the task shifts to ongoing monitoring and catalog maintenance," the report states.

After flight demonstrations of the primary deflection concepts are completed, further experiments would be integrated into scientific or exploration missions. The planetary defense program budget could then recede to operations and maintenance levels, approximately $50 million to $75 million annually, the report explains.

The task force report "strongly recommends" that the cost of NASA planetary defense activities be explicitly budgeted by the administration and funded by the Congress as a separate agency budget line, not diverted from existing NASA science, exploration, or other mission budgets.

LINK: WEBB TELESCOPE EXPENSIVE/MEANS TRADEOFFS

**THE WEBB TELESCOPE WOULD BE PAID FOR THROUGH CUTTING OTHER PROGRAMS-Grossman '10**

[Lisa; Exclusive: NASA’s Plan to Save Astrophysics From Space Telescope’s Budget Overruns; Wired; 23 November 2010; <http://www.wired.com/wiredscience/2010/11/james-webb-overruns/>; retrieved 8 August 2011]

The $1.5 billion in cost overruns needed to complete the planned successor to the Hubble Space Telescope had NASA astrophysicists fearing for the future of other projects. But it appears NASA won’t suck funds from other astrophysics research to pay for the telescope.

“They’re not going to ravage the astrophysics budget,” said Alan Boss, an astrophysicist at the Carnegie Institution for Science and chair of the NASA advisory council astrophysics subcommittee, told Wired.com. “That is wonderful news.”

The James Webb Space Telescope, named for the NASA administrator who oversaw the Apollo missions, will be the largest telescope ever launched into space. With a 21-foot-wide mirror (three times the diameter of Hubble’s), it promises to peer back to the birth of the first stars and galaxies, and will lay the foundation for much of the next generation of astrophysics research.

“It’s the cornerstone of all the rest of astrophysics in the next decade,” said Debra Elmegreen, an astronomer at Vassar College and the president of the American Astronomical Society.

But an independent review panel charged with investigating budget overruns released a report Nov. 10 announcing that, in the best-case scenario, the telescope will cost $1.5 billion more than its current $5 billion price tag. Even with the extra funds, the telescope’s launch date will slip from June 2014 to Sept. 2015.

The telescope will need an extra $250 million per year in 2011 and 2012 in order to make that 2015 launch date, the report said. If those funds are not available, the launch date will be pushed back, and the price tag will balloon further.

**WEBB TELESCOPE FULL FUNDING WOULD IMPACT DECADAL PROJECT AND ULTIMATELY EARTH SCIENCE PROJECTS-Grossman '10**

[Lisa; Exclusive: NASA’s Plan to Save Astrophysics From Space Telescope’s Budget Overruns; Wired; 23 November 2010; <http://www.wired.com/wiredscience/2010/11/james-webb-overruns/>; retrieved 8 August 2011]

The new price tag imperiled other projects in NASA’s Astrophysics Science Division, which until this month had managed JWST.

Historically, when NASA projects exceeded their budgets, the first place to look for extra funds was within the bloated project’s home division.

“That was the context in which I was thinking, ‘Oh my god, this is Hurricane Katrina for astrophysics,’” Boss said.

The Astrophysics Division is expected to receive about $1.1 billion a year from 2011 to 2015, and pays for all the astronomy satellites currently in operation, including Hubble, plus all the researchers who analyze the data those satellites collect.

Particularly at risk were major projects suggested in the 2010 astronomy decadal survey, a community-wide effort to identify priorities for the next 10 years of research, which announced its intentions in an Aug. 13 report. The report’s top priorities, like the $1.6 billion WFIRST satellite that is designed to look for dark energy, may need to be delayed, cut back or canceled.

The next place to look would be the other science divisions, which manage Earth science, heliophysics and planetary science, and then elsewhere in the space agency.

**NASA WILL SQUEEZE OTHER PROGRAMS IF PRESSED TO FINISH THE WEBB TELESCOPE-Greenfieldboyce '11**

[Nell; Scientists Undeterred By Hubble Successor's Costs; National Public Radio's Morning Edition; 8 June 2011; <http://www.npr.org/2011/06/08/137040818/scientists-undeterred-by-hubble-successors-costs>; retrieved 8 August 2011]

Mountain says the technologies they worry least about are the ones that "scare" people the most. Those are the "unfolding technologies" that make this a collapsible telescope. The James Webb Space Telescope is the size of a Boeing 737, but it has to fold up to fit in a slender rocket — then unfold once it's in space. And the whole thing has to work perfectly, because repair missions won't be an option for an instrument that's so far away.

About $3 billion has already been spent. NASA officials are now hunting around for the extra money it will take to complete the testing and building. The agency also just shook up the telescope's management and put a new project manager, Rick Howard, in charge. Howard says some scientists do worry that James Webb could become the telescope that ate NASA's entire astronomy budget.

"There are a lot of people that are concerned about that, there's no doubt about that," he acknowledges.

**WEBB TELESCOPE IS SLATED TO GO BILLIONS OF DOLLARS OVER BUDGET-Vergano ‘11**

[Dan; Hubble telescope's successor could face budget ax; USA Today; 28 July 2011; <http://www.usatoday.com/tech/science/space/2011-07-28-James-Webb-Space-Telescope-budget-cuts_n.htm>; retrieved 12 August 2011]

For years, astronomers have set their sights on launching a successor to the Hubble Space Telescope— one with 100 times its power — that could peer back to the earliest light of the universe. But funding for the costly James Webb Space Telescope is now targeted for the chopping block.

Amid the larger budget debate, a House appropriations committee vote this month proposed killing the telescope.

Costs have risen to $6.8billion — up 50% from a 2005 estimate — and may go higher after another NASA review next year.

The telescope is "billions of dollars over budget and plagued by poor management," said the committee, in a statement accompanying the bill, which also proposed cutting NASA's budget 9% to $16.8 billion.

**INDEPENDENT REVIEW OF WEBB PROVES THAT THE PROGRAM WILL COST MORE THAN SLATED-Horn ‘10**

[Leslie; NASA's Webb Telescope Behind Schedule, Over Budget; PC Magazine; 11 November 2010; <http://www.pcmag.com/article2/0,2817,2372548,00.asp>; retrieved 12 August 2011]

Work on the James Webb Space Telescope (JWST) - intended to be the Hubble's replacement - is behind schedule and over budget, according to a Wednesday report.

JWST will study the history of the universe and document the far corners of space; it's managed by NASA's Goddard Space Flight Center in Greenbelt, Md. Previously slated to launch in 2014, the telescope is now delayed until at least September 2015. It's $1.5 billion over its $5 billion budget.

But it's not the design or build of the telescope that is causing the problems. JWST is in "very good technical shape," according to a Friday letter John Casani from NASA's Jet Propulsion Lab wrote to NASA chief Charles Bolden. Instead, the root causes of the cost and scheduling issues are due to a "badly flawed" budget and the inability of those involved to adequately assess what is needed, Casani wrote.

The report was conducted by the JWST Independent Comprehensive Review Panel (ICRP) at the request of Sen. Barbara Mikulski, a Maryland Democrat. In June, Mikulski penned a letter to Bolden in which she expressed concern about the escalating costs associated with JWST. She called on him to conduct an independent and comprehensive review of the program, which resulted in Wednesday's study.

LINK: MARS PROGRAM WOULD BE EXPENSIVE

**MARS IS A $600 BILLION PROJECT-Easterbrook ‘04**

[Gregg; Why We Shouldn't Go to Mars; Time; 26 January 2004; <http://www.time.com/time/magazine/article/0,9171,993172,00.html>; retrieved 15 August 2011]

Two centuries ago, Meriwether Lewis and William Clark left St. Louis to explore the new lands acquired in the Louisiana Purchase," George W. Bush said, announcing his desire for a program to send men and women to Mars. "They made that journey in the spirit of discovery ... America has ventured forth into space for the same reasons."

Yet there are vital differences between Lewis and Clark's expedition and a Mars mission. First, Lewis and Clark were headed to a place amenable to life; hundreds of thousands of people were already living there. Second, Lewis and Clark were certain to discover places and things of immediate value to the new nation. Third, the Lewis and Clark venture cost next to nothing by today's standards. In 1989 NASA estimated that a people-to-Mars program would cost $400 billion, which inflates to $600 billion today. The Hoover Dam cost $700 million in today's money, meaning that sending people to Mars might cost as much as building about 800 new Hoover Dams. A Mars mission may be the single most expensive nonwartime undertaking in U.S. history.

**EVEN ACCOUNTING FOR MEDIA INFLATION, MARS IS A $500 BILLION PROJECT-Day ‘04**

[Dwayne; Whispers in the echo chamber; The Space Review; 22 March 2004; <http://www.thespacereview.com/article/119/1>; retrieved 15 August 2011]

Over the weekend the $1 trillion estimate took on more apparent legitimacy. On Sunday, January 11, “CNN Late Edition With Wolf Blitzer” had on several guests, including U.S. Commerce Secretary Don Evans and Democratic presidential candidate Senator Joseph Lieberman. Blitzer asked Evans about the cost figure. “Some estimating already this could cost a trillion dollars over 20 years,” Blitzer said, according to a CNN transcript of the program. Evans, who had no role in the space policy, did not deny the $1 trillion figure, but stated that “this program will be within a responsible fiscal budget.”

A few minutes later Blitzer asked the same question of Senator Lieberman, but did not repeat the trillion dollar figure in his question. In his reply Lieberman declared his support for the space program. “But if you asked me whether the best use of $1 trillion of American taxpayer money in the coming years is to land a mission on Mars or the Moon, I’d say no,” Lieberman added. “We need it right here on Earth to give health care that’s affordable to everybody, to improve our education system, and do better on veteran’s benefits and homeland security.”

Commerce Secretary Don Evans, who had no role in the space policy, did not deny the $1 trillion figure, but stated that “this program will be within a responsible fiscal budget.”

On January 14 the Denver Post printed an article on the new plan that stated that congressman Mark Udall, Colorado Democrat, suspected the cost of the new plan would be “more along the lines of $1 trillion over 30 years.” There is no indication how Udall arrived at this figure, but he undoubtedly also got it from the AP story.

LINK: NASA PROJECT GO OVER BUDGET, MEANING CUTS/TRADEOFFS

**NASA EXPLORATION MISSIONS ULTIMATELY COST MORE THAN PLANNING, MAKING BUDGET NEGOTIATIONS EVEN TIGHTER-Lawler '09**

[Andrew; Science Journalist and Editor; Trouble on the Final Frontier; 3 April 2009; <http://www.andrewlawler.com/science/sci2009/item/30-trouble-on-the-final-frontier.html>; retrieved 14 August 2011]

NASA's scientific missions have enjoyed spectacular success. But significant cost overruns and launch delays jeopardize future missions.

The $273 million Orbital Carbon Observatory's plunge into the Southern Ocean shortly after launch last month was a sobering reminder of the unforgiving nature of space exploration. But the ability to put a spacecraft safely into orbit is the least of the pressing issues facing NASA's $4.5 billion science program. A bigger challenge than the rare but dramatic rocket failure is finding the money to pay for an ambitious, complex, and unique set of missions.

The squeeze on NASA's science budget arrives as researchers in a host of disciplines (see graphic below) begin planning the next generation of missions. No one--lawmaker, NASA manager, or senior scientist--seems to have an answer to the ballooning cost of space science projects. "There's no simple fix, or the situation would have been resolved long ago," said a frustrated Representative Gabrielle Giffords (D-AZ), the new chair of the House of Representatives science committee's space panel, during a 5 March hearing that covered both science and space-flight overruns.

**NASA PROJECTS COST UPWARDS OF FOUR TIMES THE ESTIMATED COST MAKING BUDGET DISCUSSIONS MORE COMPLEX-Lawler '09**

[Andrew; Science Journalist and Editor; Trouble on the Final Frontier; 3 April 2009; <http://www.andrewlawler.com/science/sci2009/item/30-trouble-on-the-final-frontier.html>; retrieved 14 August 2011]

Complaints about overruns in the science program extend back to at least 1980. Back then, however, NASA's entire budget equaled that of its science budget today. And today, there's a much longer line of telescopes, planetary robots, and Earth-monitoring satellites waiting to be designed, built, and launched.

That queue, ironically, is due in part to the success enjoyed by scientists in plotting their future. Since the 1960s, astronomers have created a consensus decadal plan for the next generation of telescopes. Earlier this decade, the other three disciplines that depend heavily on NASA dollars--earth sciences, solar system exploration, and solar studies--followed suit. Providing the space agency with a clear set of missions and their costs has helped scientists make their case with members of Congress and NASA bureaucrats. "I'm a slave to the decadals," says Weiler.

But that community process relies on accurate cost estimates. And when the costs soar, the process breaks down. The most infamous example is the James Webb Space Telescope, which astronomers pegged at $1 billion, not including operations and launch, in a 2001 report. The true cost likely will top $4 billion by its launch in 2013, forcing NASA to slow down work on a slew of other astronomy and astrophysics missions.

Weiler headed the space program from 1998 to 2004 before becoming director of Goddard Space Flight Center in nearby Greenbelt, Maryland. Last April, he was called back downtown to run the program after S. Alan Stern quit in a funding dispute with then-Administrator Michael Griffin, who left NASA in January. Stern made cutting costs his mantra, and he played hardball with project managers and contractors. But Stern also failed to win advocates for his cause and departed after only 12 months on the job.

"When I walked into this office, there were a lot of promises made out there, and communities were pretty happy," Weiler said in a recent interview at NASA headquarters. But within days, he says, a team of independent cost reviewers gave him the bad news. "Over a 10-year period there were $6 billion of promises made [in planetary sciences] that could not be met. And so I was put in the position of being the bad guy."

INTERNAL LINK: SPACE EXPLORATION TRADES OFF WITH EARTH SCIENCE PROGRAMS

**LARGE EXPLORATIONS TRADE OFF WITH SCIENCE PROGRAMS IN A ZERO-SUM ENVIRONMENT-Robinson '08**

[Michael; Assistant Professor of History at Hillyer College; History News Network at George Mason University; 6 July 2008; <http://hnn.us/articles/51386.html>; retrieved 8 August 2011]

But Wellman’s story is worth taking seriously, especially as the United States gears up to replace the aging shuttle fleet. NASA’s course, like Wellman’s, has been shaped by tragic events. The destruction of Challenger in 1986 and Columbia in 2003 brought about much soul searching, and strengthened the agency’s commitment to safety. Yet NASA has focused most of its attention on improving the methods of exploration, rather than assessing its merits. Like Wellman, they have chosen to honor their fallen comrades by focusing on the construction of better machines, not the development of better missions. Consider President Bush’s 2004 speech “A Renewed Spirit of Discovery,” in which he lays out his vision for the U.S. space program. The document runs a little over 1400 words. Boiled down, it says this: send Americans back into space, first to the moon, then Mars. NASA now proceeds accordingly, gearing up, as Americans did a century ago, to send very brave people to very distant places.

But space exploration is a zero-sum game. Sending astronauts to Mars (a planet now studied quite efficiently by rovers, orbiters, and, as of late May, the Phoenix Lander) requires an enormous investment that will come at the expense of smaller, more useful, scientific projects. Already NASA plans to cut millions of dollars from the space science budget over the next five years. The savings will help cover a portion of the staggering costs of the “Constellation Program,” an initiative to design and produce a new generation of launch vehicles (Ares) and crew exploration vehicles (Orion).

**CONGRESS HAS PROPOSED TO TAKE MONEY AWAY FROM CLIMATE CHANGE RESEARCH TO FUND EXPLORATION INITIATIVES-Sanz ‘11**

[Alex; NASA’s future holds great promise, but it's complicated; KHOU News; 26 July 2011; <http://www.khou.com/news/NASAs-future-holds-great-but-promise-but-its-complicated-126228648.html>; retrieved 16 August 2011]

Continued gridlock in Washington and Congressional calls for spending cuts have called into question how long it will take NASA to return Americans to space.

Johnson Space Center Director Michael Coats told KHOU 11 News the future of the space program rests on decisions made by members of Congress.

“The reality, when you get down to it, depends on the budget,” Coats said. “It’s a tough time right now. We’re going to be in a period where we can’t put humans into orbit for the first time in 50 years.”

Washington has pressed NASA to push beyond Earth’s orbit, reach an asteroid and orbit Mars.

NASA accounts for half of one percent of federal spending, but a committee in Congress has proposed cutting its budget by 10 percent this year.

Congress has said it wants NASA to shift its focus away from climate research and turn its attention to deep-space exploration.

“It’s not a hard sell to have the Congress commit,” said Pete Olson (R)-Houston. “It’s a hard sell to have the Congress commit with more money. NASA does not need to be doing that research. That money should go to human spaceflight exploration.”

**SCIENCE FUNDING IS A PRIME TARGET FOR THE CONGRESSIONAL SUPER COMMITTEE, FORCING TRADEOFFS-Hand ‘11**

[Eric; U.S. Debt Deal Could Dramatically Slash Science Funding in 2013; Scientific America; 9 August 2011; <http://www.scientificamerican.com/article.cfm?id=us-debt-deal-could-dramatically-slash-science-funds-in-2013>; retrieved 10 August 2011]

Scalpel or guillotine? Those are the possible fates in store for US science funding after Congress and the White House reached a deal to cut federal spending and raise the nation's self-imposed debt limit before a 2 August deadline.

The product of tumultuous negotiations, the deal largely spares science in the short term but puts a day of reckoning on the horizon: 2 January 2013. If politicians cannot agree on how to improve the government's fiscal outlook by then through targeted cuts and other means--the scalpel option--their failure will automatically trigger the guillotine: a deep cut applied across a range of expenditures, including research. In the worst case, the automatic cuts could mean shuttered laboratories and mass lay-offs at universities.

Whether or not that happens depends partly on a special Joint Select Committee on Deficit Reduction, the 'super-committee', to be set up as part of the deal. The super-committee, which congressional leaders must appoint by 16 August, will be charged with finding ways of raising revenues or reducing the costs of en­titlement programs such as health care and social security, which the government is legally required to fund. If the super-committee fails, the automatic triggers would force discretionary spending to fall under the indiscriminate blade of across-the-board cuts.

"Then there will be extraordinary pain," says Michael Lubell, director of public affairs for the American Physical Society in Washington DC. "And it will get worse in 2014."

The two-stage structure of the debt deal explains both the short-term reprieve and the long-term worry. The first set of agreed cuts, totaling US$917 billion, will be spread over 10 years, but two factors mitigate their effect. First, reductions to defense spending will account for a significant share of the cuts--meaning that other US agencies won't bear the entire burden. Second, the cuts are heavily loaded forward onto the 2014 fiscal year and beyond, in an apparent effort to shelter the current fragile economy. Only minimal cuts will be implemented in fiscal years 2012 and 2013.

In fact, the cap for overall discretionary spending that legislators will use in finishing the 2012 appropriations process is $29 billion higher than the cap that House Republicans have used for their budget proposals so far (see 'Fiscal tug-of-war'). This means that the National Institutes of Health (NIH) might yet escape cuts to its funding that previously seemed likely. The higher cap also leaves wiggle room for Senate legislators to restore pet projects, such as NASA's James Webb Space Telescope, which the House last month voted to cancel.

**NASA BUDGETING STRATEGIES MEANS THAT TRADE OFFS COULD BE MADE UNDER THE GUISE OF TOUGH CHOICES-Harwood '11**

[William; Veteran Space Journalist and Writer; NASA 2012 budget reflects 'tough choices,' uncertain outlook; c|Net News; 14 February 2011; <http://news.cnet.com/8301-19514_3-20031912-239.html>; retrieved 8 August 2011]

Because "these are tough fiscal times, tough choices had to be made," he said. "Our No. 1 priority is safely flying out the shuttle and maintaining the safety and well being of the American astronauts currently living and working in space."

NASA is working under a continuing resolution that requires the agency to operate at 2010 funding levels. The $19 billion fiscal 2011 budget remains in limbo, as does precise funding to begin ramping up work on commercial manned spacecraft, the new heavy lift launcher and the multipurpose crew vehicle NASA is planning for deep-space exploration.

The new budget funds the congressionally mandated Space Launch System heavy-lift rocket and the Multi-Purpose Crew Vehicle at roughly the same levels that were authorized in the 2011 budget: $1.8 billion for the rocket and $1 billion for the crew capsule.

**EMPIRICALLY, MANDATES FOR SPACE EXPLORATION MEAN CUTS IN EARTH SCIENCE PROGRAMS-Berger '05**

[Brian; NASA's Exploration Focus Blamed for Earth Science Cuts; Space.com; 2 May 2005; <http://www.space.com/1028-nasa-exploration-focus-blamed-earth-science-cuts.html>; retrieved 5 August 2011]

House Science Committee Chairman Sherwood Boehlert (R-N.Y.) expressed alarm over recent budget cuts and delays in NASA's Earth science program that a recent National Research Council report attributed to the U.S. space agency's shift in focus toward lunar and Mars exploration.

"This report has to be a red flag for all of us," Boehlert said during an April 26 hearing examining how Earth science programs fare in NASA's 2006 budget request. "We need to stop, examine what's happening, and make sure that the fiscal 2006 budget for NASA - whatever its top-level number - includes adequate funding to keep Earth science moving forward for the foreseeable future."

NASA merged its Earth science and space science programs into a single organization, the Science Mission Directorate, in 2004 and no longer maintains separate budgets for the two activities. But according to a House Science Committee analysis of NASA's budget request, of the $5.47 billion included for the Science Mission Directorate, only $1.36 billion would be spent on Earth science activities, a drop of 8 percent below the 2005 level and 12 percent less than the 2004 level. Earth science spending would continue to decline in 2007, NASA projections show, even as overall science funding would grow by $500 million.

The National Research Council report, written by an expert panel and released the day of the hearing, says the budget trend for Earth science already is translating into program delays and cancellations. The report, "Earth Science Applications from Space: Urgent Needs and Opportunities to Serve the Nation," points out that NASA has "canceled, descoped, or delayed at least six planned missions" and has nothing in the pipeline to replace the fleet of Earth Observing System satellites the agency has spent more than a decade putting on orbit.

"At NASA, the vitality of Earth science and application programs has been placed at substantial risk by a rapidly shrinking budget that no longer supports already-approved missions and programs of high scientific and societal relevance," the report states. "Opportunities to discover new knowledge about Earth are diminished as mission after mission is canceled, descoped, or delayed because of budget cutbacks, which appear to be largely the result of new obligations to support flight programs that are part of the Administration's vision for space exploration."

**EXPANSION OF EXPLORATION MEANS NASA SPENDS LESS ON EARTH SCIENCE PROGRAMS-Haymet '07**

[Tony; Director of the Scripps Institution of Oceanography at the University of California at San Diego; and Mark Abbott and Jim Luyten; The Planet NASA Needs to Explore; The Washington Post; 10 May 2007; <http://www.washingtonpost.com/wp-dyn/content/article/2007/05/09/AR2007050902451.html>; retrieved 5 August 2011]

Decades ago, a shift in NASA priorities sidelined progress in human space exploration. As momentum gathers to reinvigorate human space missions to the moon and Mars, we risk hurting ourselves, and Earth, in the long run. Our planet -- not the moon or Mars -- is under significant threat from the consequences of rapid climate change. Yet the changing NASA priorities will threaten exploration here at home.

NASA not only launches shuttles and builds space stations, it also builds and operates our nation's satellites that observe and monitor the Earth. These satellites collect crucial global data on winds, ice and oceans. They help us forecast hurricanes, track the loss of Arctic sea ice and the rise of sea levels, and understand and prepare for climate changes.

NASA's budget for science missions has declined 30 percent in the past six years, and that trend is expected to continue. As more dollars are reallocated to prepare for missions back to the moon and Mars, sophisticated new satellites to observe the Earth will be delayed, harming Earth sciences.

**CLIMATE CHANGE DOUBTERS WILL PUT UP CLIMATE CHANGE STUDIES AS A FIRST CUT WITH NASA BUDGET INCREASES-Space Politics '11**

[Human spaceflight versus Earth sciences?; Space Politics; 9 February 2011; <http://www.spacepolitics.com/2011/02/09/human-spaceflight-versus-earth-sciences/>; retrieved 15 August 2011]

There are a number of issues with the letter. They claim that NASA spent “over a billion dollars” on “studying global warming/climate change” in FY2010. The agency got about $1.4 billion for all Earth sciences research in FY10, according to agency budget documents. There’s no breakout for how much of that went specifically to climate change research, though. The letter also claims that the “lion share” of NASA’s share of stimulus funding went to climate change studies. In fact, only about a third of the agency’s stimulus funding, $325 million, went to Earth sciences programs, to accelerate development of Earth science spacecraft. Human spaceflight got even more: $400 million, including $50 million for the CCDev program. And their claim that NASA’s core mission is human spaceflight is not supported by other documents, ranging from the National Aeronautics and Space Act from 1958 to the latest NASA authorization act, which declared that NASA “is and should remain a multi-mission agency with a balanced and robust set of core missions in science, aeronautics, and human space flight and exploration” and that “NASA plays a critical role through its ability to provide data on solar output, sea level rise, atmospheric and ocean temperature, ozone depletion, air pollution, and observation of human and environment relationships”.

A bigger issue, though, is that this letter may be indicative of a bigger battle some in Congress want to wage between human spaceflight and Earth science. Some members have openly expressed their skepticism about the validity of climate change research, questioning either the existence of global warming or the role of human activities in causing climate change. The letter to appropriators makes no judgment on the quality of validity of such research, only NASA’s role in supporting it, but some might see that unspoken argument there. For example, one of the letter’s signers, Rep. Brooks, said last week in regards to NASA funding that there would be “hearings soon on global warming” by the House science committee without going into more details. An attack on Earth sciences funding to support human spaceflight could create or reinvigorate opponents of human spaceflight programs, reminiscent of previous debates between human spaceflight and robotic space exploration advocates—a battle that the agency presumably would want to avoid.

**CLIMATE SCIENCE IS VERY VULNERABLE IN THE CURRENT CONGRESSIONAL ATMOSPHERE-Hand ‘11**

[Eric; U.S. Debt Deal Could Dramatically Slash Science Funding in 2013; Scientific America; 9 August 2011; <http://www.scientificamerican.com/article.cfm?id=us-debt-deal-could-dramatically-slash-science-funds-in-2013>; retrieved 10 August 2011]

But 'mission' agencies, such as NASA, or the National Oceanic and Atmospheric Administration (NOAA), where science is a large but ultimately ancillary activity, could suffer. Worst off would be programs supporting research that is controversial in the current Congress, says Patrick Clemins, director of the research and development budget program at the American Association for the Advancement of Science in Washington DC. This could spell trouble for climate-change research at NOAA and within NASA's Earth Science Division. The Department of Energy's applied energy and loan-guarantee programs could also be vulnerable, as some members of Congress see them as picking winners in a part of the economy that should be governed by the free market.

**EMPIRICALLY, INCREASES IN THE EXPLORATION BUDGET TRADE OFF OF THE EARTH SCIENCE BUDGET-Science Magazine '04**

[Scientists Fear Collateral Damage From NASA’s Revised Vision; Science Magazine; 26 March 2004; <http://www.sciencemag.org/content/303/5666/1952.2.full.pdf>; retrieved 6 August 2011]

Everyone agrees that President George W. Bush’s space exploration plan puts NASA’s science program on a new trajectory. But last week academic researchers and agency officials sparred over whether that change will help or hurt the agency’s $6.5 billion science efforts.

At a meeting of the National Research Council’s space studies board in Washington, D.C.—the first detailed public airing of NASA’s new course—NASA managers insisted that the plan will generate more research opportunities. But some scientists grumbled that they were not consulted about the changes and complained that areas such as solar studies and astrophysics are already being targeted for cuts.

NASA currently spends nearly $4 billion on space science, with another $1.5 billion for earth science and $965 million for biological and physical research. Bush’s January call for robotic and human exploration of the moon and Mars would mean new monies for the Mars robotic effort, a new line of lunar orbiters and landers costing $1.3 billion through 2009, and more biological research on the space station tailored to the needs of future astronauts (see table). Under the new plan, space science budgets would grow from $3.9 billion this year to $5.5 billion by 2009.

A host of projects not directly related to such exploration, however, face significant changes. The Laser Interferometer Space Antenna, for example, would be launched in 2012, a year later than planned, and

Contellation-X, also slated for launch after 2010, would face a 2 - year delay. NASA is halting preliminary work on a series of probes named after Einstein and designed to examine mysteries such as dark energy. In earth science, the Global Precipitation Mission would be delayed 2 years, a probe to measure ocean winds would be postponed indefinitely, and a series of small earth science platforms would be put on hold for a year.

“This is a massive shift in direction,” said Yale University astronomer Meg Urry. “It is a little disorienting.” She and several board members called these and other changes “collateral damage” from the new exploration plan. “We’re ending up with a very narrowly focused science program,” complained James Burch, vice president of the Southwest Research Institute in San Antonio, Texas, and a former NASA space physicist.

**CONGRESS COMMITTED TO PROTECTING SPACE FLIGHT EVEN IN TIGHT BUDGET TIMES-Wilson ‘11**

[Reid; We Love the Final Frontier; The National Journal; 20 July 2011; <http://www.nationaljournal.com/columns/on-the-trail/why-even-some-devoted-gop-budget-cutters-want-to-spend-money-on-human-spaceflight-20110720>; retrieved 11 August 2011]

Why are conservative Republicans, who love nothing more than trimming government as far as they can, bent on perpetuating NASA’s human spaceflight program?

Along with powerful appropriators and well-placed veteran members of Congress, tea party freshmen are concluding that sending humans into space is a valuable use of the country’s limited resources.

That view is at odds with many in the scientific community, who believe that repeatedly sending astronauts to low-Earth orbit is a waste of time and resources. “We haven’t learned one thing from the space station, not an iota,” Bob Park, a former head of the University of Maryland’s Physics Department told me. “There is nothing that a human being can do in space at this point that we can’t do far better, cheaper, safer, more reliably—all of these things—than robots.”

But human spaceflight has powerful allies, thanks to both the aerospace contractors who stand to make billions off future endeavors and the members of Congress who realize just how many jobs will be lost if manned flight is permanently shelved. Tens of thousands of jobs are on the line in Alabama, California, Florida, and Texas alone, with NASA itself and in dependent industries. Freshmen such as Reps. Sandy Adams, R-Fla., and Mo Brooks, R-Ala., represent districts that will be hit the hardest.

IMPACT: EARTH SCIENCE PROGRAMS CRITICAL

**DAMAGE TO EARTH SCIENCE PROGRAMS ARE IRREVOCABLE AND COULD HURT DECADES OF INFRASTRUCTURE-Killeen '05**

[Timothy L.; Director of the National Center for Atmospheric Research; Prepared Statement; House Committee on Science, Space and Technology; 28 April 2005; <http://www.spaceref.com/news/viewsr.html?pid=16382>; retrieved 12 August 2011]

Third, the importance of Earth science and the central role of NASA in this field argue for careful, thorough, and deliberative assessment to inform program planning, especially when major changes are being considered. The current pace of budgetary and program change in NASA is inconsistent with such an approach and could result in irrevocable damage to programs and scientific teams that have taken decades and billions of tax dollars to build.

I fully understand that NASA faces many difficult choices arising from the pursuit of ambitious goals in a period of national budget constraints. However, I believe it important to proceed carefully when making decisions regarding important national assets and programs such as those represented within the NASA Earth Science effort.

**NASA IS THE PREDOMINANT AGENCY FUNDING EARTH SCIENCE STUDIES-Killeen '05**

[Timothy L.; Director of the National Center for Atmospheric Research; Prepared Statement; House Committee on Science, Space and Technology; 28 April 2005; <http://www.spaceref.com/news/viewsr.html?pid=16382>; retrieved 12 August 2011]

First, NASA plays a crucial role in this country's vibrant Earth sciences program. NASA is the dominant federal funding agency for U.S. scientists and engineers who address fundamental questions about our planet, provide practical knowledge about the way the Earth functions, and reveal how human activities affect the environment upon which all life depends. NASA funding for Earth science provides the intellectual capital and scientific infrastructure to produce work that is not just intellectually exciting but critical to human existence.

**NASA'S BUDGET UNIQUELY SUPPORTS EFFORTS THAT ARE CRITICAL TO MANY SCIENTIFIC ENDEAVORS-Killeen '05**

[Timothy L.; Director of the National Center for Atmospheric Research; Prepared Statement; House Committee on Science, Space and Technology; 28 April 2005; <http://www.spaceref.com/news/viewsr.html?pid=16382>; retrieved 12 August 2011]

In closing, I hope that my short list of examples suffices to emphasize the fact that it is not possible to conceive of a vigorous and healthy Earth system science effort in the United States without a strong ongoing NASA program. The scientific community is in the initial stages of a knowledge revolution enabled by the vast increases in the capabilities of, and synergy between, observation and information technologies. The advances in Earth system science that are being enabled by these capabilities are critical for understanding the Earth system and how it is changing. Such understanding is an important contribution to natural resource management, natural-hazard mitigation, and sustainable economic growth. I understand that NASA faces many difficult choices arising from pursuit of ambitious goals in a period of budget constraints, but I urge you to take account of the unique and central role of NASA observing programs in our nation's climate, weather, and Earth system science efforts as you oversee development of the plans and strategies that will guide NASA in the coming decade and beyond.

**NASA IS THE LARGEST ENVIRONMENTAL SCIENCE PROGRAM SUPPORTED BY THE FEDERAL GOVERNMENT-Killeen '05**

[Timothy L.; Director of the National Center for Atmospheric Research; Prepared Statement; House Committee on Science, Space and Technology; 28 April 2005; <http://www.spaceref.com/news/viewsr.html?pid=16382>; retrieved 12 August 2011]

Earth system science in the U.S. In sheer budgetary terms, NASA is the single largest environmental science program supported by the federal government. The widely respected budget analyses of the American Association for the Advancement of Science (AAAS) indicate that NASA provided 34 percent of the total funding for the environmental sciences in 2004. Much of this spending is devoted to the design, development, and operation of scientific instruments, the spacecraft that carry them, and the data systems required to process, analyze, archive, and distribute data to the scientific community and other users. But it should also be remembered that NASA provides significant resources to university investigators through the research and analysis component of its program.

**NASA IS CRITICAL TO THE EARTH SCIENCES-Zuber '08**

[Maria; Professor of Geophysics at MIT; Statement by Maria T. Zuber: Hearing on NASA at 50: Past Accomplishments and Future Opportunities and Challenges; House Committee on Science, Space, and Technology; 30 July 2008; <http://www.spaceref.com/news/viewsr.html?pid=28736>; retrieved 10 August 2011]

NASA's contributions toward understanding the state and workings of our Earth has a tremendously rich history. The most innovative approaches used in remote satellite observation were developed by NASA or by the scientific and technological community under the auspices of NASA support. Satellites and analysis tools originally conceived and built by NASA are commonly distributed to other, more operational, government agencies, such as the National Oceanic and Atmospheric Association of the Department of Commerce, and the U.S. Geological Survey under the Department of the Interior. Among numerous accomplishments NASA can claim credit for the first measurements of the steady but miniscule motions of the Earth's tectonic plates, characterization of the ozone hole, the three-dimensional structure of hurricanes, the general circulation of the oceans, biological ocean productivity, rainfall patterns in the tropics, and the global wind pattern over the oceans and its relationship to wave distribution and height. Efforts are ongoing to study changes on the Earth on decadal time scales - sea level rise, the surface ice volume, and measurement of changes in water reservoirs.

**NASA PROGRAMS CRITICAL TO EARTH SCIENCE DATA COLLECTION PROJECTS-NASA ‘11**

[Earth Science Data Records Programs, NASA Information Sheet; 18 February 2011; <http://science.nasa.gov/earth-science/earth-science-data/Earth-Science-Data-Records-Programs/#ESDR_in_research_environments>; retrieved 11 August 2011]

There are several programs whose overall goal is to improve and extend Earth science data records using data from NASA satellites. These programs support Earth science researchers by providing measurements that benefit from data coming from multiple missions spanning longer time periods.

The programs that support these goals are:

* Earth System Data Records Uncertainty Analysis
* Making Earth Science Data Records for Use in Research Environments (MEaSUREs)
* Research, Education and Applications Solutions Network (REASoN)

IMPACT: NASA EARTH SCIENCE CRITICAL TO CLIMATE CHANGE STUDIES

**CUTS IN EARTH SCIENCE PROGRAMS LEAVE THE UNITED STATES WITHOUT CLIMATE DATA COLLECTION SYSTEMS-Berger '05**

[Brian; NASA's Exploration Focus Blamed for Earth Science Cuts; Space.com; 2 May 2005; <http://www.space.com/1028-nasa-exploration-focus-blamed-earth-science-cuts.html>; retrieved 5 August 2011]

Berrien Moore, co-chairman of the panel that wrote the scathing report, told the House Science Committee that NASA's shift in priorities has jeopardized U.S. leadership in Earth observation. He noted that NASA has no major Earth science missions in development besides the Global Precipitation Measurement mission, a proposed international constellation of satellites tentatively slated to start launching around the end of the decade.

"This is the first time I can remember in the long history I've had with NASA seeing that there is essentially an end," Moore said.

Moore also said he was concerned about NASA's plan to rely more heavily in the future on operational satellites operated by other agencies for collecting environmental data important to scientists. The centerpiece of that strategy is the National Polar-orbiting Operational Environmental Satellite System (NPOESS), a new series of polar orbiting weather satellites to be jointly operated by the U.S. National Oceanic and Atmospheric Administration and the U.S. Air Force starting around 2010.

The NPOESS system is expected to take over a number of Earth Observing System measurements as well as host a land-imaging sensor to gather data that for 30 years has been collected by dedicated Landsat satellites. In addition, NASA officials are now eying the NPOESS system as a possible host for a greenhouse gas analyzing instrument that NASA designed for the recently canceled Glory mission.

Rep. Mark Udall (Colo.), ranking Democrat on the House Science space and aeronautics subcommittee, expressed concern about the overall health of the Earth science program and said he was not convinced that putting science instruments on NPOESS is the answer.

"There may well be good budgetary reasons to consider moving the Landsat sensor onto NPOESS, for instance, but I am concerned that neither the technical impacts of such a move nor its likely cost impacts are well understood at this point," Udall said.

**NASA PROJECTS ARE CRITICAL TO MEASURE AND RECORD CLIMATE CONTROL DATA-Bolden '10**

[Charles; NASA Administrator; Statement before the House Subcommittee on Commerce, Justice, Science and Related Agencies; 24 March 2010; <http://www.spaceref.com/news/viewsr.rss.html?pid=33755>; retrieved 10 August 2011]

Climate change research and observations, which will enable NASA to substantially accelerate and expand its Earth Science capabilities, including a replacement for the Orbiting Carbon Observatory, development of new satellites recommended by the National Academy of Sciences Decadal Survey, and development of smaller Venture class missions. This investment will ensure the critically important continuity of certain key climate measurements and enable new measurements to address unknowns in the climate system, yielding expanded understanding of our home planet and improved understanding of climate change.

**NASA KEY FOR CLIMATE CHANGE RESEARCH-Haymet '07**

[Tony; Director of the Scripps Institution of Oceanography at the University of California at San Diego; and Mark Abbott and Jim Luyten; The Planet NASA Needs to Explore; The Washington Post; 10 May 2007; <http://www.washingtonpost.com/wp-dyn/content/article/2007/05/09/AR2007050902451.html>; retrieved 5 August 2011]

Government agencies and the private sector, as well as individual citizens, need to better grasp the risks and potential paths of global climate change. Mitigating these risks and preparing for the effects of warming will require scientific understanding of how our complex planet operates, how it is changing, and how that change will affect the environment and human society.

John F. Kennedy's brilliant call to put a man on the moon by the end of the 1960s set an arbitrary deadline, but the deadline we face today is set by nature. NASA must continue to play a vital role in helping find ways to protect our planet for (and perhaps from) its intelligent life. Exploration of space is a noble quest. But we can't afford to be so starry-eyed that we overlook our own planet.

**NASA CRITICAL FOR EARTH RESEARCH AS THEY PROVIDE THE BULK OF THE DATA FOR CLIMATE CHANGE RESEARCH LOCALLY AND ABROAD-Bolden '10**

[Charles; NASA Administrator; Statement before the House Subcommittee on Commerce, Justice, Science and Related Agencies; 24 March 2010; <http://www.spaceref.com/news/viewsr.rss.html?pid=33755>; retrieved 10 August 2011]

At present, NASA Earth-observing satellites provide the bulk of the global environmental observations used for climate change research in the United States and abroad. This year, analyses of NASA satellite measurements quantified the rates of ground water depletion since 2003 in California and in India's Indus River valley--rates that are unsustainable for the future. NASA conducted the first ICEBridge airborne campaigns in both Arctic and the Antarctic, to maintain the critical ice measurements during the gap in time between the ICESAT-1 and -2 satellites.

**NASA PARTICIPATION KEY TO GIVE DATA TO MAKE INFORMED DECISIONS ABOUT CLIMATE CHANGE-Schwartz ‘10**

[Ariel; NASA Getting $2.4 Billion for Climate Change Research; Fast Compay; 5 April 2010; <http://www.fastcompany.com/1607529/nasa-getting-24-billion-for-climate-change-research>; retrieved 12 August 2011]

NASA's spiffed-up satellites might not be able to stop climate change by themselves, but they will at least offer concrete data that can be used to make informed decisions about whether we should implement geoengineering solutions or increase greenhouse gas restrictions in certain industries. The satellites can also hopefully be integrated into NASA and Cisco's Planetary Skin, a proposed global monitoring system of environmental conditions that uses a worldwide network of sensors to analyze nearly everything happening on the planet. At the very least, more climate change data can't hurt.

IMPACT: CLIMATE CHANGE IS MOST IMPORTANT ISSUE FOR HUMANKIND

**CLIMATE CHANGE IS THE MOST IMPORTANT PROBLEM EARTH FACES-Haymet '07**

[Tony; Director of the Scripps Institution of Oceanography at the University of California at San Diego; and Mark Abbott and Jim Luyten; The Planet NASA Needs to Explore; The Washington Post; 10 May 2007; <http://www.washingtonpost.com/wp-dyn/content/article/2007/05/09/AR2007050902451.html>; retrieved 5 August 2011]

The National Academy of Sciences has noted that the Landsat satellite system, which takes important measurements of global vegetation, is in its fourth decade of operation and could fail without a clear plan for continuation. The same is true for the QuikSCAT satellite, which provides critical wind data used in forecasting hurricanes and El Niño effects.

In January, a partnership of university and NASA scientists demonstrated that climate change and higher ocean temperatures were reducing the growth of microscopic plants and animals at the heart of the marine food web.

Their analysis was based on nearly a decade of NASA satellite measurements of ocean color, which unfortunately are at risk of being interrupted for several years.

Sea levels are rising, and the Arctic Ocean may be ice-free in summer. The buildup of carbon dioxide in the oceans threatens to make them more acidic, which may in turn hinder the ability of some types of marine life, including corals, to build their shells and skeletons. We must learn as much as we can to assess these threats and develop solutions.

Satellites provide coverage of vast, remote regions of our planet that would otherwise remain unseen, especially the oceans, which play an important role in climate change. Without accurate data on such fundamentals as sea surface height, temperatures and biomass, as well as glacier heights and snowpack thickness, we will not be able to understand the likelihood of dangers such as more severe hurricanes along the Gulf Coast or more frequent forest fires in the Pacific Northwest.

Climate change is the most critical problem the Earth has ever faced.

**THE THREAT OF IMPENDING DOOM MAKES THE EARTH SCIENCE FUNDING FOR CLIMATE CHANGE CRITICAL-Schwartz ‘10**

[Ariel; NASA Getting $2.4 Billion for Climate Change Research; Fast Compay; 5 April 2010; <http://www.fastcompany.com/1607529/nasa-getting-24-billion-for-climate-change-research>; retrieved 12 August 2011]

The race to save our planet from climate change has often been compared to the space race in the 1960s, and for good reason--both races offer a time crunch, the threat of impending doom, and the promise that throwing money and resources at the problem might make a difference. So the Obama administration recently proposed a NASA budget that would give $2.4 billion to the organization's Earth Sciences division, which, as you might guess, studies the Earth from above.

VentureBeat reports that the money--a 62% increase in the Earth Sciences budget--will be used to keep track of ice cap size, CO2 growth in the atmosphere, where CO2 is coming from, and ocean and atmospheric temperatures. NASA buffs will be quick to point out that the organization already has 13 climate change satellites in orbit, but all of them are old and in need of repair or replacement. The cash infusion from the government will allow NASA to fix the satellites, launch five new models, and tack on an ozone-monitoring extension to the International Space Station.

IMPACT: EARTH SCIENCE STUDY CRITICAL FOR HUMANKIND

**DIMINISHING NASA'S EARTH SCIENCE SYSTEMS COULD SIGNIFICANTLY HAMPER EARTH'S WARNING ABOUT NATURAL DISASTERS-Killeen '05**

[Timothy L.; Director of the National Center for Atmospheric Research; Prepared Statement; House Committee on Science, Space and Technology; 28 April 2005; <http://www.spaceref.com/news/viewsr.html?pid=16382>; retrieved 12 August 2011]

The central role of NASA in supporting Earth system science, the demonstrated success and impact of previous and current NASA missions, and the promise of continued advances in scientific understanding and societal benefits all argue for a careful, analytical approach to major modifications in the NASA Earth science program.

As noted above, the development of space systems is a time-consuming and difficult process. Today's actions and plans will have long-term consequences for our nation's capabilities in this area.

The link between plans and actions is one of the most important points I want to address today. From the outside, the interagency planning process seems to be experiencing substantial difficulties in maintaining this link. The NASA Earth science program is part of two major Presidential initiatives, the Climate Change Science Program (CCSP) and the Global Earth Observation System of Systems (GEOSS). With regard to the CCSP, it is not apparent that the strategies and plans developed through the interagency process are having much impact on NASA decision-making. In January 2004, then-Administrator of NASA, Sean O'Keefe, called for acceleration of the NASA Glory mission because of the direct relevance of the mission to understanding the roles of aerosols in the climate system, which is one of the highest-priority science questions defined in the CCSP research strategy. NASA is now proposing cancellation of the mission. As I have emphasized throughout this testimony, the progress of and benefits from Earth system science research are contingent upon close coordination between research, modeling, and observations. The close coordination of program planning among the agencies that support these activities is also a necessity. This coordination currently appears to be fragile.

The effect of significant redirections in NASA and reduction in NASA's Earth science effort are equally worrisome in the case of the Administration's GEOSS initiative, which is focused on improving the international coordination of environmental observing systems. Both NASA and NOAA satellite programs are vital to this effort. The science community is very supportive of the GEOSS concept and goals. There are over 100 space-based remote-sensing systems that are either operating or planned by various nations for the next decade. Collaboration among space systems, between space- and ground-based systems, and between suppliers and users of observational data is critical to avoiding duplication of effort and to getting the most out of the investments in observing technology. The tragic example of the Indian Ocean Tsunami demonstrates the need for such coordination. The tsunami was detected and observed before hitting land, but the absence of effective communication links prevented warnings from reaching those who needed them in time. A functioning GEOSS could lead to major improvements in the rapid availability of data and warnings, and the U.S. is right to make development of such a system a priority. But U.S. credibility and leadership of this initiative will be called into question if our nation is unable or unwilling to coordinate and maintain the U.S. programs that make up the core of our proposed contribution.

**NASA STUDIES CRITICAL TO STUDYING NATURAL HAZARDS AND CLIMATE CHANGE-Zuber '08**

[Maria; Professor of Geophysics at MIT; Statement by Maria T. Zuber: Hearing on NASA at 50: Past Accomplishments and Future Opportunities and Challenges; House Committee on Science, Space, and Technology; 30 July 2008; <http://www.spaceref.com/news/viewsr.html?pid=28736>; retrieved 10 August 2011]

Science goals of high merit in solid Earth, atmospheric, oceanic, hydrologic and cryospheric science have been prioritized in a recent decadal study that forms the plan for moving ahead. The questions are of both purely scientific interest and practical regard, the latter associated with natural hazards and climate change. What is clear in both cases is that collection and analysis of high-quality data of global extent, with repeated observations over time, is essential if we are to understand the state and future of our Earth.

**NASA IS THE MOST CRITICAL AGENCY FOR UNDERSTANDING PLANET EARTH-Zuber '08**

[Maria; Professor of Geophysics at MIT; Statement by Maria T. Zuber: Hearing on NASA at 50: Past Accomplishments and Future Opportunities and Challenges; House Committee on Science, Space, and Technology; 30 July 2008; <http://www.spaceref.com/news/viewsr.html?pid=28736>; retrieved 10 August 2011]

Likewise there are numerous challenging questions about workings of Earth that are appropriate for study by NASA. There seems to be a spectrum of opinion both within and outside the agency as to how much NASA should be involved in Earth science. As head of a pre-eminent Earth Science Department with a view on the most challenging questions in contemporary Earth and atmospheric science and oceanography, I have a strong opinion on this topic. The Earth is a complex, dynamic, system of systems that requires detailed in situ study combined with precise global views over time to unravel its workings. From the point of view of remote observation, no other agency is capable of developing the kind of state-of- the-art sensors and observation strategies that only NASA can provide. NASA simply must play a role in the essential mission of understanding our Earth.

**NASA EARTH SCIENCE MISSION IS CRITICAL TO UNDERSTANDING THE EARTH-Chameides '09**

[Bill; Dean of the Duke University Nicholas School of the Environment; Is NASA Spacing Out?; The Green Gork Blog; 20 July 2009; <http://www.nicholas.duke.edu/thegreengrok/moonwalk>; retrieved 5 August 2011]

Though we immediately think space when we hear “NASA,” the U.S. National Aeronautics and Space Administration, established in 1958, is also a leader in research aimed at understanding and monitoring the Earth.

As I wrote about last month, NASA images have provided us with vital information about heat waves, hurricanes, volcanoes, forest fires, ocean productivity, ice cover, air pollution, coal ash sites and penguin populations. Critical satellites monitor all sorts of data important to our everyday lives — everything from temperature and weather to carbon dioxide and ozone levels, aerosols, sea levels, solar output, and soil moisture. This is stuff that’s not just important to us scientists but to all of us on the blue planet.

**CLIMATE DATA IS CRITICAL FOR DEALING WITH NATURAL DISASTERS-Huetteman '11**

[Emmarie; Blind to the threat; Global Warming/National Security Journalism Initiative; 25 January 2011; <http://global-warning.org/main/satellites/>; retrieved 10 August 2011]

In a world where the Larsen B Ice Shelf in Antarctica is intact one day and collapses into the sea the next, scientists say the need for continuous, reliable satellite observation is vital. It enables more accurate projections, allowing policymakers to decide, for example, whether to build a military base in an area that will flood as sea levels rise; more accurate data also warns the U.S. military that it may have to evacuate people before a devastating tsunami, like the one that killed hundreds of thousands in Indonesia in 2004.

Dr. Berrien Moore III, who co-chaired a National Research Council committee on space-based observation, said calculated climate change predictions failed to capture how fast sea ice would decline, a problem that experts say will threaten national security as it causes mass flooding from rising sea levels. But satellites caught what the models missed.

“Thank God for the [satellite] observations because otherwise we wouldn’t have known this is going on,” said Moore, vice president for weather and climate programs at the University of Oklahoma.

Answers

UNIQUENESS: EARTH SCIENCE SPENDING HAS BEEN HISTORICALLY SHORTED

**CLIMATE CHANGE AND EARTH SCIENCE HAVE LONG BEEN SHORTED COMPARED TO OTHER PRIORITIES-Huetteman '11**

[Emmarie; Blind to the threat; Global Warming/National Security Journalism Initiative; 25 January 2011; <http://global-warning.org/main/satellites/>; retrieved 10 August 2011]

Shortly after liftoff in February 2009, NASA’s Orbiting Carbon Observatory — or what was left after it re-entered the atmosphere — crashed into the Pacific Ocean near Antarctica, unable to reach orbit due to a faulty shield. A $250 million investment had become scrap metal on the ocean floor.

If the launch had been successful, OCO would have been the first satellite dedicated to measuring carbon dioxide in the atmosphere and tracking emission reduction efforts, offering crucial insight into the earth’s changing climate. This information is needed not only by scientists monitoring the environment but also federal officials struggling to understand rising threats of those climate changes to national security.

“Here’s a key variable for understanding climate change, the only satellite in the world that will do the kind of global collection we need, [and it] crashes,” said James Lewis, a senior fellow at the Center for Strategic and International Studies and author of an influential report on climate observation. “And we haven’t thought about how to replace it.”

The short, unproductive life of OCO — and the lack of a backup plan — marked another chapter in the long-running story of the nation’s teetering climate observation system. For two decades, the U.S. constellation of earth science satellites has been beset by competing priorities, shrinking budgets and mismanagement, even as intelligence and military officials express serious concerns about the national security threats posed by climate change and the need for accurate data to help assess those threats.

**EARTH SCIENCE HAS ALREADY BEEN DRAMATICALLY CUT-House Committee on Science ‘05**

[HEARING BEFORE THE COMMITTEE ON SCIENCE, HOUSE OF REPRESENTATIVES, 109th Congress; 28 April 2005; <http://www.gpo.gov/fdsys/pkg/CHRG-109hhrg20736/html/CHRG-109hhrg20736.htm>; retrieved 15 August 2011]

In addition to reducing funding for specific large missions, NASA has sharply reduced the Earth System Science Pathfinders (ESSP), a research program to launch small, experimental satellites that can test ideas for future larger missions. ESSP missions are not allowed to cost more than about $230 million over the life of the mission (as opposed to close to $1 billion for GPM). NASA now plans to delay for a year the ESSP proposal solicitation that was scheduled for this summer. The NAS Committee interim report calls for NASA to go forward with the solicitation this summer. (ESSP launches approved from previous solicitations are on schedule. Two should launch this year.) NASA has also substantially cut its Earth science research and analysis program, which focuses on developing the tools and techniques to interpret Earth science data. The program also helps scientists determine how to prioritize potential future research missions. These cuts particularly affect graduate student funding. According to the NAS Committee interim report, the research and analysis programs at NASA have suffered disproportionately large cuts. The NAS Committee interim report also notes that the Earth science reductions could jeopardize NASA's ability to fulfill its obligations to interagency initiatives, such as the development of a Global Earth Observing System of Systems (GEOSS). This international effort will develop a comprehensive and coordinated Earth observing system. Earlier this year, Secretary of Commerce Carlos Gutierrez represented the United States at the meeting in Brussels where the GEOSS plan was adopted. The NAS Committee interim report also calls into question NASA's ability to fulfill its commitments to the Climate Change Science Program (CCSP). NASA's Earth Science program represents the largest portion of the CCSP budget, (62 percent in the President's FY 2006 budget request).

UNIQUENESS: OBAMA/CONGRESS SUPPORTS EXPLORATION INITIATIVES

**PRESIDENT HAS ALREADY RECOMMEND INCREASES IN SPACE EXPLORATION BUDGETS-Bolden '10**

[Charles; NASA Administrator; Statement before the House Subcommittee on Commerce, Justice, Science and Related Agencies; 24 March 2010; <http://www.spaceref.com/news/viewsr.rss.html?pid=33755>; retrieved 10 August 2011]

The President's FY 2011 budget request for NASA is $19.0 billion, which represents an increase of $276.0 million above the amount provided for the Agency in the FY 2010 Consolidated Appropriations Act (P.L. 111-117), and an increased investment of $6.0 billion in NASA science, aeronautics, human spaceflight and enabling space technologies over the next five-years compared with last year's budget plan. Enclosure 1 displays the details of the President's FY 2011 budget request for NASA.

Before I discuss the details of the NASA budget request, I would like to talk in general about the President's new course for human exploration of space. With this budget, the United States has positioned itself to continue our space leadership for years to come.

**NASA ALREADY PUSHING AN EXPENSIVE NEW EXPLORATION ROCKET THAT WILL FORCE BUDGET TRADEOFFS-Matthews ‘11**

[Mark; New NASA moon rocket could cost $38 billion; The Los Angeles Times; 11 August 2011; <http://articles.latimes.com/2011/aug/11/nation/la-na-nasa-next-moonshot-20110812>; retrieved 12 August 2011]

The rocket and capsule that NASA is proposing to return astronauts to the moon would fly just twice in the next 10 years and cost as much as $38 billion, according to internal NASA documents obtained by the Orlando Sentinel.

The money would pay for a new heavy-lift rocket and Apollo-like crew capsule that eventually could take astronauts to the moon and beyond. But it would not be enough to pay for a lunar landing or for more than one manned test flight, in 2021.

That timeline and price tag could pose serious problems for supporters of the new spacecraft, which is being built from recycled parts of the shuttle and the now-defunct Constellation moon program. In effect, it means that it would take the U.S. manned-space program more than 50 years — if ever — to duplicate its 1969 landing on the moon.

Such an outlook is certain to infuriate NASA supporters in Congress, who last year ordered the agency to build a new heavy-lift rocket by December 2016, a deadline NASA says it can't meet. And it may well convince others that there's no good reason not to slash NASA's budget as part of a recent deal to cut federal spending by at least $2.1 trillion over 10 years.

"It's easier to balance the budget by going after the big numbers rather than the little numbers," said Howard McCurdy, a space policy expert at American University in Washington. He said the new rocket might be spared if NASA keeps the program within its budget, a big if considering NASA's history of significant cost overruns.

"That's what is going to get them [NASA officials] in trouble, if they come back hat in hand asking for money," McCurdy said.

According to preliminary NASA estimates, it would cost $17 billion to $22 billion to ready the new rocket and Orion capsule for a test flight in December 2017 that would put an unmanned capsule into a lunar orbit. An additional $12 billion to $16 billion would be needed to launch the first crew on a lunar flyby in August 2021.

NASA spokesman David Weaver said nothing was yet final, however, and that the agency still was crunching numbers.

"We want to get this right and ensure we have a sustainable program so we don't repeat the mistakes of the past," Weaver said in a statement.

The agency has contracted with Booz Allen Hamilton, a Virginia consulting firm, to conduct an independent assessment. The firm's findings are expected this month, and even agency insiders expect Booz Allen Hamilton to come back with a higher price tag given NASA's history of lowballing initial cost estimates.

UNIQUENESS: CUTS IN EARTH SCIENCE ARE RIFE

**OBAMA WHITE HOUSE HAS ALREADY BEGUN CUTS OF NASA EARTH SCIENCE PROGRAMS-Brinton ‘11**

[Turner; NASA Cuts 2 Earth Science Missions on White House Orders; Space.com; 7 March 2011; <http://www.space.com/11050-white-house-nasa-earth-science-cuts.html>; retrieved 15 August 2011]

Even though NASA’s Earth science budget is slated to rise next year, the U.S. space agency has been ordered by the White House to shelve a pair of big-ticket climate change missions that just last year were planned for launch by 2017.

With U.S. President Barack Obama under pressure to rein in federal spending, the White House eliminated funding for the Climate Absolute Radiance and Refractivity Observatory (CLARREO) and Deformation, Ecosystem Structure and Dynamics of Ice (DESDynI) missions, Steve Volz, associate director for flight programs at NASA’s Earth Science Division, said in a Feb. 24 interview.

The cuts came before the failed launch of the Glory satellite Friday (March 4), NASA's latest Earth-observing mission to study Earth's atmosphere, due to a rocket malfunctions. So the White House orders are unrelated to NASA's loss of the Glory satellite.The multiyear budget plan NASA sent Congress a year ago called for spending $1.2 billion between 2012 and 2015 to develop CLARREO and DESDynI, two of the four top-tier missions recommended by the National Research Council’s 2007 Earth Science decadal survey. But the White House Office of Management and Budget specifically removed these funds from the agency’s 2012 budget request, Volz said in an interview.

“Removal of these missions was not what we desired and not what the administration desired, but it was a clear recognition and acknowledgement of the budget issues we face as a nation,” Volz said. “It’s cleaner to be allowed to delete the scope that goes along with the dollars than to have to figure out how to do more with less.”

**BUDGET DEALS HAVE ALREADY IMPACTED EARTH SCIENCE SPENDING-Morello '11**

[Lauren; Climate Satellite Programs Scarred in Budget Fight; Climate Wire via the New York Times; 4 May 2011; <http://www.nytimes.com/cwire/2011/05/04/04climatewire-climate-satellite-programs-scarred-in-budget-76532.html>; retrieved 10 August 2011]

Scientists have warned for years that successive rounds of spending cuts have taken their toll on the nation's constellation of Earth-observing satellites. The National Academy of Sciences warned in 2007 that the United States' ability to monitor Earth from space was "at great risk" as the current stable of satellites aged and their replacements were delayed or shelved.

The spending deal hammered out earlier this month by House Republicans, Senate Democrats and the White House adds to that pain.

This year's budget chopped the National Oceanic and Atmospheric Administration's purse to $4.6 billion for fiscal 2011, $140 million less than the agency received in the 2010 budget cycle.

That has forced the agency to delay the launch of Jason-3, a joint mission with the European Organisation for the Exploitation of Meteorological Satellites to monitor sea level rise, by one year.

"It is impacted by the FY '11 budget decision," said Mary Kicza, NOAA's assistant administrator for satellite and information services. "The launch has slipped to 2014."

The spending cuts have also scrambled launch plans for the agency's Joint Polar Satellite System, a series of probes that will supply information for weather and climate forecasts. The launch of the program's first satellite, JPSS-1, will be delayed by at least 18 months beyond the original 2016 target.

**EARTH SCIENCE SATELLITES ALREADY ON HOLD-Brinton ‘11**

[Turner; NASA Cuts 2 Earth Science Missions on White House Orders; Space.com; 7 March 2011; <http://www.space.com/11050-white-house-nasa-earth-science-cuts.html>; retrieved 15 August 2011]

When NASA chose the Hampton, Va.-based Langley Research Center in late 2009 to manage CLARREO, agency officials tentatively estimated the cost of the mission at $600 million to $800 million.

The four-satellite constellation, as envisioned, would collect extremely precise data on emitted and reflected energy in order to study long-term changes in the Earth’s climate. The first two CLARREO satellites would launch aboard a single rocket in 2018 followed two years later by two more satellites, according to a Jan. 21 mission overview posted on Langley’s website.

Volz said that although NASA will not fund development of the satellites at least for the next five years, it will continue to study alternatives, such as international partnerships, for obtaining this data.

“We were directed to not go into development or formulation for CLARREO and to eliminate from our developmental timeline the CLARREO mission,” he said. “The guidelines are to continue to study the measurements but not the CLARREO mission.”

**CUTS TO EARTH SCIENCE PROGRAMS DON'T HAVE IMPACT DUE TO THE REDUNDANCY IN OTHER AGENCIES-Berger '05**

[Brian; NASA's Exploration Focus Blamed for Earth Science Cuts; Space.com; 2 May 2005; <http://www.space.com/1028-nasa-exploration-focus-blamed-earth-science-cuts.html>; retrieved 5 August 2011]

Appearing on behalf of NASA was Alphonso Diaz, the agency's associate administrator for science. Diaz noted that NASA has 16 Earth science missions on orbit and plans to launch eight more between now and 2010.

He said making greater use of operational satellites will help minimize what the government has to spend to fly science instruments.

"We've made major investments over the past 15 to 20 years . and a lot of that investment . has gone into infrastructure -- platforms that hold instruments," Diaz said. "The platforms themselves are very similar, if not identical, to the ones that NOAA flies for operational programs. So the strategy we are on is one that would try to minimize the investment that needs to be made by the government overall on infrastructure to support these instruments."

Diaz said he was sympathetic to the worries of environmental scientists, but added that the changes to NASA's Earth science programs are all for the best.

"I can understand the concern because of the changing strategy that is taking place," Diaz said. "The reason I feel more confident is largely because I believe when we come out of this transition we will be much better positioned to do the work we have been doing in the past than we would [be] otherwise."

**TIGHT BUDGET TIMES DON'T BODE WELL FOR EARTH SCIENCE INITIATIVES-Morello '11**

[Lauren; Climate Satellite Programs Scarred in Budget Fight; Climate Wire via the New York Times; 4 May 2011; <http://www.nytimes.com/cwire/2011/05/04/04climatewire-climate-satellite-programs-scarred-in-budget-76532.html>; retrieved 10 August 2011]

"Right now, we have satellites in orbit," Kicza said. "They are producing important measurements that our modelers are using to provide two-to-five-day weather forecasts and long-term climate forecasts. On the face of things, things don't look broken. But it takes many years to field these systems -- for a complex satellite, on average, it's six to eight years. So you need to make investments now to ensure you don't have a gap in the future."

Satellites have also taken a hit at NASA. The space agency largely evaded lawmakers' budget ax this year, but with another spending fight looming for 2012, the Obama administration did some trimming of its own. he president's fiscal 2012 budget request shelved two climate satellite missions.

**NASA IS A TARGET OF BUDGET CUTTERS; SCIENCE PROGRAMS HAVE ALREADY TAKEN A BEATING-Zabarenko ‘11**

[Deborah; Post-shuttle, US space explorers need not be human; Reuters; 4 August 2011; <http://www.reuters.com/article/2011/08/04/space-science-idUSN1E76Q1A520110804>; retrieved 10 August 2011]

Not all robotic space discoveries are explained with such dramatics. Most offer unprecedented glimpses into the workings of the cosmos rather than science that can be quickly turned into Earthly profit.

"The search to answer fundamental questions in science always leads to the biggest discoveries," said John Grunsfeld, deputy director of the Space Telescope Science Institute in Baltimore, which manages Hubble. He has seen the orbiting telescope close up, as a veteran shuttle astronaut when he worked on three missions to upgrade the observatory.

Grunsfeld said X-ray astronomy led to airport scanners, CAT scans and MRIs, though that was not the initial intent: "People didn't go out and say, I'm going to find a device that's going to be able to image tendons, shoulders and knees. They were studying the properties of the nucleus of atoms."

Grunsfeld sees human exploration of space as "our destiny." But as a scientist and official at the telescope institute, he is troubled that NASA's science budget has been sliced by more than $2 billion to divert more money to crewed space programs.

He blames poor national management for the 2010 Obama administration decision to scrap the $10 billion Constellation program that aimed to return U.S. astronauts to the Moon by 2020. Instead, the United States would finance commercial space taxi services provided by private companies that are developing spaceships designed to carry people and cargo. [ID:nN1E76205S]

NASA is a frequent target of budget-cutters, with space science more vulnerable than human spaceflight. NASA projects that aim to document climate change came under fire this year, when six members of Congress urged reductions in this effort and reallocating those funds to spaceflight.

**NEWEST OBAMA PLANS PUT EARTH SCIENCE CUTS BACK ON THE TABLE-Moskowitz ‘11**

[Clara; Commercial Spaceflight a Priority Under NASA's Proposed Budget; Space.com; 15 February 2011; <http://www.space.com/10867-nasa-budget-commercial-spaceflight.html>; retrieved 18 August 2011]

Other elements of NASA's portfolio would take a hit under the new budget proposal, including a plan to develop a heavy-lift rocket capable of carrying humans to the moon, asteroids and Mars.

The 2012 budget request offers $1.8 billion for a heavy-lift booster, and $1 billion for a crew capsule to ride atop it. In comparison, last year's authorization bill sought $2.6 billion for the rocket and $1.4 billion for the capsule.

NASA officials acknowledged that these cuts could delay the process of building such a vehicle, and declined to say whether or not they would be able to complete the heavy lift rocket by 2016 as stipulated in the NASA Authorization Act.

Bolden said the booster would be "evolvable" and later versions would build on initial precursor models.

"It doesn't start out as the biggest rocket known to man," Bolden said.

Other NASA projects would also receive funding hits under the new proposal — notably the agency's Earth science program, robotic precursor exploration missions intended to map out solar system destinations before astronauts visit and a plan to redesign NASA's Florida Kennedy Space Center as a "21st Century Launch Complex."

LINK: NO TRADEOFFS

**TRADEOFFS WON'T OCCUR; NASA PLANNERS WILL MITIGATE BUDGET CHOICES-Hsu '11**

[Jeremy; Space on a budget balances risk vs. innovation; MSNBC; 27 June 2011; [http://www.msnbc.msn.com/id/43555581/ns/technology\_and\_science-innovation/#](http://www.msnbc.msn.com/id/43555581/ns/technology_and_science-innovation/); retrieved 1 August 2011]

"What I see is an equal amount of unreasonable pressure being applied to all mission sets, rather than making really hard choices about what the true priorities are and funding at level of consistency and phasing that makes sense," Bearden said.

The U.S. space agency might also consider the time spent on mission reviews and evaluate which reviews actually help prepare a low-risk, effective mission, said Andy Dantzler, a program area manager at the Johns Hopkins Applied Physics Laboratory.

**ZERO-SUM TRADEOFF ARGUMENTS ARE OVERHYPED-McLane ‘10**

[James C.; Associate Fellow in the American Institute of Aeronautics and Astronautics; Mars as the key to NASA’s future; the Space Review; 1 June 2010; <http://www.thespacereview.com/article/1635/1>; retrieved 12 August 2011]

Naysayers claim the country can’t afford to send a person to Mars, but they forget we’ve successfully funded expensive space programs before and in tough economic times. Our space agency has relatively few direct government employees and distributes most of its money into the private sector all over the country. Some incorrectly believe that spending on NASA might divert funds from other needy government programs. One thing that keeps wealth in the US from being a “zero sum game” (where for some to win, others must lose) are those scientific developments that enable us to produce more output with less input. NASA is on the tip of this technology spear. Spending on the scientific segment of America is what keeps our standard of living moving ahead in a world of ever-diminishing natural assets.

Rather than some fanciful and inaccurate speculation on what a tiny Mars outpost might cost, we should consider just what the country ought to be willing to spend. Forty years ago, at its peak, the US dedicated close to 1% of its Gross National Product (GNP) to the Apollo Moon landing. This was deemed affordable, in spite of the need to simultaneously fund an expensive war in Vietnam and massive new government welfare programs. In recent years the percent of our GNP that is devoted to space exploration is down in the range of one-quarter of one percent. America should easily be able to devote perhaps half a percent of its GNP each year—that’s just half the cost of Apollo, in a decade-long effort that would provide a permanent human presence on Mars. Such a program would receive enthusiastic, unwavering financial support when the entire world understands that humanity is finally embarked on a dramatic new course out into the universe.

IMPACT: NASA DATA HAS DISPROVEN CLIMATE CHANGE THEORIES

**NASA SCIENTIFIC DATA HAVE PREVIOUSLY DISPROVEN CLIMATE CHANGE THEORIES-FoxNews.com ‘11**

[Does NASA Data Show Global Warming Lost in Space?; FoxNews; 29 July 2011; <http://www.foxnews.com/scitech/2011/07/29/data-cooling-on-global-warming/>; retrieved 10 August 2011]

Has a central tenant of global warming just collapsed?

Climate change forecasts have for years predicted that carbon dioxide would trap heat on Earth, and increases in the gas would lead to a planetwide rise in temperatures, with devastating consequences for the environment.

But long-term data from NASA satellites seems to contradict the predictions dramatically, according to a new study.

“There is a huge discrepancy between the data and the forecasts that is especially big over the oceans,” said Dr. Roy Spencer, a research scientist at the University of Alabama in Huntsville and U.S. science team leader for the Advanced Microwave Scanning Radiometer -- basically a big thermometer flying on NASA’s Aqua satellite.

“The satellite observations suggest there is much more energy lost to space during and after warming than the climate models show,” he said. The planet isn't heating up, in other words.

James Taylor, a senior fellow for environment policy at conservative think-tank The Heartland Institute, wrote at Forbes that the meaning of the new research is clear -- and it compromises what he called a "central premise of alarmist global warming theory."

"Real-world measurements … show far less heat is being trapped in the Earth's atmosphere than the alarmist computer models predict, and far more heat is escaping into space than the alarmist computer models predict," Taylor wrote.

**NASA CLIMATE DATA ACTUALLY DISPROVED THE CLIMATE CHANGE MODELS-Wilson ‘11**

[Susan; Climate change skeptic claims climate change models are flawed; Green Blorge; 29 July 2011; <http://green.blorge.com/2011/07/climate-change-skeptic-claims-climate-change-models-are-flawed/>; retrieved 10 August 2011]

According to scientists at the University of Alabama in Huntsville, current climate change models are flawed. So according to these known climate skeptics all of the models that have predicted a rapid global warming due to an increase of carbon dioxide are wrong. Mainstream climate scientist don’t agree.

According to recent research conducted by Dr. Roy Spencer and Dr. Danny Braswell, research scientists at the Earth System Science Center at the University of Alabama, Huntsville, current climate models don’t factor in the release of energy from our atmosphere into space. Their results were published in the open access journal Remote Sensing.

Dr. Spencer used Clouds and Earth’s Radiant Energy System (CERES) data from the NASA Terra satellite along with surface temperature data from the Hadley Climate Research Unit in Great Britain. From this data they postulated that cloud cover not carbon dioxide is causing global warming.

Spencer and Braswell were using current climate models used by the U.N.’s Intergovernmental Panel on Climate Change (IPCC) along with the NASA and Hadley data in an effort to discredit the climate models. Dr. Spencer summed up their findings like this:

"The main finding from this research is that there is no solution to the problem of measuring atmospheric feedback, due mostly to our inability to distinguish between radiative forcing and radiative feedback in our observations."

In other words, cloud behavior was chaotic and unpredictable.

Capitalism Kritik

**A. AN ECONOMIC SYSTEM PREDICATED ON RAPACIOUS GROWTH HAS PLACED THE PLANET ON THE VERGE OF A GIANT DEATH SENTENCE, THREATENING MASS EXTINCTION AND A PLANET WE CAN NO LONGER INHABIT-Williams ‘10**

[Chris; chair of the Science Department at Packer Collegiate Institute; *Ecology and Socialism: Solutions to Capitalist Ecological Crisis; 2010; Kindle Edition]*

There is a giant death sentence hanging over much of our world. The once majestic polar bear, reduced to starvation due to dwindling sea ice in the Arctic, is only the latest forlorn poster child for the coming global ecocide that human civilization is visiting upon the earth. With rates of extinction running at a hundred to a thousand times the geological statistical norm, it is a species sadly far from alone. Thousands of species sit on Extinction Death Row awaiting the coup de grace, to be administered by a mutually reinforcing set of human-induced conditions. At the forefront of these conditions rank habitat destruction and rapid, human-induced climate change. The human species seems well on the way to creating the Sixth Great Extinction as we exterminate other species faster than they can be classified; scientists estimate that we have classified less than 10 percent of all the species on earth. According to the International Union for the Conservation of Nature (IUCN), the world’s largest coalition of environmental organizations, of the nearly 50,000 on its red list of endangered species up to 17,000 face the prospect of immediate extinction. If nothing is done, the IUCN predicts the demise over the course of the twenty-first century of 50 percent of amphibians, 70 percent of botanic life, 37 percent of freshwater fish, 28 percent of reptilians, 21 percent of mammals, and 12 percent of all birds.

Species extinction is natural and nothing new; 99.999 percent of all species that have ever existed have become extinct. Sentient life, as represented by humans, is one outcome of this turnover. Over a period spanning millions of years, from our immediate bipedal forebears, Homo sapiens have evolved on a planet of stunning biodiversity, breathtaking vistas, and awe-inspiring feats of evolutionary development as biotic and abiotic factors have intertwined in a spectacular and ever-changing dance of mesmerizing beauty.2 However, we live within a social system intent on hacking, burning, and destroying the biosphere in a time period measured in mere hundreds. It is a social system predicated on endless expansion; one that sickeningly combines historic and gargantuan amounts of wealth alongside oceans of poverty and mountains of waste. It is no exaggeration to state that without swift, dramatic and profound changes to societal priorities, including a fundamental reorientation away from fossil-fuel-based energy and profit-driven capitalist economic growth, the generation growing up today will be, in all likelihood, the last to know climate stability. Nor is it wild-eyed doom-mongering to argue that if humanity continues on its present course, effecting only minor technological changes over the next ten to twenty years, civilization on anything like the current scale cannot be sustained. Capitalist society threatens the breakdown of the basic biogeochemical cycles of the biosphere as we have come to know them.

We are hurtling toward a series of ecological tipping points beyond which we will lose our ability to preserve a stable climate. Indeed, according to research published in 2009 in the journal Ecology and Society, we have already gone beyond three of nine planetary boundaries. A group of internationally renowned environmental and earth-systems scientists delineated nine “planetary life support systems” that were critical to human survival, and the processes that put them under stress: climate change, ocean acidification, stratospheric ozone depletion, interference with global phosphorus and nitrogen cycles, rate of biodiversity loss, global freshwater use, land-system change, aerosol loading, and chemical pollution. While stressing that these are only rough estimates that need refining, the group quantified where we are in relation to keeping within boundaries in order to avoid “irreversible and abrupt environmental change.” By their calculations we have already surpassed boundaries for the nitrogen cycle, rate of biodiversity loss, and climate change. This doesn’t mean we can’t reverse them, but points to the extreme urgency of lowering the disruption that we are causing in these three sectors and making sure we do not pass through any of the other boundaries.

A world economic system predicated on relentless growth, devouring increasing amounts of raw materials and energy and spewing out ever-larger amounts of toxic waste products, has produced a whole series of environmental threats: species extinction, air and water pollution, genetically modified organisms, desertification, deforestation, soil depletion, and the ever-present possibility of nuclear warfare, to name only a few. However, as it intersects with all other threats, and furthermore has a tendency to aggravate them, the most urgent and all-encompassing of these is global climate change.

**B. SPACE IS A NEW “OUTSIDE” IN WHICH CAPITALISM CAN EXPAND TO DIVERT ITSELF FROM RECURRING CRISES-Dickens ‘10**

[Peter; professor @ Universities of Brighton and Cambridge; The Humanization of the Cosmos--To What End?; Monthly Review; November 2010; retrieved 28 Jun 2011

[http://monthlyreview.org/2010/11/01/the-humanization-of-the-cosmos-to-what-end]](http://monthlyreview.org/2010/11/01/the-humanization-of-the-cosmos-to-what-end%5D)

Since Luxemburg wrote, an increasing number of political economists have argued that the importance of a capitalist “outside” is not so much that of creating a new pool of customers or of finding new resources. Rather, an outside is needed as a zone into which surplus capital can be invested. Economic and social crisis stems less from the problem of finding new consumers, and more from that of finding, making, and exploiting zones of profitability for surplus capital. Developing “outsides” in this way is also a product of recurring crises, particularly those of declining economic profitability. These crises are followed by attempted “fixes” in distinct geographic regions. The word “fix” is used here both literally and figuratively. On the one hand, capital is being physically invested in new regions. On the other hand, the attempt is to fix capitalism’s crises. Regarding the latter, however, there are, of course, no absolute guarantees that such fixes will really correct an essentially unstable social and economic system. At best, they are short-term solutions.

The kind of theory mentioned above also has clear implications for the humanization of the cosmos. Projects for the colonization of outer space should be seen as the attempt to make new types of “spatial fix,” again in response to economic, social, and environmental crises on earth. Outer space will be “globalized,” i.e., appended to Earth, with new parts of the cosmos being invested in by competing nations and companies. Military power will inevitably be made an integral part of this process, governments protecting the zones for which they are responsible.

Some influential commentators argue that the current problem for capitalism is that there is now no “outside.”[11](http://monthlyreview.org/2010/11/01/the-humanization-of-the-cosmos-to-what-end#en75) Capitalism is everywhere. Similarly, resistance to capitalism is either everywhere or nowhere. But, as suggested above, the humanization of the cosmos seriously questions these assertions. New “spatial fixes” are due to be opened up in the cosmos, capitalism’s emergent outside. At first, these will include artificial fixes such as satellites, space stations, and space hotels. But during the next twenty years or so, existing outsides, such as the moon and Mars, will begin attracting investments. The stage would then be set for wars in outer space between nations and companies attempting to make their own cosmic “fixes.”

**C. TIME IS SHORT. ONLY A SOCIALIST FUTURE HOLDS THE PROMISE OF A SUSTAINABLE PLANET- Williams ‘10**

[Chris; chair of the Science Department at Packer Collegiate Institute; *Ecology and Socialism: Solutions to Capitalist Ecological Crisis; 2010; Kindle Edition]*

Apart from the tiny sliver of the population at the top of society hell-bent on accumulation and the continuation of business as usual—with the attendant war, racism, famine, and environmental degradation that that prospect necessarily entails—the rest of the population of the planet has a direct interest in ending this madness and has the means to do so. Only a socialist future holds out the hope of a sustainable one for the planet. We need to build a global society in which production is democratically decided upon and centered round what nature and humanity collectively need. To do this means overthrowing capitalism and abolishing the “metabolic rift.” There is simply no other alternative. However, time is short and because something is necessary does not make it inevitable. Organization lags behind the urgency of the need. The urban and rural working classes that make today’s economy operate need to become organized into a political force that can take charge of the productive machinery and democratically redirect it toward the sustainable satisfaction of human need. Only by organizing and fighting for change on this class basis will the possible future become a real one.

**D. EITHER WE SAVE CAPITALISM OR WE SAVE HUMANITY. WE CANNOT DO BOTH-Smith**

[Richard, Professor and member of Institute for Policy Research & Development; Beyond Growth or Beyond Capitalism? A Reprise; 2011; <http://www.esee2011.org/registration/fullpapers/esee2011_33bb83_1_1304793549_9860_2495.pdf;> retrieved 29 June 2011]

Daly and the anti-growth school are absolutely right that we need to break out of the “iron cage of consumerism,” “downshift” to a simpler life, find meaning and self-realization in promoting the common good instead of self-enrichment, build an ecological economy that conserves nature and resources for the benefit of our children, build a society based on an equitable decent material sufficiency for everyone on the planet. These are critically important goals. But we can’t get any of these under capitalism because under capitalism we’re all just rats racing in Paul Krugman’s cages. We can’t stop consuming more and more because if we stop racing, we face economic collapse. If capitalism can’t brake the slide to global ecological collapse, then it follows that we need a completely different kind of economic system, a non-capitalist economic system based on human needs, environmental needs, and a completely different value system, not on profit. Ecological economists from Herman Daly to Tim Jackson call for a “new macro-economic model” a “new vision,” a “new paradigm,” a “new central organizing principle.” But in their overriding concern to defend the capitalist market system and avoid confronting the need for systemic change, all they offer us are unworkable, warm and fuzzy capitalist utopias, with no plausible means of escaping the rat race of consumerism, no way to stop the market-powered drive to collapse, and no solution to the mass unemployment that any steady-state capitalism would inevitably produce. Jonathon Porrit said that “like it or not” we have to hope that sustainability will be delivered within a capitalist framework and “we don’t have time to wait for any big-picture ideological successor.” But if the engine of capitalist growth and overconsumption can’t be stopped, or even throttled back, and if capitalist efficiency and rationality are systematically wiping out life on earth, what choice to we have but to rethink the theory? “Like it or not,” Jonathan, we don’t have more decades to waste in fruitless pursuit of delusionary capitalist utopias. It’s time to abandon the fantasy of a degrowing “steady-state” capitalism, go back to the drawing boards and come up with a real “new macro-economic model,” a practical, workable post-capitalist ecological economy, an economy by the people, for the people, that is geared to production for need, not for profit. “Socialism?” “Economic democracy”? Call it what you like. But what other choice do we have? Either we save capitalism or we save humanity. We can’t save both.

CAPITALISM DEMANDS NEVER-ENDING EXPANSION

**THE FUNDAMENTAL ECONOMIC FLAWS OF CAPITALISM DRIVE NEVER-ENDING EXPANSION AND EXPLOITATION-Bellamy Foster ‘09**

[Jeremy; professor of sociology at the University of Oregon; A Failed System: The World Crisis of Capitalist Globalization and its Impact on China; Monthly Review; 11 Jan 2009; <http://monthlyreview.org/2009/03/01/a-failed-system-the-world-crisis-of-capitalist-globalization-and-its-impact-on-china;> retrieved 29 Jun 2011]

Indeed, there is only one way of accounting for the fact that orthodox economists constitute the leading ideological opponents of aggressive reductions in greenhouse gas emissions, even at the risk of a planetary inferno—and that is their primary role as ideological defenders of the capitalist system and promoters of its drive for profits and accumulation at any cost. Nothing so clearly demonstrates what John Kenneth Galbraith characterized (in the title to his last book) as The Economics of Innocent Fraud. “Capitalism, as we know it today,” James Gustave Speth, former head of the United Nations Development Programme, has written, “is incapable of sustaining the environment.”[36](http://monthlyreview.org/2009/03/01/a-failed-system-the-world-crisis-of-capitalist-globalization-and-its-impact-on-china#en36) To turn to mainstream economics for answers is therefore a serious, perhaps fatal, error of current policy.

The fundamental ecological flaws of the capitalist system have been emphasized primarily by critical political-economic thinkers coming out of or deeply influenced by the Marxist tradition. In the United States environmental sociology has been deeply affected by two critical concepts arising out of Marx, the “treadmill of production,” and the “metabolic rift.” The treadmill of production concept is the notion that capitalism is geared above all to exponential growth, as suggested by Marx’s M-C-M’ shorthand. The level of economic activity in each period starts with the end point of the previous period, leading to a doubling of economic output in, say, a quarter-century at a 3 percent annual rate of growth—a process which is interrupted, but not brought to an end, by business cycle downturns. The driving force of this expansion is capital accumulation and the search for ever expanding profits. The country that has experienced the fastest rate of growth over a sustained period of time is of course China where the economy, according to the rather fantastic (and somewhat suspect) claim by Bloomberg.com, “has increased by 69-fold” since 1978.[37](http://monthlyreview.org/2009/03/01/a-failed-system-the-world-crisis-of-capitalist-globalization-and-its-impact-on-china#en37) But exponential growth, if at lower levels than in China, is characteristic of capitalism in general, even where the economy, is experiencing only slow growth or stagnation, as has typified the advanced capitalist economies in recent decades. Under capitalism, Marx argued,

We see how…the mode of production and the means of production are continually transformed, revolutionised, how the division of labour is necessarily followed by greater division of labor, the application of machinery by still greater application of machinery, work on a large scale by work on a still larger scale.

That is the law which again and again throws bourgeois production out of its old course and which compels capital to intensify the productive forces of labour, because it has intensified them, it, the law which gives capital no rest and continually whispers in its ear: “Go on! Go on!”

For Marx workers too were chained to the treadmill of production since their conditions were made tolerable for short periods only by rapid economic growth—even though this reduced their relative condition within the system, and hence made them ever more dependent on their capitalist overlords.

**CAPITALISM DEMANDS THAT WE SACRIFICE THE FUTURE FOR IMMEDIATE PROFIT AND GROWTH-Smith ‘11**

[Richard, Professor and member of Institute for Policy Research & Development; Green Capitalism: The God That Failed; 11 May 2011; <http://climateandcapitalism.com/?p=4405;> retrieved 29 Jun 2011]

But the problem is not just special interests, lobbyists and corruption. And courageous political leaders could not turn the situation around. Because that’s not problem. The problem is capitalism. Because, given capitalism, it is, perversely, in the general interest, in everyone’s immediate interests to do all we can to maxmize growth right now, therefore, unavoidably, to maximize fossil fuel consumption right now – because practically every job in the country is, in one way or another, dependent upon fossil fuel consumption. And any cutback, particularly the massive and urgent cuts that climate scientists like James Hansen say we have to make to save the humans in the decades and centuries to come, can only come at the expense of massive layoffs for the humans in the here and now. There is no way to cut CO2 emissions by anything like 80 percent without imposing drastic cuts across the board in industrial production. But since we live under capitalism, not socialism, no one is promising new jobs to all those coal miners, oil drillers, gas frackers, power plant operators, farmers and fertilizer manufacturers, loggers and builders, autobuilders, truck drivers, airplane builders, airline pilots and crews and the countless other occupations whose jobs would be at risk if fossil fuel use were really seriously curtailed.24 So rational people can understand the science, grasp the implications of the failure to act right now, and still find they have to “live in denial” to carry on. Given capitalism, they have little choice but to focus on the short-term, to prioritize saving their jobs in the here and now to feed their kids today – and worry about tomorrow, tomorrow. That’s why, when in 2009 President Obama tried to eliminate some tax credits and deductions tied to coal, oil and natural gas, there was furious protest from coal states and Congress never enacted the changes. That’s why UAW autoworkers have often joined their bosses in protesting against EPA efforts to impose higher CAFE fuel economy standards. It’s not that personally those workers don’t understand that we all need to consume less oil.25 But what other choice do they have given that, today, Detroit’s best defense against the Asian invasion is to concentrate on its niche market building giant gas-hog Ticonderogas, Escalades, Suburbans, Dodge Ram and Ford F150 trucks? Given capitalism, tragically, the autoworkers’ best hope for job security today is to work to destroy their childrens’ tomorrows.

**CAPITALISM REGARDS THE ENVIRONMENT AS A SOURCE OF RAW MATERIALS OR A SINK-Williams ‘10**

[Chris; chair of the Science Department at Packer Collegiate Institute; *Ecology and Socialism: Solutions to Capitalist Ecological Crisis; 2010; Kindle Edition]*

Capitalists have only two uses for the “environment”; it is either a source of raw materials or a sink. Resources—such as oil, coal, metals, etc.—are extracted from the environment and waste products are dumped back in. Capitalists define as waste any byproduct they can’t reuse or sell and therefore must dump. Since each capitalist firm, in its competition for market share, attempts to drive down costs and maximize profits, there is a built-in tendency to exclude from expense anything that falls outside the immediate process of production, which leads to capitalists’ insistence on dumping for free.

CAPITALISM THREATENS HUMAN SURVIVAL

**THE ECOLOGICAL COLLAPSE BROUGHT ON BY THE FAILED NEOLIBERAL ECONOMIC SYSTEM IS THE GREATEST THREAT TO HUMAN SURVIVAL-Bellamy Foster ‘09**

[Jeremy; professor of sociology at the University of Oregon; A Failed System: The World Crisis of Capitalist Globalization and its Impact on China; Monthly Review; 11 Jan 2009; <http://monthlyreview.org/2009/03/01/a-failed-system-the-world-crisis-of-capitalist-globalization-and-its-impact-on-china;> retrieved 29 Jun 2011]

In addressing capitalism as a failed system I have focused first on the deepening economic crisis. But this is not the worst of the world’s problems. The greatest peril is the growing threat of planetary ecological collapse. Here the danger is much greater than in the case of the world economy but the sense of alarm and the call for immediate and massive action is less widespread. As the Swedish Tällberg Foundation stated in its 2008 report, Grasping the Climate Crisis: A Provocation,

The world [at present] faces a breakdown of the global financial system. The consequences are staggering, with ripple effects the world over that deliver the severest blows to the poor. Fear is rising. One would have expected somewhat of the same level of anxiety with regard to the looming breakdown of major parts of the Earth system—rapid deforestation, overfishing, freshwater scarcity and the disappearing Arctic sea ice. Reports of such events and processes are abundant, but the level of concern is still conspicuously low.

The most serious ecological threat is of course global warming, which is inducing widespread, multi-faceted climate change, with disastrous implications for life on earth. But in a wider sense, the global environmental crisis involves manifold problems and cannot be reduced to global warming alone. These multiple hazards have a common source in the world economy, including: the extinction of species, loss of tropical forests (as well as forest ecosystems generally), contamination of and destruction of ocean ecology, loss of coral reefs, overfishing, disappearing supplies of fresh water resources, the despoliation of lakes and rivers, desertification, toxic wastes, pollution, acid rain, the approaching exhaustion of easily available crude oil resources, urban congestion, the detrimental effects of large dams, world hunger, overpopulation, etc. Together these threats constitute the greatest challenge to the survival of humanity since its prehistory.

**FAILURE TO ADJUST WITHIN A DECADE WILL DOOM ⅓ OF THE PLANET’S SPECIES AND MILLIONS OF PEOPLE-Bellamy-Foster et al ‘10**

[John, professor of sociology at the University of Oregon; Brett Clark, professor of sociology at North Carolina State; and Richard York, professor of sociology at the University of Oregon; *The Ecological Rift: Capitalism’s War on the Earth*; 2010; pg. 152-53]

In 2008, James Hansen, director of NASA's Goddard Institute for Space Studies, captured the state of the existing "planetary emer­gency," with respect to climate change:

Our home planet is dangerously near a tipping point at which human-made greenhouse gases reach a level where major climate changes can proceed mostly under their own momentum. Warming will shift climatic zones by intensifying the hydrologic cycle, affecting freshwater availabil­ity and human health. We will see repeated coastal tragedies associated with storms and continuously rising sea levels. The implications are pro­found, and the only resolution is for humans to move to a fundamentally different energy pathway within a decade. Otherwise, it will be too late for one-third of the world's animal and plant species and millions of the most vulnerable members of our own species.

According to environmentalist Lester Brown in his Plan B 3.0: "We are crossing natural thresholds that we cannot see and violating deadlines that we do not recognize. Nature is the time keeper, but we cannot see the clock.... We are in a race between tipping points in the earth's natural systems and those in the world's political systems. Which will tip first?"5 As the clock continues to tick and little is accomplished, it is obvious that decisive and far-reaching changes are required to stave off ultimate disaster. This raises the question of more revolutionary social change as an ecological as well as a social necessity.

**FAILURE TO ACT WILL LEAD TO A TERMINAL CRISIS THAT WILL END HUMAN DOMINANCE OF THE PLANET AND LEAD TO MASSIVE EXTINCTION-Bellamy-Foster et al ‘10**

[John, professor of sociology at the University of Oregon; Brett Clark,professor of sociology at North Carolina State; and Richard York, professor of sociology at the University of Oregon; *The Ecological Rift: Capitalism’s War on the Earth*; 2010; pg. 424]

When we speak today of the world ecological crisis, however, we are referring to something that could turn out to be final, that is, there is a high probability, if we do not quickly change course, of a terminal crisis—a death of the whole period of human dominance of the plan­et. Human actions are generating environmental changes that threaten the extermination of most species on Earth, along with civilization, and conceivably our own species as well.

What makes the current ecological situation so serious is that climate change, arising from human-generated increases in greenhouse gas emissions, is not occurring gradually and in a linear process, but is undergoing a dangerous acceleration, pointing to sudden shifts in the state of the earth system. We can therefore speak, to quote James Hansen, of "tipping points . . . fed by amplifying feedbacks."2 Four amplifying feedbacks are significant at present: (1) rapid melting of Arctic sea ice, with the resulting reduction of the earth's albedo (reflec­tion of solar radiation) due to the replacement of bright reflective ice with darker blue sea water, leading to greater absorption of solar energy and increasing global average temperatures; (2) melting of the frozen tundra in northern regions, releasing methane (a much more potent greenhouse gas than carbon dioxide) that is trapped beneath the sur­face, causing accelerated warming; (3) a drop in the efficiency of the car­bon absorption of the world's oceans since the 1980s, and particularly since 2000, due to growing ocean acidification (from past carbon absorption) and other factors, potentially contributing to a faster carbon buildup in the atmosphere and enhanced warming; (4) extinction of species due to changing climate zones, leading to the collapse of ecosys­tems dependent on these species, and the death of still more species.3

CAPITALISM CAUSES ENVIRONMENTAL DEVASTATION

**THE GLOBAL CAPITALIST SYSTEM IS ECO-SUICIDAL-Smith ‘11**

[Richard, Professor and member of Institute for Policy Research & Development; Green Capitalism: The God That Failed; 11 May 2011; <http://climateandcapitalism.com/?p=4405;> retrieved 29 Jun 2011]

Third, green capitalism theorists vastly underestimate the gravity, scope, and speed of the global ecological collapse of we face. They imagine that growth can continue forever if we just tweak the incentives and penalties a bit here and there with green taxes and such. I claim that the capitalist economic system is inherently eco-suicidal, that endless growth can only end in catastrophic global eco-collapse, that no amount of tinkering can alter the market system’s suicidal trajectory, and that, therefore, like it or not, humanity has no choice but to try to find a way to replace capitalism with a post-capitalist ecologically sustainable economy.

**CAPITALISM RESTS ON A DESTRUCTIVE IMPULSE TO DESTROY ENVIRONMENTS IN THE PURSUIT OF GROWTH-Bellamy Foster, Clark, and York ‘08**

[John, professor of sociology at the University of Oregon; Brett,professor of sociology at North Carolina State; and Richard, professor of sociology at the University of Oregon; Ecology: The Moment of Truth—An Introduction; Juy-Aug 2008; retrieved 29 Jun 2011; [http://monthlyreview.org/2008/07/01/ecology-the-moment-of-truth-an-introduction]](http://monthlyreview.org/2008/07/01/ecology-the-moment-of-truth-an-introduction%5D)

None of this should surprise us. Capitalism since its birth, as Paul Sweezy wrote in “Capitalism and the Environment,” has been “a juggernaut driven by the concentrated energy of individuals and small groups single-mindedly pursuing their own interests, checked only by their mutual competition, and controlled in the short run by the impersonal forces of the market and in the longer run, when the market fails, by devastating crises.” The inner logic of such a system manifests itself in the form of an incessant drive for economic expansion for the sake of class-based profits and accumulation. Nature and human labor are exploited to the fullest to fuel this juggernaut, while the destruction wrought on each is externalized so as to not fall on the system’s own accounts.

“Implicit in the very concept of this system,” Sweezy continued, “are interlocked and enormously powerful drives to both creation and destruction. On the plus side, the creative drive relates to what humankind can get out of nature for its own uses; on the negative side, the destructive drive bears most heavily on nature’s capacity to respond to the demands placed on it. Sooner or later, of course, these two drives are contradictory and incompatible.” Capitalism’s overexploitation of nature’s resource taps and waste sinks eventually produces the negative result of undermining both, first on a merely regional, but later on a world and even planetary basis (affecting the climate itself). Seriously addressing environmental crises requires “a reversal, not merely a slowing down, of the underlying trends of the last few centuries.” This, however, cannot be accomplished without economic regime change.

**CAPITALISM IS INCAPABLE OF SUSTAINING THE ENVIRONMENT-Bellamy Foster, Clark, and York ‘08**

[John, professor of sociology at the University of Oregon; Brett,professor of sociology at North Carolina State; and Richard, professor of sociology at the University of Oregon; Ecology: The Moment of Truth—An Introduction; Juy-Aug 2008; retrieved 29 Jun 2011; [http://monthlyreview.org/2008/07/01/ecology-the-moment-of-truth-an-introduction]](http://monthlyreview.org/2008/07/01/ecology-the-moment-of-truth-an-introduction%5D)

Recently, however, in his Bridge at the Edge of the World: Capitalism, the Environment, and Crossing from Crisis to Sustainability (2008), Speth has emerged as a devastating critic of capitalism’s destruction of the environment. In this radical rethinking, he has chosen to confront the full perils brought on by the present economic system, with its pursuit of growth and accumulation at any cost. “Capitalism as we know it today,” he writes, “is incapable of sustaining the environment.” The crucial problem from an environmental perspective, he believes, is exponential economic growth, which is the driving element of capitalism. Little hope can be provided in this respect by so-called “dematerialization” (the notion that growth can involve a decreasing impact on the environment), since it can be shown that the expansion of output overwhelms all increases in efficiency in throughput of materials and energy. Hence, one can only conclude that “right now…growth is the enemy of [the] environment. Economy and environment remain in collision.” Here the issue of capitalism becomes unavoidable. “Economic growth is modern capitalism’s principal and most prized product.” Speth favorably quotes Samuel Bowles and Richard Edwards’s Understanding Capitalism, which bluntly stated: “Capitalism is differentiated from other economic systems by its drive to accumulate, its predisposition toward change, and its built-in tendency to expand.”

**WORLD ECONOMIC SYSTEM PREDICATED ON RELENTLESS GROWTH THREATENS THE ENTIRE ENVIRONMENT-Williams ‘10**

[Chris; chair of the Science Department at Packer Collegiate Institute; *Ecology and Socialism: Solutions to Capitalist Ecological Crisis; 2010; Kindle Edition]*

A world economic system predicated on relentless growth, devouring increasing amounts of raw materials and energy and spewing out ever-larger amounts of toxic waste products, has produced a whole series of environmental threats: species extinction, air and water pollution, genetically modified organisms, desertification, deforestation, soil depletion, and the ever-present possibility of nuclear warfare,4 to name only a few.5 However, as it intersects with all other threats, and furthermore has a tendency to aggravate them, the most urgent and all-encompassing of these is global climate change.

**PROFIT-DRIVEN GROWTH HAS DRIVEN THE PLANET TO THE BRINK-Williams ‘10**

[Chris; chair of the Science Department at Packer Collegiate Institute; *Ecology and Socialism: Solutions to Capitalist Ecological Crisis; 2010; Kindle Edition]*

It is true that less developed countries of the South cannot emulate the consumer lifestyles and type of development of the North to which everyone, without a hint of irony, North and South, is nevertheless constantly taught to aspire. Further capitalist development of the North is quite enough to wreck the planet on its own; were the people of the southern hemisphere to join in and catch up, we would need the equivalent of five planets.13 The problem, this book will argue, is not economic growth per se or population growth, but profit-driven, unplanned growth that in many cases is either socially useless or actively detrimental to humans and the biosphere—the kind of growth that has brought us to the brink of social and ecological disaster. Development and growth must be fundamentally redefined to prioritize real human and ecological needs rather than the priorities of profit and the market.

**BECAUSE CAPITALISM REGARDS NATURE AS A FREE GIFT, IT WILL INEVITABLY BE EXPLOITED TO THE BREAKING POINT-Williams ‘10**

[Chris; chair of the Science Department at Packer Collegiate Institute; *Ecology and Socialism: Solutions to Capitalist Ecological Crisis; 2010; Kindle Edition]*

The requirement for profit-taking gives rise to the third contradiction that makes capitalism unsustainable—its inherent short-termism. The bloody heart of capitalism, competition and the drive for profits, makes economic growth and a short-term outlook imperative and integral components of the system. In an example with clear resonance today, this short-term outlook and lack of foresight derived from the need to make an immediate profit, was analyzed by Marx with respect to the longevity of the worker:

Capital that has such good reasons for denying the sufferings of the legions of workers that surround it, is in practice moved as much and as little by the sight of the coming degradation and final depopulation of the human race, as by the probable fall of the earth in to the sun. In every stock-jobbing swindle everyone knows that some time or other the crash must come, but every one hopes that it may fall on the head of his neighbor, after he himself has caught the shower of gold and placed it in safety. Après moi le déluge! is the watchword of every capitalist and every capitalist nation. Hence Capital is reckless of the health or length of life of the labourer, unless under compulsion from society.

But Marx did not limit his concern with the short-termism of capitalism just to the worker, but equally with respect to the longevity of the earth’s fertility, which capitalist agricultural practices are incapable of taking into account. Again, the argument made here by Marx was in clear evidence during the recent world food crisis: The dependence of the cultivation of particular agricultural products upon fluctuations of market-prices, and the continual changes in this cultivation with these price fluctuations—the whole spirit of capitalist production, which is directed toward the immediate gain of money—are in contradiction to agriculture, which has to minister to the entire range of permanent necessities of life required by the chain of successive generations.

Through their writings and analysis, Marx and Engels demonstrated that capitalism is incompatible with itself internally, due to the diametrically opposed interests of workers and capitalists, and with nature externally because of its view of nature as something separate from us—a free gift. While capitalists do have to pay something to workers to keep us alive and breeding to replenish our stock, as far as they’re concerned, nothing has to be paid to the earth.

**ECOLOGICAL DEVASTATION IS AN INTRINSIC ELEMENT OF CAPITALISM, ONE THAT THREATENS HUMAN SURVIVAL-Williams ‘10**

[Chris; chair of the Science Department at Packer Collegiate Institute; *Ecology and Socialism: Solutions to Capitalist Ecological Crisis; 2010; Kindle Edition]*

On the current path, at a time not too far distant, Homo sapiens will lose the ability to consciously and creatively direct our own destiny. We will have unleashed long-term planetary forces far beyond our control that will initiate a descent into a future that we thought we had escaped several thousand years ago. Natural forces will once again come to dominate and radically curtail social possibilities. The rapacity of capitalism knows no bounds. Indeed, capitalism, by its very nature is “unbounded”—as soon as a limit or boundary is reached, it must be exceeded. Capitalism has reached a point in its development that it now threatens the basic biogeochemical processes of the planet as human civilization has come to know them. Ecological devastation is not an accidental outcome of capitalist development but an intrinsic element of the system, just as integral as class exploitation, poverty, racism, and war. Capitalism forcibly alienates us both from ourselves and our own planet. The capitalist system effectively turns the planet into a giant machine for the manufacture and accumulation of larger and larger amounts of money. Raw materials, energy, and human workers are fed into the maw of this giant profit-making machine at ever-growing rates. The machine spews out money for a tiny minority along with truly gargantuan rivers of effluent, belching forth atmospheric toxins while tossing workers on the scrap heap after a lifetime of service.

**CAPITALISM IS DRIVEN BY THE DESTRUCTIVE IMPULSE TO EXPLOIT RESOURCES WHILE EXTERNALIZING THE IMPACT-Bellamy-Foster et al ‘10**

[John, professor of sociology at the University of Oregon; Brett Clark,professor of sociology at North Carolina State; and Richard York, professor of sociology at the University of Oregon; *The Ecological Rift: Capitalism’s War on the Earth*; 2010; pg. 156-57]

None of this should surprise us. Capitalism since its birth, as Paul Sweezy wrote in 1989 in his article "Capitalism and the Environment," has been "a juggernaut driven by the concentrated energy of individuals and small groups single-mindedly pursuing their own interests, checked only by their mutual competition, and con­trolled in the short run by the impersonal forces of the market and in the longer run, when the market fails, by devastating crises." The inner logic of such a system manifests itself in the form of an incessant drive for economic expansion for the sake of class-based profits and accu­mulation. Nature and human labor are exploited to the fullest to fuel this juggernaut, while the destruction wrought on each is externalized so as to not fall on the system's own accounts.

"Implicit in the very concept of this system," Sweezy continued, "are interlocked and enormously powerful drives to both creation and destruction. On the plus side, the creative drive relates to what humankind can get out of nature for its own uses; on the negative side, the destructive drive bears most heavily on nature's capacity to respond to the demands placed on it. Sooner or later, of course, these two drives are contradictory and incompatible." Capitalism's overex­ploitation of nature's resource taps and waste sinks eventually pro­duces the negative result of undermining both, first on a merely regional, but later on a world and even planetary basis (affecting the climate itself). Seriously addressing environmental crises requires "a reversal, not merely a slowing down, of the underlying trends of the last few centuries." This, however, cannot be accomplished without economic regime change.

**AN UNQUESTIONING COMMITMENT TO GROWTH AT ANY COST IS UNDERMINING THE PLANET’S ABILITY TO SUSTAIN LIFE-Speth ‘09**

[James Gustav; former professor Yale School of Forestry and Environmental Studies and current professor of law, U. of Vermont; *The Bridge at the Edge of the World: Capitalism, the Environment, and Crossing from Crisis to Sustainability*; 2009; Kindle Edition]

The capitalist operating system, whatever its shortcomings, is very good at generating growth. These features of capitalism, as they are constituted today, work together to produce an economic and political reality that is highly destructive of the environment. An unquestioning society-wide commitment to economic growth at almost any cost; enormous investment in technologies designed with little regard for the environment; powerful corporate interests whose overriding objective is to grow by generating profit, including profit from avoiding the environmental costs they create; markets that systematically fail to recognize environmental costs unless corrected by government; government that is subservient to corporate interests and the growth imperative; rampant consumerism spurred by a worshipping of novelty and by sophisticated advertising; economic activity so large in scale that its impacts alter the fundamental biophysical operations of the planet-all combine to deliver an ever-growing world economy that is undermining the planet's ability to sustain life.

**DEGRADATION OF THE ENVIRONMENT IS A CRITICAL COMPONENT TO THE CAPITALIST NARRATIVE-Brooks ‘06**

[Mick; Columnist; Capitalism and the Environment; In Defense of Marxism; 21 August 2006; <http://www.marxist.com/capitalism-environment-ecology-marxism210806.htm>; retrieved 23 August 2011]

Anyone who has read a standard account of the problem of global warming, for instance, will realise that it is possible, apparently through carelessness, to wipe out human life on earth. Hold on, and take a deep breath! Don’t capitalists also live on the planet? Is it in their interests that human life, including not just their profits but even their very existence, should be extinguished?

Of course it’s not in their interests. But things that happen under capitalism don’t just reflect the interests of the individual capitalist. Events follow the logic of the system.

This is how Marxism explains environmental degradation, “As individual capitalists are engaged in production and exchange for the sake of immediate profit, only the nearest, most immediate results must first be taken into account…What cared the Spanish planters in Cuba, who burned down the forests on the slopes of the mountains and obtained from the ashes sufficient fertiliser for one generation of highly profitable coffee trees – what cared they that heavy tropical rainfall afterwards washed away the unprotected upper stratum of soil, leaving behind only bare rock! In relation to nature, as to society, the present mode of production is predominantly concerned only about the immediate, most tangible result, and then surprise is expressed that the more remote effects of actions directed to this end turn out to be quite different, are mostly quite opposite in character.” (Engels – Part played by labour in the transition from ape to man).

TIMEFRAME FOR ENVIRONMENT CRITICAL

**WE HAVE LESS THAN A GENERATION TO AVOID IRREVERSIBLE, DEVASTATING ECOLOGICAL DECLINE-Das ‘10**

[Asit; Climate Change And Social Justice: Towards An Ecosocialist Perspective; 26 Jun 2010; <http://www.countercurrents.org/das260610.htm;> retrieved 29 Jun 2011]

Explaining the magnitude of the crisis and the urgency to deal with it, John Bellamy Foster in his note “Ecology: The Moment of Truth" says: "It is impossible to exaggerate the environmental problem facing humanity in the twenty-first century.” Nearly fifteen years ago he observed (John Bellamy Foster, “This Vulnerable Planet”, 1994): "We have only four decades left in which to gain control over our major environmental problems if we are to avoid irreversible ecological decline.

1. Today, with a quarter-century still remaining in this projected time line, it appears to have been too optimistic. Available evidence now strongly suggests that under a regime of business as usual we could be facing an irrerevocable “tipping point” with respect to climate change, within a mere decade.
2. Other crises such as species extinction (percentage of bird, mammal and fish species “vulnerable or in immediate danger of extinction” are “now measured in double digits”).
3. The rapid depletion of the oceans’ bounty; desertification; deforestation; air pollution; water shortages/pollution; soil degradation; the imminent peaking of world oil production (creating new geopolitical tensions); and a chronic world food crisis - all point to the fact that the planet as we know it and its ecosystems are stretched to the breaking point. The moment of truth for the earth and human civilization has arrived.”

**THE PERIOD OF TIME LEFT TO ADDRESS ENVIRONMENTAL CATASTROPHE IS VERY SHORT-Das ‘10**

[Asit; Climate Change And Social Justice: Towards An Ecosocialist Perspective; 26 Jun 2010; <http://www.countercurrents.org/das260610.htm;> retrieved 29 Jun 2011]

To be sure, it is unlikely that the effects of ecological degradation in our time, though enormous, will prove apocalyptic for human civilization within a single generation, even under conditions of capitalist business as usual. Normal human life spans, there is no doubt that considerable time is still left before the full effect of the current human degrading the planet comes into play. Yet, the period remaining in which we can avert future environmental catastrophe, before it is essentially out of our hands, is much shorter. Indeed, the growing sense of urgency of environmentalists has to do with the prospect of various tipping points being reached as critical ecological thresholds are crossed, leading to the possibility of a drastic contraction of life on earth. (See “Ecology: The Moment of Truth” by John Bellamy Foster, Brett Clark and Richard York, Monthly Review, July-August 2008).

**THE MOMENT OF TRUTH FOR HUMANITY AND THE PLANET HAS ARRIVED-Bellamy Foster, Clark, and York ‘08**

[John, professor of sociology at the University of Oregon; Brett,professor of sociology at North Carolina State; and Richard, professor of sociology at the University of Oregon; Ecology: The Moment of Truth—An Introduction; Juy-Aug 2008; retrieved 29 Jun 2011; [http://monthlyreview.org/2008/07/01/ecology-the-moment-of-truth-an-introduction]](http://monthlyreview.org/2008/07/01/ecology-the-moment-of-truth-an-introduction%5D)

It is impossible to exaggerate the environmental problem facing humanity in the twenty-first century. Nearly fifteen years ago one of us observed: “We have only four decades left in which to gain control over our major environmental problems if we are to avoid irreversible ecological decline.”1 Today, with a quarter-century still remaining in this projected time line, it appears to have been too optimistic. Available evidence now strongly suggests that under a regime of business as usual we could be facing an irrevocable “tipping point” with respect to climate change within a mere decade.2 Other crises such as species extinction (percentages of bird, mammal, and fish species “vulnerable or in immediate danger of extinction” are “now measured in double digits”);3 the rapid depletion of the oceans’ bounty; desertification; deforestation; air pollution; water shortages/pollution; soil degradation; the imminent peaking of world oil production (creating new geopolitical tensions); and a chronic world food crisis—all point to the fact that the planet as we know it and its ecosystems are stretched to the breaking point. The moment of truth for the earth and human civilization has arrived.

**THE TIME WE HAVE TO AVERT FUTURE ENVIRONMENTAL CATASTROPHE IS RAPIDLY DIMINISHING-Bellamy Foster, Clark, and York ‘08**

[John, professor of sociology at the University of Oregon; Brett,professor of sociology at North Carolina State; and Richard, professor of sociology at the University of Oregon; Ecology: The Moment of Truth—An Introduction; Juy-Aug 2008; retrieved 29 Jun 2011; [http://monthlyreview.org/2008/07/01/ecology-the-moment-of-truth-an-introduction]](http://monthlyreview.org/2008/07/01/ecology-the-moment-of-truth-an-introduction%5D)

To be sure, it is unlikely that the effects of ecological degradation in our time, though enormous, will prove “apocalyptic” for human civilization within a single generation, even under conditions of capitalist business as usual. Measured by normal human life spans, there is doubtless considerable time still left before the full effect of the current human degradation of the planet comes into play. Yet, the period remaining in which we can avert future environmental catastrophe, before it is essentially out of our hands, is much shorter. Indeed, the growing sense of urgency of environmentalists has to do with the prospect of various tipping points being reached as critical ecological thresholds are crossed, leading to the possibility of a drastic contraction of life on earth.

Such a tipping point, for example, would be an ice free Arctic, which could happen within two decades or less (some scientists believe as early as 2013). Already in summer 2007 the Arctic lost in a single week an area of ice almost twice the size of Britain. The vanishing Arctic ice cap means an enormous reduction in the earth’s reflectivity (albedo), thereby sharply increasing global warming (a positive feedback known as the “albedo flip”). At the same time, the rapid disintegration of the ice sheets in West Antarctica and Greenland points to rising world sea levels, threatening coastal regions and islands.

**CAPITALISM’S UNINTENDED DESTRUCTION SPEEDS THE TIMEFRAME OF ECOLOGICAL CATASTROPHE-Williams ‘10**

[Chris; chair of the Science Department at Packer Collegiate Institute; *Ecology and Socialism: Solutions to Capitalist Ecological Crisis; 2010; Kindle Edition]*

While life will evolve and biodiversity will eventually be reestablished on a planet that is 60 C warmer than today, it will do so on a timescale vastly greater than human planning and life spans could possibly contemplate. As mentioned earlier, it took fifty million years for biodiversity to recover from the Permian-Triassic mass extinction. In the interim period, 50 to 90 percent of species currently extant will die out as they will be unable to adapt fast enough to such rapid changes and the resulting breakdown in ecosystems within which these species are embedded. It is not just the overall amount of climatic change that will be so devastating to ecosystems, but just as importantly, the rate at which that change occurs. Alongside such drastic reductions in biodiversity, human misery will multiply. Mass migration, droughts, floods, wars, and famine will be endemic rather than periodic features of a greatly constrained human society.

Frederick Engels outlined over one hundred years ago the contradictions between an exploitative, short-term relationship of humanity to nature and the long-term problems that would inevitably engender:

Let us not, however, flatter ourselves overmuch on account of our human victories over nature. For each victory nature takes its revenge on us. Each victory, it is true, in the first place brings about the results we expected, but in the second and third places it has quite different, unforeseen effects which only too often cancel out the first. The people who, in Mesopotamia, Greece, Asia Minor and elsewhere, destroyed forests to obtain cultivable land, never dreamed that by removing along with the forests the collecting centers and reservoirs of moisture they were laying the basis for the present forlorn state of those countries. When the Italians of the Alps used up the pine forests on the southern slopes, so carefully cherished on the northern slopes, they had no inkling that by doing so they were thereby depriving their mountain springs of water for the greater part of the year, making possible for them to pour still more furious torrents on the plains during the rainy season… Thus at every step we are reminded that we by no means rule over nature like a conqueror over a foreign people, like someone standing outside of nature—but that we, with flesh, blood and brain, belong to nature, exist in its midst, and that all our mastery of it consists in the fact that we have the advantage of all other creatures of being able to learn its laws and apply them correctly.

This failure to take into account the long-term, unintended consequences of human actions reaches its height of contradiction under capitalism where both the scale of the destructive impact of these unintended consequences, as well as the scientific and material means to overcome them, develop in tandem.

GLOBAL WARMING IS AT A TIPPING POINT

**A FAILURE TO ADDRESS WARMING WITHIN DECADES COULD LEAD TO A MASS EXTINCTION OF SPECIES AND BILLIONS OF HUMAN DEATHS-Williams ‘10**

[Chris; chair of the Science Department at Packer Collegiate Institute; *Ecology and Socialism: Solutions to Capitalist Ecological Crisis; 2010; Kindle Edition]*

If two degrees of warming is indeed a planetary “critical threshold,” then once we have passed it, we head inexorably for three degrees of warming, then four, five, and six. What would a world five to six degrees warmer look like? A glance back millions of years, to when crocodiles flourished in what is now Canada, gives us some idea. The Amazon will have disappeared and turned into a desert. The collapse of the Greenland ice sheet and the Antarctic ice shelf will produce sea-level rises of 25 meters, inundating coastal cities and placing large areas of land far underwater. Coral reefs will be dead from ocean acidification. Fish stocks will plunge due to acidity and decreased dissolved oxygen as oceans warm. Searing heat, the extreme violence of “hypercanes” caused by warmer oceans and greater kinetic energy in the atmosphere, and flash flooding will make growing crops impossible across large areas of formerly fertile continents. Southern Europe, the Southwestern U.S., and Central America, along with Central Asia and Africa and almost the whole of Australia will become desert. Humans will be constrained to “zones of habitability” near the poles to escape the twin extremes of drought and flood. All these changes will occur far too rapidly to allow for adaptation on the part of upwards of 50-60 percent of plant and animal species, which will cease to exist. The level of mass extinction could rival the climate-change-induced Permian-Triassic (P-T) mass extinction of 251 million years ago, which saw planetary life hanging by a thread as 95 percent of all species, plant and animal became extinct; it took 50 million years for the earth to return to its pre P-T level of biodiversity. Human population will drop by the billions even as mass migrations and civilizational breakdown become continuous features of life for those who survive. More worrisome still— if that’s possible—is that, while in the past such “rapid” climate swings generally occurred over thousands or hundreds of years, continuing on our present course could produce a similar swing in a matter of decades.

**EARTH AT TIPPING POINT NOW FOR TAKING ACTION-Agence France-Presse ‘08**

[Earth in crisis, warns NASA's top climate scientist; Agence France-Presse; 6 April 2008; <http://afp.google.com/article/ALeqM5g2Wkbo6PcynAVeJzSPWDQZaWAI8g>; retrieved 23 August 2011]

Global warming has plunged the planet into a crisis and the fossil fuel industries are trying to hide the extent of the problem from the public, NASA's top climate scientist says.

"We've already reached the dangerous level of carbon dioxide in the atmosphere," James Hansen, 67, director of NASA's Goddard Institute for Space Studies in New York, told AFP here.

"But there are ways to solve the problem" of heat-trapping greenhouse gases like carbon dioxide, which Hansen said has reached the "tipping point" of 385 parts per million.

In a paper he was submitting to Science magazine on Monday, Hansen calls for phasing out all coal-fired plants by 2030, taxing their emissions until then, and banning the building of new plants unless they are designed to trap and segregate the carbon dioxide they emit.

**GLOBAL WARMING IS AT A GLOBAL TIPPING POINT WHICH COULD SOON BECOME IRREVOCABLE-Bellamy Foster ‘09**

[Jeremy; professor of sociology at the University of Oregon; A Failed System: The World Crisis of Capitalist Globalization and its Impact on China; Monthly Review; 11 Jan 2009; <http://monthlyreview.org/2009/03/01/a-failed-system-the-world-crisis-of-capitalist-globalization-and-its-impact-on-china;> retrieved 29 Jun 2011]

The global warming threat is rapidly closing in. The melting of sea ice in the Arctic, which some scientists believe could be ice free in the summer in less than a decade, is seen as threatening an “albedo flip,” a drastic reduction in the reflectivity of solar radiation and an acceleration of climate change. Meanwhile, the melting of the ice sheets in West Antarctica and Greenland points to an irreversible “tipping point” within a decade that portends rising world sea levels that will eventually engulf major population centers in low-lying areas. The combination of momentous environmental tipping points and positive feedback mechanisms accelerating climate change have convinced a growing number of climatologists that irrevocable and catastrophic climate change is inevitable unless actions are taken in the next decade or so drastically to reduce greenhouse gas emissions. The atmosphere is near the ceiling of CO2 and other greenhouse gases that will produce the 2°C increase in average global temperatures that the United Nations’ Intergovernmental Panel on Climate Change has sought to avoid. Moreover, the world is on a course under business as usual that could well lead to average global temperature increases two or even three times as high during this century, spelling an inferno for life on the planet.

Indeed, new scientific data suggests that a 2°C increase would itself be disastrous, in terms of rising sea levels and the setting off of various self-reinforcing feedback mechanisms that could accelerate climate change throughout the earth system. This means that allowing for a stabilization of greenhouse gas concentration in the atmosphere at 550 parts per million (ppm), as envisioned in the Stern Review—characterized by most mainstream economists as a “radical” response to controlling carbon emissions—or even a buildup of carbon to 450 ppm (seen as consistent with a 2°C ceiling in average global temperature rise) are now viewed by many leading scientists as running the risk of catastrophic change.

**CROSS THE TIPPING POINT THERE WILL BE NO RETURN FROM EXTERMINATION OF MILLIONS OF SPECIES-Speth ‘09**

[James Gustav; former professor Yale School of Forestry and Environmental Studies and current professor of law, U. of Vermont; *The Bridge at the Edge of the World: Capitalism, the Environment, and Crossing from Crisis to Sustainability*; 2009; Kindle Edition]

The real possibility of these amplifying feedbacks has alarmed some of our top scientists. James Hansen, the courageous NASA climate scientist, is becoming increasingly outspoken as his investigations lead him to more and more disturbing conclusions. He offered the following assessment in 2007: "Our home planet is now dangerously near a `tipping point.' Human-made greenhouse gases are near a level such that important climate changes may proceed mostly under the climate system's own momentum. Impacts would include extermination of a large fraction of species on the planet, shifting of climatic zones due to an intensified hydrologic cycle with effects on freshwater availability and human health, and repeated worldwide coastal tragedies associated with storms and a continuously rising sea level.... "Civilization developed during the Holocene, a period of relatively tranquil climate now almost 12,000 years in duration. The planet has been warm enough to keep ice sheets off North America and Europe, but cool enough for ice sheets on Greenland and Antarctica to be stable. Now, with rapid warming of o.6°C in the past 30 years, global temperature is at its warmest level in the Holocene. "This warming has brought us to the precipice of a great `tipping point.' If we go over the edge, it will be a transition to `a different planet,' an environment far outside the range that has been experienced by humanity. There will be no return within the lifetime of any generation that can be imagined, and the trip will exterminate a large fraction of species on the planet. "The crystallizing scientific story reveals an imminent planetary emergency. We are at a planetary tipping point. We must move onto a new energy direction within a decade to have a good chance to avoid setting in motion unstoppable climate change with irreversible effects.

LINKS: SPACE EXPLORATION

**EFFORTS TO EXPLORE SPACE FURTHER CAPITALIST INTERESTS-Dickens ‘10**

[Peter; professor @ Universities of Brighton and Cambridge; The Humanization of the Cosmos--To What End?; Monthly Review; November 2010; retrieved 28 Jun 2011

[http://monthlyreview.org/2010/11/01/the-humanization-of-the-cosmos-to-what-end]](http://monthlyreview.org/2010/11/01/the-humanization-of-the-cosmos-to-what-end%5D)

Society is increasingly humanizing the cosmos. Satellites have for some time been central to the flow of information, to surveillance, and to the conduct of warfare. As these examples suggest, however, the humanization of the cosmos is primarily benefiting the powerful. These include major economic and military institutions. Furthermore, the forthcoming commodification and colonization of the cosmos is again likely to enhance the interests of the powerful, the major aerospace companies in particular. The time has come to consider alternative forms of cosmic humanization. These would enhance the prospects of the socially marginalized. They would also allow humanity to develop a better understanding of the cosmos and our relationship to it.

**EXPANSION OF CAPITALISM INTO THE COSMOS IS THE UNDERLYING RATIONALE FOR SPACE EXPLORATION-Dickens ‘10**

[Peter; professor @ Universities of Brighton and Cambridge; The Humanization of the Cosmos--To What End?; Monthly Review; November 2010; retrieved 28 Jun 2011

[http://monthlyreview.org/2010/11/01/the-humanization-of-the-cosmos-to-what-end]](http://monthlyreview.org/2010/11/01/the-humanization-of-the-cosmos-to-what-end%5D)

The general point is that the vision of the Space Renaissance Initiative, with its prime focus on the power of the supposedly autonomous and inventive individual, systematically omits questions of social, economic, and military power. Similarly, the Initiative’s focus on the apparently universal benefits of space humanization ignores some obvious questions. What will ploughing large amounts of capital into outer space colonization really do for stopping the exploitation of people and resources back here on earth? The “solution” seems to be simultaneously exacerbating social problems while jetting away from them. Consumer-led industrial capitalism necessarily creates huge social divisions and increasing degradation of the environment. Why should a galactic capitalism do otherwise? The Space Renaissance Initiative argues that space-humanization is necessarily a good thing for the environment by introducing new space-based technologies such as massive arrays of solar panels. But such “solutions” are again imaginary. Cheap electricity is most likely to increase levels of production and consumption back on earth. Environmental degradation will be exacerbated rather than diminished by this technological fix.

A simplistic and idealistic view of history, technology, and human agency therefore underpins the starting point of the Space Renaissance Initiative. Humanization in this shape—one now finding favor in official government circles—raises all kinds of highly problematic issues for society and the environment. What would an alternative, more critical, perspective on humanizing the cosmos tell us?

Instead of indulging in over-optimistic and fantastic visions, we should take a longer, harder, and more critical look at what is happening and what is likely to happen. We can then begin taking a more measured view of space humanization, and start developing more progressive alternatives.

At this point, we must return to the deeper, underlying processes which are at the heart of the capitalist economy and society, and which are generating this demand for expansion into outer space. Although the humanization of the cosmos is clearly a new and exotic development, the social relationships and mechanisms underlying space-humanization are very familiar.

**SPACE TECHNOLOGY FURTHERS CAPITALISM WHICH IS STALKING SPACE FOR MORE RESOURCES-Dickens ‘10**

[Peter; professor @ Universities of Brighton and Cambridge; The Humanization of the Cosmos--To What End?; Monthly Review; November 2010; retrieved 28 Jun 2011

[http://monthlyreview.org/2010/11/01/the-humanization-of-the-cosmos-to-what-end]](http://monthlyreview.org/2010/11/01/the-humanization-of-the-cosmos-to-what-end%5D)

In the early twentieth century, Rosa Luxemburg argued that an “outside” to capitalism is important for two main reasons. First, it is needed as a means of creating massive numbers of new customers who would buy the goods made in the capitalist countries. As outlined earlier, space technology has extended and deepened this process, allowing an increasing number of people to become integral to the further expansion of global capitalism. Luxemburg’s second reason for imperial expansion is the search for cheap supplies of labor and raw materials. Clearly, space fiction fantasies about aliens aside, expansion into the cosmos offers no benefits to capital in the form of fresh sources of labor power.[8](http://monthlyreview.org/2010/11/01/the-humanization-of-the-cosmos-to-what-end#en78) But expansion into the cosmos does offer prospects for exploiting new materials such as those in asteroids, the moon, and perhaps other cosmic entities such as Mars. Neil Smith’s characterization of capital’s relations to nature is useful at this point.

The reproduction of material life is wholly dependent on the production and reproduction of surplus value. To this end, capital stalks the Earth in search of material resources; nature becomes a universal means of production in the sense that it not only provides the subjects, objects and instruments of production, but is also in its totality an appendage to the production process…no part of the Earth’s surface, the atmosphere, the oceans, the geological substratum or the biological superstratum are immune from transformation by capital.9

Capital is now also “stalking” outer space in the search for new resources and raw materials. Nature on a cosmic scale now seems likely to be incorporated into production processes, these being located mainly on earth.

**EFFORTS TO PRIVATIZE SPACE EXPLORATION ENCOURAGE CAPITALIST MONOPOLIES-Dickens ‘10**

[Peter; professor @ Universities of Brighton and Cambridge; The Humanization of the Cosmos--To What End?; Monthly Review; November 2010; retrieved 28 Jun 2011

[http://monthlyreview.org/2010/11/01/the-humanization-of-the-cosmos-to-what-end]](http://monthlyreview.org/2010/11/01/the-humanization-of-the-cosmos-to-what-end%5D)

All this suggests not just that the outer space economy is doing well while other sectors are doing less well, but that growing investment in the solar system is a response to global economic crisis. Again, this growth of the private space economy underlines the significance of President Obama’s shift toward private sector “solutions” to space humanization. The private sector has long argued that, in terms of creating technological innovation and reducing costs, it is superior to NASA and other government agencies. Now—and, it should be noted, with extensive earlier financial backing from NASA—it is advancing itself as capable of taking over large parts of the space program.

But, at the same time, restructuring within the space industry is following some very familiar lines. Close links and mergers are taking place between large monopolistic companies and the smaller enterprises celebrated by the Space Renaissance Initiative. For example, Northrop-Grumman, one of the leading U.S. defense manufacturers, has recently bought Scaled Composites, the latter having pioneered lightweight materials used for space tourism vehicles. Northrop-Grumman has for many years designed and constructed satellite-guided drones used in Iraq, Afghanistan, and elsewhere. This merger raises the prospect of skills and technologies originally designed to take wealthy people into outer space being developed to observe and eliminate warlords—and others—back on earth.

**SATELLITE DEVELOPMENT FUELS FAILED NEOLIBERAL ECONOMIC POLICIES-Dickens and Ormrod ‘08**

[Peter; professor @ Universities of Brighton and Cambridge, and James, lecturer in sociology in the School of Applied Social Science, University of Brighton; Who Really Won the Space Race?; Monthly Review; February 2008; <http://monthlyreview.org/2008/02/01/who-really-won-the-space-race;> retrieved 28 Jun 2011]

The space race is being won by those who are already powerful. It has recently been estimated that by 2010 the American investment in space will reach $500 to $600 billion. This equals the value of all current U.S. investments in Europe. Who is gaining and who is losing as a result of this massive investment?

Some of these capital-investments in space at first seem relatively beneficial and benign. Communications satellites are, for example, a key way in which trade is conducted, a means by which information and capital flow on a global scale. Whether this is viewed as beneficial or benign depends on your view of global capitalism. But note that the development of the Internet, which partly depends on satellites, roughly coincided with the rise of neoliberalism. This involved widescale deregulation and privatization—what David Harvey calls “accumulation by dispossession.”

The neoliberal experiment was an attempt to recreate a profitable capitalism after the social and economic crises of the 1960s and 70s. But it has not substantially delivered on its promises. The record is, to use Harvey’s diagnosis, “nothing short of dismal.” Large proportions of the population have fallen into poverty, especially in Russia and the old East European societies that fully adopted the neoliberal creed. Global indicators of health levels, life expectancy, and infant mortality have worsened almost universally since the 1960s. Significant exceptions to this trend are those societies such as Sweden and Poland that have managed to resist or at least tame the neoliberal experiment. Neoliberalization has therefore consolidated class power in the economic, political, and cultural spheres. But the human and environmental costs have been very high. Furthermore, neoliberalization has largely failed to generate economic expansion. Aggregate growth rates have fallen from 3.5 percent in the 1960s to 1.1 percent at the present time. Only East and South-East Asia, plus most recently India, have seen substantial economic growth.

Satellites have been used as a way of exerting economic and political authority and creating the neoliberal experiment. The United States has not really won the space race. To the extent that some of the most powerful corporations using networks based on satellites are located in the United States, that country has indeed “won.” But this leaves millions of people “losing,” many of whom live in the United States. Once more it is the powerful, whether they are located in the United States or elsewhere, who have gained the most from the space race.

**SPACE EXPLORATION IS INEXTRICABLY BOUND WITH CAPITALISM AND WAR-Parrington ‘99**

[John; Dark side of the moon; Socialist Review; July/Aug 1999; <http://pubs.socialistreviewindex.org.uk/sr232/parrington.htm;> retrieved 30 Jun 2011]

No one likes being deceived. One of the distressing features of coming to terms with the reality of capitalist society is learning that events which inspired us as children were based on quite different motives than we perceived at the time. Thirty years ago this month, on 20 July 1969, a human being stood on the surface of the moon for the very first time. I cannot have been the only child who truly believed Neil Armstrong when he stepped out from the lunar lander and uttered those famous words, 'One small step for man, one giant leap for mankind.'

The drive to discover and explore the natural world is surely one of humanity's endearing attributes. Who but a total cynic could not be moved by the beauty of our solar system as it has unfolded over the past few decades? Whether it is the awesome volcanoes and canyons of Mars, the boiling hell of Venus, the aquamarine beauty of the blue gas giant Uranus or its strange, scrambled moon, Miranda, it is hard to know whether to class these images as science or art.

Yet space exploration has been inextricably bound up with another rather more sinister tendency the drive within capitalism towards war. The pioneering efforts in rocketry of characters like the American Robert H Goddard were largely ignored or ridiculed by the establishment. What helped to change this attitude was the very practical wartime demonstration, by the German V-2 missile, that rockets could be powerful weapons of mass destruction.

**SPACE EXPLORATION REVEALS THE CONTRADICTION AT THE HEART OF CAPITALISM-Parrington ‘99**

[John; Dark side of the moon; Socialist Review; July/Aug 1999; <http://pubs.socialistreviewindex.org.uk/sr232/parrington.htm;> retrieved 30 Jun 2011]

The lunar landings still stand as a measure of humankind's technological achievements. From a scientific point of view, however, they were of extremely limited value. Such, at least, was the view of geophysicists at the prestigious Carnegie Institute, who voted their disapproval of the Apollo programme by 110 to three. What was perhaps most surprising was how quickly the excitement over the lunar landing dissipated. By the time the astronauts made their successful return to earth, interest was already beginning to wane. One factor in this was that there were other, more terrestrial distractions. The Vietnam War was, after all, in full swing. The irony was that the whole point of the moon landing had been to demonstrate the US's overwhelming technological superiority. And yet here it was being trounced by a tiny Third World country.

The writer Norman Mailer could not make up his mind as to whether the lunar project was 'the noblest expression of the 20th century or the quintessential statement of our fundamental insanity'. Mailer had identified the contradiction at the heart of capitalism itself. On the one hand, the collective inspiration and ingenuity of human beings making possible a voyage into the heavens that would have truly astounded past generations. On the other hand, a system that uses such events as a cover for developing ever more powerful weapons of destruction.

**SPACE IS COMMODIFIED TO PROMOTE ECONOMIC AND MILITARY INTERESTS- Dickens and Ormrod ‘07**

[Peter, Visiting Professor of Sociology at the University of Essex, and James,Lecturer in Sociology at the University of Brighton; *Outer Space and Internal Nature: Towards a Sociology of the Universe*; 2007]

While pro-space activists and others are daydreaming about fantastical and yet seemingly benign things to do in outer space, socially and militarily dominant institutions are actively rationalizing, humanizing and commodifying outer space for real, material, ends. The cosmos is being used as a way of extending economic empires on Earth and monitoring those individuals who are excluded from this mission. On a day-to-day level, communications satellites are being used to promote predominantly ‘Western’ cultures and ways of life. They also enable the vast capital flows so crucial to the global capitalist economy. Since the 1950s, outer space has been envisaged as ‘the new high ground’ for the worldwide exercise of military power. The ‘weaponization of space’ has been proceeding rapidly as part of the so-called ‘War on Terror’ (Langley, 2004).

**SATELLITES ARE THE PRIMARY DRIVER OF CAPITALISM IN THE WEST AND EXACERBATE THE DIGITAL DIVIDE BETWEEN NORTH AND SOUTH-Dickens and Ormrod ‘07**

[Peter, Visiting Professor of Sociology at the University of Essex, and James,Lecturer in Sociology at the University of Brighton; *Outer Space and Internal Nature: Towards a Sociology of the Universe*; 2007]

Uncritical thinking about ‘networks’ is dangerous. There are reasons to doubt that what some commentators have called a win–win scenario resulting from increased use of satellite technology is actually as beneficial or apolitical as it appears. First and foremost it needs to be pointed out that the use of satellite technology by the developing world remains a potential rather than an actuality. Most internet terminals are located not only within the developed world but within the major cities within the developed world. It is thus to those already well connected that the internet is offering an advantage. The benefits that satellite communication offers to Western business and social organization therefore heighten the ‘digital divide’ or ‘information gap’ between North and South, exacerbating inequalities between the two (Graham 2001; Pelton et al. 2004). In the North, satellites are a major enabler of economic growth, although through the escalation of the liquid economy that they allow they may soon be agents of economic collapse. In the meantime, though some Samoans may have been able to use the internet to get the best prices for their produce (Pelton et al. 2004: 22), it is overwhelmingly a tool of use to those with capital. The internet is predominantly a tool with which to manage a global economy in which production is relocated away from the developed nations and markets are spread internationally. Because of the economic utility of satellites, as explained in Chapter 2, the development of space law has been marked by battles over access to geostationary orbit 108 Satellites and social power (GEO), or rather bandwidth that they can use to transmit from GEO. Two attempts have been made by developing countries to claim their share of GEO, one under the conditions of the Outer Space Treaty and one (the Bogota Declaration) in which twelve equatorial countries claimed the orbital space above them as extensions of their own airspace. Neither was entirely successful, though there has been some concession in recent years, with each country being entitled to some satellite bandwidth. The commitment to developing countries has also supposedly been met in proposals to provide services to the third world at the cheapest possible cost. This still grants ownership of the massive means of (information) production represented by GEO to the world’s most powerful nations and companies, reducing the rest of the world’s population to consumers of their services (discussions in Harris and Olby 2000; Hulstroj 2002). Hulstroj advocated an auction system for satellite bandwidths, a case, he says, of ‘basic Adam Smith’. It is also true than even where developing countries have procured their own satellites they have purchased them from developed nations. This includes the cost of development, build, launch and maintenance. Nigeria-Sat, for example, heralded as Nigeria’s entry into space, was designed and built by a company in Surrey, UK. Often satellites and satellite capacities are not even bought but leased from the major satellite organizations, such as Intelsat and Panamsat, which have dominated the satellite sector as private/public entities since the 1960s and as private corporations since the end of the Cold War. Again, monopoly capitalists own these means of production and extract their profit from the rest of the world’s use of their services. Satellite production remains part of the primary circuit of capital in the West, and yet it also represents investment in the secondary circuit as users then pay for their services.

LINK: TECHNOLOGY

**RELIANCE ON TECHNOLOGICAL SOLUTIONS FOR ECOLOGICAL PROBLEMS BLOCK SYSTEMIC CRITIQUE OF CAPITALISM AND ENTRENCH ITS RAPACIOUS DESTRUCTION-Bellamy Foster ‘09**

[Jeremy; professor of sociology at the University of Oregon; A Failed System: The World Crisis of Capitalist Globalization and its Impact on China; Monthly Review; 11 Jan 2009; <http://monthlyreview.org/2009/03/01/a-failed-system-the-world-crisis-of-capitalist-globalization-and-its-impact-on-china;> retrieved 29 Jun 2011]

Confronted with ecological crises, no attempt is made by the system to go to the root of the problem in the social relations that are undermining what Marx called “the vital conditions of existence.” Rather the problem is shifted around, with capitalism continuing “to play out the same failed strategy again and again.”[45](http://monthlyreview.org/2009/03/01/a-failed-system-the-world-crisis-of-capitalist-globalization-and-its-impact-on-china#en45) The result is a compounding of ecological disaster. The solution that capitalism provided to the nineteenth century soil crisis that Liebig and Marx addressed was not to restore the human metabolism with the soil, but rather to develop synthetic, particularly nitrogen-based, fertilizers, which marked the beginning of modern agribusiness, and which (because of the high petroleum use) is a major source of global warming, as well as contributing to ocean dead zones. Capitalism’s solution to world agricultural production in the form of modern agribusiness has resulted in a further polarization of wealth and hunger. Of the more than six billion people in the world today, the United Nation indicates that around one billion are hungry, and their numbers (both relative and absolute) are growing. In the United States itself over 36 million people, about 12 percent of the population, were “food insecure” in 2007.

Capitalism’s ultimate solution to ecological problems—since fundamental changes in the system itself are off limits—is technological. But any technological gains in efficiency in the use of natural resources are overwhelmed by the extensive and ecologically disruptive pattern of growth that characterizes this rapacious system. Hence, capitalism is a failed system where ecological sustainability is concerned.

**PRESENTING THE ECOLOGICAL CRISIS AS A PROBLEM THAT CAN BE SOLVED WITH CAPITALIST TECHNOLOGICAL DEVELOPMENT JUST ENTRENCHES THE DESTRUCTIVE IDEOLOGY-Das ‘10**

[Asit; Climate Change And Social Justice: Towards An Ecosocialist Perspective; 26 Jun 2010; <http://www.countercurrents.org/das260610.htm;> retrieved 29 Jun 2011]

Although the ecological crisis has captured public attention, the dominant economic forces are attempting to seize the moment by assuring us that capital, technology and the market can be employed so as to ward off any threats without a major transformation of society. For example, numerous technological solutions are proposed to remedy global climate change, including agro-fuels, nuclear energy, and new coal plants that will capture and sequester carbon underground. The ecological crisis is thus presented as a technical problem that can be fixed within the current system, through better ingenuity, technological innovation and the magic of the market. In this view, the economy will be increasingly dematerialized, reducing demands placed on nature. The market will ensure that new avenues of capital accumulation are created in the very process of dealing with environmental challenges.

Yet this line of thought ignores the root causes of the ecological crisis. The social metabolic order of capitalism is inherently anti-ecological, since it systematically subordinates nature in its pursuit of endless accumulation and production on ever-larger scales. Technical fixes to socio-ecological problems typically have unintended consequences and fail to address the root of the problems - the political economic order. Rather than acknowledging metabolic rifts, natural limits, and ecological contradictions, capital seeks to play a shell game with the environmental problems. It generates, moving them around rather than addressing the root causes.

**UNDER CAPITALISM, DEVELOPMENT OF TECHNOLOGY DOES NOT PROTECT THE ENVIRONMENT, BUT ONLY INCREASES WASTE AND DESTRUCTION-Williams ‘10**

[Chris; chair of the Science Department at Packer Collegiate Institute; *Ecology and Socialism: Solutions to Capitalist Ecological Crisis; 2010; Kindle Edition]*

Capitalism is an economic system profoundly and irrevocably at odds with a sustainable planet, as it requires ever-greater material and energy throughput to keep expanding. According to a 2000 study carried out by five major European and U.S. research centers: Industrial economies are becoming more efficient in their use of materials, but waste generation continues to increase…Even as decoupling between economic growth and resource throughput occurred on a per capita and per unit of GDP basis, overall resource use and waste flows to the environment continued to grow. We found no evidence of an absolute reduction in resource throughput. One half to three quarters of annual resource inputs to industrial economies are returned to the environment as wastes within a year.

Let’s dwell on that last sentence for a second: One-half to three-quarters of industrial inputs returned to the environment as wastes within a year! Capitalism simultaneously and of necessity exploits the land and the people and sacrifices the interests of both on the altar of profit. Philosophically, the approach that capitalism takes to the environment, and the attitude it forces us to adopt, is one of separation and alienation. As a species we are forcibly cut off from the land, separated from nature, and alienated from coevolving with it. It’s an attitude amply summed up by Marx in volume 1 of Capital:

Capitalist production…disturbs the metabolic interaction between man and the earth, i.e. prevents the return to the soil of its constituent elements consumed by man in the form of food and clothing; it therefore violates the conditions necessary to lasting fertility of the soil…. The social combination and organization of the labor processes is turned into an organized mode of crushing out the workman’s individual vitality, freedom and independence… Moreover, all progress in capitalist agriculture is a progress in the art, not only of robbing the worker, but of robbing the soil; all progress in increasing the fertility of the soil for a given time is a progress towards ruining the more long-lasting sources of that fertility. The more a country starts its development on the foundation of modern industry, like the United States, for example, the more rapid is this process of destruction. Capitalist production, therefore, develops technology… only by sapping the original sources of all wealth—the soil and the worker.

**BELIEF THAT SCIENCE AND TECHNOLOGY CAN SOLVE OUR PROBLEMS ENTRENCHES THEIR IMPACTS UNDER CAPITALISM-Williams ‘10**

[Chris; chair of the Science Department at Packer Collegiate Institute; *Ecology and Socialism: Solutions to Capitalist Ecological Crisis; 2010; Kindle Edition]*

As István Mészáros states, To say that “science and technology can solve all our problems in the long run” is worse than believing in witchcraft; for it tendentiously ignores the devastating social embeddedness of present-day science and technology. In this respect, too, the issue is not whether or not we use science and technology for solving our problems—for obviously we must—but whether or not we succeed in radically changing their direction which is at present narrowly determined and circumscribed by the self-perpetuating needs of profit maximization.

**TECHNOLOGY AND DEVELOPMENT AND SUBVERTED INTO SOURCES OF WANT AND ENVIRONMENTAL DAMAGE-Williams ‘10**

[Chris; chair of the Science Department at Packer Collegiate Institute; *Ecology and Socialism: Solutions to Capitalist Ecological Crisis; 2010; Kindle Edition]*

Marx, on the contradictions engendered by capitalism as even more symptomatic of our time than it was of his: In our days, everything seems pregnant with its contrary. Machinery, gifted with the wonderful power of shortening and fructifying human labour, we behold starving and overworking it. The new-fangled sources of wealth, by some strange weird spell, are turned into sources of want. The victories of art seem bought by the loss of character. At the same pace that man masters nature, man seems to become enslaved to other men or to his own infamy…This antagonism between modern industry and science on the one hand, modern misery and dissolution on the other hand; this antagonism between the productive powers and the social relations of our epoch is a fact, palpable, overwhelming, and not to be controverted.

**INTRODUCTION OF NEW TECHNOLOGY DOES NOT ALTER CAPITALISM, BUT SPEED ITS DESTRUCTIVE POWER-Williams ‘10**

[Chris; chair of the Science Department at Packer Collegiate Institute; *Ecology and Socialism: Solutions to Capitalist Ecological Crisis; 2010; Kindle Edition]*

The introduction of new technology on its own does not alter the nature of capitalism’s treadmill of production, but merely serves to speed it up in new directions and enlarge the scale of the economy yet further. Capitalism’s waste of resources and its sickening sense of priorities are plumbing new depths of absurdity and depravity. Apart from the $1 trillion spent annually on advertising and the $1.2 trillion on arms (with the United States accounting for more than half of what the world spends), import tariffs and subsidies in developed countries dictate that millions of European cows each get paid better for metabolizing grass than the one billion people living on less than $2 per day.

**TECHNOLOGICAL FIXES ARE ECOLOGICAL DENIAL WHICH IGNORES CAPITALISM’S CULPABILITY--Bellamy-Foster et al ‘10**

[John, professor of sociology at the University of Oregon; Brett Clark,professor of sociology at North Carolina State; and Richard York, professor of sociology at the University of Oregon; *The Ecological Rift: Capitalism’s War on the Earth*; 2010; pg. 436]

If the foregoing argument is correct, humanity is facing an unprecedent­ed challenge. On the one hand, we are confronting the question of a ter­minal crisis, threatening most life on the planet, civilization, and the very existence of future generations. On the other hand, attempts to solve this through technological fixes, market magic, and the idea of a "sustainable capitalism" are mere forms of ecological denial, since they ignore the inherent destructiveness of the current system of unsustainable develop­ment—capitalism. This suggests that the only rational answer lies in an ecological revolution, which would also have to be a social revolution, aimed at the creation of a just and sustainable society.

**THE AFFIRMATIVE’S NEW TECHNOLOGY CANNOT SOLVE. HISTORY DEMONSTRATES THAT NEW TECHNOLOGY SIMPLY ACCELERATES CAPITAL FORMATION AND PROLIFERATION OF COMMODITIES-Bellamy-Foster et al ‘10**

[John, professor of sociology at the University of Oregon; Brett Clark,professor of sociology at North Carolina State; and Richard York, professor of sociology at the University of Oregon; *The Ecological Rift: Capitalism’s War on the Earth*; 2010; pg. 180]

Seen in the context of a capitalist society, the Jevons Paradox there­fore demonstrates the fallacy of current notions that the environmen­tal problems facing society can be solved by purely technological means. Mainstream environmental economists often refer to "demate­rialization," or the "decoupling" of economic growth, from consump­tion of greater energy and resources. Growth in energy efficiency is often taken as a concrete indication that the environmental problem is being solved. Yet savings in materials and energy, in the context of a given process of production, as we have seen, are nothing new; they are part of the everyday history of capitalist development.36 Each new steam engine, as Jevons emphasized, was more efficient than the one before. "Raw materials-savings processes," environmental sociologist Stephen Bunker noted, "are older than the Industrial Revolution, and they have been dynamic throughout the history of capitalism." Any notion that reduction in material throughput, per unit of national income, is a new phenomenon is therefore "profoundly ahistorical."

What is neglected, then, in simplistic notions that increased ener­gy efficiency normally leads to increased energy savings overall, is the reality of the Jevons Paradox relationship—through which energy sav­ings are used to promote new capital formation and the proliferation of commodities, demanding ever greater resources. Rather than an anomaly, the rule that efficiency increases energy and material use is integral to the "regime of capital" itself.38 As stated in *The Weight of Nations,* an important empirical study of material outflows in recent decades in five industrial nations (Austria, Germany, the Netherlands, the United States, and Japan): "Efficiency gains brought by technolo­gy and new management practices have been offset by [increases in] the scale of economic growth."

**TECHNOLOGICAL SOLUTIONS ARE FANTASTICALLY UNREAL ANSWERS WHICH IGNORE SCIENCE AND THE UNDERLYING LOGIC OF CAPITALISM-Bellamy-Foster et al ‘10**

[John, professor of sociology at the University of Oregon; Brett Clark,professor of sociology at North Carolina State; and Richard York, professor of sociology at the University of Oregon; *The Ecological Rift: Capitalism’s War on the Earth*; 2010; pg. 427]

We are increasingly led to believe that the answers to climate change are primarily to be found in new energy technology, specifically increased energy and carbon efficiencies in both production and consumption. Technology in this sense, however, is often viewed abstractly as a *deus ex machina,* separated from both the laws of physics (such as entropy or the second law of thermodynamics) and from the way technology is embedded in historically specific condi­tions. With respect to historical conditions, it is worth noting that, under the present economic system, increases in energy efficiency normally lead to increases in the scale of economic output, effectively negating any gains from the standpoint of resource use or carbon effi­ciency—a problem known as the Jevons Paradox. As William Stanley Jevons observed in the nineteenth century, every new steam/ engine was more efficient in the use of coal than the one before, which did not prevent coal burning from increasing overall, since the efficiency gains only led to the expansion of the number of steam engines and of growth in general. This relation between efficiency and scale has proven true for capitalist economies up to the present day.

LINKS: EXPANSION TO SPACE

**CAPITALISM SEEKS TO SIMPLY SHIFT EACH DISASTER TO A NEW GEOGRAPHIC SPACE IN AN ENDLESS SUCCESSION OF CRISES-Das ‘10**

[Asit; Climate Change And Social Justice: Towards An Ecosocialist Perspective; 26 Jun 2010; <http://www.countercurrents.org/das260610.htm;> retrieved 29 Jun 2011]

One obvious way capital shifts around ecological problems is through simple geographical displacement. Once resources are depleted in one region, capitalists search far and wide to seize control of resources in other parts of the world, whether by military force or markets.

One of the drives of colonialism was clearly the demand for more natural resources in rapidly industrializing European nations. However, expanding the area under the control of global capitalism is only one of the ways in which capitalists shift ecological problems around. There is a qualitative dimension as well, whereby one environmental crisis is solved (typically only in the short term) by changing the type of production process and generating a different crisis, such as how the shift from the use of wood to plastic in the manufacturing of many consumer goods replaced the problems associated with wood extraction by those associated with plastic production and disposal. Thus, one problem is transformed into another - a shift in the type of rift.

The global reach of capital is creating a planetary ecological crisis. A fundamental structural crisis cannot be remedied within the operations of the system. Capitalism is incapable of regulating its social metabolism with nature in an environmentally sustainable manner. Its very operations violate the laws of restitution and metabolic restoration. The constant drive to renew the capital accumulation process intensifies its destructive social metabolism imposing the needs of capital on nature, regardless of the consequences to natural systems. Capitalism continues to play out the same failed strategy.

The solution to each environmental problem further generates new environmental problems - one crisis follows another, in an endless succession of failure, stemming from the internal contradictions of the system. If we are to solve our environmental crisis, we need to go to the root of the problem – i.e., the social relation of capital itself, given that this social metabolic order undermines the vital conditions of existence. Resolving the ecological crisis thus requires in the end a complete break with the logic of capital and the social metabolic order it creates.

**THE SPREAD OF MARKETS TO NEW AREAS IS ENVIRONMENTAL DEVASTATING-Speth ‘09**

[James Gustav; former professor Yale School of Forestry and Environmental Studies and current professor of law, U. of Vermont; *The Bridge at the Edge of the World: Capitalism, the Environment, and Crossing from Crisis to Sustainability*; 2009; Kindle Edition]

Third, as Karl Polanyi described long ago in The Great Transformation, the spread of the market into new areas, with its emphasis on efficiency and ever-expanding commodification, can be very costly environmentally and socially. It is a pleasure to read Polanyi. He saw so clearly in 1944 the costs of unbridled capitalism, yet he believed this "19th century system," as he called it, was collapsing. He saw the self-adjusting market as a "stark utopia." "Such an institution could not exist for any length of time without annihilating the human and natural substance of society; it would have physically destroyed man and transformed his surroundings into a wilderness.... "To allow the market mechanism to be sole director of the fate of human beings and their natural environment, indeed, even of the amount and use of purchasing power, would result in the demolition of society.... Nature would be reduced to its elements, neighborhoods and landscapes defiled, rivers polluted, military safety jeopardized, the power to produce food and raw materials destroyed.... "[T]he commodity fiction disregarded the fact that leaving the fate of soil and people to the market would be tantamount to annihilating them."Z'

ALTERNATIVE: HUMANITY MUST ABANDON CAPITALISM

**HUMANKIND CAN SAVE ITSELF BY ABANDONING FAILED CAPITALISM-Bellamy Foster ‘09**

[Jeremy; professor of sociology at the University of Oregon; A Failed System: The World Crisis of Capitalist Globalization and its Impact on China; Monthly Review; 11 Jan 2009; <http://monthlyreview.org/2009/03/01/a-failed-system-the-world-crisis-of-capitalist-globalization-and-its-impact-on-china;> retrieved 29 Jun 2011]

What exactly this something else is we do not know, and cannot know at this point: because it depends on the responses not just of states and corporations, but more importantly the response of the world’s populations. On top of the intense class alienation, exploitation, and inequality endemic to capitalism at every level, we are now faced with widening global fractures. So far, on a continental level, leadership in recognizing that the only answer is the revolutionary one—a new socialism for the twenty-first century—has been taken by the peoples of Latin America, in Cuba, Venezuela, Bolivia, Ecuador, and is also manifest in struggles taking place in Brazil, Mexico, Nicaragua, and elsewhere.[58](http://monthlyreview.org/2009/03/01/a-failed-system-the-world-crisis-of-capitalist-globalization-and-its-impact-on-china#en58) Latin America, which was the first continent to feel the full brunt of neoliberal globalization, the hardest hit region outside of the Middle East in terms military interventions in the last quarter-century, and the region that was the initial basis of U.S. international hegemony, is now showing the way to the world—not only in relation to the struggle for substantive equality, which is essential, but also in relation to saving the planet from capitalism. As Morales has stated, “Humankind is capable of saving the earth if we recover the principles of solidarity, complementarity, and harmony with nature, in contraposition to the reign of competition, profits, and rampant consumption of natural resources” that distinguishes the failed system of capitalism.

**TO SURVIVE WE MUST END THE CAPITALIST SYSTEM-Smith**

[Richard, Professor and member of Institute for Policy Research & Development; Beyond Growth or Beyond Capitalism? A Reprise; 2011; <http://www.esee2011.org/registration/fullpapers/esee2011_33bb83_1_1304793549_9860_2495.pdf;> retrieved 29 June 2011]

Of course, the minute we start talking about shutting down the coal industry or pesticide producers, or forcing them to change, and directing resources into new industries, then we’re talking about violating capitalist “freedom” to produce and sell whatever they like, and consumer “choice” to buy whatever we want and can afford. We would be screwing up the market. That’s right. But that is exactly what we have to do because the rational efficient market is very efficiently liquidating every resource on the planet and wiping us out in the process. If we want to save ourselves and other species, then we have to give up the freedom of capitalists to produce and sell as they please and consumers to buy whatever they like and can afford -- in order to win the greater freedom for humanity to breathe clean air, to have safe water to drink, to have safe food to eat, to live long and healthy lives free of toxics-induced diseases, to restore a forested, clean, safe, habitable planet we can pass on to our children.

**THE ONLY LONG-TERM VIABLE SOLUTION TO LIVING IN HARMONY WITH EARTH IS OVERTHROWING AND REJECTING CAPITALISM-Williams ‘10**

[Chris; chair of the Science Department at Packer Collegiate Institute; *Ecology and Socialism: Solutions to Capitalist Ecological Crisis; 2010; Kindle Edition]*

This chapter and the next will attempt to answer these questions. Capitalist social relations systematically compel certain types of behavior that dictate the way in which “the environment” is viewed and treated. It will be argued that this compulsion results in the capitalist system being fundamentally incapable of developing in a sustainable manner. If this is in fact the case, then there can be no such thing as “green” capitalism or “environmentally friendly” capitalism. In the short term, grassroots socio-ecological movements must build independent struggles for reforms that will slow down the daily degradation of the environment caused by the current economic and social structure. This will both buy time and build confidence for the more profound social change that will ultimately be necessary. As is becoming clearer with each passing scientific report, the only long-term, viable solution to living in harmony with the earth is to overthrow capitalism and replace it with a different socioeconomic system of production and distribution, one that puts people and the planet before profit.

**FOCUS ON PROFIT AND SHORT-TERM GAIN MAKE CAPITALISM ANTI-ECOLOGICAL-Williams ‘10**

[Chris; chair of the Science Department at Packer Collegiate Institute; *Ecology and Socialism: Solutions to Capitalist Ecological Crisis; 2010; Kindle Edition]*

Three of capitalism’s basic features make it anti-ecological: an imperative for constant expansion of the economy as a whole; the drive for profit in each economic unit; and a built-in focus on the short term. Marx captured capitalism’s general drive for expansion with his classic definition of the root purpose of the system—the “self-expansion” of capital, symbolized as M-C-M’. The process begins with money, M, which is turned into a commodity C, to be sold on the market for M’, where M’ is more money than the original M. The cycle then repeats on an enlarged basis with a larger starting pot of capital, M’. Thus capitalism entirely abstracts the exchange value of a commodity from its use value. Put another way, the only thing that matters is whether a commodity can be sold for more money than was used to manufacture it, not whether it’s actually useful. Furthermore, Marx’s schema captures the relentlessly expansive drive for exchange value (money-price), otherwise known as the drive for profit. To quote Burkett from Marx and Nature: “[W]hile a viable co-evolution of society and nature requires quantitative limits on human production, the value form of wealth by definition imbues production with an expansive character. As a result, capitalist societies are on an unsustainable “treadmill of production” featuring ever greater quantities of material and energy throughput.”

ALTERNATIVE: SOCIALISM

**WE MUST REPLACE CAPITALISM WITH A DEMOCRATICALLY-PLANNED SOCIALIST ECONOMY-Smith ‘11**

[Richard, Professor and member of Institute for Policy Research & Development; Green Capitalism: The God That Failed; 11 May 2011; <http://climateandcapitalism.com/?p=4405;> retrieved 29 Jun 2011]

But this means that, so long as the global economy is based on capitalist private/corporate property and competitive production for market, we’re doomed to collective social suicide and no amount of tinkering with the market can brake the drive to global ecological collapse.

We can’t shop our way to sustainability because the problems we face cannot be solved by individual choices in the marketplace. They require collective democratic control over the economy to prioritize the needs of society and the environment. And they require national and international economic planning to re-organize the economy and redeploy labor and resources to these ends.

I conclude, therefore, that if humanity is to save itself, we have no choice but to overthrow capitalism and replace it with a democratically-planned socialist economy.

**TO SURVIVE, WE NEED DIRECT ECONOMIC PLANNING AND THE ABOLITION OF PRIVATE PROPERTY-Smith ‘11**

[Richard, Professor and member of Institute for Policy Research & Development; Green Capitalism: The God That Failed; 11 May 2011; <http://climateandcapitalism.com/?p=4405;> retrieved 29 Jun 2011]

We can’t shop our way to sustainability because the problems we face cannot be solved by individual choices in the marketplace. In fact most of the ecological problems we face from global warming to deforestation, to overfishing, to pollution, to species extinction and many others, are way beyond the scope of companies, industries, even countries. They require concerted, large-scale national and international action. And they require direct economic planning at global, national and local levels. For example, the world’s climate scientists tell us we’re doomed unless we shut down the coal industry and sharply reduce our consumption of all fossil fuels. But even the world’s largest corporations, such as Exxon Mobil, can’t afford to take such losses, to sacrifice its owners -- merely to save the humans. Corporations can’t make the socially and ecologically rational decisions that need to be made to save the humans because they represent only private particular interests, not the social and universal interests of humanity, the environment, and future generations. But society can afford to close down coal, retrench oil production and socialize those losses. Society can ration oil, like we did during World War II, and society can redeploy labor and resources to construct the things we do need to save the humans, like renewable energy, public transit, energy efficient housing for all, and many other social needs that are currently unmet by the market system. In the final analysis, the only way to align production with society’s interests and the needs of the environment is to do so directly. The huge global problems we face require the visible hand of direct economic planning to re-organize the world economy to meet the needs of humans and the environment, to enforce limits on consumption and pollution, to fairly ration and distribute the goods and service we produce for the benefit of each and every person on the planet, and to conserve resources so that future generations of humans and other life forms can also live their lives to the full. All this is inconceivable without the abolition of capitalist private property in the means of production and the institution of collective bottom-up democratic control over the economy and society. And it will be impossible to build functioning national and global economic democracies unless we also abolish global economic inequality. This is both the greatest moral imperative of our time and it is also essential to winning world-wide popular support for the profound changes we must make to prevent the collapse of civilization. A tall order to be sure. But we will need even taller waterproof boots if we don’t make this happen. If Paul Hawken, Lester Brown, Francis Cairncross and Paul Krugman have a better plan, where is it?

**IT IS ONLY THROUGH FUNDAMENTAL CHANGE FROM CAPITALISM TO SOCIALISM THAT WILL AVERT ECOLOGICAL CATASTROPHE-Das ‘10**

[Asit; Climate Change And Social Justice: Towards An Ecosocialist Perspective; 26 Jun 2010; <http://www.countercurrents.org/das260610.htm;> retrieved 29 Jun 2011]

The real prospects for the solutions of global ecological crisis can be seen in the struggles to revolutionise social relations in the strife for a just and sustainable society, and are now emerging in the periphery of the world capitalism system, that is the third world societies. They are somehow mirrored in movement for ecological and social revolution in the advanced capitalist world. It is only through fundamental change at the centre of the system, from which the pressure on the planet principally emanates, that there is any genuine possibility of avoiding ultimate ecological destruction. For ecopessimists, this may seem to be an impossible goal. Nevertheless, it is important to recognize that there is now an ecology as well as political economy of revolutionary change known as ecosocialism. The emergence in our times - the struggles for sustainable human development in various people’s struggle in the global periphery could mark the beginning of a revolt against both world alienation and human self-estrangement. Such revolts, if consistent, could have only one objective – i.e., the creation of a society of associated producers rationally regulating their metabolic relation to nature, and doing so not only in accordance with their own needs, but also in accordance with those of future generations and life as a whole. Today the task of transition to socialism and the transition to an ecological society are one.

**THE PROJECT TO EMBRACE A RATIONAL ECONOMIC SYSTEM HAS TO BECOME A PRIORITY FOR THE HUMAN RACE-Wallis ‘09**

[Victor; Professor of Political Science, Berklee; Economic/Ecological Crisis and Conversion; Socialism and Democracy Online; July 2009; <http://sdonline.org/50/economicecological-crisis-and-conversion/;> retrieved 29 Jun 2011]

If the present crisis of neoliberalism can in some respects be compared with the post-1929 slump, the convergence now of economic breakdown with imminently foreseeable environmental collapse is unprecedented. It signals that the traditional indicator of economic recovery – the revival of capitalist growth – has now itself become problematic. Correspondingly, the struggle against capital has evolved from being overwhelmingly class-based to being one which from the outset links working-class demands with the fight to reassert collective control over the entire nexus between the human species and the rest of the natural world. The argument can now be advanced that the project of attaining a more rational social order has become a priority not only (or primarily) for those directly oppressed by the existing order, but rather for the whole human race – not to mention other species threatened with extinction.

**TO END THE CONTRADICTION BETWEEN HUMANITY AND NATURE REQUIRES ENDING PRIVATE PROPERTY AND EMBRACING PLANNED ECONOMY-Williams ‘10**

[Chris; chair of the Science Department at Packer Collegiate Institute; *Ecology and Socialism: Solutions to Capitalist Ecological Crisis; 2010; Kindle Edition]*

To end the contradiction between humanity and nature requires “something more than mere knowledge. It requires a complete revolution in our hitherto existing mode of production, and simultaneously a revolution in our whole contemporary social order.”13 To truly end the exploitation of nature in the service of profit requires that the profit motive be excised from society in a revolutionary reconstitution by the majority on whose labor the system depends. The right to privately own the land and the means of production, which lies at the very root of capitalist economics and forces the population at large to work for a living at the behest of private capital, must be abolished. Only by holding land, along with the instruments of production, in common and producing to meet social need will the simultaneous exploitation of nature and humanity end. Only then can we interact with nature according to a conscious plan, utilizing the scientific knowledge and technique that we already possess to organize production and distribution on a completely new footing that thus establishes a more harmonious relationship between humanity and nature. The methodology developed and used by Marx and Engels offers insightful clues as to how to do that.

**MARXISM PROVIDES THE BEST FRAMEWORK FOR DEVELOPING A SUSTAINABLE RELATIONSHIP WITH THE PLANET-Williams ‘10**

[Chris; chair of the Science Department at Packer Collegiate Institute; *Ecology and Socialism: Solutions to Capitalist Ecological Crisis; 2010; Kindle Edition]*

The reason I bring up these examples is to illustrate that a central preoccupation of socialists, beginning with Marx and Engels, but including scientists and leading Bolsheviks from the 1920s among others, has been our relationship to the environment. Socialists have made serious and fundamental contributions to ecological or “green” thought and practice. In addition, socialists were thinking along these lines and were able to make these contributions precisely because they were socialists.

Marxism provides by far the best framework for understanding the concept of sustainability. This is in contrast with much of green thought that for far too long has neglected the issue of class and the nature of the economic system. Many people truly concerned with environmental degradation and global warming view sustainability through the lens of individual responsibility—working within the system to reduce one’s personal carbon footprint, biking to work, not eating meat, making sure to recycle or not drinking bottled water. There is a focus on individual lifestyle changes in order to show in practice what an alternative, more sustainable life would look like and prefigure a sustainable world, one person at a time. I am all for making those personal choices if you can, but it shouldn’t be confused with a political strategy that will actually bring about the change everyone wants to see. If we subscribe to lifestyle politics we then see ourselves exactly as corporate and political elites want us to see ourselves—as consumers. This is not where our power lies. It allows capitalism to go on as before, with more and more environmental damage and pollution, while we are lulled into believing we’re actually doing something—recycling is the classic case. If we view ourselves primarily as consumers, they will figure out a way to sell us crap. As they have successfully done with all of the new “green” merchandise, organic and “carbon-neutral” products, hybrid vehicles, and so on, which are doing nothing to challenge the competition-driven growth imperative hardwired into a system based on profit as its prime objective.

**A SUSTAINABLE EGALITARIAN SOCIETY IS ESSENTIAL FOR HUMAN SURVIVAL-Bellamy-Foster et al ‘10**

[John, professor of sociology at the University of Oregon; Brett Clark,professor of sociology at North Carolina State; and Richard York, professor of sociology at the University of Oregon; *The Ecological Rift: Capitalism’s War on the Earth*; 2010; pg. 442]

An essential element of such an ecological and socialist revolution for the twenty-first century is a truly radical conception of sustainabil­ity, as articulated by Marx: "From the standpoint of a higher socio­economic formation, the private property of particular individuals in the earth will appear just as absurd as the private property of one man in other men [slavery]. Even an entire society, a nation, or all simulta­neously existing societies taken together, are not the owners of the earth. They are simply its possessors, its beneficiaries, and have to bequeath it in an improved state to succeeding generations as *boni patres familias* [good heads of the household]."37

Such a vision of a sustainable, egalitarian society must define the present social struggle, not only because it is ecologically necessary for human survival but also because it is historically necessary for the development of human freedom. Today we face the challenge of forg­ing a new organic revolution in which the struggles for human equal­ity and for the earth are becoming one. There is only one future: that of sustainable human development.

**OUR RESPONSE TO THE FAILED ECONOMIC ORDER IS THE MOST IMPORTANT QUESTION FACING HUMANITY-Bellamy Foster ‘09**

[Jeremy; professor of sociology at the University of Oregon; A Failed System: The World Crisis of Capitalist Globalization and its Impact on China; Monthly Review; 11 Jan 2009; <http://monthlyreview.org/2009/03/01/a-failed-system-the-world-crisis-of-capitalist-globalization-and-its-impact-on-china;> retrieved 29 Jun 2011]

In referring in my title here to “A Failed System” I do not of course mean that capitalism as a system is in any sense at an end. Rather I mean by “failed system” a global economic and social order that increasingly exhibits a fatal contradiction between reality and reason—to the point, in our time, where it threatens not only human welfare but also the continuation of most sentient forms of life on the planet. Three critical contradictions make up the contemporary world crisis emanating from capitalist development: (1) the current Great Financial Crisis and stagnation/depression; (2) the growing threat of planetary ecological collapse; and (3) the emergence of global imperial instability associated with shifting world hegemony and the struggle for resources. Such structural weaknesses of the system, as Joseph Schumpeter might have said, are the product of capitalism’s past successes, but they raise catastrophic problems and failures in the present nonetheless.[1](http://monthlyreview.org/2009/03/01/a-failed-system-the-world-crisis-of-capitalist-globalization-and-its-impact-on-china#en1) How we choose to act today in response to this failed system is therefore the most critical question that humanity has ever faced.

ALTERNATIVE: SOCIALIST ECOLOGY

**TO SOLVE THE ECOLOGICAL CRISIS, WE MUST SITUATE ECOLOGY’S RELATIONSHIP TO THE POLITICAL ECONOMY OF CAPITALISM-Das ‘10**

[Asit; Climate Change And Social Justice: Towards An Ecosocialist Perspective; 26 Jun 2010; <http://www.countercurrents.org/das260610.htm;> retrieved 29 Jun 2011]

There is a certain urgency to the present ecological crisis. Now it has been proved that the world economy has been driven to the limits, and in some cases beyond a whole range of ecological thresholds. The global ecological crisis is not impending, it is already here. To understand the structural logic of this crisis, we have to have a historical perspective on globalization and distinguishing the new from the old, in the present juncture and trying to situate the contemporary dynamics of the world historically. Our response to the fate of human civilization depends on how we deal with this age of ecological catastrophes. By locating today's ecological transformations within the long run and large-scale patterns of recurrence and evolution in the modern world, we may unravel the distinctiveness of the impending ecological catastrophe. This means that we have to situate ecological relations internal to the political economy of capitalism and not merely placing concepts of ecological transformation and governance, alongside those of political categories of political economy from the standpoint of the historically existing dialectic of nature and society. Once ecological relations of production are put into the mix, one of the chief things that come into view is the production of socio-ecological regimes, both regional and on world scale. These initially liberate the accumulation of capital, only to generate self-limiting contradictions that culminate in renewed ecological bottlenecks to continued accumulation each time the cycle starts anew; historically, this has been more expansive and intensifies relations between capital labour and external nature. The task before us is to identify the different forms and kinds of the unfolding ecological crises.

**AN ECOLOGICAL SOCIALIST PERSPECTIVE IS ESSENTIAL TO SUSTAINABLE HUMAN DEVELOPMENT-Das ‘10**

[Asit; Climate Change And Social Justice: Towards An Ecosocialist Perspective; 26 Jun 2010; <http://www.countercurrents.org/das260610.htm;> retrieved 29 Jun 2011]

It is here that the socialist response to global ecological crisis assumes importance. A socialist social order, that is a society of associated producers, can serve as the basis for potentially bringing social metabolism in line with the natural metabolism, in order to sustain the inalienable conditions for the existence and reproduction of the chain of human generation. Given that human society must always interact with nature, concerns regarding the social metabolism are constant, regardless of the society. But a mode of production in which associated producers can regulate their exchange with nature in accordance with natural limits and know, while retaining the regenerative properties of natural processes and cycles, is fundamental to an environmentally sustainable social order.

The above clearly shows that to solve the world ecological crisis we should struggle for the creation of a socialist social order.

The transition from capitalism to socialism is a struggle for sustainable human development on which societies in the periphery of the capitalist world system have been leading the way.

The transition from capitalism to socialism is the most difficult problem of socialist theory and practice, the question of ecology magnifies the importance of finding a way out of this global ecological mess. Human relation with nature lies at the heart of the transition to socialism. An ecological perspective is pivotal to our understanding of capitalism’s limits, the failures of the early socialist experiments, and the overall struggle for an egalitarian and sustainable human development.

**ECOSOCIALISM IS AN ECONOMIC POLICY THAT PROVIDES THE ALTERNATIVE TO CAPITALISM’S DESTRUCTION OF THE ENVIRONMENT-Das ‘10**

[Asit; Climate Change And Social Justice: Towards An Ecosocialist Perspective; 26 Jun 2010; <http://www.countercurrents.org/das260610.htm;> retrieved 29 Jun 2011]

Ecosocialsm is an attempt to provide a radical civilizational alternative to capitalism’s destructive process. It advances an economic policy founded on the non-monetary and extra economic criteria of social needs and ecological equilibrium. Grounded on the basic arguments of ecological movement and Marxist critique of political economy, this dialectical synthesis attempted by a broad spectrum of authors from Andre Gorz to Elma Aluater, James O’Connor, Joel Kovel and John Bellamy Foster. It is at the same time a critique of market ecology which does not challenge the capitalist system, and of “productivist socialism” which ignores the issue of natural limits.

According to O’Connor, the aim of ecological socialism is a new society based on ecological rationality, democratic control, social equality and the predominance of use value over exchange value. (See James O’Connor, ‘Natural Causes: Essays in Ecological Marxism’, The Guilford Press, New York, 1998). The above aims require: (a) collective ownership of the mean of production by, and (b) democratic planning, which makes it possible for society to define the goals of investment and production, and (c) new technological structure of the productive forces. In other words, a revolutionary social and economic transformation.

**THE ECOSOCIALIST VISION IS THE ONLY WAY TO BEAT THE DEGRADATION PUSH BY CAPITALIST MINDSETS-Butler ‘10**

[Simon; The case for ecosocialism; GreenLeft; 27 February 2010; <http://www.greenleft.org.au/node/43317>; retrieved 23 August 2011]

The ecosocialist vision of change is grounded in a vision of grassroots democracy and full equality for all people in the world. Unlike capitalism, the purpose of the economy would be to make sure everyone had enough. Under capitalism, much of the world's population is condemned to extreme material hardship, while others are constantly urged to consume more.

A central goal of ecosocialists is to fight for a society that allows every human being to develop to their full potential — free of racism, war, poverty and discrimination. This goal of genuine human development, which applies to current and future generations, is unachievable unless society can be transformed to exist in harmony with nature's limits.

This point was made forcefully by Venezuelan President Hugo Chavez at December's UN climate summit in Copenhagen. "A spectre is haunting the streets of Copenhagen, and walks silently through this room", he said.

"This spectre is capitalism — almost nobody wants to mention it ... Capitalism, the model of destructive development, is killing people, and threatens to put an end to the human species. They are saying in the streets: If the climate were a bank, it would have been saved already."

ALTERNATIVE: GRASSROOTS/BOTTOM-UP ANSWERS

**SOLVING THE ECOLOGICAL CRISIS REQUIRES GLOBAL BOTTOM-UP SOLUTIONS-Smith ‘11**

[Richard, Professor and member of Institute for Policy Research & Development; Green Capitalism: The God That Failed; 11 May 2011; <http://climateandcapitalism.com/?p=4405;> retrieved 29 Jun 2011]

Fifth, consumerism and overconsumption are not “dispensable” and cannot be exorcised because they’re not just “cultural” or “habitual.” They are built into capitalism and indispensable for the day-to-day reproduction of corporate producers in a competitive market system in which capitalists, workers, consumers and governments alike are all locked into an endless cycle of perpetually increasing consumption to maintain profits, jobs, and tax revenues. We can’t shop our way to sustainability because the problems we face cannot be solved by individual choices in the marketplace. The global ecological crisis we face cannot be solved by even the largest individual companies. Problems like global warming, deforestation, overfishing, species extinction, the changing ocean chemistry are even beyond the scope of nation states. They require national and international cooperation and global economic planning. This requires collective bottom-up democratic control over the entire world economy. And since a global economic democracy could only thrive in the context of a rough economic equality, this presupposes a global redistribution of wealth as well.

**ONLY MASSIVE COLLECTIVE ACTION CAN SOLVE THE CORPORATE DESTRUCTION OF THE PLANET-Williams ‘10**

[Chris; chair of the Science Department at Packer Collegiate Institute; *Ecology and Socialism: Solutions to Capitalist Ecological Crisis; 2010; Kindle Edition]*

The above would seem like a good program for a genuinely reform-minded social democratic government that has cast off the sickness of neoliberal economics and raging militarism. A program such as this could even get couched as “a Green New Deal for the Twenty-First Century—good for the planet, good for people, good for profits.” These proposals could theoretically be carried out under capitalist social relations through governmental regulation, particularly by a pro-active and forward-thinking Obama administration. But while there has certainly been a most welcome change of tone and a more serious approach to energy and climate change, after one year in office, rhetoric aside, Obama has largely backed the dictates of Big Business. If it wasn’t apparent before, it is now crystal clear that the Democrats and Obama cannot be relied upon to take action on climate change seriously.

Only mass collective organizations, social pressure, and action can possibly bring to fruition the kind of plans outlined above as they fly in the face of the short-term interests of the corporations that have the political parties on their speed dials. Put another way, reforms that are theoretically possible under capitalism won’t be made because they “make sense,” but because the politicians are forced to implement them. Otherwise we will get fobbed off with false solutions and only make progress that is too slow and piecemeal to make real inroads to dramatically slowing climate change. We need a far bigger vision for change than any of the mainstream parties are prepared to sanction. To cut costs, mass production is what’s needed, not just more research. Between 2002 and 2008 federal subsidies to the fossil fuel industry in direct spending and tax breaks amounted to $72 billion. A further $16.8 billion went to corn ethanol production for biofuels. Over the same period, only $12.2 billion went to federal subsidies for renewable energy. These priorities need reversing.

A/T: CAPITALISM NEEDED FOR SPACE EXPLORATION

**CAPITALISM IS HOLDING BACK EVERY ASPECT OF HUMAN SCIENTIFIC ADVANCEMENT-Palecek ‘09**

[Mike; reporter and editor; Capitalism Versus Science; 12 Aug 2009; <http://www.marxist.com/capitalism-versus-science.htm;> retrieved 28 Jun 2011]

We are constantly bombarded with the myth that capitalism drives innovation, technology, and scientific advancement. We are told that competition, combined with the profit motive, pushes science to new frontiers and gives big corporations incentive to invent new medicines, drugs, and treatments. The free market, we are told, is the greatest motivator for human advance. But in fact, the precise opposite is true. Patents, profits, and private ownership of the means of production are actually the greatest fetters science has known in recent history. Capitalism is holding back every aspect of human development, and science and technology is no exception.

**CAPITALISM IS WHAT IS PREVENTING HUMANS FROM EXPLORING THE ENTIRE UNIVERSE-Palecek ‘09**

[Mike; reporter and editor; Capitalism Versus Science; 12 Aug 2009; <http://www.marxist.com/capitalism-versus-science.htm;> retrieved 28 Jun 2011]

Today, it is the task of those interested in science and socialism to learn the lessons of history. Science is being held back by private interests and industry. A lack of resources for education and research keep doors closed to young aspiring minds. Religious interference locks science in a cage and declares important fields of study off-limits. The chains of the free-market prevent meaningful research from being done. Private companies refuse to let new technologies out of their back rooms. Private collectors hold unique and important specimens for their own personal amusement. Potential cures for deadly diseases are tossed aside to clear the way for research into the latest drug to cure erectile dysfunction. This is madness. Capitalism does not drive innovation, but hinders it at every step.

Humanity today is being held back by an economic system designed to enslave the majority for the benefit of a minority. Every aspect of human development is hindered by the erroneously-named free-market. With the development of computers, the internet and new technologies, humanity stands at the doorstep of a bright future of scientific advancement and prosperity. We are learning more and more about every aspect of our existence. What was once impossible, is now tangible. What was once a mystery, is now understood. What was once veiled, is now in plain sight. The advancement of scientific knowledge will one day put even the farthest reaches of the universe at our fingertips. The only thing that stands in our way is capitalism.

A/T: SUSTAINABLE/GREEN CAPITALISM PERM

**NO PERM: SUSTAINABLE CAPITALISM CANNOT WORK; WE MUST SUBORDINATE DESIRE FOR PROFIT TO ECOLOGICAL CONCERNS-Smith ‘11**

[Richard, Professor and member of Institute for Policy Research & Development; Green Capitalism: The God That Failed; 11 May 2011; <http://climateandcapitalism.com/?p=4405;> retrieved 29 Jun 2011]

In rejecting the antigrowth approach of the first wave of environmentalists in the 1970s, pro-growth “green capitalism” theorists of the 1980s-90s like Paul Hawken, Lester Brown, and Francis Cairncross argued that green technology, green taxes, eco-conscious shopping and the like could “align” profit-seeking with environmental goals, even “invert many fundamentals” of business practice such that “restoring the environment and making money become one and the same process.”

This strategy has clearly failed.

I claim first, that the project of sustainable capitalism was misconceived and doomed from the start because maximizing profit and saving the planet are inherently in conflict and cannot be systematically aligned even if, here and there, they might coincide for a moment.

That’s because under capitalism, CEOs and corporate boards are not responsible to society, they’re responsible to private shareholders. CEOs can embrace environmentalism so long as this increases profits.

But saving the world requires that the pursuit of profits be systematically subordinated to ecological concerns: For example, the science says that to save the humans, we have to drastically cut fossil fuel consumption, even close down industries like coal. But no corporate board can sacrifice earnings to save the humans because to do so would be to risk shareholder flight or worse.

I claim that profit-maximization is an iron rule of capitalism, a rule that trumps all else, and this sets the limits to ecological reform – and not the other way around as green capitalism theorists supposed.

**NO PERM: GREEN CAPITALISM AND SAVING THE PLANET ARE INHERENTLY IN CONFLICT-Smith ‘11**

[Richard, Professor and member of Institute for Policy Research & Development; Green Capitalism: The God That Failed; 11 May 2011; <http://climateandcapitalism.com/?p=4405;> retrieved 29 Jun 2011]

First, the project of “sustainable” “green” “natural” capitalism was misconceived and doomed from the start because maximizing profit and saving the planet are inherently in conflict and cannot be systematically aligned even if, here and there, they might coincide for a moment. That’s because, under capitalism, CEOs and corporate boards are not responsible to society; they’re responsible to private owners and shareholders. CEOs might embrace environmentalism so long as this also increases profits but they’re not free to subordinate profit maximizing to saving the world because to do so would be to risk shareholder flight or worse. I claim that profit-maximization is an iron rule of capitalism, a rule that trumps all else and sets the possibilities and limits of ecological reform -- and not the other way around as green capitalism theorists suppose.

**GREEN CAPITALISM CANNOT SOLVE; ITS UNDERLYING VALUES FORCE US TO CONTINUE TO DESTROY THE ENVIRONMENT AT AN EVER-INCREASING PACE-Smith ‘11**

[Richard, Professor and member of Institute for Policy Research & Development; Green Capitalism: The God That Failed; 11 May 2011; <http://climateandcapitalism.com/?p=4405;> retrieved 29 Jun 2011]

Secondly, I claim that contrary to green capitalism proponents, across the spectrum from resource extraction to manufacturing, the practical possibilities for “greening” and “dematerializing” production are severely limited.

This means, I contend, that the only way to prevent overshoot and collapse is to enforce a massive economic contraction in the industrialized economies, retrenching production across a broad range of unnecessary, resource-hogging, wasteful and polluting industries, even virtually shutting down the worst.

Yet this option is foreclosed under capitalism because this is not socialism: no one is promising new jobs to unemployed coal miners, oil-drillers, automakers, airline pilots, chemists, plastic junk makers, and others whose jobs would be lost because their industries would have to be retrenched – and unemployed workers don’t pay taxes.

So CEOs, workers, and governments find that they all “need” to maximize growth, overconsumption, even pollution, to destroy their childrens’ tomorrows to hang onto their jobs today because, if they don’t, the system falls into crisis, or worse.

So we’re all onboard the TGV of ravenous and ever-growing plunder and pollution. And as our locomotive races toward the cliff of ecological collapse, the only thoughts on the minds of our CEOS, capitalist economists, politicians and labor leaders is how to stoke the locomotive to get us there faster.

**NO PERM: GREEN CAPITALISM IS A CONTRADICTION IN TERMS-Das ‘10**

[Asit; Climate Change And Social Justice: Towards An Ecosocialist Perspective; 26 Jun 2010; <http://www.countercurrents.org/das260610.htm;> retrieved 29 Jun 2011]

Proponents of green capitalism respond to this by saying that economic growth, far from being the problem, is what holds the solutions. Environmentalism in this view is a purely negative response to ecological crisis giving rise to unpopular practices like regulation and prohibition. Hence, the singular “green capitalist” caricature of environmentalists. All of them direct our attention to stopping the bad, not creating the good. The “good” from this perspective, is a scenario of jobs, material abundance, and energy independence, understood however, within a characteristically capitalist competitive framework. While the need to cut greenhouse gases is recognized, the challenge is posed in narrowly technological terms. Attempts to resist consumerism are belittled, on the assumption that innovations, along with massive public investment, will solve any problem of scarcity; the vision is emphatically centered on the visited states, with China invoked to signify that the growth is unstoppable. The very existence of an environmental nexus is called into question, on the grounds that the category “environment” can only be conceived either as excluding humans or as being synonymous with everything - at either of which extreme it is seen to make sense. The biological understanding of the environment as a matrix with inter-penetrating parts is not entertained. Ultimately, green capitalism is a contradiction in terms.

A/T: ANT-GROWTH CAPITALISM PERM

**ANTI-GROWTH CAPITALISM CANNOT SOLVE; ECOLOGICAL SUICIDE IS BUILT INTO CAPITALISM-Smith**

[Richard, Professor and member of Institute for Policy Research & Development; Beyond Growth or Beyond Capitalism? A Reprise; 2011; <http://www.esee2011.org/registration/fullpapers/esee2011_33bb83_1_1304793549_9860_2495.pdf;> retrieved 29 June 2011]

In what follows, I will argue that Herman Daly, Tim Jackson, Andrew Simms and the rest of the anti-growth school of ecological economists are right that we need a new macro economic model that allows us to thrive without endless consumption. But they are mistaken to think that this can be a capitalist economic model. I will try to show why ecologically suicidal growth is built into the nature of any conceivable capitalism. This means, I contend, that the project of a steady-state capitalism is impossible and a distraction from what I think ought to the highest priority for ecological economists today – which is to develop a broad conversation about what the lineaments of a post-capitalist ecological economy could look like. I’m going to start by stating three theses which I take to be fundamental principles and rules for reproduction that define any capitalism and shape the dynamics of capitalist economic development.

**NO PERM:WE CANNOT CRITIQUE THE IMPACT OF CAPITAL ACCUMULATION FROM WITHIN A CAPITALIST SYSTEM-Bellamy-Foster et al ‘10**

[John, professor of sociology at the University of Oregon; Brett Clark,professor of sociology at North Carolina State; and Richard York, professor of sociology at the University of Oregon; *The Ecological Rift: Capitalism’s War on the Earth*; 2010; pg. 163]

In a capitalist society any critique of capital accumulation is diffi­cult to maintain within a reformist framework, since this constitutes the main condition of existence of the system. In 2010, in the midst of the greatest economic crisis since the Great Depression, it is clear to all that capitalism is a grow-or-die system.22 To raise the question of a no-growth economy and capitalism in the same breath in this context would thus mean a clear rejection of the latter. The notion of a station­ary-state capitalism as a sustainable society would at this time fool no one. Rather than promote such views and put himself perhaps in the untenable political position of an out-and-out rejection of the system, Speth has to resort to vague generalities. The critique of capitalism has been removed from his analysis precisely when the question becomes most serious, that is, during a major crisis of accumulation.

**THERE CAN BE NO SOCIALIST REVOLUTION THAT IS NOT ECOLOGICAL AND NO ECOLOGICAL REVOLUTION THAT IS NOT SOCIALIST-Bellamy-Foster et al ‘10**

[John, professor of sociology at the University of Oregon; Brett Clark,professor of sociology at North Carolina State; and Richard York, professor of sociology at the University of Oregon; *The Ecological Rift: Capitalism’s War on the Earth*; 2010; pg. 436]

What is clear is that the long-term strategy for ecological revolu­tion throughout the globe involves the building of a society of substan­tive equality—the struggle for socialism. Not only are the two insepa­rable, but they also provide essential content for each other. There can be no true ecological revolution that is not socialist; no true socialist revolution that is not ecological. This means recapturing Marx's own vision of socialism/communism, which he defined as a society where "the associated producers govern the human metabolism with nature in a rational way, bringing it under their collective control . . . accom­plishing it with the least expenditure of energy and in conditions most worthy and appropriate for their human nature."

A/T: OUR ENERGY PLAN SOLVES

**EVEN IF WE SHIFT TO CLEANER ENERGY, CAPITALISM WILL JUST RESPOND WITH MORE DESTRUCTIVE CONSUMERISM-Smith ‘11**

[Richard, Professor and member of Institute for Policy Research & Development; Green Capitalism: The God That Failed; 11 May 2011; <http://climateandcapitalism.com/?p=4405;> retrieved 29 Jun 2011]

Yet even if we could get a dramatic shift to solar and other renewables for energy generation, given the Jevons paradox noted above, we cannot assume that this would necessarily lead to large permanent reductions in overall pollution. For if there are no non- market constraints on production, then the advent of cheap clean energy production could just as easily encourage the production of endless electric vehicles, appliances, lighting, laptops, phones, iPads and new toys we can’t even imagine yet. The expanded production all this stuff, on a global scale, would just consume ever more raw materials, more metals, plastics, rare earths, etc., produce more pollution, destroy more of the environment, and all end up in some landfill somewhere someday. In short, at the end of the day, the only way society can really put the brakes on overconsumption of electricity is to impose non-market limits on electricity production and consumption, enforce radical conservation, rationing, and stop making all the unnecessary gadgets that demand endless supplies of power.

**RENEWABLE ENERGY CANNOT SOLVE UNDERLYING CAPITALIST EXPLOITATION OF THE ENVIROMENT-Das ‘10**

[Asit; Climate Change And Social Justice: Towards An Ecosocialist Perspective; 26 Jun 2010; <http://www.countercurrents.org/das260610.htm;> retrieved 29 Jun 2011]

As this whole current of opinion becomes stronger, advocates of green capitalism pick up on the popular call for renewable energy, but accompany it with a vision of undiminished proliferation of industrial products. In so doing, they overlook the complexity of the environmental crisis which has not only to do with the burning of fossil fuels, but also with assaults on the earth’s resource base as a whole, including for example, the paving over the green space, the raw material and energy costs of producing solar collectors and wind turbines, the encroachment on natural habitats not only by buildings and pavements, but also by dams, wind turbines, etc; the toxins associated with high-tech commodities and the increasingly critical problems of waste disposal; in short, the routine spin-offs from capital’s unqualified prioritization of economic growth.

A/T: SOCIALISM WILL NEVER HAPPEN

**A COALITION OF MOVEMENTS IS GATHERING STRENGTH TO OVERTHROW GLOBAL CAPITALISM-Bellamy Foster, Clark, and York ‘08**

[John, professor of sociology at the University of Oregon; Brett,professor of sociology at North Carolina State; and Richard, professor of sociology at the University of Oregon; Ecology: The Moment of Truth—An Introduction; Juy-Aug 2008; retrieved 29 Jun 2011; [http://monthlyreview.org/2008/07/01/ecology-the-moment-of-truth-an-introduction]](http://monthlyreview.org/2008/07/01/ecology-the-moment-of-truth-an-introduction%5D)

Building on this critique, Speth goes on to conclude in his book that: (1) “today’s system of political economy, referred to here as modern capitalism, is destructive of the environment, and not in a minor way but in a way that profoundly threatens the planet” (2) “the affluent societies have reached or soon will reach the point where, as Keynes put it, the economic problem has been solved…there is enough to go around” (3) “in the more affluent societies, modern capitalism is no longer enhancing human well-being” (4) “the international social movement for change—which refers to itself as ‘the irresistible rise of global anti-capitalism’—is stronger than many imagine and will grow stronger; there is a coalescing of forces: peace, social justice, community, ecology, feminism—a movement of movements” (5) “people and groups are busily planting the seeds of change through a host of alternative arrangements, and still other attractive directions for upgrading to a new operating system have been identified” (6) “the end of the Cold War…opens the door…for the questioning of today’s capitalism.”

**NOW IS THE TIME FOR SOCIALIST EDUCATION-Wallis ‘09**

[Victor; Professor of Political Science, Berklee; Economic/Ecological Crisis and Conversion; Socialism and Democracy Online; July 2009; <http://sdonline.org/50/economicecological-crisis-and-conversion/;> retrieved 29 Jun 2011]

If there has ever been an opportunity for socialist education, it is now. Part of what makes the ecological challenge seem so alarming is the very fact that the goal of addressing it is viewed largely in isolation from the interests of any clearly identifiable sector of the population. The environment is the concern of “everybody,” but by the same token it is the concern of no one in particular. It is an issue of global scope, but yet the only way many of us can see of responding to it is by our individual actions. Beyond the individual level, there is a vague hope that appropriate measures will be taken – to which many corporations and political leaders respond by proclaiming green agendas – but there is little public awareness of the constraints surrounding such promises.

**THERE IS HOPE FOR CHANGE. NEOLIBERAL HEGEMONY HAS BEEN BROKEN-Williams ‘10**

[Chris; chair of the Science Department at Packer Collegiate Institute; *Ecology and Socialism: Solutions to Capitalist Ecological Crisis; 2010; Kindle Edition]*

Amid all the disappointment and disillusionment, there are significant reasons for hope. First and foremost, the prevailing idea of the last thirty years—that the market is the single best arbiter of change—has been shattered. The economic turmoil beginning in 2008 has ended capitalist triumphalism and its bastard child neoliberalism’s hegemonic claim to legitimacy. Second, despite the repeated disappointments, there is still a great deal of hope in Obama and an expectation for change that can be channeled into a movement to pressure him to go significantly beyond his rhetorical promises. Third, many people who were firmly of the belief that Obama would be different have not just sunk into disillusionment and apathy. Rather, driven by the urgency of the need for action many, especially students and young people, are coming to the conclusion that such action will only come about through their own independent self-activity. Finally, it has become clear to millions of people that money is available when ruling elites want it to be. Vast quantities of cash suddenly came on tap to bail out of the banking system. According to Joseph Stiglitz, the United States will eventually end up paying $3 trillion for the wars in Afghanistan and Iraq.

**THE CURRENT ECONOMIC CRISIS PRESENTS A NEW OPPORTUNITY TO INCREASE CONSCIOUSNESS ABOUT SOCIALISM-Wallis ‘09**

[Victor; Professor of Political Science, Berklee; Economic/Ecological Crisis and Conversion; Socialism and Democracy Online; July 2009; <http://sdonline.org/50/economicecological-crisis-and-conversion/;> retrieved 29 Jun 2011]

The current economic crisis carries with it a new opportunity to impress this understanding on broad sectors of the population. Whereas the environmental crisis has appeared to many as being beyond our collective capacity to affect, the economic crisis can be more easily seen as the outcome of practices springing from a transparent class-interest. Much useful socialist analysis along these lines is already circulating.5 What I want to stress here is that such analysis – and the associated outreach work – should be integrally linked to consciousness-raising about the environment. While the economic critique can underline the class interests that have been at play, the ecological focus can call attention both to the universality of the issues – their implications at the most basic level for every human being – and to the urgency of society-wide planning.

**THE ECONOMIC CRISIS HAS MADE SOCIALISM A PRACTICAL, REALISTIC SOLUTION TO THE EXCESS OF CAPITALISM-Williams ‘10**

[Chris; chair of the Science Department at Packer Collegiate Institute; *Ecology and Socialism: Solutions to Capitalist Ecological Crisis; 2010; Kindle Edition]*

The economic crisis has reawakened interest in investigating what socialism has to offer as an alternative world model and guide to action. The economic crisis broke out alongside the ecological crisis and both can trace their ancestry to the remorseless drive to accumulate characteristic of capitalism. Stating that capitalism must therefore be abolished and replaced with a democratic system of the “associated producers” (i.e., workers) no longer seems so outlandish a proposition to be dismissed as utopian dreaming by unreconstructed socialists still living in the late nineteenth century. Rather it evinces interest, conversation, and dialogue about what that might mean and look like, or how it might be achieved. Chapters seven and eight outline some of the ways in which more fundamental change will have to be envisioned. Our society is unrecognizable from fifty years ago, let alone one hundred. Imagine what we could do if we the people had the power to decide what it would look like fifty years from now. This book represents the beginning of a discussion of that vision—a contribution to the discussion of real solutions to climate change and ecological degradation and how they could be implemented via collective action for social equality and justice.

A/T: INDIVIDUAL ACTION SOLVES

**INDIVIDUAL ACTION IS INSUFFICIENT; THE ECOLOGICAL CRISIS DEMANDS COLLECTIVE RESPONSE-Williams ‘10**

[Chris; chair of the Science Department at Packer Collegiate Institute; *Ecology and Socialism: Solutions to Capitalist Ecological Crisis; 2010; Kindle Edition]*

So what can be done? Quite clearly, engaging in individual acts of conservation, recycling, resource restraint, and other actions to reduce your personal “carbon footprint” are not going to be enough. These millions of individual acts do show that people are far from apathetic about environmental issues, and we should celebrate this spirit of ecological concern. But to concentrate solely on these actions, or worse, berate people who are unable to do so, is misdirected effort when the kinds of action that are really necessary are qualitatively different—and collective. It is self-evident that no individual can build a wind turbine on their own, dismantle a coal-fired power station, or set up a light rail system in their city. But these are precisely the kind of systemic and infrastructural changes that are needed to make any kind of difference. Writing in Red Pepper, Kevin Smith, researcher with Carbon Trade Watch, had this to say about the effectiveness and underlying ideological traps that accompany the promotion of changes to personal consumption and carbon offset schemes: No matter how many low-energy light bulbs you install, or how much recycling you do, there is still the need for more systemic changes to take place in society. No amount of individualistic action is going to bring about this change in itself. Such changes will not happen without community organizing and collective political action. Yet there are no offset schemes that encourage individuals to engage in collective action to bring about wider structural change. [Carbon o]ffset schemes place the onus for climate action on individuals acting in isolation from others. This inhibits their political effectiveness. The act of commodification at the heart of offset schemes assigns a financial value to the impetus that someone may feel to take climate action, and neatly transforms this potential to bring about change into another market transaction. There is then no urgent need for people to question the underlying assumptions about the nature of the social and economic structures that brought about climate change in the first place.

**INTERNATIONAL NATURE OF THE PROBLEM REQUIRED A COLLECTIVE SOLUTION-Xinhua News Agency ‘11**

[UNEP calls on collective response from globe to combat climate change; Xinhua News Agency; 21 July 2011; <http://news.xinhuanet.com/english2010/world/2011-07/21/c_13998451.htm>; retrieved 23 August 2011]

With climate change having "potentially far-reaching implications for global stability," the United Nations Environment Program (UNEP) executive director called on Wednesday for a collective response from the international community in assessing and managing risks.

Addressing a Security Council open debate on the maintenance of international peace and security in regards to the impact of climate change, Achim Steiner, UN under-secretary general and UNEP executive director, examined the links between climate change and security.

"There can be little doubt today that climate change has potentially far-reaching implications for global stability and security in economic, social and environmental terms which will increasingly transcend the capacity of individual nation states to manage," Steiner said.

The sustainable development paths of each nation will increasingly be predicted upon the ability of the international community to act collectively, he added.

A/T: GOVERNMENT SOLUTION

**FORCED ACTION BY GOVERNMENTS AND CORPORATIONS WILL NOT BE ENOUGH. SYSTEMATIC CHANGE WILL REQUIRE RADICAL SOCIAL ACTION-Williams ‘10**

[Chris; chair of the Science Department at Packer Collegiate Institute; *Ecology and Socialism: Solutions to Capitalist Ecological Crisis; 2010; Kindle Edition]*

As planetary environmental degradation increases and individual climate-related disasters such as Hurricane Katrina multiply, even without an environmental justice movement it is probable governments and corporations will be pushed into implementing some genuine, albeit limited, reforms. It is also quite possible that they will be pushed into some of these reforms by actions taken by workers, farmers, peasants, and their communities being devastated by environmental changes, regardless of whether they call themselves environmentalists or not. Some of the more far-sighted corporations without significant investments in fossil fuels will see the way the wind is blowing and that money can be made from investing in alternative energies, as is already the case. This will create tension and splits among ruling elites and between conflicting corporate interests, which will open up space for social and labor movements to demand swifter and more coordinated action.

Bringing about the kind of changes we need, however, systematically and in the near term, will require building a mass movement that combines the best aspects of the social movements of the 1960s with the workers’ radicalism of the 1930s. Such a movement needs to argue and fight for these changes and take head-on the argument that the market is the best arbiter of what should and shouldn’t be produced. In addition, such a movement will require squarely placing the blame where it lies: unregulated free-market capitalism. Any ecological movement that develops needs to forcefully argue that this is not about sacrifice but improving lives and creating jobs. If it does not seek to establish connections and link up with the people who make all the products in the world and who in many instances are already organized into mass collective organizations—the global working class—it is hard to see how it could be even minimally successful.

**THE “SYSTEM” HAS FAILED AND CANNOT SOLVE THE ENVIRONMENTAL CRISIS-Speth ‘09**

[James Gustav; former professor Yale School of Forestry and Environmental Studies and current professor of law, U. of Vermont; *The Bridge at the Edge of the World: Capitalism, the Environment, and Crossing from Crisis to Sustainability*; 2009; Kindle Edition]

It follows, I submit, that something is wrong. Most of us with environmental concerns have worked within the system, but the system has not delivered. The mainstream environmental community as a whole has been the "ultimate insider." But it is time for the environmental community-indeed, everyone-to step outside the system and develop a deeper critique of what is going on. We all live lives powerfully shaped by a complex system that rewards as well as destroys. As I will describe, that system is giving rise to an undesirable reality-environmentally, socially, and politically. If we want to transform that system for the better, we should stop being predictable and become agents of change. And to do that we need to understand the structures that influence us, identify the new directions needed, and build the strengths to pursue them. George Bernard Shaw famously said that all progress depends on not being reasonable. It's time for a large amount of civic unreasonableness.

A/T: SOVIET UNION/MARXISM BAD

**FAILURES OF USSR AND CHINA DO NOT PROVE THAT SOCIALISM CANNOT SOLVE-Williams ‘10**

[Chris; chair of the Science Department at Packer Collegiate Institute; *Ecology and Socialism: Solutions to Capitalist Ecological Crisis; 2010; Kindle Edition]*

The language of socialism and the mantle of Marx and Engels were adopted by Stalin in the USSR, Mao in China, and other “socialist” societies not to further the course of socialism but to derail it. While going into detail on the nature of these regimes is beyond the scope of this book, it should be clear that if socialism means anything, it is the free association of the people who do the work raising themselves into power to collectively and democratically decide the future course of society.3 The workers and peasants who make the revolution should bear its fruits. That is, they democratically decide the direction of the economy and society in the interests of the vast majority; a society where production of goods is based on human need, not profit.

**MARXISM HOLDS USEFUL INSIGHT ABOUT CURRENT ENVIRONMENTAL CRISIS-Williams ‘10**

[Chris; chair of the Science Department at Packer Collegiate Institute; *Ecology and Socialism: Solutions to Capitalist Ecological Crisis; 2010; Kindle Edition]*

This chapter is important because we need not just a critique of the past but also a vision for the future, one that is rooted in historical experience and theoretical cogency that we can build on and develop. Just as socialism needs to be rescued from the distortions of some of its supposed practitioners, so the writings of Marx and Engels should be recognized for their usefulness in examining the natural world and human relationships to it. This is not to take every word of Marx and Engels as the gospel truth more than a hundred years after they wrote them. Rather it is to argue that the methodology of Marxism holds key insights into our relationship to nature that are extremely useful for understanding our place in the biosphere and interaction with it.

**LONG HISTORY OF CAPITALISM’S ABUSE DEMANDS A BETTER ALTERNATIVE-Butler ‘10**

[Simon; The case for ecosocialism; GreenLeft; 27 February 2010; <http://www.greenleft.org.au/node/43317>; retrieved 23 August 2011]

For centuries, capitalism has treated the air, rivers and oceans as a global sewer. The long-term damage to natural ecosystems are never reflected in any corporate bottom-line. And as capitalism has developed into a global system, the environmental havoc it creates has been globalised too.

As public concern about the climate crisis rises, pro-capitalist economists and politicians are under pressure to find answers. But the business-as-usual solutions they offer generally rely on extending the market to more aspects of nature.

Answers

PERM: SPACE EXPLORATION W/O CAP

**PERM: WE CAN EXPLORE SPACE FOR HUMAN DEVELOPMENT, NOT CAPITALIST INTERESTS-Dickens ‘10**

[Peter; professor @ Universities of Brighton and Cambridge; The Humanization of the Cosmos--To What End?; Monthly Review; November 2010; retrieved 28 Jun 2011

[http://monthlyreview.org/2010/11/01/the-humanization-of-the-cosmos-to-what-end]](http://monthlyreview.org/2010/11/01/the-humanization-of-the-cosmos-to-what-end%5D)

Most obviously, the technology allowing a human presence in the cosmos would be focused mainly on earthly society. There are many serious crises down here on Earth that have urgent priority when considering the humanization of outer space. First, there is the obvious fact of social inequalities and resources. Is $2 billion and upwards to help the private sector find new forms of space vehicles really a priority for public funding, especially at a time when relative social inequalities and environmental conditions are rapidly worsening? The military-industrial complex might well benefit, but it hardly represents society as a whole. This is not to say, however, that public spending on space should be stopped. Rather, it should be addressed toward ameliorating the many crises that face global society. Satellites, for example, have helped open up phone and Internet communications for marginalized people, especially those not yet connected by cable. Satellites, including satellites manufactured by capitalist companies, can also be useful for monitoring climate change and other forms of environmental crisis such as deforestation and imminent hurricanes. They have proved useful in coordinating humanitarian efforts after natural disasters. Satellites have even been commissioned by the United Nations to track the progress of refugees in Africa and elsewhere So outer space technology can be used for tackling a number of immediate social and political issues. But these strategies do not add up to a philosophy toward outer space and the form humanization should take. Here again, the focus should be on the development of humanity as a whole, rather than sectional interests. First, outer space, its exploration and colonization, should be in the service of some general public good. Toward this end, the original intentions of the 1967 UN Outer Space Treaty should be restored. Outer space should not be owned or controlled by any economic, social, and political vested interest. The cosmos should not, in other words, be treated as an extension of the global environment, one to be owned and exploited. We have seen enough of this attitude and its outcomes to know what the result would be. Spreading private ownership to outer space would only reproduce social and environmental crises on a cosmic scale.

**HUMANIZING SPACE COULD HAPPEN WITHOUT PROMOTION OF CAPITALISM-Dickens and Ormrod ‘08**

[Peter; professor @ Universities of Brighton and Cambridge, and James, lecturer in sociology in the School of Applied Social Science, University of Brighton; Who Really Won the Space Race?; Monthly Review; February 2008; <http://monthlyreview.org/2008/02/01/who-really-won-the-space-race;> retrieved 28 Jun 2011]

So it is once more the economically and politically powerful that have so far won the space race and it is the powerless who so far are losing out. Yet this is not necessarily the end of the story. The exercise of power inevitably breeds resistance. One form of resistance consists of localized social movements that are now internationalizing—in part via the satellite-based Internet.

An excellent example is the Global Network Against Weapons and Nuclear Power in Space. This organization does not accept that the humanization of outer space in its present form is inevitable. The network aims not just to prevent the arms race from moving into space but to demonstrate the link between this process and the protection and enhancement of private property on earth. Domination of outer space is seen by them as no more and no less than domination of global society by a bloc of already dominant class interests. The central implication of the Global Network is that humanization of outer space is not necessarily of itself a bad thing. The question is who is doing the humanizing, and what kind of society is being reproduced on earth and in the cosmos. The impressive technologies developed for exploring and understanding the universe do not have to be used by the powerful to further strengthen their economic, military, and cultural authority. Humanizing the cosmos could be a means by which humanity enhances itself through the acquisition of new knowledge. Such knowledge could be used not to make the powerful even more powerful but to understand the cosmos, its evolution, and our place within it.

PERM: SUSTAINABLE CAPITALISM

**IT’S FOOLISH TO THINK THAT THERE CAN’T BE ALTERNATIVE FORMS OF CAPITALISM OTHER THAN THE ANGLO-AMERICAN GROWTH MODEL-Speth ‘09**

[James Gustav; former professor Yale School of Forestry and Environmental Studies and current professor of law, U. of Vermont; *The Bridge at the Edge of the World: Capitalism, the Environment, and Crossing from Crisis to Sustainability*; 2009; Kindle Edition]

Significantly, what these authors are saying is that capitalism's inability to sustain the environment is one of the biggest threats to its future, perhaps the biggest threat. They all see current environmental challenges as contributing to crises that delegitimize an existing order that is unable to cope. None of them think the outcome of such crisis is predetermined. Indeed, the eventual outcome is ground for contestation and struggle. But the struggle offers promise, says Wallerstein, "which is the most we can ever expect."" Of course, the big problem facing all discussions of alternatives to capitalism is that there do not seem to be any alternatives. Throughout the Cold War, the alternative was state socialism or communism, but it is fading fast around the globe. Asked about alternatives to capitalism today, most people draw a blank. Some would add, for good reason. It is therefore worth noting the diversity of economic systems both within capitalism and within socialism, a point stressed by the Tellus Institute.14 Within capitalism, a variety of national economic systems exist, where the key variable is the degree of engagement of government in determining economic priorities and social conditions. At one end of the spectrum, the so-called Anglo-American model approximates laissez-faire. Here, the market tends to dominate the state. In Scandinavia and elsewhere on the Continent, one finds varieties of social democratic capitalism." Social democratic nations exert greater public control over capital investment and have created more comprehensive social programs including higher minimum wages and unemployment compensation, greater protections against layoffs, free or near-free health care and schooling, and so on. In these countries the market and the state are seen as partners. In Japan and elsewhere in Asia, there are systems that can be described as state capitalism, where there is heavy government involvement in directing the economy and where the state tends to dominate the market.

**WE MUST TRANSFORM AND IMPROVE CONTEMPORARY CAPITALISM-Speth ‘09**

[James Gustav; former professor Yale School of Forestry and Environmental Studies and current professor of law, U. of Vermont; *The Bridge at the Edge of the World: Capitalism, the Environment, and Crossing from Crisis to Sustainability*; 2009; Kindle Edition]

The transformation of contemporary capitalism requires far-reaching and effective government action. How else can the market be made to work for the environment rather than against it? How else can corporate behavior be altered or programs built that meet real human and social needs? Government is the principal means available to citizens to collectively exercise their stewardship responsibility to leave the world a better place. Inevitably, then, the drive for transformative change leads to the political arena, where a vital, muscular democracy steered by an informed and engaged citizenry is needed. Yet, for Americans, merely to state the matter this way suggests the enormity of the challenge. Democracy in America today is in deep trouble. Weak, shallow, dangerous, and corrupted, it is the best democracy that money can buy. The ascendancy of market fundamentalism and antiregulation, antigovernment ideology makes the current moment particularly frightening, but even the passing of these extreme ideas would leave deeper, longer-term deficiencies. It is unimaginable that American politics as we know it will deliver the transformative changes needed.

NO CHANCE OF SOCIALISM

**THERE IS NO MOVEMENT TOWARDS SOCIALISM IN THE STATUS QUO-Speth ‘09**

[James Gustav; former professor Yale School of Forestry and Environmental Studies and current professor of law, U. of Vermont; *The Bridge at the Edge of the World: Capitalism, the Environment, and Crossing from Crisis to Sustainability*; 2009; Kindle Edition]

As this brief review suggests, there are many options and gradations in organizing economic activity. As for the socialist alternative, hardly anyone wants a return to state socialism. The democratic market socialist alternative is still part of political discourse in Europe, but it is not faring well. Two sociologists, Lawrence Peter King and Ivan Szelenyi, summed up the current situation: "We are perfectly aware that, despite a revival of theoretical interest in new ideas about socialism, and despite the electoral success of various new social democratic parties, there is no social movement on the horizon. The ideas are there, but at present there is no political force that could make these ideas a reality."" The important question is no longer the future of socialism; rather, it is to identify the contours of a new nonsocialist operating system that can transform capitalism as we know it. One vision of such a new system is that offered by Clive Hamilton in his book Growth Fetish. Hamilton argues that what will animate the new system is not the old struggle to replace capitalism with socialism. "Capitalism is so called because the motivating force of production and social organization is ownership of private capital; socialism is so called because it is centered on social ownership of the means of production. Political philosophies whose competing claims have defined the history of the world for the last two centuries have been at one in identifying the central social problem-how to produce and distribute material wealth. But now that in rich countries the economic problem has been solved, the axis of political debate and social change must move away from the production sphere and the forms of ownership of the means of production.""

**NO CHANCE FOR SOCIALIST REGRESSION EVEN IN FORMER SOVIET EMPIRE-Aron ‘11**

[Leon; Everything You Think You Know About the Collapse of the Soviet Union Is Wrong; Foreign Policy; July/August 2011; <http://www.foreignpolicy.com/articles/2011/06/20/everything_you_think_you_know_about_the_collapse_of_the_soviet_union_is_wrong?print=yes&hidecomments=yes&page=full>; retrieved 23 August 2011]

One needs only to spend a few days in Moscow talking to the intelligentsia or, better yet, to take a quick look at the blogs on LiveJournal (Zhivoy Zhurnal), Russia's most popular Internet platform, or at the sites of the top independent and opposition groups to see that the motto of the 1980s -- "We cannot live like this any longer!" -- is becoming an article of faith again. The moral imperative of freedom is reasserting itself, and not just among the limited circles of pro-democracy activists and intellectuals. This February, the Institute of Contemporary Development, a liberal think tank chaired by President Dmitry Medvedev, published what looked like a platform for the 2012 Russian presidential election:

In the past Russia needed liberty to live [better]; it must now have it in order to survive.… The challenge of our times is an overhaul of the system of values, the forging of new consciousness. We cannot build a new country with the old thinking.… The best investment [the state can make in man] is Liberty and the Rule of Law. And respect for man's Dignity.

It was the same intellectual and moral quest for self-respect and pride that, beginning with a merciless moral scrutiny of the country's past and present, within a few short years hollowed out the mighty Soviet state, deprived it of legitimacy, and turned it into a burned-out shell that crumbled in August 1991. The tale of this intellectual and moral journey is an absolutely central story of the 20th century's last great revolution.

NIAC/On The Ground Counterplan

**Ed Note:** *This is a variation on some of the On-the-Ground counterplans that were run/developed at camps this summer. It’s particularly useful against cases which rely on technology advantages. Combined with some kind of space debris/spending/carbon disadvantage, you can argue that we need to develop the technology here on earth before we do the damage the disad will result in.*

Counterplan text: The United States Federal Government should \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ on the Earth, using the research program of the NASA Institute for Advanced Concepts.

**Observation 1.** The counterplan is non-topical because it takes place on Earth, within the Earth’s mesosphere.

**Observation 2. SOLVENCY**

**A. THE NIAC PLAYED A CRITICAL ROLE FOR IMAGINATIVE TECHNOLOGIES THAT PROMISED REVOLUTIONIZING SPACE EXPLORATION-Silver ‘07**

[Matthew; NASA Needs the Institute for Advanced Concepts; Ad Astra; Summer 2007]

In mid-March NASA announced that it will likely shut down the NASA Institute for Advanced Concepts (NIAC) after nine years of operation. The ostensible reasons for this decision involve budgetary constraints and the need to focus engineering and developmental efforts on near-term goals. While budget concerns are very real, the cost-benefit analysis that led to this decision is highly dubious. NIAC's budget is tiny, just $4 million per year. Yet its termination would deal a terrible blow to NASA's future and the innovative potential of the broader United States aerospace sector.

In just nine years the institute has grown to occupy a unique and critical niche within NASA's innovation ecosystem. Under the leadership of Dr. Robert Cassanova, it has operated with a simple yet powerful philosophy: The greatest advances often occur where imagination and creativity are not bound by the constraints of near-term financial demand. Playing a role similar to that of DARPA for the military, NIAC encourages, identifies and then catalyzes big, high risk ideas with the potential to revolutionize space exploration and, by extension, humanity as a whole. As the military knows, such big thinking is necessary for the U.S. to maintain global technological leadership. Yet, because the research is by definition high-risk, the government has a critical role in supporting it.

**B. FAILURE TO REOPEN THE NIAC WILL UNDERMINE INTEREST IN SCIENCE AND PRECLUDE THE DEVELOPMENT OF REVOLUTIONARY AEROSPACE CONCEPTS-Braun ‘09**

[Robert; co-chair of Aeronautics and Space Engineering Board @ National Academies of Science and Professor at Georgia Institute of Technology; Fostering Visions for the Future: A Review of the NASA Institute for Advanced Concepts; 2009; <http://books.nap.edu/openbook.php?record_id=12702&page=R4;> retrieved 11 Jul 2011]

Through NASA, the United States would be well served by investing at least a small fraction of the agency’s budget in support of advanced concepts—concepts so difficult to achieve that their chance of individual success within a decade is less than 10 percent, yet projects so innovative that their success could serve as game-changers for entirely new aeronautics and space endeavors. The importance of high-value basic and applied research is now as great as ever. Major breakthroughs are needed to address society’s energy, health, transportation, and environmental challenges. While NASA investments alone will not solve these grand challenges, NASA does have a unique ability to motivate and attract many of the country’s best minds into educational programs and careers in engineering and science. If NASA does not support advanced concept activities, no other U.S. source of funding is likely to fill the gap—not the National Science Foundation, and not the Defense Advanced Research Projects Agency. Although it is not possible to predict which advanced concepts will produce world-shaking results, it is certainly true that in the absence of research on such concepts, the United States will not make revolutionary technological advances in aeronautics and space. This line of thought led to the establishment of NIAC.

SOLVENCY

**THE NIAC HAS BEEN RESPONSIBLE FOR SOME OF THE MOST DARING IDEAS IN SPACE EXPLORATION-Jha ‘07**

[Alok; science correspondent; Space: Nasa grounds its ideas factory; The Guardian; 22 Mar 2007; pg. 9]

In almost 20 years of research, it has been the home of some of the most daring ideas to aid exploration: space elevators, crops that could grow on Mars and a shield to protect our planet from global warming. But now Nasa's Institute for Advanced Concepts (Niac) has fallen victim to a very down-to-earth problem - a lack of money.

The US space agency is set to close its futuristic ideas factory as part of a cost-cutting exercise which it hopes will help pay for ambitious plans to explore the moon and Mars. Bobby Mitchell, who works at Niac's headquarters in Atlanta, told the Guardian: "From what I understand, Nasa are out of money. We haven't got an official notice yet but we have heard from Nasa that they are going to discontinue funding."

**NIAC WAS THE PLACE TO ENVISION TECHNOLOGIES FOR SPACE EXPLORATION-Jha ‘07**

[Alok; science correspondent; Space: Nasa grounds its ideas factory; The Guardian; 22 Mar 2007; pg. 9]

Former Nasa scientist Keith Cowing said the decision to close Niac was "just plain stupid". Writing on his Nasa Watch website, he directed comments to Nasa's administrator, Mike Griffin: "Advanced spacesuits . . . will open the surface of the moon - and then Mars - to meaningful and productive human exploration. Where are you going to get all of the things you need to put on those Ares rockets so as to allow their crews to carry out their missions, Mike? Or do you 'just need a good map'? Explorers without the right tools die - or turn around - and head back home. Wrong answer, Mike."

Niac was set up in 1988 as a way to brainstorm revolutionary ideas that go beyond anything Nasa does today. It draws $4m (£2.04m) every year from the agency's $16bn budget and funds about a dozen projects every year for long-term ideas, things that could come to fruition within 10 to 40 years.

**NIAC HAD TREMENDOUS RESEARCH IMPACT RELATIVE TO ITS SIZE-Silver ‘07**

[Matthew; NASA Needs the Institute for Advanced Concepts; Ad Astra; Summer 2007]

NIAC's impact, relative to its size, has been tremendous. It has initiated 162 projects spanning aeronautics, space transportation, lunar and Mars exploration, mission operations, and space science. These include the now famous space elevator championed by Dr. Bradley Edwards; a radical new skintight spacesuit designed by Professor Dava Newman of MIT; innovative genetic engineering experiments with implications for living on Mars; and magnetic sails, to name a very few. Such studies have opened important and unforeseen technological options for NASA and the civil space exploration industry. They have generated intellectual capital and other returns far in excess of the relatively minor initial investment.

**ONE NIAC RESEARCH PROJECT ALONG SAVED ENOUGH MONEY TO FUND THE AGENCY FOR 1200 YEARS-Silver ‘07**

[Matthew; NASA Needs the Institute for Advanced Concepts; Ad Astra; Summer 2007]

Some NIAC projects have moved from radical concept to viable NASA mission in a surprisingly short time period. In 2004 Webster Cash of the University of Colorado proposed the New Worlds Imager, a highly innovative optical system that would use a specially shaped occulter on its own spacecraft to block starlight and reveal Earth-like planets that presumably orbit distant stars. Under NIAC funding, the team assembled by Dr. Cash showed that by using only existing aerospace technology, it is possible and affordable for NASA to seriously undertake the search for habitable planets and to study them for signs of life. The cost savings and scientific returns of such a project could be enormous. Dr. Cash estimates that if implemented in place of previously planned technology, the New Worlds Imager could conceivably save NASA over $5 billion for the same science return. The savings made possible by this project alone could support NIAC for 1,250 years.

**NASA SHOULD REVIVE THE NIAC TO IMPROVE SPACE TECHNOLOGY AND ENHANCE LIKELIHOOD OF MARS EXPLORATION-Grossman ‘09**

[Lisa; Expert Panel Urges NASA to Revive Futuristic Think Tank; New Scientist; Aug 2009; <http://www.newscientist.com/article/dn17568-expert-panel-urges-nasa-to-revive-futuristic-think-tank.html;> retrieved 10 Jul 2011]

NASA should revive its Institute for Advanced Concepts, a blue-skies idea mill that closed in 2007, says an expert panel – but it says the new incarnation should have its feet a little closer to the ground.

NASA's Institute for Advanced Concepts (NIAC) was founded in 1998 to harvest innovative ideas for spaceflight and aeronautics from outside the NASA community.

It received $4 million a year, about 0.02 per cent of NASA's annual budget, and funded more than 100 futuristic spaceflight and aeronautics projects that no one else would touch. The projects included motion-sensitive spacesuits that generate their own power, techniques to construct buildings in space using radio waves, and spherical robots to explore Mars, among many others.

**DESPITE “FAR OUT” NATURE OF NIAC RESEARCH, A SURPRISING NUMBER YIELDED REAL RESULTS-Grossman ‘09**

[Lisa; Expert Panel Urges NASA to Revive Futuristic Think Tank; New Scientist; Aug 2009; <http://www.newscientist.com/article/dn17568-expert-panel-urges-nasa-to-revive-futuristic-think-tank.html;> retrieved 10 Jul 2011]

Three NIAC-funded projects are now "on a path toward one day being a NASA mission", Braun says, including a prototype plasma rocket, an X-ray interferometer that is being considered for NASA's Black Hole Imager mission, and a "star shade", which could help existing space telescopes search for extrasolar planets.

Other projects have had unexpected medical spinoffs, like a skin-tight spacesuit that can help children with cerebral palsy walk. "By and large, the topics that they invested in were pushing the state of the art, were very advanced in terms of far-out thinking, and I'd say a decent percentage of them had the possibility of turning into something," Braun told New Scientist.

**NIAC WAS AN AMAZING VALUE FOR ITS COST-Grossman ‘09**

[Lisa; Expert Panel Urges NASA to Revive Futuristic Think Tank; New Scientist; Aug 2009; <http://www.newscientist.com/article/dn17568-expert-panel-urges-nasa-to-revive-futuristic-think-tank.html;> retrieved 10 Jul 2011]

The committee also recommends that a new NIAC come down to Earth – just a little. NIAC's original mission was to pursue revolutionary ideas, projects that would be ready for development in 10 to 40 years. "But most of the things that were done by the old NIAC were closer to 40 than to 10," Braun says. The committee suggests that a new NIAC focus on projects for "10 years and beyond."

"It's still possible that the new NIAC would fund things that are out there quite a ways, but the committee was hoping for more advanced concepts that will come to fruition in about 10 years," Braun says.

Despite the current uncertainty in NASA's future plans and budget, the committee says that NIAC is still a worthwhile investment. "NIAC was efficiently run, there was no waste of money," says John Cramer, a physicist at the University of Washington and a former member of a council that reviewed NIAC projects. "NASA got an amazing amount of bang for the buck," Cramer told New Scientist.

**THE NATIONAL ACADEMY OF SCIENCE RECOMMENDED THE REOPENING OF NIAC-Lawler ‘09**

[Andrew; Panel Says NASA Should Reopen Innovation Institute; Science Insider; 07 Aug 2009; <http://news.sciencemag.org/scienceinsider/2009/08/panel-says-nasa.html;> retrieved 10 Jul 2011]

In a rare rebuke to NASA, today the National Academy of Sciences told the space agency it should reopen an organization designed to come up with innovative technologies.

The NASA Institute for Advanced Concepts (NIAC) was set up in 1998 to provide the agency with creative aeronautics and space ideas that could lower the cost of air and space travel. But the institute—which cost about $4 million a year in operations and grant costs--was shut down two years ago because of budget constraints. That closure prompted Congress to order the academy to study the institute’s record. “NIAC inspired an atmosphere for innovation that stretched the imagination and encouraged creativity,” the report released today concluded.

The panel, chaired by aerospace engineer Robert Braun of Georgia Institute of Technology in Atlanta, determined that NIAC’s program was effective, that NASA has nothing comparable, and that the agency needs an organization to provide “visionary, far-reaching concepts.” As a result, the panel urged NASA to create a next-generation NIAC that reports directly to the agency’s chief. No comment yet from NASA. But the agency’s new administrator, Charles Bolden, is likely to be sympathetic to the recommendation. He said at his confirmation hearing in the Senate last month that he would push to reinvigorate an ambitious technology program at the agency.

**NIAC DEVELOPED A WIDE NETWORK OF INNOVATORS-Braun ‘09**

[Robert; co-chair of Aeronautics and Space Engineering Board @ National Academies of Science and Professor at Georgia Institute of Technology; Fostering Visions for the Future: A Review of the NASA Institute for Advanced Concepts; 2009; <http://books.nap.edu/openbook.php?record_id=12702&page=R4;> retrieved 11 Jul 2011]

NIAC was successful in encouraging and supporting a wide community of innovators from diverse disciplines and institutions. Through establishment of its NIAC Fellows program, conferences, and awards, NIAC developed a community of innovators. NIAC was successful in its mission of developing a large community of innovative advanced concepts, as evidenced by receipt of 1,309 proposals in its 9-year lifetime. The 126 NIAC Phase I studies were led by a total of 109 distinct principal investigators, each of which led a research team of 3 to 10 personnel, often across multiple organizations.

**NIAC HAD DRAMATIC SUCCESS IN TURNING CONCEPT STUDIES INTO REALITY-Braun ‘09**

[Robert; co-chair of Aeronautics and Space Engineering Board @ National Academies of Science and Professor at Georgia Institute of Technology; Fostering Visions for the Future: A Review of the NASA Institute for Advanced Concepts; 2009; <http://books.nap.edu/openbook.php?record_id=12702&page=R4;> retrieved 11 Jul 2011]

Throughout its 9-year existence, NASA invested $36.2 million in NIAC advanced concept studies. Fourteen NIAC Phase I and Phase II projects, which were awarded $7 million by NIAC, received an additional $23.8 million in funding from a wide range of organizations, demonstrating the significance of the nation’s investment in NIAC’s advanced concepts. NIAC successfully matured 12 of the 42 Phase II advanced concepts (29 percent), as measured by receipt of post-NIAC funding; 9 of them (21 percent) received post-NIAC funding from NASA itself. In addition, 3 NIAC Phase II efforts (7 percent of the Phase II awards) appear to have impacted NASA’s long-term plans, and 2 of these efforts have either already been incorporated or are currently under consideration by the National Research Council Astronomy and Astrophysics Decadal Survey as a future NASA missions.

**NIAC ENCOURAGED YOUNG PEOPLE TO PURSUE SCIENCE AND AERONAUTICS-Braun ‘09**

[Robert; co-chair of Aeronautics and Space Engineering Board @ National Academies of Science and Professor at Georgia Institute of Technology; Fostering Visions for the Future: A Review of the NASA Institute for Advanced Concepts; 2009; <http://books.nap.edu/openbook.php?record_id=12702&page=R4;> retrieved 11 Jul 2011]

In addition, due to the open nature of NIAC, its Web site, and its annual meetings, substantial publicity was afforded to NASA. Some of these efforts, like the Space Elevator project, have spawned widespread interest and annual competitions that were not heretofore envisioned. Through media coverage and the establishment of the NIAC Student Fellows program for undergraduate students, NIAC motivated young people to pursue engineering and science programs and begin a potential career in aeronautics and space. Perhaps out of these seedling efforts, a new cadre of innovators will arise to continue this advancement in aeronautics and space technology.

**NASA NEEDS A NIAC-LIKE ENTITY TO DRIVE EXPLORATION AND TECHNOLOGY-Braun ‘09**

[Robert; co-chair of Aeronautics and Space Engineering Board @ National Academies of Science and Professor at Georgia Institute of Technology; Fostering Visions for the Future: A Review of the NASA Institute for Advanced Concepts; 2009; <http://books.nap.edu/openbook.php?record_id=12702&page=R4;> retrieved 11 Jul 2011]

NASA should reestablish a NIAC-like entity, referred to in this report as NIAC2, to seek out visionary, far-reaching, advanced concepts with the potential of significant benefit to accomplishing NASA’s charter and to begin the process of maturing these advanced concepts for infusion into NASA’s missions.

This recommendation is based on a combination of factors identified by the committee:

1. NASA needs to have a viable, long-term plan for new missions and systems in order to meet its obligations to the public.
2. NASA needs appropriate, open methods to ensure that it has access to the best new mission and system concepts from any source, not only those developed within NASA.
3. NASA needs effective and efficient processes to assess new ideas for its future systems and missions and to develop the most promising of those ideas to a level suitable for its plans.
4. NASA needs to continue to develop and expand its reputation for international leadership in aeronautics and space research and to inspire the public with bold missions of exploration.

**NIAC COULD FACILITATE THE DEVELOPMENT OF INTELLECTUAL AND MATERIAL IDEAS FOR FUTURE USE-Braun ‘09**

[Robert; co-chair of Aeronautics and Space Engineering Board @ National Academies of Science and Professor at Georgia Institute of Technology; Fostering Visions for the Future: A Review of the NASA Institute for Advanced Concepts; 2009; <http://books.nap.edu/openbook.php?record_id=12702&page=R4;> retrieved 11 Jul 2011]

One of NASA’s roles is to inspire the public with a spirit of discovery and exploration, and NASA is at its best when it accomplishes this through significant scientific and technical achievement in aeronautics and space. By fostering the identification and development of innovative advanced concepts, and by its actions to advertise the results of its projects to the public at large, NIAC served NASA well in support of this inspirational role.

A NIAC-like entity could facilitate the introduction of valuable products—intellectual and material—into NASA. It could broaden the population that can contribute creative ideas and concepts to NASA, a breadth that has generated significant new ideas. These aspects of the success of the previous NIAC form a compelling set of reasons to reinstate an organization with this charter.

**NIAC MUST FOCUS ON REVOLUTIONARY IDEAS AT LEAST 10 YEARS IN THE FUTURE-Braun ‘09**

[Robert; co-chair of Aeronautics and Space Engineering Board @ National Academies of Science and Professor at Georgia Institute of Technology; Fostering Visions for the Future: A Review of the NASA Institute for Advanced Concepts; 2009; <http://books.nap.edu/openbook.php?record_id=12702&page=R4;> retrieved 11 Jul 2011]

The emphasis of the original NIAC on funding only those concepts that are new and not already identified in NASA’s future mission planning should be maintained. However, the committee found that NIAC’s focus only on concepts that were revolutionary was too restrictive. There is a spectrum of advances, ranging from incremental or evolutionary improvements in individual components through innovative combinations of existing technologies to produce new results, to concepts that are truly revolutionary because they replace existing capabilities with something very different or enable new missions not previously possible.

By emphasizing revolutionary concepts, the original NIAC contributed to a sense that it was often “too far out” to be relevant to NASA’s more immediate and pressing needs (for example, the lunar exploration architecture). The committee recommends that NIAC2 adopt a standard of “technically innovative” rather than “revolutionary” to help to address this issue. The committee further recommends that NIAC2 focus on concepts 10 years in the future and beyond. The committee strongly endorses the primary standard of the original NIAC, i.e., only those concepts that are new and not already identified in NASA’s future mission needs should be funded; however, to qualify for NIAC2 support, concepts should have the potential to provide a major benefit to a future NASA mission or system.

**NASA HAS NO CURRENT AGENCY TO EXPLORE ADVANCED CONCEPTS-Braun ‘09**

[Robert; co-chair of Aeronautics and Space Engineering Board @ National Academies of Science and Professor at Georgia Institute of Technology; Fostering Visions for the Future: A Review of the NASA Institute for Advanced Concepts; 2009; <http://books.nap.edu/openbook.php?record_id=12702&page=R4;> retrieved 11 Jul 2011]

NASA is now an agency oriented toward flight-system development and operations. Priorities have thus diminished within NASA for long-range research and development efforts. At present, there is no NASA organization responsible for solicitation and evaluation of advanced concepts (defined as technology readiness level 1 or 2) and subsequent infusion of worthy candidates into NASA planning and development activities.

**THE US NEEDS A VISIONARY AGENCY TO INVESTIGATE ADVANCED CONCEPTS-Braun ‘09**

[Robert; co-chair of Aeronautics and Space Engineering Board @ National Academies of Science and Professor at Georgia Institute of Technology; Fostering Visions for the Future: A Review of the NASA Institute for Advanced Concepts; 2009; <http://books.nap.edu/openbook.php?record_id=12702&page=R4;> retrieved 11 Jul 2011]

The committee found that the NASA Institute for Advanced Concepts (NIAC) program met its mission and accomplished its stated goals. Funded at approximately $4 million per year, NIAC received a total of $36.2 million in NASA funding and expended more than 75 percent of these funds directly for its grants. At present, there is no NASA organization responsible for solicitation and evaluation of advanced concepts (defined as technology readiness level 1 or 2) and subsequent infusion of worthy candidates into NASA planning and development activities. Testimony from several sectors confirmed that NASA and the nation must maintain some mechanism to investigate visionary, far-reaching advanced concepts in order to achieve NASA’s mission. As such, the committee recommends that NASA should reestablish a NIAC-like entity (NIAC2) to seek out visionary, far-reaching advanced concepts relevant to NASA’s charter and to begin the process of maturing these advanced concepts for infusion into NASA’s missions.

**NIAC WAS DESIGNED TO FOSTER CREATIVE, VISIONARY APPROACHES FOR DECADES IN THE FUTURE-Toner ‘07**

[Mike; staff writer; NASA is eliminating funding for flights of fancy; St. Louis Post-Dispatch; 25 Mar 2007]

Cassanova is the first to acknowledge that none of the futuristic concepts the institute has been nurturing - from space elevators to exotic propulsion systems and miniature robots for exploring Mars - are likely to play a role in NASA's next decade in space.

But that was entirely by design. From its inception in 1998, the institute funded dozens of little-known researchers - seldom with grants of more than $75,000 each - with ideas that, even if they showed promise, would be attainable 10 to 40 years in the future.

The overriding goal was to nurture creative thinking. Among the concepts was the New Worlds Observer, a proposal by University of Colorado astronomer Webster Cash, who proposed building a free-flying "star shade" that would enable scientists to detect any Earth-sized planets around nearby stars at a fraction of the cost of other proposals.

**NIAC RESEARCH INVESTIGATED SPACESHIPS, SPACE ELEVATORS, AND MORE-Spotts ‘09**

[Pete; staff writer; Time to let NASA think big and bold again -- for a pittance; Christian Science Monitor; 07 Aug 2009; <http://www.csmonitor.com/Science/Discoveries/2009/0807/time-to-let-nasa-think-big-and-bold-again-for-a-pittance;> retrieved 10 Jul 2011]

But today, the National Research Council (NRC) issued a report strongly urging Congress and the space agency to reestablish the one-time NASA Institute for Advanced Concepts (NIAC).

This outfit, on a shoestring budget, was not asked to nurture ideas that would lead to technologies for the next mission. Instead, NIAC's job was to focus on concepts for technologies that might be needed 10, 20, 30, or 40 years down the road.

What sorts of ideas was NIAC nurturing? Advanced space suits, spacecraft powered by flowing ions captured in a "sail" of magnetic fields, and all sorts of concepts for robotic exploration of the surface of Mars and the clouds of Venus, just to name a few the Monitor has covered over the years.

Other research projects looked into space elevators for slashing the cost of putting payloads into orbit as well as concepts for advanced space-based telescopes.

**NIAC WAS AN EFFICIENT, COST-EFFECTIVE AGENCY-Spotts ‘09**

[Pete; staff writer; Time to let NASA think big and bold again -- for a pittance; Christian Science Monitor; 07 Aug 2009; [http://www.csmonitor.com/Science/Discoveries/2009/0807/time-to-let-nasa-think-big-and-bold-again-for-a-pittance; re](http://www.csmonitor.com/Science/Discoveries/2009/0807/time-to-let-nasa-think-big-and-bold-again-for-a-pittance)trieved 10 Jul 2011]

How well did NIAC perform? Quite effectively, according to the NRC report (which has yet to be posted on the Internet). NASA funded NIAC to the tune of about $4 million a year between the outfit's inception in 1998 and its demise two years ago. For comparison, the president's fiscal 2010 budget asked $18.7 billion for the agency.

More than 75 percent of NIAC's money went directly to researchers as peer-reviewed grants so they could figure out ways to turn the stuff of science fiction into everyday space hardware.

You'd get two shots at your idea -- maybe. You'd get a grant for six months for feasibility studies. If the idea looked feasible (to experts other than you, of course), you'd get a two-year grant to continue developing the idea.

Private Enterprise Counterplan

Text: The USFG should pay a prize to a private corporation which successfully \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**A. COMMERCIAL ENTREPRENEURS HAVE A BETTER SENSE OF RISK, TECHNOLOGY AND VISION THAN GOVERNMENT BUREAUCRACIES-Walker ‘11**

[Robert; former chairman of the President’s Commission on the Future of Aerospace; A Powerful Case for Commercial Space; 02 May 2011; <http://spacenews.com/commentaries/110502-powerful-case-for-commercial-space.html>; retrieved 11 Aug 2011]

What we know after 50 years of space history is that each time we have seen technology mature to the point the investors and entrepreneurs can see real business potential, the role of space in our lives has expanded and the benefits to our economy and our national security have been enhanced. Communication, GPS and remote sensing have all contributed significantly to our national well-being and have become more valuable the longer they have been market-driven.

Today, commercial space entrepreneurs appear to have a better grasp of the complex formula of resources, risk, technology, vision and imagination that define space leadership than do government bureaucracies. Tapping that asset will carry us forward to remarkable new adventures and discoveries.

**B. PRIVATE COMPETITION WILL DRIVE TECHNOLOGICAL INNOVATION AND REDUCE COSTS-Reynolds ‘10**

[Jackie; Renewing the Dream: How Free Market Principles Can Enable Commercial Space Development; 27 April 2010; <http://files.jackiedewaynereynolds.info/0410_Renewing.the.Dream.pdf>; retrieved 14 Aug 2011]

An immutable law of economics is that business success begets competition, and this is particularly true in undeveloped or underdeveloped markets. In other words, success in space—any success—will increase competition. More competition drives up innovation and drives down costs, which increases the quantity demanded. In the case of commercial space development, increased quantity demanded translates into larger launch manifests, more launch systems to meet the growing manifest, and, ultimately and most importantly, lower launch costs. As commercial space missions become increasingly profitable due to lower costs and increased efficiencies, even more businesses will clamor to enter the market, further driving down costs.

**C. GOVERNMENT USE OF INNOVATION PRIZES IS AN EFFECTIVE MEANS OF DEVELOPING COST-EFFECTIVE TECHNOLOGY-Sargeant ‘08**

[Benjamin; The Use of Innovation Prizes by the National Aeronautics and Space Administration: An Analysis of Future Possibilities for Fostering Research and Development; 28 Jul 2008; <http://www.sts.virginia.edu/wip/docs/papers/Sargeant_08_r.pdf>; retrieved 11 Aug 2011]

Government use of innovation prizes is a viable, effective means of complementing traditional research and development activities. The National Aeronautics and Space Administration (NASA) currently holds innovation prize contests called Centennial Challenges with the goal of finding innovative research solutions to pressing technical challenges. Judged by the recent success of the Ansari X-Prize and the DARPA Grand Challenge, innovation prize competitions excite the public and media about space and attract talented teams that normally would not participate in government-funded research. Although NASA’s initial innovation prize efforts are heading in the right direction, they limit their potential by focusing too much on teams that respond primarily for the notoriety of winning a NASA challenge. The current Centennial Challenges program offers medium-scale prizes with the goal of increasing public interest in space and attracting independent teams of skilled entrepreneurs to solve tough technical objectives. NASA should also study the benefits of expanding its program to include larger-scale prizes for major space exploration milestones, such as a robotic mission to the Moon, and should consider establishing private foundations, which would generate matching contributions from private sources and promote public interest in and excitement about the prize.

NASA BLOCKS PRIVATE ACTION

**NASA BLOCKS PRIVATE DEVELOPMENT, WHICH IS NECESSARY FOR MORE INEXPENSIVE SPACE TRAVEL-Boaz ‘08**

[David; Space Privatization-from Cato to the BBC; 15 Sep 2008; <http://www.cato-at-liberty.org/space-privatization-from-cato-to-the-bbc/>; retrieved 16 Aug 2011]

Edward L. Hudgins, former editor of Regulation magazine, wrote a great deal about private options in space. In 1995, he testified before the House Committee on Appropriations that the government should move out of non-defense related space activities, noting the high costs and wastefulness incurred by NASA. In 2001, Hudgins wrote “A Plea for Private Cosmonauts,” in which he  urged the United States to follow the Russians (!) in rediscovering the benefits of free markets after NASA refused to honor Dennis Tito’s request for a trip to the ISS. Hudgins testified again before the House in 2001, this time before the Subcommittee on Space and Aeronautics. He noted that since the beginning of the Space Age, NASA has actively discouraged and barred many private space endeavors. This effectively works against the advancement and expansion of technology, while pushing out talent to foreign countries who court American scientists and researches to launch from their less-regulated facilities. In “Move Aside NASA,” Hudgins reported that neither the station nor the shuttle does much important science. This makes the price tag of $100 billion for the ISS, far above its original projected cost, unjustifiable.

**THE PATH TOWARDS EFFICIENT, PROFITABLE EXPLORATION AND DEVELOPMENT OF SPACE DEPENDS ON ELIMINATING BUREAUCRATIC OBSTACLES-Younkins ‘10**

[Edward; Professor of Accountancy at Wheeling Jesuit University; From NASA to Commercial Space Enterprises; 2010; retrieved 14 Jul 2011; <http://rebirthofreason.com/Articles/Younkins/From_NASA_to_Commercial_Space_Enterprises.shtml>]

NASA spends money that is taken from taxpayers. If space exploration had occurred in the private sector, funds would not have been diverted from uses that would have better met consumer preferences. The private sector understands the moneymaking nature of space travel. Free-enterprising people, spending their own money, would find cost-effective ways to get to space. In a free market, individuals search for and adopt the best methods. There would be more flexibility with competing private companies using a variety of approaches and launch vehicles.

Space entrepreneurs view space as a place for people to work, vacation, study, and live. Manufacturing, tourism, and exploration in space can be better provided by the free market than by centralized planning by a bureaucratic machine. There can be an exciting future for science, business, and industry in space. Of course, for this to occur, we need to further remove bureaucratic barriers to private space development and to establish a system to secure and protect property rights and claims in space that is recognized by all nations.

**THE BEST THING FOR SPACE EXPLORATION WOULD BE IF NASA GOT OUT OF THE WAY-Taylor ‘11**

[Robert; The Case for Defunding NASA; 2011; <http://www.policymic.com/article/show?id=54>; retrieved 11 Jul 2011]

The best thing that could happen for the future of space exploration, discovery, and information would be for NASA to retire all of its shuttles, send those billions back to the American people, and open the sky up to the free market. Private entrepreneurs tend to produce and invest in a way that attempts to minimize costs in order to gain profit, while government programs work in the exact opposite manner.

**OBAMA ADMINISTRATION APPROACH WILL MANDATE GOVERNMENT REGULATION AND BUREAUCRACY ON PRIVATE SPACEFLIGHT- Sterner ‘10**

[Eric; Associate Deputy Administrator, Policy and Planning and Acting Chief of Strategic Communications, NASA; Worthy of a Great Nation? NASA’s Change of Strategic Direction; George C. Marshall Policy Outlook; April 2010; <http://www.marshall.org/pdf/materials/798.pdf>; retrieved 18 Aug 2011]

The Obama administration’s approach will undo that balance. While it has retained and expanded COTS, in many ways to its credit, its cancellation of Constellation raises the stakes for COTS and commercial human spaceflight in general. It will no longer be an experiment in promoting innovation with the potential to evolve into something more comprehensive. Instead, it will become the government’s primary means of sending people to space. As such, there will be strong pressure on the government to exercise increased oversight and accountability, undermining, if not eventually eliminating, the very flexibility built into the COTS concept. Indeed, this is already happening. A Congressional hearing revealed an already extant conflict over responsibilities between the Federal Aviation administration, which has legal responsibility for regulating commercial human spaceflight, and NASA, which is responsible for the safety of its astronauts. 32 Given the nature of bureaucratic politics, it is quite likely that both agencies will impose different sets of standards on commercial human spaceflight service providers.

**NASA’S CULTURE INTERFERES WITH ENTREPRENEURIAL APPROACHES-CMurphy ‘05**

[Robert; professor of economics at Hillsdale College; A Free Market in Space; The Free Market; January 2005; <http://mises.org/freemarket_detail.aspx?control=525>; retrieved 06 Jul 2011]

On October 4, 2004, the privately funded SpaceShip-One climbed to an altitude of over 70 miles, clinching the $10 million "X Prize." Many analysts were excited by the prospects for commercial space travel, and the day when orbital or even interplanetary flights would be affordable for the average person. As if to rebut the naysayers who dismissed SpaceShipOne as a mere tourist attraction for millionaires, Las Vegas hotel magnate Robert Bigelow capitalized on the event by announcing a $50 million prize for the first team to put a privately funded space station into orbit.

Beyond the obvious implications for sci-fi buffs and other space enthusiasts, the episode sheds light on the versatility of free enterprise. Most obvious, we see that the government is not necessary for space exploration; engineers and pilots do not suddenly become smarter when they are hired by NASA. Indeed, because a free market in space industries would be open to all competitors, we have every reason to expect technological innovation to be much quicker than in a monopolized space program.

In a free market, the maverick pioneer just needs to convince one or a few capitalists (out of thousands) to finance his revolutionary project, and then the results will speak for themselves. In contrast, an innovative civil servant at NASA needs to convince his direct superiors before trying anything new. If his bosses happen to dislike the idea, that’s the end of it.

**NASA HAS CONTRACTORS BELIEVING THAT IT CANNOT PERFORM THE CRITICAL FUNCTIONS OF A PROGRAM-Paur ‘09**

[Jason; Let Private Sector Help NASA; Wired; 20 August 2009; <http://www.wired.com/autopia/2009/08/commercial-space-programs/>; retrieved 23 August 2011]

But NASA contractor and aerospace giant Lockheed Martin says there’s too much risk associated with commercial space flight to make that a viable alternative to a government program.

Aviation Week reports that Lockheed Martin believes the commercial space programs could cost a lot more — in terms of time, money and safety — than a NASA program. “We know how difficult it is to transport to the station and we don’t want people to cut corners, and downstream having NASA pay the penalty of the time and cost of doing this,” John Stevens, of Lockheed Martin’s human spaceflight division, told Aviation Week.

NASA/GOVERNMENT CANNOT SOLVE

**THE GOVERNMENT SHOULD BE A CONSUMER NOT A PROVIDER OF SPACE EXPLORATION AND TECHNOLOGIES-Dyson ‘11**

[Esther; member of the NASA Advisory Council; Sputnik Redux; 20 Jan 2011; <http://www.project-syndicate.org/commentary/dyson28/English;> retrieved 28 Jun 2011]

The emphasis at SpaceX is on getting the job done, rather than just doing the job. Whereas governments and government contractors generally enjoy job security, private companies know that the money may run out. Also, private companies compete. Behind SpaceX is a crowd of other private companies developing spacecraft, including Masten Space Systems, XCOR Aerospace, Armadillo Aerospace, and Blue Origin.

These companies aren’t all competing to build precisely the same kind of vehicle; in fact, each considers its own approach superior. This kind of redundancy is actually efficient in the long run, as each player experiments and all of them learn from everyone’s failures and successes. In the meantime, each of them is competing not for a single grand prize but for a share of a growing market, risking investors’ money and their own reputations.

It is this free-market economy, which rewards useful innovation and purposeful risk-taking, that we should honor and recognize. The US government (or European governments, for that matter) can’t get us out of our current economic mess any better than they can get us to the moon at this point. In most areas of endeavor, the government should be a demanding customer rather than a provider (or subsidizer).

**CONTINUED COMMITMENT TO NASA-LED SPACE EXPLORATION IS A COMMITMENT TO FAILED PROGRAMS-Pelton ‘10**

[Joseph; Space & Advanced Communications Research Institute, George Washington University; A new space vision for NASA—And for space entrepreneurs too?; Space Policy; May 2010; pgs. 78-80]

One of the more eloquent yet haunting calls for change came some six years ago. The occasion was when Space X founder Elon Musk testified before the US Senate in April, 2004 at a Hearing on The Future of Launch Vehicles:

“The past few decades have been a dark age for development of a new human space transportation system. One multi-billion dollar Government program after another has failed….When America landed on the Moon, I believe that we made a promise and gave people a dream. It seemed then that…someone who was not a billionaire, not an Astronaut with the “Right Stuff”, but just a normal person, might one day see Earth from space. That dream is nothing but broken disappointment today. If we do not now take action different from the past, it will remain that way”

One might think that, since Musk was seeking to develop his own launch capability, he was exaggerating; but a review of the record suggests otherwise. Today nearly 25 years after the Rogers and Paine Commission reports that followed the Challenger disaster, we find that the recommendations for NASA to develop a reliable and cost-effective vehicle to replace the Shuttle is somewhere between being a disappointment and a fiasco. Billions of dollars have gone into various spaceplane and reusable launch vehicle developments by NASA over the past 20 years. Spaceplane projects have been started by NASA time and again amid great fanfare and major expectations and then a few years later either cancelled in failure or closed out with a whimper. The programs that NASA has given up on now include the Delta Clipper, the HL-20, X-33, the X-34, X-37, X-38, and X-43 after billions of US funds and billions more of private money have been sacrificed to the cause.

**NASA IS NOT DRIVEN BY NATIONAL INTEREST, BUT POLITICIZED AIMS-Schmitt ‘11**

[Harrison; former US Senator and astronaut; *Space Policy and the Constitution*; 2011; pg. xi]

The bi-partisan, patriotic foundations of NASA underpinned the remarkable Cold War and scientific success of the Apollo Program in meeting the goal of “landing a man on the Moon and returning him safely to the Earth”. Those foundations gradually disappeared during the 1970s as geopolitical perspectives withered and NASA aged. For Presidents and the media, NASA’s activities became an occasional tragedy or budgetary distraction rather than the window to the future envisioned by Eisenhower, Kennedy and the Apollo generation. For Congress, rather than being viewed as a national necessity, NASA became a source of politically acceptable “pork barrel spending” in states and districts with NASA Centers, large contractors, or concentrations of sub-contractors. Neither taxpayers nor the Nation benefit significantly from this current, self-centered rationale for a space program.

**NASA IS A POLITICIZED ENTITY WHICH CANNOT SOLVE BECAUSE OF INTERNAL POLITICS-Garmong ‘04**

[Robert; Ph.D. in philosophy, is a writer for the Ayn Rand Institute; Privative the Space Program; The Rational Argumentator; 02 Mar 2004; <http://rationalargumentator.com/issue20/privatizespace.html>; retrieved 16 Aug 2011]

After years of declining budgets, public apathy, and failed missions, NASA has gotten a big boost from the Bush Administration's recent promises of extravagant missions to permanently settle the moon and eventually explore Mars. No one knows what it would cost, but a similar idea in 1989 was estimated to cost up to $500 billion.

Rather than lavishing money on new missions of dubious value, President Bush should consider a truly radical solution for America's moribund space program: privatize it.

There is a contradiction at the heart of the space program: space exploration, as the grandest of man's technological advancements, requires the kind of bold innovation possible only to minds left free to pursue the best of their thinking and judgment. Yet by placing the space program under governmental funding, we necessarily place it at the mercy of governmental whim. The results are written all over the past twenty years of NASA's history: the space program is a political animal, marked by shifting, inconsistent, and ill-defined goals.

**NASA HAS BECOME A SLOW, INEFFICIENT BUREAUCRACY ILL-SUITED TO THE NEXT GENERATION OF SPACE EXPLORATION-Conover ‘11**

[Scott; senior in business administration; Private industry will lead space exploration; The Daily Barometer; 08 Jun 2011; <http://www.dailybarometer.com/forum/private-industry-will-lead-space-exploration-1.2380067>; retrieved 22 Jul 2011]

Oftentimes when people think of space and space exploration in the modern world, NASA is considered for the role. As a large, multibillion dollar government entity, NASA has been involved in space observation, training and exploration for over five decades now. Yet it will not be NASA that will be on the forefront of exploration, the vanguard of settlement or the peak of human development in the cosmos. It will be private industry, seeking to soar far and wide, deep in the asteroids and high above the Earth, who will find profit in the void of space and fulfillment in the dark skies beyond our planet. The problem with NASA is that it exists and functions in the public sector. Government organizations are wonderful for dangerous and unprofitable activities - cleaning radiation spills, sending people hurtling around the moon, funding shuttles with no profit potential, checking for environmental hazards, taking a census or any other number of relatively unprofitable yet useful activities. Thus, NASA was a great organization in the decades before the new millennium, reigning from the early 60s to the late 90s as a dedicated agency that sought to promote space and its treasures. However, NASA has largely become an inefficient and ineffective organization, paralyzed by political infighting and by a slow, long-term outlook on space exploration.

**NASA IS TOO CAUTIOUS AND CANNOT ACCOMPLISH ANYTHING AS A RESULT-Conover ‘11**

[Scott; senior in business administration; Private industry will lead space exploration; The Daily Barometer; 08 Jun 2011; <http://www.dailybarometer.com/forum/private-industry-will-lead-space-exploration-1.2380067>; retrieved 22 Jul 2011]

This viewpoint is extremely pervasive in NASA. For example, with regard to exploring Mars, the Economic Times reported that "NASA aims to put man on Mars by 2037," a considerable distance away. Give enough time for an objective, and it is likely to either succeed or become irrelevant by the time that everyone gets there. The formerly young people will largely have forgotten about this minor fact in their journey to middle age and the older, more educated people will largely have forgotten about it or died off.

It seems as if NASA is afraid to make any serious errors, and instead provides long-range figures that are very difficult to measure, and which are so far ahead, chances are, few of us will care by the time we get there, since ordinary people do not wait until the end of time (or until the end of their lives) to get a mundane task accomplished.

**NASA HAS FAILED MISERABLY-Powell ‘08**

[Stewart; bureau writer; Houston Congressman: NASA Needs Complete Restructuring; Houston Chronicle; 18 Jul 2008; <http://www.chron.com/neighborhood/baytown-news/article/Houston-congressman-NASA-needs-complete-1769311.php>; retrieved 11 Jul 2011]

Two days after telling an online town hall meeting that NASA had "failed us miserably" and "wastes a vast amount of money," Houston Rep. John Culberson said Thursday he was weighing legislation to overhaul the structure of the space agency, responsible for about 20,000 jobs in the Houston area.

Culberson, a blunt-spoken conservative from a heavily Republican westside district, said his proposal would slash NASA headquarters' bureaucracy and enable scientists and engineers to rekindle visionary space exploration.

"We need revolutionary change, a complete restructuring," Culberson told the Houston Chronicle. "NASA needs complete freedom to hire and fire based on performance; it needs to be driven by the scientists and the engineers, and it needs to be free of politics as much as possible."

**NASA IS A DEEPLY DISAPPOINTING GOVERNMENT AGENCY WHICH HAS SURRENDERED A 40 YEAR LEAD ON SPACE EXPLORATION-Powell ‘08**

[Stewart; bureau writer; Houston Congressman: NASA Needs Complete Restructuring; Houston Chronicle; 18 Jul 2008; <http://www.chron.com/neighborhood/baytown-news/article/Houston-congressman-NASA-needs-complete-1769311.php>; retrieved 11 Jul 2011]

Culberson, a member of the House Appropriations Committee, said that despite spending $156.5 billion over the past decade, NASA had surrendered "a 40-year advantage" in space exploration. He said the agency continues to rely on liquid-fueled rockets with technology dating back to "Robert Goddard-era rockets" in the 1920s.

"I have always been a zealous advocate for the space program," said Culberson, who dates his interest in the subject to a childhood telescope. "But the setbacks are inexcusable and maddening — all because the magnificent men and women scientists and engineers have been frustrated by the bureaucracy, waste and duplication at headquarters."

Culberson's remarks came two days after criticizing NASA during a call-in town hall meeting with constituents.

"We've spent a fortune on NASA, and we don't have a whole lot to show for it," Culberson said in response to a question from a caller who harshly criticized NASA. "It's deeply disappointing, and it's because it's a government-run agency."

**GOVERNMENT CONTROL OF SPACE FURTHERS STATIST ENDS, DESPITE CONSTANT FAILURES-Anderson ‘03**

[William; professor of economics at Frostburg State College; The Trouble With NASA; The Free Market; April 2003; <http://mises.org/freemarket_detail.aspx?control=434>; retrieved 11 Aug 2011]

In a more perfect world, or at least one in which the free market reigned, the space shuttle accidents would be clear signals that government space travel represents the height of fiscal foolishness. Alas, the statist gods of our age have used these mishaps to further the state's agenda, which is being done ultimately at the expense of our freedom, President George W. Bush's demand for an extra $500 million for NASA this year eloquently making my point.

The National Aeronautic and Space Administration (NASA) was born in the wake of the hysteria that came about after the Soviet Union launched the tiny satellite Sputnik in 1957. After the Russians launched a manned spacecraft—and returned it safely to Earth—in 1961, President John F. Kennedy promised that the United States would land someone on the moon and bring him back by the end of the decade.

The promise outlived JFK, but came to fruition in the summer of 1969 with the words, "One small step for man, one giant leap for mankind." It seemed that socialist space travel truly had proven to be one of the keys to "national greatness," and certainly many people reveled in this monumental technological accomplishment.

Ever since the "success" of the Manhattan Project, in which an all-star cast of government scientists created the atomic bomb that killed hundreds of thousands of Japanese civilians in 1945 at the end of World War II, the US government has engaged in numerous crash programs to accomplish monumental goals.

**MASSIVE GOVERNMENT PROGRAMS FAIL; NASA’S FAILURE IS INEVITABLE-Anderson ‘03**

[William; professor of economics at Frostburg State College; The Trouble With NASA; The Free Market; April 2003; <http://mises.org/freemarket_detail.aspx?control=434>; retrieved 11 Aug 2011]

Following Manhattan was NASA; President Lyndon Johnson's "war on poverty"; Richard Nixon's "war on cancer"; Jimmy Carter's short-lived "synfuels" program; and the current "war on AIDS," which have consumed huge portions of the federal budgets under four presidents.

All of these programs either have ended in abject failure or have eaten up hundreds of billions of tax dollars with questionable results. While any one of these programs—including the ostensibly "successful" Manhattan Project—can be clearly demonstrated to be disastrous in their own right, I would like to deal with NASA since it has managed to get back into the news by losing one of its vaunted spacecrafts and seven astronauts.

**POLITICAL CONSIDERATIONS DRIVE NASA PURCHASING AND DEVELOPMENT, PREVENTING BEST TECHNOLOGY-Anderson ‘03**

[William; professor of economics at Frostburg State College; The Trouble With NASA; The Free Market; April 2003; <http://mises.org/freemarket_detail.aspx?control=434>; retrieved 11 Aug 2011]

The technological inferiority of NASA manned space gear is not unlike the situation that faces Federal Aviation Administration air traffic controllers every day, who must rely on obsolete equipment in order to safely guide passenger airliners through takeoff and landing. While Americans have been trained to think for decades that government is ahead of the technology curve, the nature of state operations guarantees that government sectors that depend upon high technologies are always going to lag behind private sector operations.

The reason for this situation, in short, is politics. Equipment must be manufactured, and behind each manufacture stands an interest group that fights change. Interest groups develop ties with politicians, and politicians decide where allocation of tax monies will go. This is not just true in democratic systems. China, for example, manufactured and used steam-powered locomotives long after diesels were being utilized because entire regions where these steam engines were made were totally dependent upon the government's rail transportation decisions.

**GOVERNMENT CONTROLLED SPACE EXPLORATION IS A DANGEROUS FAILURE-Anderson ‘03**

[William; professor of economics at Frostburg State College; The Trouble With NASA; The Free Market; April 2003; <http://mises.org/freemarket_detail.aspx?control=434>; retrieved 11 Aug 2011]

Yet, all of this desire for "national resolve" also reminds me of something else. In the cult movie Animal House, someone grabs the baton from a band director and marches the band into a blind alley that is blocked by a wall. However, when they reach the wall, the band members, instead of stopping, continue marching, oblivious to the fact that there is a wall in front of them.

This has been the real symbol of manned space travel under a government regime. Were space travel a private, profit-seeking venture, owners would have the incentive to keep up with technologies and balance the risk of manned spacecraft with any benefits that might accrue from such activities.

Instead, we have politicians giving eloquent but meaningless eulogies, refusing to admit they have been wrong when the evidence is overwhelming, and interest groups that are enriching themselves at the public trough, insisting that we not turn back. There are too many examples of this sort of thing to count, from the Vietnam quagmire to the endless military action in the Persian Gulf to the bogus "security" offered by government agents to Americans waiting fearfully for terrorists to strike us again.

The real lesson of the Columbia disaster is that government enterprises are failures, and in the case of the space program, dangerous failures. Unfortunately, politicians and their worshipful pundits refuse to heed what is obvious. Last week, seven brave individuals were incinerated in a modern technological meltdown; we can expect more of the same in the future, but when it happens, don't look for anyone in power to learn anything constructive.

**NASA BUREAUCRACY STANDS IN THE WAY OF SCIENTIFIC DEVELOPMENT-Malik ‘11**

[Tariq; space columnist; Newt Gingrich on Space Exploration: 'NASA Is Standing in the Way’; Fox News; 14 Jun 2011; <http://www.foxnews.com/scitech/2011/06/14/newt-gingrich-on-space-exploration-nasa-is-standing-in-way/>; retrieved 01 Aug 2011]

Newt Gingrich, former speaker of the House of Representatives

Well, sadly — and I say this sadly, because I'm a big fan of going into space and I actually worked to get the shuttle program to survive at one point — NASA has become an absolute case study in why bureaucracy can't innovate.

If you take all the money we've spent at NASA since we landed on the moon and you had applied that money for incentives to the private sector, we would today probably have a permanent station on the moon, three or four permanent stations in space, a new generation of lift vehicles. And instead what we've had is bureaucracy after bureaucracy after bureaucracy, and failure after failure.

I think it's a tragedy, because younger Americans ought to have the excitement of thinking that they, too, could be part of reaching out to a new frontier

You know, you'd asked earlier, John, about this idea of limits because we're a developed country. We're not a developed country. The scientific future is going to open up, and we're at the beginning of a whole new cycle of extraordinary opportunities. And, unfortunately, NASA is standing in the way of it, when NASA ought to be getting out of the way and encouraging the private sector.

NASA/GOVERNMENT IS TOO EXPENSIVE

**NASA IS ONE OF THE GOVERNMENT’S WORST OFFENDERS FOR WASTEFUL SPENDING-CATO Institute ‘10**

[Can NASA Compete with SpaceX; CATO Institute; 28 Dec 2010; <http://www.downsizinggovernment.org/can-nasa-compete-with-spacex>; retrieved 19 Jul 2011]

A Cato essay on cost overruns in government programs points out that NASA is one of the government’s worst offenders:

The National Aeronautics and Space Administration has long had major cost overrun problems, such as on its space station program. A GAO report in 2009 found that 10 of 13 major projects examined had substantial cost overruns or schedule delays. Alan Stern, a former NASA associate administrator, recently noted that “our space program is run inefficiently, and without sufficient regard to cost performance,” and further noted that costs overruns are a “cancer” on the agency.

Perhaps it’s a little unfair to use the word “compete” since SpaceX is receiving federal funds from NASA. That said, it seems clear that allowing the private sector to play a greater role in space is ideal, especially given NASA’s history of fiscal mismanagement. Whereas private companies are responsible to shareholders, NASA is responsible to policymakers who are often more concerned about maintaining space-related jobs in their districts rather than getting the best bang for the taxpayer buck.

**NASA HAS ENDEMIC COST OVERRUNS-Edwards ‘09**

[Chris; Government Cost Overruns; Mar 2009; <http://www.downsizinggovernment.org/government-cost-overruns>; retrieved 22 Jul 2011]

The National Aeronautics and Space Administration has long had major cost overrun problems, such as on its space station program. A GAO report in 2009 found that 10 of 13 major projects examined had substantial cost overruns or schedule delays.33 Alan Stern, a former NASA associate administrator, recently noted that "our space program is run inefficiently, and without sufficient regard to cost performance," and further noted that costs overruns are a "cancer" on the agency.

**NASA HAS LONG-TERM DIFFICULTIES WITH EFFICIENT SPENDING-Matthews and Block ‘08**

[Mark and Robert; Out-of-this-world missions, and costs; Los Angeles Times; 19 Dec 2008; <http://articles.latimes.com/2008/dec/19/nation/na-nasa19>; retrieved 05 Aug 2011]

Most nights it's possible to look skyward with a pair of cheap binoculars and see a $100,000 mistake circling the Earth. The glowing object -- an orbiting NASA tool bag -- was lost last month by an astronaut during a routine spacewalk.

The canvas-and-acrylic caddy contained two grease guns, a scraper, a trash bag and some wipes, hardly cutting-edge technology. So why did it cost $100,000?

NASA officials said they had no answer to that question -- beyond the fact that, as spokesman Allard Beutel put it, "space flight is expensive." That expense is drawing serious scrutiny from the incoming administration of President-elect Barack Obama.

Of 74 questions submitted to the agency by Obama's NASA transition team, more than half asked about basic spending issues, including cost overruns.

It's clear that NASA's long-standing inability to manage its money has attracted the team's attention.

For nearly two decades, NASA and its out-of-this-world projects have made a "high-risk" list compiled by government auditors because of cost overruns totaling millions -- sometimes billions -- of dollars.

The designation applies to programs that are "impeding effective government and costing the government billions of dollars each year," according to the Government Accountability Office, a federal watchdog agency.

**COST OVERRUNS ARE A CANCER UNDERMINING NASA’S MISSION-Matthews and Block ‘08**

[Mark and Robert; Out-of-this-world missions, and costs; Los Angeles Times; 19 Dec 2008; <http://articles.latimes.com/2008/dec/19/nation/na-nasa19>; retrieved 05 Aug 2011]

"Our space program is running inefficiently, and without sufficient regard to cost performance," wrote Alan Stern, a former NASA associate administrator who has been mentioned as a possible replacement for Michael Griffin, the current NASA administrator.

In a recent op-ed piece in the New York Times, Stern called the cost overruns a "cancer" that has cost the agency's science program about $5 billion over five years.

**NASA IS AN OVERLY CAUTIOUS INSTITUTION WITH A MASSIVELY INFLATED COST FOR EACH MISSION-Younkins ‘10**

[Edward; Professor of Accountancy at Wheeling Jesuit University; From NASA to Commercial Space Enterprises; 2010; retrieved 14 Jul 2011; <http://rebirthofreason.com/Articles/Younkins/From_NASA_to_Commercial_Space_Enterprises.shtml>]

NASA, a government bureaucracy founded in 1958, has little reason to develop inexpensive space transportation. Whereas entrepreneurs are rewarded when they cut costs, public managers are rewarded when they increase the size and scope of their programs and increase their budgets. In addition, public managers avoid risk by inflating their costs—errors could lead Congress to cut NASA’s budget.

Unlike the trial and error approaches of private entrepreneurs, NASA’s program is run as a centralized bureaucracy. After carefully studying all of its options and considering the political aspects of the program, bureaucrats choose the one best approach to an opportunity or a problem and massively fund the program until it works.

**NASA SPENDS BILLIONS ON INEFFICIENT PROGRAMS-Tumlinson ‘05**

[Rick; columnist; Private Industry Can Help NASA Open the Space Frontier; 11 Mar 2005; Space.com; <http://www.space.com/171-private-industry-nasa-open-space-frontier.html>; retrieved 02 Aug 2011]

How does NASA justify its intention to spend tens of billions of dollars in taxpayer funds to build what will probably be a far less efficient space transportation system than what the commercial space industry is developing for its own purposes.

Look at the contrasts. Bigelow is assuming that his $50 million dollar America's Prize will result in a safe and reusable passenger capsule for roundtrips between Earth and low Earth orbit. NASA is expecting to spend over $10 billion dollars to develop the same sort of capability. Yes, Bigelow expects the winner to spend far more than the actual prize amount based on hopes of follow-on markets; and yes, the winning capsule will have fewer bells and whistles that anything NASA builds, but the magnitude of difference in the development costs is ridiculous.

**NASA IS PLAGUED BY COST OVERRUNS-Fox News ‘09**

[NASA BY THE NUMBERS: COST OVERRUNS PLAGUE KEY PROJECTS; Fox News; 10 April 2009; <http://www.foxnews.com/story/0,2933,513575,00.html>; retrieved 23 August 2011]

NASA's next administrator will have his hands full — with federal funds and a set of formidable challenges, including how to return to the moon by 2020 without seeing the agency's budget go into orbit itself.

Despite cost overruns totaling nearly $1.1 billion in nine of its flagship projects, NASA will see its 2010 fiscal year budget increase to $18.7 billion. Combined with the $1 billion NASA got from the new stimulus package, that’s $2.4 billion more than the space agency received in 2008.

SOLVENCY: PRIVATE ENTERPRISE SOLVES BETTER

**PRIVATE COMPANIES ARE MORE EFFICIENT AND SPEEDIER ABOUT GETTING RESULTS-Dyson ‘11**

[Esther; member of the NASA Advisory Council; Sputnik Redux; 20 Jan 2011; <http://www.project-syndicate.org/commentary/dyson28/English;> retrieved 28 Jun 2011]

More than 50 years ago (1957), the Soviets launched the world’s first orbiting satellite, beating the US into space. For Americans, the so-called “Sputnik moment” was a wake-up call that pushed the United States to increase investment in technology and science education. Months later, the US launched the Explorer 1 satellite, and the race was on. Children were encouraged to study math and science, and American know-how helped the US meet the challenge.

But things have slowed down dramatically since then, and NASA has been trying since early November to get its latest shuttle ready for launch. In December, US President Barack Obama talked of the need for a new “Sputnik moment” to revitalize America’s once-leading role in technology.

Ironically, that moment happened two days later, but with lamentably little media coverage. However, this Sputnik moment – actually a “Dragon moment” – delivers a somewhat different message. The launch of the Dragon spacecraft was in fact a US achievement, in a traditionally American spirit. On December 8, a US company, SpaceX, founded by an immigrant and financed mostly by private US investors, successfully launched a spacecraft into orbit and then recovered it from a splashdown in the Pacific Ocean.

The message is not just that STEM (science, technology, engineering, and math) education is necessary, but also that this achievement by a private company cost just a fraction of NASA's budget in money and time. Governments are great at funding and carrying out research, but competitive private companies motivated by profit and glory tend to be more efficient and speedier in applying the results.

**ENTREPRENEURIAL SPACE EXPLORATION IS FASTER, CHEAPER, AND BETTER-Pelton ‘10**

[Joseph; Space & Advanced Communications Research Institute, George Washington University; A new space vision for NASA—And for space entrepreneurs too?; Space Policy; May 2010; pgs. 78-80]

Any private company with NASA's record on the Space Shuttle, the ISS deployment and spaceplane development, would have gone bankrupt decades ago. In all three cases the US Congress has been told by NASA essentially what it wanted to hear rather than the grim facts as to cost, schedule and performance. I personally remember when Congress was being told quite unbelievable things about the cost and expected performance of the Space Shuttle. We at Intelsat presented testimony that strongly contradicted NASA's statements on cost and performance.

There are dozens of examples of entrepreneurial space enterprises that have generated innovative ideas that seemed to show us how we could have gotten ourselves into space faster, cheaper and better.

**PRIVATE ENTERPRISE IS BETTER SUITED TO A WIDE RANGE OF SPACE POLICY, FROM POWER GENERATION TO ASTEROID DEFENSE-Pelton ‘10**

[Joseph; Space & Advanced Communications Research Institute, George Washington University; A new space vision for NASA—And for space entrepreneurs too?; Space Policy; May 2010; pgs. 78-80]

With a change in priorities we can deploy far more spacecraft needed to address the problems of climate change via better Earth observation systems. We can fund competitions and challenges to spur space entrepreneurs to find cheaper and better ways to send people into space. We can also spur the development of solar power satellites to get clean energy from the sun with greater efficiency. We can deal more effectively with finding and coping with “killer” asteroids and near earth objects. We may even find truly new and visionary ways to get people into space with a minimum of pollution and promote the development of cleaner and faster hypersonic transport to cope with future transportation needs.

**KEEPING SPACE UNDER THE CONTROL OF GOVERNMENT RESULTS IN A POLITICAL, INEFFICIENT FAILURE. ONLY THE FREE MARKET CAN LEAD TO NECESSARY INNOVATION-Garmong ‘04**

[Peter; Ph.D. in philosophy; Privatize Space Exploration: The Free-Market Solution For America's Space Program; Capitalism Magazine; 27 Jun 2004; <http://www.capitalismmagazine.com/science/space/3763-privatize-space-exploration-the-free-market-solution-for-america-039-s-space-program.html;> retrieved 28 Jun 2011]

There is a contradiction at the heart of the space program: space exploration, as the grandest of man's technological advancements, requires the kind of bold innovation possible only to minds left free to pursue the best of their thinking and judgment. Yet, by placing the space program under governmental funding, we necessarily place it at the mercy of governmental whim. The results are written all over the past twenty years of NASA's history: the space program is a political animal, marked by shifting, inconsistent, and ill-defined goals.

The space shuttle was built and maintained to please clashing constituencies, not to do a clearly defined job for which there was an economic and technical need. The shuttle was to launch satellites for the Department of Defense and private contractors--which could be done more cheaply by lightweight, disposable rockets. It was to carry scientific experiments--which could be done more efficiently by unmanned vehicles. But one "need" came before all technical issues: NASA's political need for showy manned vehicles. The result, as great a technical achievement as it is, was an over-sized, over-complicated, over-budget, overly dangerous vehicle that does everything poorly and nothing well.

**NON-SECURITY RELATED SPACE EXPLORATION IS BEST SERVED BY PRIVATE SECTOR INVESTMENT-Schmitt ‘11**

[Harrison; former US Senator and astronaut; *Space Policy and the Constitution*; 2011; pg. 5]

In contrast to space activities that relate to national security, including the geopolitical standing of the Unites States among competing states and ideologies, there exists great potential for investor-driven commercial enterprises related to space. Commercial communications satellites remain the best example of the realization of this potential. Lunar helium-3 fusion power may someday reach and surpass this level of true commercialization. The key to such enterprises is that they are investor-driven even though their technology base may include earlier development activities by the United States government.

**SPACE EXPLORATION MUST BE COMMERCIAL TO HAVE LONG-TERM VIABILITY-Milstein ‘09**

[Michael; staff writer; NASA Makes Space U-Turn, Opening Arms to Private Industry; Popular Mechanics; 01 Oct 2009; <http://www.popularmechanics.com/science/space/4263233>; retrieved 01 Aug 2011]

Financial support from NASA represents an important vote of confidence that should help space entrepreneurs leverage even more money from private investors, says XCOR Aerospace CFO Randy Baker. XCOR could take astronaut trainees or scientists to the edge of space on its small, agile space planes for perhaps $250,000, compared to the many millions NASA spends on each launch. At the same time, however, Baker says the company's business plan does not hinge on government support.

NASA has undergone a cultural revolution, compared to the 1980s and 1990s, in its attitude toward the private sector, says David Gump, president of Transformational Space Corp., which had an early contract with NASA to help design a new space capsule. He notes that NASA turned away Dennis Tito, the first suborbital tourist, but later tried to help pop star Lance Bass reach space. Gump says this signals the agency's emphasis on public attention and appeal, says Gump, who insists that even space exploration must have commercial value if it's going to sustain itself over the long term.

SOLVENCY: FREE MARKET SOLUTIONS LEAD TO INNOVATION

**ONLY FREE MARKETS CAN UNLEASH THE BEST ENGINEERING MINDS TO EXPLORE SPACE-Garmong ‘04**

[Peter; Ph.D. in philosophy; Privatize Space Exploration: The Free-Market Solution For America's Space Program; Capitalism Magazine; 27 Jun 2004; <http://www.capitalismmagazine.com/science/space/3763-privatize-space-exploration-the-free-market-solution-for-america-039-s-space-program.html;> retrieved 28 Jun 2011]

We often hear that the most ambitious projects can only be undertaken by government, but in fact the opposite is true. The more ambitious a project is, the more it demands to be broken into achievable, profit-making steps--and freed from the unavoidable politicizing of government-controlled science. If space development is to be transformed from an expensive national bauble whose central purpose is to assert national pride to a practical industry, it will only be by unleashing the creative force of free and rational minds.

We have now made the first steps toward the stars. Before us are enormous technical difficulties, the solution of which will require even more heroic determination than that which tamed the seas and the continents. To solve them, America must unleash its best engineering minds, as only the free market can do.

**ENCOURAGING PRIVATE ENTERPRISE WILL LEAD TO SYNERGISTIC, EFFECTIVE SPACE EXPLORATION-Milstein ‘09**

[Michael; staff writer; NASA Makes Space U-Turn, Opening Arms to Private Industry; Popular Mechanics; 01 Oct 2009; <http://www.popularmechanics.com/science/space/4263233>; retrieved 01 Aug 2011]

NASA got its start in aeronautics research, kick-starting a U.S. aviation industry that came to dominate the world. NASA administrator Michael Griffin said in an interview last year with PM that he wants the agency to do the same for commercial space transportation.

"I'd like for us to get to the point where we have the kind of private/public synergy in space flight that we have had for a hundred years in aviation," Griffin said. The spirit of private enterprise is crucial to the future of space exploration, he acknowledged. "I see a day in the not-very-distant future where instead of NASA buying a vehicle, we buy a ticket for our astronauts to ride to low Earth orbit, or a bill of lading for a cargo delivery to space station by a private operator. I want us to get to that point."

**PRIVATE COMPANIES CAN FIND REWARDS AND OPPORTUNITIES GOVERNMENT WILL NEVER SEE-Milstein ‘09**

[Michael; staff writer; NASA Makes Space U-Turn, Opening Arms to Private Industry; Popular Mechanics; 01 Oct 2009; <http://www.popularmechanics.com/science/space/4263233>; retrieved 01 Aug 2011]

Private companies, for instance, may find commercial opportunities in space--be it mining the moon or holding lotteries for trips into space--that NASA might never notice or think to exploit. Those same opportunities may pay off for NASA by helping to make mass space transportation of cargo and crews more affordable, Gump says.

"The main challenge of going back to the moon is doing it sustainably and affordably," he says. For that to happen, "We've got to move toward things that cost a lot less than they do now ... Governments in general are not willing to step up and take the risk necessary to get to that point. In government, you're only punished for failure. You're not really rewarded for success."

**PRIVATE INDUSTRY AND INDIVIDUALS CAN MUCH MORE CHEAPLY AND EFFICIENTLY EXPLORE SPACE-Taylor ‘11**

[Robert; The Case for Defunding NASA; 2011; <http://www.policymic.com/article/show?id=54>; retrieved 11 Jul 2011]

One of the best examples of this is when two MIT students, Justin Lee and Oliver Yeh, sent a camera into space to photograph the curvature of the Earth. For what it takes NASA millions of dollars to do, it took them $150. This is because Lee and Yeh, relying on private initiative and the incentive to minimize costs, filled a weather balloon with helium and hung a styrofoam beer cooler underneath to hold the camera. NASA, with the reverse incentives, uses rockets, boosters, and expensive control systems that may draw "oohs" and "ahs," but at the expense of the terrible opportunity costs of taxation.

SOLVENCY: PRIVATIZATION LEADS TO AMERICAN LEADERSHIP

**THE ONLY PLAUSIBLE PATH TOWARDS AMERICAN SPACE LEADERSHIP IS TO ENCOURAGE R&D BY PRIVATE FIRMS-Hertzfeld ‘11**

[Henry; Research Professor of Space Policy and International Affairs; George Washington University; *Toward a Theory of Spacepower*; <http://www.ndu.edu/press/space-Ch5.html>; 2011; retrieved 16 Aug 2011]

Economic competition does encourage the development and deployment of new products and services, but not all of them may be of domestic origin. However, some U.S. policies, such as those that have encouraged the merger of many companies involved in space and defense work into an oligopolistic framework, have led to an interesting new economic structure where competition is among a few giant firms rather than among many providers. It also has led to similar conglomerations of firms abroad. This type of competition may not yield the same advantages (particularly to consumers—including the government as a purchaser of services) that usually are attributed to true competitive industries.

**TO MAINTAIN LEADERSHIP IN SPACE, THE US MUST ENCOURAGE PRIVATE COMPANIES-- Hertzfeld ‘11**

[Henry; Research Professor of Space Policy and International Affairs; George Washington University; *Toward a Theory of Spacepower*; <http://www.ndu.edu/press/space-Ch5.html>; 2011; retrieved 16 Aug 2011]

To the extent that the global market opportunity is denied by restrictive commercial policies, spacepower from a purely international economic competitive perspective is diminished. As encouraging as the U.S. commercial space policies are in Presidential documents over the past 20 years, they have been unintentionally undermined to a large extent by other policies. In the United States, security almost always trumps commerce.

The United States is still the largest investor in space in the world and the technological and commercial space leader in many areas. This leadership is being challenged. From an economic standpoint alone, it will become increasingly important for the United States to stimulate its industry to develop better and less expensive space products in order to maintain its competitive position. A strong commercial space industry can and will contribute to spacepower. It must be recognized that space is no longer the province of one or two strong nations and that other nations will continue to enter the market and continuously challenge this leadership.

**PRIVATIZATION WILL PREVENT AMERICA ABANDONING SPACE. LEADERSHIP DEPENDS ON IT-Nelson ‘11**

[Steven; staff writer; Fiscal Conservatives Call for Increased Privatization of Space; The Daily Caller; 08 Feb 2011; <http://dailycaller.com/2011/02/08/fiscal-conservatives-call-for-increased-privatization-of-space/>; retrieved 11 Aug 2011]

Space spending has long been the multibillion-dollar government project that is rarely discussed and even more infrequently brought up as a primary focus by fiscal conservatives.

Tuesday morning the Competitive Space Task Force, a self-described group of fiscal conservatives and free-market leaders, hosted a press conference to encourage increased privatization of the space industry.

Members of the task force issued several recommendations to Congress, including finding an American replacement to the Space Shuttle (so to minimize the costly expenditures on use of Russian spacecraft) and encouraging more private investment in the development of manned spacecraft.

Former Republican Rep. Robert S. Walker of Pennsylvania said, “If we really want to ‘win the future’, we cannot abandon our commitment to space exploration and human spaceflight. The fastest path to space is not through Moscow, but through the American entrepreneur.”

Task Force chairman Rand Simberg, of the Competitive Enterprise Institute, said, “By opening space up to the American people and their enterprises, NASA can ignite an economic, technological, and innovation renaissance, and the United States will regain its rightful place as the world leader in space.”

SOLVENCY: PRIVATIZATION GOOD FOR ECONOMY

**COMMERCIAL SPACE EXPLORATION WILL CREATE JOBS-Dyson ‘10**

[Esther; Prepare for Liftoff; Foreign Policy; 08 Feb 2010; <http://www.foreignpolicy.com/articles/2010/02/08/prepare_for_liftoff?page=0,1>; retrieved 14 Aug 2011]

Politically, the fuss is mainly about jobs that can help politicians get elected, and not about space exploration itself. The simple solution is some promise that the jobs will not be lost; they will simply be transformed. If no commercial company is willing to hire these workers, then perhaps they could retrain as teachers, an area where the United States desperately needs more scientists and technical people, or in medicine, which requires the same meticulous attention to detail.

But the commercial space market will need at least some of them. President Obama and all of us who want to focus on the future should not forget how good the private sector can be at creating both jobs and opportunities.

**A HIGH-TECH BOOM IN COMMERCIAL SPACE WILL DRIVE THE AMERICAN ECONOMY TO NEW HEIGHTS-Reynolds ‘10**

[Jackie; Renewing the Dream: How Free Market Principles Can Enable Commercial Space Development; 27 April 2010; <http://files.jackiedewaynereynolds.info/0410_Renewing.the.Dream.pdf>; retrieved 14 Aug 2011]

During the dot-com boom of the late =90s, venture capital investment grew by an annual average rate of 43 percent— from $7.5 billion in 1995 to over $120 billion in 2000 (MoneyTree Report). NASA‘s entire budget that year was only $17 billion. The capital invested in 2000 was three times NASA‘s single largest budget of $40 billion in 1966 (OMB). During any comparable period of time since 1995, venture capital investment has exceeded NASA‘s combined quarter trillion dollar budget from 1962 to1972 by more than $75 billion. A high-tech boom in the commercial space sector could fuel the next big surge in venture capital investment and drive our economy to even greater heights.

**COMBINATION OF NASA AND PRIVATE SECTOR CAN LEAD TO HUGELY INNOVATIVE AND PROFITABLE EXPLORATION OF SPACE-Tumlinson ‘05**

[Rick; columnist; Private Industry Can Help NASA Open the Space Frontier; 11 Mar 2005; Space.com; <http://www.space.com/171-private-industry-nasa-open-space-frontier.html>; retrieved 02 Aug 2011]

This lease would be part of an overall package designed to make it so sweet a deal that the firm and its investors would be able to see past any potential risks. Such a contract would include: The right of the developer to rent out any volume beyond the government's to anyone it pleases at whatever rate it chooses; the right to own all intellectual property it may develop while building the facility; the right to sell any advertising based on its contract and involvement in the project; and freedom from any taxes it might be assessed on profits realized from any activities generated by the project.

The privately funded new space firms will push into space if the money continues to flow and it doesn't turn out to be a billionaire's fad. NASA eventually might be able to spend billions and get something or someone to the Moon in a couple of decades -- if politicians and presidents continue their support.

For now NASA has billions of dollars and a mandate to push outward into space, but it needs a partner that thinks outside the box. The new space firms live outside of the box and if given the right support they could accelerate the push into space and make it permanent.

SOLVENCY: FUTURE OF SPACE EXPLORATION IS PRIVATIZATION

**THE FUTURE OF SPACE EXPLORATION AND DEVELOPMENT IS THROUGH WORLDWIDE PRIVATE EXPLORATION-Hertzfeld ‘11**

[Henry; Research Professor of Space Policy and International Affairs; George Washington University; *Toward a Theory of Spacepower*; <http://www.ndu.edu/press/space-Ch5.html>; 2011; retrieved 16 Aug 2011]

Until the 1980s, private companies in the United States were contractors and suppliers to the government space program and projects. They did not offer space services to the public. The one exception to this was in the important area of telecommunications. From the very beginning of the space age, U.S. private companies (in particular, AT&T) designed, built, and operated communications satellites and sold services to the public under strict government regulations and supervision.

Today, the landscape has changed. Companies in the United States are in direct competition with many foreign entities in space in almost all areas: launch vehicles, remote sensing satellites, telecommunications satellites of all kinds (voice, direct TV, fixed and mobile services), and navigation services. The technological capability to build and operate sophisticated space equipment has spread worldwide.

All evidence points to a continuation of this trend. Space has become a global enterprise with the number of nations and firms with space goods and services growing rapidly. And not only are more people involved in space but also the unique advantages of the space environment have contributed greatly to the growing trend toward globalization through its almost universal coverage of populated areas with communications and observation products and services.

**THE ONLY PATH FORWARD IS PRIVATE R&D DEVELOPMENT-Hertzfeld ‘11**

[Henry; Research Professor of Space Policy and International Affairs; George Washington University; *Toward a Theory of Spacepower*; <http://www.ndu.edu/press/space-Ch5.html>; 2011; retrieved 16 Aug 2011]

In summary, for a variety of reasons, the United States cannot return to the space era and space policies of the 1960s. It can be and is a leader in space technology, but it is not the leader in all aspects of space. Spacepower through commercial prowess is likely to be shared among spacefaring nations. Policies aimed at isolation and at protection of commercial industries only encourage others to develop similar (and sometimes better) products. The only policy that can now be effective in developing a larger and more powerful economic competitive engine for space products is one that encourages R&D investments by space firms. The introduction of new and more advanced products will create a larger global market for the United States. A policy emphasizing offense rather than defense would be advantageous for stimulating spacepower through space commerce.

**COMMERCIAL DEVELOPMENT IS THE ONLY WAY THE US CAN ACHIEVE ITS GOAL OF SOLAR SYSTEM EXPLORATION-Milstein ‘09**

[Michael; staff writer; NASA Makes Space U-Turn, Opening Arms to Private Industry; Popular Mechanics; 01 Oct 2009; <http://www.popularmechanics.com/science/space/4263233>; retrieved 01 Aug 2011]

For decades, NASA kept a tight fist around the construction and operation of the spacecraft that ferried its astronauts and hardware into orbit. Sure, an army of private contractors actually built the vehicles, but NASA oversaw the designs--and always kept the pink slips. Now, however, the agency seems to be shifting course, as NASA officials insist that the budding commercial spacecraft fleet represents the only way the United States can realize its dreams of solar-system conquest on schedule and at an affordable cost.

Because of a new focus for NASA's strategic investments--not to mention incentives like the Ansari X Prize, which spurred the space-tourism business, and the Google Lunar X Prize, which could do the same for payloads--private-sector spaceships could be ready for government service soon, says Sam Scimemi, who heads NASA's Commercial Orbital Transportation Services program. "The industry has grown up," he tells PM. "It used to be that only NASA or the Air Force could do such things.

**PRIVATE COMPANIES WILL LEAD TO PUSH TO HUMANITY BECOMING A SPACE-FARING CIVILIZATION-Diamandis ‘10**

[Peter; chief executive of the X Prize Foundation Space: The Final Frontier of Profit?; Wall Street Journal; 13 Feb 2010; http://online.wsj.com/article/SB10001424052748703382904575059350409331536.html; retrieved 21 Jul 2011]

Within the next several decades, privately financed research outposts will be a common sight in the night sky. The first one-way missions to Mars will be launched. Mining operations will spring up on the moon. More opportunities we have yet to even comprehend will come out of the frontier. One thing is certain: The next 50 years will be the period when we establish ourselves as a space-faring civilization.

As the generation that has never known a world without "Star Wars" and "Star Trek" matures, it will not be content to watch only government astronauts walk and work on the moon. A "let's just go do it" mentality is emerging, and it is that attitude that will bring the human race off this planet and open the final frontier.

**PRIVATE COMPANIES MUST LEAD THE WAY TO PROFITABLE EXPLORATION OF SPACE-Conover ‘11**

[Scott; senior in business administration; Private industry will lead space exploration; The Daily Barometer; 08 Jun 2011; <http://www.dailybarometer.com/forum/private-industry-will-lead-space-exploration-1.2380067>; retrieved 22 Jul 2011]

For NASA, space exploration should be second-hand, as they deal with the possibilities every day. For NASA, exploration should be easy. But, due to their organizational structure, their dependence on the government for funding, their adversity to risk and their utter lack of temerity when it comes to opportunities in their own fields of expertise, NASA will not be at the forefront of space settlement and exploration.

It will be private companies, as a part of the private sector and private industry, who will lead the way. Perhaps after there are private entities in space, doing as they wish, making profits as they see fit, there may come government entities seeking to match the efforts of these private organizations.

However, until that day, the potential aims and goals of private industry will drive space exploration and settlement. From space tourism, to mining near-earth asteroids, to helium-3 extraction from the moon, private industry holds the secret power - willpower - to explore the cosmos and bend them to our will. One small step for a corporation - one great profit for humankind.

**OUR FUTURE SPACE LEADERSHIP WILL DEPEND ON COMMERCIAL SECTOR’S CORE INVOLVEMENT IN SPACE-Walker ‘11**

[Robert; former chairman of the President’s Commission on the Future of Aerospace; A Powerful Case for Commercial Space; 02 May 2011; <http://spacenews.com/commentaries/110502-powerful-case-for-commercial-space.html>; retrieved 11 Aug 2011]

Already in this new century, three presidential commissions have examined the U.S. space program and have agreed. The case for commercial space is very strong. All three did not start out with a bias toward greater use of commercial space assets, but all three came to the conclusion that the private sector must become a prominent player in our space future. The Walker commission, the Aldridge commission and the Augustine commission each discovered independently that a robust space industry requires greater reliance on nongovernment investment and entrepreneurial vision.

Despite this overwhelming consensus among experts chosen to provide focus on where our space ambitions should take us, the plan of President Barack Obama’s administration for utilizing greater commercial assets in the civilian space arena engendered controversy on Capitol Hill when it was announced. The opposition to the new NASA direction claimed that abandoning “old space” would lead to an incapacity for exercising space leadership.

Yet the evidence compiled by each of the three expert commissions says just the opposite of the Capitol Hill conclusion. Our future leadership in space will depend on our ability to integrate the proven capabilities of the commercial sector into our national space objectives, civilian and military.

SOLVENCY: NASA SHOULD BE A CUSTOMER

**GOVERNMENT’S ROLE IS TO ANSWER PURE SCIENCE QUESTIONS AND AS A CUSTOMER-Diamandis ‘10**

[Peter; chief executive of the X Prize Foundation Space: The Final Frontier of Profit?; Wall Street Journal; 13 Feb 2010; http://online.wsj.com/article/SB10001424052748703382904575059350409331536.html; retrieved 21 Jul 2011]

This is not to say that the government will have no role in the next 50 years in space. Governments will retain the critical work of pure science, and of answering some of the biggest unknowns: Is there life on Mars, or around other stars? Governments will play the important role of big customer as they get out of the operations business. Private industry routinely takes technologies pioneered by the government—like air mail, computers and the Internet—and turns them into affordable, reliable and robust industries.

**NASA MUST RESTRUCTURE ITSELF AROUND A NEW VISION EMBRACING COMMERCIAL EXPLORATION-Walker ‘11**

[Robert; former chairman of the President’s Commission on the Future of Aerospace; A Powerful Case for Commercial Space; 02 May 2011; <http://spacenews.com/commentaries/110502-powerful-case-for-commercial-space.html>; retrieved 11 Aug 2011]

The President’s Commission on the Future of the United States Aerospace Industry, which I chaired in 2001-2002, recommended that we adopt a substantive vision for our national goals in space that we called the space imperative. The space section of that report was authored largely by Neil deGrasse Tyson and Buzz Aldrin. While the need for a vision was primary, we recognized that in both our civilian and military space programs, a fundamental need existed for expansion of commercial space activity and that the government and the investment community needed to be more sensitive to the commercial opportunities available in the 21st century.

When President George W. Bush presented the country with a vision for going back to the Moon and then on to Mars, he asked the President’s Commission on Moon, Mars, and Beyond, headed by former Air Force Secretary Pete Aldridge, to specify how the vision he had put forward could be achieved within a spending profile that was realistic. The Aldridge commission report made it clear that commercial space would have to play a major role in an achievable and fiscally sound program. In fact, the recommendation was that NASA restructure itself around the new vision embracing commercial assets. In particular, we recommended that low Earth orbit (LEO) become a commercial zone with lifts to LEO provided exclusively on commercial vehicles.

**NASA SHOULD STEP ASIDE AND LET PRIVATES DO THE HEAVY LIFTING-The Associated Press ‘10**

[NASA may hitch its rides on private sector spacecraft; LJ World; 1 February 2010; <http://www2.ljworld.com/news/2010/feb/01/nasa-may-hitch-its-rides-private-sector-spacecraft/>; retrieved 23 August 2011]

The idea is that getting astronauts into orbit, which NASA has been doing for 49 years, is getting to be so old hat that someone other than the government can do it. It’s no longer really the Right Stuff. Going private would free the space agency to do other things, such as explore beyond Earth’s orbit, do more research and study the Earth with better satellites. And it would spur a new generation of private companies to innovate.

SOLVENCY: INCENTIVES/PRIZES

**PRIZES ACCELERATE INNOVATION-Kay ‘10**

[Luciano; Professor of Public Policy, Georgia Institute of Technology; Modeling incentives, R&D Activities, And Outcomes In Innovation Inducement Prizes; 12 Mar 2010; <http://www.spp.gatech.edu/faculty/WOPRpapers/Kay.WOPR10.pdf>; retrieved 07 Aug 2011]

Overall, prizes may have significant effects on innovation. Some authors have suggested that prizes can accelerate innovation, that is, speed up technological development in certain fields (Anastas & Zimmerman, 2007; Masters & Delbecq, 2008). Others suggest that prizes may change the direction of innovation, that is, focus innovative efforts on problems for which solutions otherwise do not seem to be forthcoming (Davis & Davis, 2004). Moreover, it is often emphasized the capability of prizes to leverage R&D investment as well. For instance, X-Prize-like competitions are expected to multiply the prize reward by 10 in terms of team R&D expenditures and by 100 in terms of follow-on business and investment (King, 2008).

**PRIZES INCREASE DEVELOPMENT OF TECHNOLOGY-Kay ‘10**

[Luciano; Professor of Public Policy, Georgia Institute of Technology; Modeling incentives, R&D Activities, And Outcomes In Innovation Inducement Prizes; 12 Mar 2010; <http://www.spp.gatech.edu/faculty/WOPRpapers/Kay.WOPR10.pdf>; retrieved 07 Aug 2011]

In practice, multiple effects have been attributed to prizes, including technological impacts. For example, DARPA reported that the Grand Challenge 2005 led to many technical accomplishments and remarkable improvement in several technologies related to the prize challenge (DARPA, 2006). The NASA‘s Astronaut Glove Challenge 2007 led to technology commercialization, since the winner started a company and gained a contract to provide gloves to a spacesuits manufacturer (Stine, 2009). The privately-sponsored Ansari X-Prize, finished in 2004, sought to reduce access costs to space by offering a $10 million reward, yet led to a total estimate R&D investment by all prize participants of about $100 million and laid the basis for the commercialization of civilian space flights (Newell & Wilson, 2005). The $1 million Netflix Prize announced by Netflix formed a problem-solving community of more than 34,000 developers worldwide (McKinsey & Company, 2009)

**LARGE SCALE PRIZES COULD LEAD TO ASTEROID MINING AND MOON LANDINGS-Sargeant ‘08**

[Benjamin; The Use of Innovation Prizes by the National Aeronautics and Space Administration: An Analysis of Future Possibilities for Fostering Research and Development; 28 Jul 2008; <http://www.sts.virginia.edu/wip/docs/papers/Sargeant_08_r.pdf>; retrieved 11 Aug 2011]

Although the progress made thus far by the Centennial Challenges program is significant, NASA has only begun to tap the potential of innovation prizes. The agency has a number of options for improving its current innovation prize program. These include holding several largescale prizes to generate public interest and spur major development, establishing private foundations that would conduct promotional efforts and seek private funding, and using the experience and knowledge of a worldwide community of individual problem-solvers. The program could be expanded to include several large-scale prizes between $10 million and $25 million for a robotic lunar landing, a return of a sample from a near-Earth asteroid, or a human orbital flight (Kalil, 2006, 8; NASA Contests and Prizes, 2004, testimony of Steidle, 23; Leary, 2005). Large-scale prizes often open up follow-on opportunities and new marketable technologies following the competition (Davidian, 2005, 3). These major challenges could spur additional interest in and commitment to developing a robust private spaceflight industry that is capable of assisting NASA with low-Earth orbit operations.

**INDIVIDUAL PROBLEM SOLVERS COULD DRIVE TECHNOLOGICAL DEVELOPMENT-Sargeant ‘08**

[Benjamin; The Use of Innovation Prizes by the National Aeronautics and Space Administration: An Analysis of Future Possibilities for Fostering Research and Development; 28 Jul 2008; <http://www.sts.virginia.edu/wip/docs/papers/Sargeant_08_r.pdf>; retrieved 11 Aug 2011]

Individual problem-solvers, rather than teams, have the potential to offer a substantial number of innovative solutions for smaller prizes between $5,000 and $1 million. A large international community of these active and dedicated problem-solvers, who participate for cash prizes rather than the notoriety of winning a NASA challenge, already exists. InnoCentive, for example, is an online business that allows firms to post their most difficult science and technology research and development problems for anyone in its network of problem-solvers, currently totaling more than 120,000 scientists, to solve anonymously (Lakhani, 2007, 101-102; Kali, 2006, 21; Rejeski, 2005, 1; J. Turner, personal communication, July 23, 2008). NASA could post small prizes on InnoCentive or a similar site to obtain critical solutions to key technical difficulties in areas of applied research, such as aerospace, mechanical, or electrical engineering or computer science (InnoCentive Open Innovation Marketplace, 2008).

**INCENTIVES OFFER DEMONSTRATED SUCCESS AT MEETING SPACE GOALS-Sargeant ‘08**

[Benjamin; The Use of Innovation Prizes by the National Aeronautics and Space Administration: An Analysis of Future Possibilities for Fostering Research and Development; 28 Jul 2008; <http://www.sts.virginia.edu/wip/docs/papers/Sargeant_08_r.pdf>; retrieved 11 Aug 2011]

If the Centennial Challenges program continues on its present course, it will most likely continue to produce a steady number of solutions to small- and medium-scale prize contests. This is based on the demonstrated success of the program thus far and the high level of interest for each challenge from individual inventors, student groups, and outside teams. However, NASA should not expect every prize awarded through the current Centennial Challenges program to generate significant media or general public interest comparable to the X-Prize. Based on past congressional encouragement to use innovation prizes, the Congress would likely continue to support an NASA innovation prize program consisting of small- and medium-scale prizes (NASA Authorization Act of 2008 at 59 (2008)). Under the current program, NASA pays by funding the prize and benefits by receiving the innovation, whereas the participant benefits from the monetary prize and pays by relinquishing some of the intellectual property rights of the innovation. Both NASA and the inventor benefit through the publicity generated by the contest.

**THE BEST MODEL IS OFFERING PRIZES FOR MISSION GOALS-Sterner ‘10**

[Eric; Associate Deputy Administrator, Policy and Planning and Acting Chief of Strategic Communications, NASA; Worthy of a Great Nation? NASA’s Change of Strategic Direction; George C. Marshall Policy Outlook; April 2010; <http://www.marshall.org/pdf/materials/798.pdf>; retrieved 18 Aug 2011]

True support for the burgeoning commercial human spaceflight industry would significantly limit the amount of government intervention in the infant marketplace, lest the distortions created by real-, or near-monopsonistic government domination of demand and capital markets swamp free market signals. In the long run, the best approach may be to follow the Xprize model and create an award for the first company that meets certain very simple mission goals, such as carrying three people to the ISS orbit and demonstrating the ability to rendezvous and dock with another space object. Such an approach would theoretically reduce the cost of private capital by improving the possible returns on an investment. At the same time, it would reduce government financial risk by withholding cash until a winner had actually earned the prize. This differs from the COTS program in that the goal of COTS is to meet NASA-unique requirements for access to the space station, which requires intensive government oversight, whereas the prize program’s goal is to foster private sector innovation for its own sake, mandating considerably less government oversight. (The FAA would still be involved to regulate safety of passengers and the public.)

**EXPANDING INCENTIVES WILL MAKE SOLVENCY MORE LIKELY-Sargeant ‘08**

[Benjamin; The Use of Innovation Prizes by the National Aeronautics and Space Administration: An Analysis of Future Possibilities for Fostering Research and Development; 28 Jul 2008; <http://www.sts.virginia.edu/wip/docs/papers/Sargeant_08_r.pdf>; retrieved 11 Aug 2011]

Drawing on the experience and expertise of a multi-discipline, international community of problem-solvers would increase the probability of the Centennial Challenges fulfilling its primary goal: producing cutting-edge aerospace engineering technology of value to NASA. Using an online network of problem-solvers, such as InnoCentive, would also enable broader participation by an intellectually diverse group and allow more individuals to try to solve pressing NASA challenges. The current InnoCentive policy of completely anonymous interaction between the two parties would permit participation from individuals, such as foreign competitors, who would never otherwise contribute their valuable expertise (InnoCentive: About Us, 2008).

**INCENTIVE CONTESTS DRIVE RESEARCH AND PUBLIC INTEREST-Sargeant ‘08**

[Benjamin; The Use of Innovation Prizes by the National Aeronautics and Space Administration: An Analysis of Future Possibilities for Fostering Research and Development; 28 Jul 2008; <http://www.sts.virginia.edu/wip/docs/papers/Sargeant_08_r.pdf>; retrieved 11 Aug 2011]

Taking into account the various benefits and tradeoffs of each alternative, a comprehensive blueprint for conducting the most effective innovation prize program at NASA begins to emerge. The best program will build upon the groundwork laid by the Centennial Challenges program and its recent accomplishments. NASA should continue to initiate medium scale challenges that seek to develop innovative technologies that are helpful in meeting the agency’s engineering needs. In addition to producing valuable research, these challenges increase participation from independent teams of students, inventors, and companies and raise public interest in NASA’s activities and accomplishments.

**NASA SHOULD EXPAND TO A FEW LARGE-SCALE PRIZES-Sargeant ‘08**

[Benjamin; The Use of Innovation Prizes by the National Aeronautics and Space Administration: An Analysis of Future Possibilities for Fostering Research and Development; 28 Jul 2008; <http://www.sts.virginia.edu/wip/docs/papers/Sargeant_08_r.pdf>; retrieved 11 Aug 2011]

Given the success and substantial publicity of the X-Prize, NASA should seriously consider investing in a small number of major prizes that would develop new technologies vital to space exploration. A pilot program of two or three prizes on the order of $10 million to $25 million for the first privately-financed manned orbital flight or a robotic lunar landing and exploration mission on the Moon would spur broad innovations and new methods for exploring space. NASA should carefully select and construct the prizes to fit within preexisting research and space exploration goals and agency practices. A duplication of effort between a preexisting program and the innovation prize program could be detrimental to both. For example, an innovation prize focusing on the development of human spacecraft should be carefully designed and structured so that it supplements rather than duplicates the work carried out by the Commercial Orbital Transportation Services (COTS) program, which is fostering the development of private spacecraft capable of crew and cargo transport to the International Space Station.

SOLVENCY: HE-E MINING

**THE PRIVATE SECTOR CAN TAKE THE LEAD ON HE-3 DEVELOPMENT-Schmitt ‘04**

[Harrison; staff writer; Mining the Moon; Popular Mechanics; October 2004;<http://www.popularmechanics.com/science/air_space/1283056.html>; retrieved 27 Jun 2011]

Although the president's announcement did not mention it explicitly, his message implied an important role for the private sector in leading human expansion into deep space. In the past, this type of public-private cooperation produced enormous dividends. Recognizing the distinctly American entrepreneurial spirit that drives pioneers, the President's Commission on Implementation of U.S. Space Exploration Policy subsequently recommended that NASA encourage private space-related initiatives. I believe in going a step further. I believe that if government efforts lag, private enterprise should take the lead in settling space. We need look only to our past to see how well this could work. In 1862, the federal government supported the building of the transcontinental railroad with land grants. By the end of the 19th century, the private sector came to dominate the infrastructure, introducing improvements in rail transport that laid the foundation for industrial development in the 20th century. In a similar fashion, a cooperative effort in learning how to mine the moon for helium-3 will create the technological infrastructure for our inevitable journeys to Mars and beyond.

**THE INVOLVEMENT OF THE GOVERNMENT WILL SLOW THE PROCESS AND RAISE THE COST. THE PRIVATE SECTOR IS BETTER SUITED TO HE-3 EXTRACTION-Johnstone ‘11**

[Bruce; Astronaut Has $15 Billion Plan to Mine the Moon; Leader-Post; 03 May 2011; <http://www.leaderpost.com/technology/Astronaut+billion+plan+mine+moon/4718531/story.html;> retrieved 28 Jun 2011]

Following his speech, Schmitt said his $15-billion project, which he outlined in his 2006 book, Return to the Moon, could be implemented over 15 or 20 years.

Far from being "out of this world,'' Schmitt believes this lunar mining venture could be financed primarily by the private sector.

"If NASA or some other government space agency decides they're going to support technology development, then that will improve the financial position (of the helium-3 project). Unfortunately, when you start getting governments involved, it also prolongs the time and also raises the cost. So I'd rather see it entirely done by the private sector."

**THE WORKABLE VISION FOR HE-3 MINING INVOLVES PRIVATE INVESTMENT AND ENTERPRISE-Schmitt ‘97**

[Harrison; Geologist and Astronaut; Abstract: Interlune-Intermars Business Initiative: Returning to Deep Space; Journal of Aerospace Engineering; April 1997; <http://cedb.asce.org/cgi/WWWdisplay.cgi?9701071>; retrieved 23 August 2011]

Within this vision, the major mission objectives of the Initiative are to provide investors with a competitive rate of return; protect the Earth’s environment and expand the well-being of its inhabitants by using energy from space, particularly lunar ³He, as a major alternative to fossil and fission fuels; develop resources from space that will support future near-Earth and deep-space activities and human settlement; and develop reliable and robust capabilities to launch payloads from Earth to deep space at a cost of $1,000/kg or less (1996 dollars). Attaining a level of sustaining operations for the core fusion power and lunar resource business requires about 15 years and 10–$15 billion of private investment capital as well as the successful marketing and profitable sales of a variety of applied fusion technologies.

SOLVENCY: LAUNCHES/CARGO

**COMMERCIAL EXPLORATION IS BETTER SUITED TO LAUNCHES-Walker ‘11**

[Robert; former chairman of the President’s Commission on the Future of Aerospace; A Powerful Case for Commercial Space; 02 May 2011; <http://spacenews.com/commentaries/110502-powerful-case-for-commercial-space.html>; retrieved 11 Aug 2011]

Not surprisingly, NASA turned to concepts developed by the Augustine commissioners that tracked previous recommendations, namely more reliance on commercial space providers. But they also had to cancel major elements of the Constellation program, an unpopular decision with the traditional NASA supporters on Capitol Hill. Contractors, NASA centers and astronaut heroes came forward to criticize the plan, and because commercial space proposals now looked like competition for “old space” dollars, the criticism extended to private-sector initiatives. The commercial launch industry, in particular, was said to be too untested to be trusted with future delivery of cargo and crew to the international space station, the principal role that NASA envisioned for the private companies.

But as the debate evolved, the commercial alternative looked better and better. While Congress created its own plan for NASA’s future that included some funding for commercial space, its primary focus was a demand that NASA build a new heavy-lift rocket that NASA doubts can be completed on the timeline specified in the law. Moreover, the cost of that vehicle is thought to be quite high, perhaps unaffordably high. Meantime one commercial firm, Space Exploration Technologies (SpaceX), placed its Dragon capsule in orbit and brought it safely back to Earth, and did so at costs far below those typical of orbital projects. Other space companies, such as Sierra Nevada, Orbital Sciences and Boeing, are in the process of creating their own capable vehicles.

**COMMERCIAL LAUNCHES WILL MAKE AMERICA MORE COMPETITIVE-Walker ‘11**

[Robert; former chairman of the President’s Commission on the Future of Aerospace; A Powerful Case for Commercial Space; 02 May 2011; <http://spacenews.com/commentaries/110502-powerful-case-for-commercial-space.html>; retrieved 11 Aug 2011]

For those who worry about our ability to compete internationally in the space arena, the commercial option offers much hope. We already are beginning to see the cost curve favor American launchers over their foreign competition, including the Chinese. When we have affordable launch, the result will be a better business climate for our satellite manufacturers. That, in turn, will lead to the survival of third-, fourth- and fifth-tier industrial suppliers, meaning less need to purchase components offshore.

**ALLOWING PRIVATE COMPANIES TO HAUL CARGO WILL FREE UP NASA’S BUDGET-Milstein ‘09**

[Michael; staff writer; NASA Makes Space U-Turn, Opening Arms to Private Industry; Popular Mechanics; 01 Oct 2009; <http://www.popularmechanics.com/science/space/4263233>; retrieved 01 Aug 2011]

Hauling cargo represents the grunt work of space exploration and, dominated by the space shuttle, it has long gobbled millions of dollars of NASA's budget. The agency's new vision hands that duty off to private companies that, freed from government paperwork, can do it more economically. This would free up more of the NASA budget for space exploration missions, Scimemi says.

**THE REAL LAUNCH COST IS LABOR, WHICH PRIVATE INDUSTRY CAN REDUCE-Diamandis ‘10**

[Peter; chief executive of the X Prize Foundation Space: The Final Frontier of Profit?; Wall Street Journal; 13 Feb 2010; http://online.wsj.com/article/SB10001424052748703382904575059350409331536.html; retrieved 21 Jul 2011]

The challenge faced by all space-related ventures is the high cost of launching into orbit. When the U.S. space shuttle stands down later this year, NASA will need to send American astronauts to launch aboard the Russian Soyuz at a price of more than $50 million per person. The space shuttle, on the other hand, costs between $750 million to $2 billion per flight (for up to seven astronauts) depending on the number of launches each year. Most people don't realize that the major cost of a launch is labor. Fuel is less than 2%, while the standing army of people and infrastructure is well over 80%. The annual expense NASA bears for the shuttle is roughly $4 billion, whatever the number of launches.

**PRIVATE ENTERPRISE WILL LEAD TO COMPETITIVE COMPANIES DRIVING DOWN THE COST-Diamandis ‘10**

[Peter; chief executive of the X Prize Foundation Space: The Final Frontier of Profit?; Wall Street Journal; 13 Feb 2010; http://online.wsj.com/article/SB10001424052748703382904575059350409331536.html; retrieved 21 Jul 2011]

The government's new vision will mean the development of multiple operators, providing the U.S. redundancy as well as a competitive market that will drive down the cost of getting you and me to orbit. One of the companies I co-founded, Space Adventures, has already brokered the flight of eight private citizens to orbit, at a cost of roughly $50 million per person. In the next five years we hope to drive the price below $20 million, and eventually below $5 million.

**PRIVATE SECTOR SHOULD TAKE OVER LOW-EARTH ORBITS-Dyson ‘10**

[Esther; Prepare for Liftoff; Foreign Policy; 08 Feb 2010; <http://www.foreignpolicy.com/articles/2010/02/08/prepare_for_liftoff?page=0,1>; retrieved 14 Aug 2011]

From the public's point of view, it really doesn't make much sense for the government to operate low-earth-orbit space flights when the private sector is willing to take over that part of the job. The private sector will take it on for profits and focus on efficiency over radical innovation, while NASA's scientists and engineers get the opportunity to work on more speculative, long-term research and exploration projects. Right now, a variety of companies are developing and building spacecraft, exploring the production of pharmaceuticals in zero-gravity (which produces purer crystals), and devising space tourism operations.

**PRIVATE FIRMS ALREADY POISED TO HANDLE NASA CARGO-McMaster ‘08**

[Nick; Private Firms Hope to Haul NASA's Space Cargo; Newser; 25 September 2008; <http://www.newser.com/story/38384/private-firms-hope-to-haul-nasas-space-cargo.html>; retrieved 23 August 2011]

Hauling crew and equipment between earth and the international space station is expensive work, and NASA is looking to private entrepreneurs to pick up some of the slack, the Washington Post reports. Among the front-runners is Elon Musk, a founder of Paypal, who has seen his three prototype shuttles crash before they could make it into orbit.

But Musk is confident that his company, SpaceX, will be able to reliably reach space by the end of 2010. NASA sees private space enterprise as a boon, since it would allow them to focus on real exploration—and chilled relations with Russia mean the US may not always have its help ferrying cargo to the space station.

SOLVENCY: HUMAN SPACEFLIGHT

**NASA MUST BEGIN TO ALLOW THE PRIVATE SECTOR IN MANNED SPACEFLIGHT-Boaz ‘08**

[David; Space Privatization-from Cato to the BBC; 15 Sep 2008; <http://www.cato-at-liberty.org/space-privatization-from-cato-to-the-bbc/>; retrieved 16 Aug 2011]

In the premier issue of BBC Knowledge, the Cambridge University astrophysicist Martin Rees makes several provocative arguments about manned space flight. They are:

* The completion of the International Space Station (ISS) comes with a price tag of $50 billion, with the only profit being the cooperation with foreign partners.
* There is no scientific, commercial, or military value in sending people to space.
* Future expeditions to the Moon and beyond will only be politically and financially feasible if they are cut-price ventures.

He concludes that fostering good relations with other countries is insufficient justification for the expenditures, and that NASA should move aside and allow the private sector to play a role in manned space flight. The cost of these activities must lessen if they are to continue, and that will only happen with a decrease or removal of government involvement. Rees observes that only NASA deals with science, planetary exploration, and astronauts, while the private sector is allowed to exploit space commercially for things such as telecommunications. However, there is no shortage of interest in space entrepreneurship: wealthy people with a track record of commercial achievement are yearning to get involved. Rees sees space probes plastered with commercial logos in the future, just as Formula One racers are now.

**THE PRIVATE SECTOR IS ON THE VERGE OF TECHNOLOGY FOR MANNED FLIGHT-Tumlinson ‘05**

[Rick; columnist; Private Industry Can Help NASA Open the Space Frontier; 11 Mar 2005; Space.com; <http://www.space.com/171-private-industry-nasa-open-space-frontier.html>; retrieved 02 Aug 2011]

I am not stretching reality. At some point in the next 10 years the private sector will attain the ability to transport relatively large numbers of people and payloads to and from low Earth orbit on its own, to house them while they are in orbit and to develop the infrastructure needed for industrial development. This part of the frontier formula is simple: Transportation + Destination = Habitation + Exploitation + Industrialization.

As SpaceX and Bigelow begin to develop their infrastructure, Richard Branson, who created Virgin Galactic, will have been flying suborbital commercial space flights for years, as will have Jeff Bezos, the Amazon.com founder who just announced a new commercial spaceport in West Texas. Branson and Burt Rutan, the man behind SpaceShipOne, already have said they want to go to orbit and even beyond, as do Bigelow and Bezos, including trips to and around the Moon.

Again, this is serious stuff. I am not wildly chanting L-5 in '95 as the early followers of the late Gerard O'Neill of the Space Studies Institute in their naivete used to do. I am not betting on some pie-in-the-sky magic product like Iridium and the mythical little Leo constellations to fund start up rocket companies. I am certainly not betting on some magic government X vehicle like the X-33 space goose.

SOLVENCY: MARS

**MARS PRIZE APPROACH WOULD SOLVE-Zubrin '96**

[Robert; President of the Mars Society; Mars on a shoestring; November/December 1996; page 20]

I call the third approach to getting humans to Mars the Gingrich approach because I devised it under the prodding of the speaker of the House. In the summer of 1994 I was invited to dine with Rep. Newt Gingrich (R-Ga.) and some of his staff to explain my ideas about Mars exploration. Gingrich was enthusiastic. "I want to support this with legislation," he told me, but he proposed doing it "in a more free-enterprise kind of way than just gearing up the NASA budget to go to Mars." He invited me to talk more about it on his TV show, which I did.

I then met several times with Jeff Eisenach, President of the Progress and Freedom Foundation, Gingrich's D.C. think-tank. What we came up with was the idea of a Mars Prize bill: the U.S. government would post a $20 billion reward for the first private organization to successfully land a crew on Mars and return it to earth, as well as several prizes of a few billion dollars each for attaining various technical milestones along the way.

**MARS PRIZE APPROACH HAS A NUMBER OF ADVANTAGES-Zubrin '96**

[Robert; President of the Mars Society; Mars on a shoestring; November/December 1996; page 20]

This is, to say the least, a novel approach to human space exploration, which until now has been entirely government run. But it has a number of remarkable advantages. In the first place, this approach renders cost overruns impossible. The government will not spend a penny unless the desired results are achieved, nor spend a penny more than the award sum agreed upon at the start. Success or failure will depend solely upon the ingenuity of the American people and the workings of the free enterprise system, not upon political wrangling. After all, when Charles Lindbergh flew the Atlantic, he did it not as part of a government-funded program but in pursuit of a privately posted prize. Many such prizes were offered for breakthrough technical accomplishments in aviation's early years, and collectively they played a major role in raising the art of flight from its infancy to a globe-spanning transportation network.

**MARS PRIZE PROGRAM WOULD SPUR ECONOMIC GROWTH-Zubrin '96**

[Robert; President of the Mars Society; Mars on a shoestring; November/December 1996; page 20]

There are other advantages as well. Because it would attract billions of dollars in private investment and technical development, the prize would spur economic growth even before any government expenditure. Moreover, this approach would call into being not only a private space race but a new kind of aerospace industry, one based on minimum-cost production. Under today's "cost plus" method, where the government pays aerospace companies 10 or 15 percent above whatever it costs them to do a job, contractors are overstaffed and have little incentive to control overhead. Under the prize system, the profit would be the value of the prize minus the company's costs, period. Firms would have a big incentive to drive costs down and would bear a much lighter accounting and documentation burden.

**IF NOBODY TAKES UP THE CHALLENGE, THE PROGRAM COSTS NOTHING-Zubrin '96**

[Robert; President of the Mars Society; Mars on a shoestring; November/December 1996; page 20]

No doubt many people would be skeptical that a piloted Mars mission could be flown for $6 billion--but that wouldn't matter. If the Mars Prize bill were passed, the only thing that would matter was whether a few investors think it could. We wouldn't have to convince a majority of Congress, only a Bill Gates. And if nobody took up the challenge, the whole exercise would have cost the taxpayers absolutely nothing.

SOLVENCY: MOON EXPLORATION

**FUTURE EXPEDITIONS TO THE MOON AND BEYOND WILL HAVE TO BE PRIVATE VENTURES TO SUCCEED-Rees ‘11**

[Martin; Astronomer Royal ; In Gagarin’s Footsteps;Prospect; 22 Mar 2011]

Future expeditions to the moon and beyond won't be politically and financially viable unless they are cut-price ventures, spearheaded by individuals prepared to accept high risks. The US now contracts with private companies to undertake launches, rendering Nasa more like an airport authority than an airline. The Falcon 9 rocket system, developed by the entrepreneur Elon Musk's company SpaceX, has successfully launched a payload into orbit. The involvement in the sector of credible and well-resourced figures such as Musk and Jeff Bezos, the founder of Amazon, is surely a positive step. Google, meanwhile, has offered a prize for whoever can build and launch a robotic lunar lander able to travel 500 metres and beam back a video.

**PRIVATE COMPANIES WILL MORE EFFICIENTLY AND EFFECTIVELY EXPLORE THE MOON-Schmitt ‘05**

[Harrison; Return to the Moon: Exploration, Enterprise, and Energy in the Human Settlement of Space; 2005; pgs. 46-47]

Many other issues would be approached by a private enterprise effort in ways very different from an effort managed by a government agency. For example, a private company will immediately want its lunar employees to be settlers, eliminating the costs for their return to Earth. Additionally, spacecraft will be specialized for the tasks of landing precisely at known resource-rich locations on the Moon rather than serving two or more masters, such as, the International Space Station and a Lunar Base, as envisioned by NASA. The private initiative will concentrate on lunar surface vehicles, highly mobile space suits, work facilities, and buried habitats that provide reliable, low cost resource recovery. All equipment will be designed for indefinite operational life, including embedded diagnostics, anticipatory component replacement, and ease of maintenance and refurbishment. Development of side business lines would proceed quickly to improve profit margins and help pay off debt. These potential businesses include sale of hydrogen, water and oxygen by-products from helium-3 extraction as well as food and other materials produced on the Moon. Lunar exports would be shipped to customers in space, including those going on to Mars. Launch of consumables from the Moon's one-sixth gravity to space-based customers has a great competitive cost advantage funded .

SOLVENCY: SETI

**GOVERNMENT INVOLVEMENT IN SETI COULD LEAD TO CENSORSHIP AND INTERNATIONAL COMPETITION-Harrison ‘09**  
[Albert; Professor of Psychology, UC-Davis; The future of SETI: Finite effort or search without end?; Futures; May 2009]  
  
Several ‘‘wild cards’’ could forever change the nature SETI. The first is government involvement. SETI has been a peaceful activity. The scientists involved have been quite open about their activities and look to international organizations such as the United Nations to assure order and progress. Governments could become involved if classified state-of-the-art technology detects hints of extraterrestrial intelligence, or if officials conclude that the scientists are about to hit pay dirt. Under these conditions scientists could be replaced by security agents, detailed reports by highly censored news releases, and openness by secrecy [43]. Rather than being a celebratory event for everyone, the discovery could become a bargaining chip in international affairs.

SOLVENCY: MILITARY APPLICATIONS

**MILITARY USES OF SPACE CAN ALSO BE ENHANCED THROUGH PRIVATE ENTERPRISE-Walker ‘11**

[Robert; former chairman of the President’s Commission on the Future of Aerospace; A Powerful Case for Commercial Space; 02 May 2011; <http://spacenews.com/commentaries/110502-powerful-case-for-commercial-space.html>; retrieved 11 Aug 2011]

What needs to be realized is that it is not only the civilian space programs that benefit from the growth of a commercial space industry. Our military needs also can be enhanced by competition. Fixed-price contracts for delivery of services can replace cost-plus contracts. Payloads hosted on commercial satellites can give the Pentagon lower-cost options for many of its missions. As launch costs come down because of the efficiencies that commercial providers bring to the market, traditional contractors will have to find ways to lower their costs as well. And vigorous competition among a wide range of providers, launch and satellite, will mean a broader industry with the capacity to contribute more to the national economy and the national defense.

**THE MILITARY LEASES 80% OF COMMUNICATIONS FROM COMMERCIAL SOURCES TODAY-Clark ‘11**

[Stephen; U.S. military turns to private sector for SATCOM capacity; Spaceflight Now; 17 Feb 2011; <http://spaceflightnow.com/news/n1102/17milsatcom/>; retrieved 17 Aug 2011]

The U.S. government currently leases about 80 percent of its communications capacity from commercial sources, according to Richard Pino, deputy director of communications and network programs at the Pentagon.

"The commercial marketplace for procuring commercial satellite technologies is maturing very rapidly, and in some cases may be eclipsing what the military can do," Pino said at a commercial space conference in Washington last week.

Pino said government-owned satellites should focus on nuclear-hardened communications, contested environments and anti-jamming capabilities. Commercial satellites can provide the bulk of everyday communications for the military.

**THE MILITARY HAS EMPIRICALLY RELIED ON COMMERCIAL PROVIDERS-Clark ‘11**

[Stephen; U.S. military turns to private sector for SATCOM capacity; Spaceflight Now; 17 Feb 2011; <http://spaceflightnow.com/news/n1102/17milsatcom/>; retrieved 17 Aug 2011]

"Boeing received orders for five hosted payloads in the past 18 months," said Craig Cooning, vice president and general manager of Boeing Space & Intelligence Systems. "These are a win-win for the military, which needs the bandwidth, and the commercial SATCOM service providers, which benefit from a secondary revenue stream. Our partnership with commercial satellite industry and our legacy of government support will result in many creative approaches to assisting this country's men and women in uniform."

The Boeing 702 medium-power or high-power satellite design could host secondary payloads. Inmarsat ordered three high-power 702 spacecraft in August, and each of the satellites will carry a hosted Ka-band military payload, according to Boeing.

Intelsat spacecraft have also hosted U.S. military communications payloads.

Pino told an audience of industry leaders last week the Pentagon faces upcoming decisions on the expansion of MILSATCOM programs, increasing commercial transponder leasing, hosted payloads, and purchasing off-the-shelf communications satellites from a supplier like any other private sector operator.

SOLVENCY: SPACE-BASED SOLAR POWER

**THERE ARE ALREADY SIX AMERICAN COMPANIES PURSUING SBSP COMMERCIALLY-Preble ‘09**

[Darel; Chair of the Space Solar Power Workshop**;** Space Solar Power: Star Player on the Bench; The Oil Drum; 19 April 2009; <http://www.theoildrum.com/node/5306;> retrieved 23 Jun 2011]

SSP is a simple idea. As the picture shows, huge amounts of sunlight would be gathered in high, GeoSynchronous Orbit; reflected by mirrors to photovoltaic sheets; converted to electric power; then beamed from a large transmitter to even larger antennas (rectennas - rectifying antennas - is the proper term) on Earth. Each rectenna is actually part of the grid of a contracting electric utility which would buy, transmit and distribute the power to their customers. Numerous competing technologies, many quite mature, offer robustness to SSP designs. There are numerous advantages to putting these panels in space, beginning with the fact that panels would collect 9.6 times as much energy per day at GSO than on earth, on average.

Since PG&E contracted with Solaren last week for the First Space Solar Power Delivery in 2016, controversy about this unique capability has taken on new life. Half a dozen other companies are actively courting SSP contracts, such as Heliosat, Space Energy, Space Island Group, Powersat and the Welsom Space Consortium. The reactions to Solaren’s contract are frequently dubious. Clearly Solaren and other SSP hopefuls assume their designs will win the Billions in contracts necessary to turn SSP into a winner. The joker in this big poker game is that you don't know the depth of money that may be behind a given company. And this game has just begun.

**ANY COMPANY PURSUING SBSP WILL INCUR HUGE LOSSES, BUT THE POTENTIAL PAYOFF IS ENORMOUS-Preble ‘09**

[Darel; Chair of the Space Solar Power Workshop**;** Space Solar Power: Star Player on the Bench; The Oil Drum; 19 April 2009; <http://www.theoildrum.com/node/5306;> retrieved 23 Jun 2011]

Any company starting to build an SSP System (SSPS) will incur significant losses for years before turning a profit. Google did that as people wondered about their business plan for years - they have established quite a fine business. Still, there is nothing else quite on the scale of the SSP challenge and opportunity - capturing the energy of the sun. An SSPS with reasonable assumptions about shading, collection and beaming efficiency, etc., could collect 3000 Terawatts at GSO and inject 1500 Terawatts to contracting power grids owned by participating utilities, such as PG&E, virtually anywhere on Earth.

**THE FUTURE HOPE FOR SBSP DEPENDS ON PRIVATE ENTREPRENEURS-Hsu ‘10**

[Feng; Sr. Vice President Systems Engineering & Risk Management, Space Energy Group; Harnessing the Sun: Embarking on Humanity's Next Giant Leap; Online Journal of Space Communication; Winter 2010; [http://spacejournal.ohio.edu/issue16/hsu.html; re](http://spacejournal.ohio.edu/issue16/hsu.html;r)trieved 23 Jun 2011]

I believe that the future hope for a viable Solar Power Satellite system lies in the collaborative efforts of private, entrepreneurial space businesses and venture capital investment, undertaken as a global scale commercial enterprise. Quite frankly, as a former employee of one of the great space agencies of the world, I am pessimistic about getting the necessary government support for any SBSP project. I was disappointed, even surprised, to see no mention about energy and economic development from the United States' vision for the future of its space endeavors.

**PRIVATE CORPORATIONS ARE WORKING ON SPACE BASED SOLAR POWER-Pannu ‘10**

[Aman; Aerospace & Defence Consulting Analyst, Frost & Sullivan; Space Jam: The Space Market; 30 Nov 2010; <http://www.frost.com/prod/servlet/market-insight-top.pag?docid=217302111>; retrieved 11 Aug 2011]

Space-Based Solar Power (SBSP) satellites are under consideration as a feasible energy alternative. Japan Aerospace Exploration Agency (JAXA) plan to launch a small satellite fitted with solar panels in 2015, and test beaming the electricity from space through the ionosphere, the outermost layer of the earth's atmosphere, according to the trade ministry document. The Japanese government hopes to have the solar station fully operational in the 2030s. Under this project, Mitsubishi Electric Corporation and IHI Corporation are leading a $21 billion Japanese project intending to build a giant solar-power generator in space within three decades and beam electricity to earth. Similarly 'Solar Energy' a private firm is developing a SBSP system with a similar, if not, an earlier timeline. In 2009, Pacific Gas & Electric (PG&E) an energy utility announced a deal Monday to purchase 200 megawatts of electricity from Solaren Corporation that plans to beam the power down to Earth from outer space, beginning in 2016.

**SBSP CANNOT SOLVE FOR ECONOMY AND ENVIRONMENT UNLESS PRIVATELY OWNED-Rouge, et al ‘07**

[Joseph; Acting Director, National Security Space Office; *Space‐Based Solar Power*

*As an Opportunity for Strategic Security*; 10 2007; retrieved 24 Jun 2011; [http://www.nss.org/settlement/ssp/library/final-sbsp-interim-assessment-release-01.pdf]](http://www.nss.org/settlement/ssp/library/final-sbsp-interim-assessment-release-01.pdf%5D)

The SBSP Study Group found that SBSP systems are unlikely to become economically competitive, nor produced on the scale that is needed to help solve global energy and environmental problems unless the systems are manufactured, owned, and operated by private industry. This finding is consistent with the U.S. National Space Policy that advocates space commercialization.

**PRIVATE CORPORATIONS CAN BETTER DEVELOP AND DEPLOY SOLAR POWER SATELLITES-Pelton ‘10**

[Joseph; Space & Advanced Communications Research Institute, George Washington University; A new space vision for NASA—And for space entrepreneurs too?; Space Policy; May 2010; pgs. 78-80]

The real key is to unlock the potential of commercial space initiatives while giving a very middle-aged NASA a new lease on life. Here are just some of the possibilities that are on the horizon of a revitalized commercial space industry.

Solar power satellites: The new space company Solaren has recently contracted with a US west coast energy utility to start beaming clean solar energy from space to Earth in 2016 via a tri-part solar power system. Its three key components are: 1) a lightweight solar concentrator; 2) a high performance solar cell array that will see the equivalent of many suns 24 h a day; and 3) a transmission system from space to Earth. Solar power satellites could be a major new part of the new mix of “green energy systems” we need to reduce our addiction to carbon-based fuels. Serious efforts are now underway not only in the USA but in Japan and other countries seeking a new source of clean energy [11].

SOLVENCY: SPACE DEBRIS CLEANUP

**THE “PRIZE” MODEL OFFERS THE PROMISE OF A DEBRIS SOLUTION-Johnson and Hudson ‘08**

[Lt. Kevin and John, PhD; project supervisors, Global Innovation and Strategy Center; Eliminating Space Debris: Applied Technology and Policy Prescriptions; January 2008; <http://www.slideshare.net/stephaniclark/giscinternpaperspacedebriselimination;> retrieved 27 Jul]

From launching costs to space assets, there is nothing inexpensive about space technology. As a solution to funding the technology development needed to eliminate space debris, the global interest generation concept demonstrated by a “prize” model might be effective. Global interest has the potential to not only spark inexpensive and innovative elimination technologies but are also an opportunity to create global awareness. Awareness could lead to improved prevention techniques and help reduce future debris numbers.

**GOVERNMENTS SHOULD ALLOW ENTREPRENEURS AND PRIVATE INDUSTRY TO SOLVE-Szoka and Dunstan ‘09**

[Berin, Senior Fellow at The Progress & Freedom Foundation and Jim, practices space and technology law; Beware of Space Junk: Global Warming Isn’t the Only Major Environmental Problem; Space Frontier; 20 Dec 2009; <http://spacefrontier.org/2009/12/20/beware-of-space-junk-global-warming-isnt-the-only-major-environmental-problem/;> retrieved 27 Jul 2011]

Instead, space-faring nations should create an Orbital Debris Removal and Recycling Fund (ODRRF). Satellite operators would pay relatively small fees to their governments, who would contribute the money to the Fund. These governments already charge satellite operators large licensing and regulatory fees. Private companies would be paid bounties out of the Fund for successfully removing debris according to the debris-creation-avoidance value assigned to each object. Apart from the obvious long-term benefits of preserving the usability of the space environment, satellite operators would benefit in the short term from reduced insurance rates and fewer mysterious satellite outages caused by collisions we cannot track. With the right funding mechanism, entrepreneurs can solve this problem. Governments must encourage innovation rather than crippling industry or creating yet another large government program to build and operate systems when the expertise for doing so clearly resides in the private sector.

**PRIVATES CAN BE MADE TO CLEAN UP THEIR OWN SPACE JUNK-David ‘10**

[Leonard; Space Superfund Needed to Clean Mounting Orbital Trash; Space.com; 14 December 2010; <http://www.space.com/10480-space-superfund-needed-clean-mounting-orbital-trash.html>; retrieved 23 August 2011]

At the core of the RAND report is an analysis of how industries on Earth have approached their pollution problems, and how those lessons can be applied to cleaning up orbital debris.

A set of comparable problems that share similarities with orbital debris were identified in the RAND study, related because they all share the following set of characteristics:

Behavioral norms (past and/or present) do not address the problem in a satisfactory manner.

If the problem is ignored, the risk of collateral damage will be significant.

There will always be an endless supply of "rule-breakers."

The problem will likely never be considered solved because the root cause is difficult to eliminate.

One observation from the report is that the space Superfund could serve as an effective model for orbital debris cleanup.

A Superfund for space would make space polluters pay for cleanups while creating strong incentives for nation-states and private industry to take appropriate preventative steps to avoid creating additional space debris.

Also, the report stresses that the entire space community needs to agree that purposely creating orbital debris is not acceptable behavior.

SOLVENCY: SPACE ELEVATORS

**THE BEST WAY FORWARD IS TO USE PRIVATE ENTREPRENEURS TO EXPLORE SPACE ELEVATORS-Klerkx ‘06**

[Greg; science journalist; Elevator to the stars: Forget rockets, there's a gentler way to get into space; New Scientist; 02 Sep 2006; pg. 36-39]

Even if this test succeeds, crucial questions remain. Can a lightweight cable ever be strong enough to stretch all the way into space? And even if it can, will it take an elevator into orbit any time soon?

Whatever the truth, NASA's new philosophy of giving more money and time to small entrepreneurs with big ideas has helped push both space elevators and tether technology to the fore. Not before time: as a means of lifting things into orbit, rockets are close to their maximum efficiency, both in terms of technology and cost. To launch anything of significance into space costs between $30 million and $100 million, and that doesn't include the cost of the satellite or spacecraft. These figures haven't budged for years.

**SPACE AGENCIES ARE NOT NECESSARY TO PLAY AN IMPORTANT ROLE-Klerkx ‘06**

[Greg; science journalist; Elevator to the stars: Forget rockets, there's a gentler way to get into space; New Scientist; 02 Sep 2006; pg. 36-39]

While happy that NASA is finally bringing some funding to the space elevator idea, companies such as LiftPort and Tethers Unlimited have no intention of waiting for the space agency to come onboard. Bradley Edwards, entrepreneur and author of NASA's 1999 concept study, believes that most of the research, prototyping and ultimately construction of space elevators will be done privately. "Financing is the key to progress on space elevators," he says. "We don't really see the space agencies playing a major role in the space elevator development, construction or operation."

**THERE ARE MANY PRIVATE COMPANIES CURRENTLY PURSUING SPACE ELEVATORS-Lewis ‘08**

[Leo; staff writer; Japan hopes to turn sci-fi into reality with elevator to the stars; The Sunday Times (London); 22 Sep 2008; <http://www.timesonline.co.uk/tol/news/science/article4799369.ece;> retrieved 06 Jul 2011]

In the carriages, the scientists behind the idea told *The Times*, could be any number of cargoes. A space elevator could carry people, huge solar-powered generators or even casks of radioactive waste. The point is that breaking free of Earth's gravity will no longer require so much energy — perhaps 100 times less than launching the space shuttle.

“Just like travelling abroad, anyone will be able to ride the elevator into space,” Shuichi Ono, chairman of the Japan Space Elevator Association, said.

The vision has inspired scientists around the world and government organisations including Nasa. Several competing space elevator projects are gathering pace as various groups vie to build practical carriages, tethers and the hundreds of other parts required to carry out the plan. There are prizes offered by space elevator-related scientific organisations for breakthroughs and competitions for the best and fastest design of carriage.

**SPACE ELEVATORS HAVE TO BE PRIVATELY FINANCED; GOVERNMENT WILL BLOCK ITS EFFECTIVE IMPLEMENTATION-Morris ‘04**

[Jefferson; staff writer; Space elevator' feasible because of nanotube advances; Aerospace Daily; 01 Jul 2004; pg. 1]

However, Donna Shirley, former manager with NASA's Mars exploration program and current director of the Science Fiction Museum in Seattle, warned that space elevator technology may be too economically disruptive for the government to support.

"It's got to be a privately driven system, because the government has too many incentives not to let it happen, too many incentives to throw up roadblocks in the way because they want to protect the existing infrastructure," she said.

SOLVENCY: SPACE TOURISM

**PRIVATE INVESTMENT IS BETTER FOR SPACE TOURISM AND STATIONS-Pelton ‘10**

[Joseph; Space & Advanced Communications Research Institute, George Washington University; A new space vision for NASA—And for space entrepreneurs too?; Space Policy; May 2010; pgs. 78-80]

Commercial spaceplanes and space stations: Space adventure tours to go into dark sky to see the big Blue Marble from space may become reality as soon as 2011. To date only some 500 people have gone into space since the dawn of the Space Age. This new industry (‘space tourism’ is not the right name for this high-risk-type adventure, which is much more dangerous than a commercial air flight) will potentially create the opportunity for thousands of “citizen astronauts” to fly over 100 km into space. The space adventure business is currently being developed by enterprising billionaires. Sir Richard Branson, head of Virgin Galactic, is the most visible leader, but there are many others willing to risk capital on commercial space. They include Jeff Bezos, founder of Amazon.com, Robert Bigelow, owner of Budget Suites, Paul Allen, one of the backers of the Space Ship Corporation, John Carmack, creator of video games such as “Doom”, and Elon Musk, founder of PayPal. Each of these entrepreneurs of great wealth is currently putting serious money into developing spaceplane technology and commercial space platforms. Robert Bigelow has already launched his Genesis 1 and 2 commercial space station prototypes.

**SPACE TRAVEL CAN BE ACHIEVED BY THE PRIVATE SECTOR-Younkins ‘10**

[Edward; Professor of Accountancy at Wheeling Jesuit University; From NASA to Commercial Space Enterprises; 2010; retrieved 14 Jul 2011; <http://rebirthofreason.com/Articles/Younkins/From_NASA_to_Commercial_Space_Enterprises.shtml>]

Space travel is not too costly for the private sector. The free market is capable of funding safe space exploration and tourism. For the last fifty years, advocates of a government run space program have maintained that the enormous amount of capital and resources required can best be obtained by government and that the cost was just too high for the private sector. Of course, it was the government’s emphasis of its space “program” that entailed a single concerted effort by a bureaucratic empire-building institution such as NASA that uses tax dollars to fund its projects. It was government that kept the cost high and that enhanced NASA’s monopoly through subsidization, legislation, and regulation. NASA has come to be viewed by many as a vast, nationalized, high-tech jobs program.

**SPACE TOURISM IS BEING AGGRESSIVELY PURSUED IN THE PRIVATE SECTOR-Pannu ‘10**

[Aman; Aerospace & Defence Consulting Analyst, Frost & Sullivan; Space Jam: The Space Market; 30 Nov 2010; <http://www.frost.com/prod/servlet/market-insight-top.pag?docid=217302111>; retrieved 11 Aug 2011]

Virgin Galactic, Boeing, Armadillo Aerospace, XCOR Aerospace, Bigelow Aerospace, Galactic Suite, Orbital Technologies are some of the companies working progressively towards establishing Space Tourism as a commercial reality.  Recently, in 2010, Boeing and Space Adventures partnered to Offer Commercial Spaceflight Opportunities by 2016. Also, Richard Branson (the boss of Virgin Galactic) has announced plans to launch by 2012 the first space shuttle passenger; Russian company, Orbital Technologies intend to build the first hotel in space and operate as early as 2016; and the first full-scale space hotel module by Bigelow Aerospace, the Sundancer is scheduled to take flight by 2014. Considering that nearly 330 people have made deposits totaling $45 million to reserve flights with Virgin Galactic, Space Tourism is intending to become a reality very soon and thrive in years to come. Eventually, as the interest grows, and passenger footfall increases the price is expected to get within an 'affordable price' of a wider population (albeit still considerable high earners), and vice-versa. The Tickets are currently priced at $200,000 for Virgin Galactic; with other suborbital flights include Rocketplane for $250,000 per person and XCOR for approximately $95,000. Industry experts are contemplating an industry potential of at least $1 billion by the start of the next decade. By 2030, Frost & Sullivan expects Space Tourism to become a notable contributor to the overall Space Industry revenues, with continuing potential to grow further.

A/T: PERM

**NO PERM: CAN’T TWEAK NASA AROUND THE EDGES, BUT MUST COMMIT TO A FUNDAMENTAL SHIFT EMPHASIZING PRIVATE ENTERPRISE-Pelton ‘10**

[Joseph; Space & Advanced Communications Research Institute, George Washington University; A new space vision for NASA—And for space entrepreneurs too?; Space Policy; May 2010; pgs. 78-80]

The first step, of course, would be to retool and restructure NASA from top to bottom and not just tweak it a little around the edges. The first step would be to explore what space activities can truly be commercialized and see where NASA could be most effective by stimulating innovation in the private sector rather than undertaking the full mission itself.

XPrize Founder Peter Diamandis has noted that we don't have governments operating taxi companies, building computers, or running airlines—and this is for a very good reason. Commercial organizations are, on balance, better managed, more agile, more innovative, and more market responsive than government agencies. People as diverse as movie maker James Cameron and Peter Diamandis feel that the best way forward is to let space entrepreneurs play a greater role in space development and innovation. Cameron strongly endorsed a greater role for commercial creativity in U.S. space programs in a February 2010 Washington Post article and explained why he felt this was the best way forward in humanity's greatest adventure: “I applaud President Obama's bold decision for NASA to focus on building a space exploration program that can drive innovation and provide inspiration to the world. This is the path that can make our dreams in space a reality”

**NO PERM: GOVERNMENT SUBSIDIES WILL LEAD TO GOVERNMENT CONTROL OF PRIVATE INITIATIVES IN SPACE-Schmitt ‘11**

[Harrison; former US Senator and astronaut; *Space Policy and the Constitution*; 2011; pg. 5-6]

Advocacy of extra-constitutional -investments (read subsidies) by government in ventures aimed at commercial applications, even to meet a non-defense federal requirement, reflects a desire for more federal control of private enterprise rather than belief in the realities of the market place. Few, if any, past successes for this approach can be identified. Even those past federal -commercial investments with constitutional justification, such as the Transcontinental Railroad, ended up being very messy and corrupt.

**BACKING THE GOVERNMENT OUT WILL GIVE PRIVATE ENTERPRISE THE ABILITY TO LEAD IN SPACE-Younkins ‘10**

[Edward; Professor of Accountancy at Wheeling Jesuit University; From NASA to Commercial Space Enterprises; 2010; retrieved 14 Jul 2011; <http://rebirthofreason.com/Articles/Younkins/From_NASA_to_Commercial_Space_Enterprises.shtml>]

Recognizing the need to back the government out of civilian space activities and to allow imaginative private sector ideas to flourish, Congress passed the Commercial Space Act of 1998. This step toward privatization:  (1) allows the Federal Aviation Administration (FAA) to license the launch and landing of reusable launch vehicles and commercial payloads; (2) mandates the use of commercial launch services for most government payloads; (3) requires government to purchase space science data from private companies; (4) requires NASA to study commercial possibilities for the International Space Station and further privatization of the Space Shuttle; and (5) streamlines licensing requirements for remote sensing satellites.

**IT IS IMPOSSIBLE TO INTEGRATE THE MINDSET OF GOVERNMENT AND PRIVATE DEVELOPMENT-Garmong ‘04**

[Robert; Ph.D. in philosophy, is a writer for the Ayn Rand Institute; Privative the Space Program; The Rational Argumentator; 02 Mar 2004; <http://rationalargumentator.com/issue20/privatizespace.html>; retrieved 16 Aug 2011]

There is reason to believe that the political nature of the space program may have even been directly responsible for the Columbia disaster. Fox News reported that NASA chose to stick with non-Freon-based foam insulation on the booster rockets, despite evidence that this type of foam causes up to 11 times as much damage to thermal tiles as the older, Freon-based foam. Although NASA was exempted from the restrictions on Freon use, which environmentalists believe causes ozone depletion, and despite the fact that the amount of Freon released by NASA's rockets would have been trivial, the space agency elected to stick with the politically correct foam.

It is impossible to integrate the contradictory. To whatever extent an engineer is forced to base his decisions, not on the realities of science but on the arbitrary, unpredictable, and often impossible demands of a politicized system, he is stymied. Yet this politicizing is an unavoidable consequence of governmental control over scientific research and development.

**WE CAN’T TINKER AROUND THE EDGES; NASA NEEDS A FUNDAMENTAL REFOCUSING ON PRIVATE INDUSTRY-Pelton ‘10**

[Joseph; Professor with the Institute for Applied Space Research @George Washington University, A New Space vision for NASA—And for Space Entrepeneurs Too?; Space Policy; 10 May 2010; pg. 78-79]

NASA – now past 50 – is well into middle age and seemingly experiencing a mid-life crisis. Any honest assessment of its performance over the past two decades leads to the inexorable conclusion that it is time for some serious review—and even more serious reform. National U.S. Space Study Commissions have been recommending major reform for some years and finally someone has listened. President Obama has had the political and programmatic courage to make some serious shifts in how NASA does its business. It is no longer sufficient to move some boxes around and declare this is the new and improved NASA. One of the key messages from the 2004 Aldridge Commission report, which was quickly buried by NASA, was words to this effect: “Let enterprising space entrepreneurs do what they can do better than NASA and leave a more focused NASA do what it does best—namely space science and truly long range innovation” [1]. If one goes back almost 25 years to the Rogers Commission [2] and the Paine Commission [3] one can find deep dissatisfaction with NASA productivity, with its handling of its various space transportation systems, and with its ability to adapt to current circumstances as well as its ability to embark on truly visionary space goals for the future. Anyone who rereads the Paine Commission report today almost aches for the vision set forth as a roadmap to the future in this amazing document. True there have been outstanding scientific success stories, such as the Hubble Telescope, but these have been the exception and not the rule. The first step, of course, would be to retool and restructure NASA from top to bottom and not just tweak it a little around the edges. The first step would be to explore what space activities can truly be commercialized and see where NASA could be most effective by stimulating innovation in the private sector rather than undertaking the full mission itself.

**DEFUNDING NASA WILL GIVE THE PRIVATE SECTOR THE ABILITY TO PROFITABLY EXPLORE SPACE-Taylor ‘11**

[Robert; The Case for Defunding NASA; 2011; <http://www.policymic.com/article/show?id=54>; retrieved 11 Jul 2011]

NASA also inflicts us with a misallocation of labor. The market's profit/loss mechanism is the only way that the labor involved, like scientists, is being put to its most economic and productive use. And like all government programs, it has become increasingly less efficient as time goes by and its goals have become more and more hazy; the "mission creep" of the chaotic absence of market prices.

If NASA were de-funded, the private sector could begin to deliver services that are actually valuable to consumers, things NASA barely emphasizes, like employing robot satellites that gather information about the Earth to supply the high commercial demand for more accurate weather forecasts and geological assessments. Robot satellites can also accomplish most of the things that more expensive manned flights do, just without the rah-rah, nationalistic PR.

Many Americans have sympathetic attachment to the space program, but when the $17 billion a year could be spent actually serving the people's wishes in the marketplace, the case against NASA (and, indeed, nearly all wealth-crushing government programs) grows by the day.

**NASA CANNOT BE ALLOWED TO UNDERMINE PRIVATE SPACE DEVELOPMENT-Reynolds ‘10**

[Jackie; Renewing the Dream: How Free Market Principles Can Enable Commercial Space Development; 27 April 2010; <http://files.jackiedewaynereynolds.info/0410_Renewing.the.Dream.pdf>; retrieved 14 Aug 2011]

As commercial activities in space continue to increase, the current state of space law and policy must be revisited. Needed improvements in technology will flow from the developing market, but a new body of policies must be developed and codified to enable the continued commercial exploitation of space. NASA, for example, should refine its priorities, returning nonessential programs to the private sector for development, and focus on its fundamental mission: space research and exploration. NASA is and should be strong, but its governance should be carefully monitored to advance space development without undermining private initiative. Government officials and industry leaders should finally define an appropriate post-Cold-War paradigm that shapes U.S. space policy around commercial space development as well as the nation‘s twenty-first century defense needs.

**NASA “OLD GUARD” AGAINST PRIVATE EFFORTS; WILL THWART PERM-PASZTOR ‘10**

[Andy; White House Decides to Outsource NASA Work; The Wall Street Journal; 24 January 2010; <http://online.wsj.com/article/SB10001424052748704375604575023530543103488.html>; retrieved 23 August 2011]

However, many in NASA's old guard oppose the plan. Charles Precourt, a former chief of NASA's astronaut corps who is now a senior executive at aerospace and defense firm Alliant Techsystems Inc., said that farming out large portions of the manned space program to private firms would be a "really radical" and an "extremely high risk" path. Unless the overall budget goes up, he said, whatever new direction NASA pursues "isn't going to be viable."

Such arguments already are raging around NASA's Ares I rocket, which could be replaced or scaled back if the commercial option gains traction. Some Ares I contract work could be shifted toward providing the basic elements of a future larger, more-powerful NASA family of rockets. Alliant and other Ares proponents have argued the program is several years behind schedule primarily because Congress and previous administrations failed to provide promised funding. According to some of these analyses, Congress in the past five years earmarked a total of about $4 billion less than initially projected for NASA's manned exploration programs. The design of the Ares I also changed and became more complex since its inception.

A/T: SPIN-OFF TECH

**THE SPACE PROGRAM HAS STALLED AND NOT CREATED ANY TECHNOLOGY TO IMPROVE OUR LIVES-Anderson ‘03**

[William; professor of economics at Frostburg State College; The Trouble With NASA; The Free Market; April 2003; <http://mises.org/freemarket_detail.aspx?control=434>; retrieved 11 Aug 2011]

When discussing NASA and its impact upon our society, one must deal with myths that have been spawned by the agency and its supporters over the last four decades, the first being that NASA, supposedly driven by technology, has created new technologies that have been easily transferred to civilian use. Thus, the argument goes, had not NASA existed, we most likely would not have had the modern computer system, microchips, transistors, and the like, or at least their development would have lagged far behind where they are today.

The reality of modern space travel—in our case, the shuttles—is quite different. As Gregg Easterbrook noted in his recent commentary in Time, the shuttle vehicles, more than 20 years old and operating off of a 30-year-old design, are technologically inferior to nearly any computer driven consumer product, including children's video games. We have no evidence that the space program has created on its own any of the new technologies that make our material lives better; instead, the program has utilized existing technologies.

**SPIN-OFF TECHNOLOGIES ARE NOT A JUSTIFICATION FOR CONTINUED NASA SPENDING-Taylor ‘11**

[Robert; The Case for Defunding NASA; 2011; <http://www.policymic.com/article/show?id=54>; retrieved 11 Jul 2011]

NASA and its defenders claim, however, that this constant stream of tax revenue has benefited the American public by introducing many inventions and technological advancements, ignoring the broken window fallacy - unintended consequences that accompany perceived production.

Besides, most of these innovations have actually been the result of commercial markets. Telstar I, the world’s first telecommunications satellite, was a product of AT&T’s drive to provide a better communication service (only later to be used by the Defense Department). The telephone, personal computers, the Internet, Velcro, Tang, Tempur-Pedic mattresses, hand-calculators, and the hundreds of products created from the advantage of integrated circuits and semiconductors have advanced our lives through the mutual benefit of buyer and seller. Consumers, not bureaucrats, should decide where precious resources should go.

A/T: PRIVATES CAN’T DO CHALLENGING/LARGE MISSIONS

**THE MORE AMBITIOUS THE PROJECT IS, THE BETTER SUITED THE PRIVATE SECTOR IS-Garmong ‘04**

[Robert; Ph.D. in philosophy, is a writer for the Ayn Rand Institute; Privative the Space Program; The Rational Argumentator; 02 Mar 2004; <http://rationalargumentator.com/issue20/privatizespace.html>; retrieved 16 Aug 2011]

Nor would it be difficult to spur the private exploration of space. Phase out government involvement in space exploration, and the free market will work to produce whatever there is demand for, just as it now does with traditional aircraft, both military and civilian. Develop a system of property rights to any stellar body reached and exploited by an American company, and profit-minded business will have the incentive to make it happen.

We often hear that the most ambitious projects can only be undertaken by government, but in fact the opposite is true. The more ambitious a project is, the more it demands to be broken into achievable, profit-making steps—and freed from the unavoidable politicizing of government-controlled science. If space development is to be transformed from an expensive national bauble whose central purpose is to assert national pride to a practical industry with real and direct benefits, it will only be by unleashing the creative force of free and rational minds.

A/T: NO PRIVATE COMPANIES/PROFIT

**PRIVATE CAPITAL IS READY TO INVEST IN SPACE-Diamandis ‘10**

[Peter; chief executive of the X Prize Foundation Space: The Final Frontier of Profit?; Wall Street Journal; 13 Feb 2010; http://online.wsj.com/article/SB10001424052748703382904575059350409331536.html; retrieved 21 Jul 2011]

Two fundamental realities now exist that will drive space exploration forward. First, private capital is seeing space as a good investment, willing to fund individuals who are passionate about exploring space, for adventure as well as profit. What was once affordable only by nations can now be lucrative, public-private partnerships.

**PRIVATE CORPORATIONS CAN PROFITABLY EXPLORE SPACE-Diamandis ‘10**

[Peter; chief executive of the X Prize Foundation Space: The Final Frontier of Profit?; Wall Street Journal; 13 Feb 2010; http://online.wsj.com/article/SB10001424052748703382904575059350409331536.html; retrieved 21 Jul 2011]

Second, companies and investors are realizing that everything we hold of value—metals, minerals, energy and real estate—are in near-infinite quantities in space. As space transportation and operations become more affordable, what was once seen as a wasteland will become the next gold rush. Alaska serves as an excellent analogy. Once thought of as "Seward's Folly" (Secretary of State William Seward was criticized for overpaying the sum of $7.2 million to the Russians for the territory in 1867), Alaska has since become a billion-dollar economy.

The same will hold true for space. For example, there are millions of asteroids of different sizes and composition flying throughout space. One category, known as S-type, is composed of iron, magnesium silicates and a variety of other metals, including cobalt and platinum. An average half-kilometer S-type asteroid is worth more than $20 trillion.

**PRIVATE ENTERPRISE IS THE ONLY AFFORDABLE PATH TO DEVELOPMENT OF SPACE-Reynolds ‘10**

[Jackie; Renewing the Dream: How Free Market Principles Can Enable Commercial Space Development; 27 April 2010; <http://files.jackiedewaynereynolds.info/0410_Renewing.the.Dream.pdf>; retrieved 14 Aug 2011]

Commercial space development is neither easy nor cheap, but it can no longer be funded by big government. Back when the nation‘s wealth was concentrated in a handful of American aristocrats, it made sense for the government to pick up the slack where the private sector simply wouldn‘t or couldn‘t fund projects themselves. While the government maintains its fundamental role in funding basic research and codifying appropriate policy and legal regimes to support economic commerce, the fact of the matter is it is no longer necessary for the government to fund large space development projects. In the last hundred years or more, the American economy has diversified and given rise to a huge investment class. Globalization has helped replicate that investment class in countries all over the world. Private investment capital flows more freely now than at any other time in our history.

**HIGH COSTS AND SLOW RETURNS WILL NOT STOP INVESTMENT-Reynolds ‘10**

[Jackie; Renewing the Dream: How Free Market Principles Can Enable Commercial Space Development; 27 April 2010; <http://files.jackiedewaynereynolds.info/0410_Renewing.the.Dream.pdf>; retrieved 14 Aug 2011]

The cost of getting to space is largely regarded as the single greatest contributing factor to the high cost of commercial space operations. It is this high up-front cost that many believe makes commercial space operations unlikely candidates for venture capital. High start-up costs are often associated with lengthy returns on investment. In other words, the more it costs to start a venture the longer it takes to show a profit and provide the return investors require. But high cost and long investment return times have never been a significant enough impediment to capitalistic exploitation of undeveloped markets.

Answers

PERM

**PERM: THE GOVERNMENT AND PRIVATE INDUSTRY CAN WORK EFFECTIVELY TOGETHER IN SPACE-Spotts ‘05**

[Peter; staff writer; Beyond NASA: The Push to Privatize Spaceflight; Christian Science Monitor; 21 Jul 2005; <http://www.csmonitor.com/2005/0721/p14s01-stss.html>; retrieved 17 Aug 2011]

At a time when the National Aeronautics and Space Administration (NASA) struggles to return its aging shuttle fleet to service and realign itself to implement President Bush's blueprint for sending astronauts to the moon and beyond, several companies and interest groups are pursuing their own vision for putting humans into space more cheaply. "If we drive down the cost of transportation in space, we can do great things," Mr. Musk insists.

The goal: to loft people and cargo at one-tenth the current cost. Building reusable rockets is only the first step. Industry sources say NASA, too, will have to buy services and hardware - at lower cost - from a broader cast of aerospace characters than the traditional players. And while taking the lead in high-risk human exploration of space, the government also needs to build an infrastructure in orbit - such as the space station - from which private companies could launch missions and conduct research.

**THE STATUS QUO BUDGET IS A COMBINATION OF PUBLIC/PRIVATE INVESMENT-Dyson ‘10**

[Esther; Prepare for Liftoff; Foreign Policy; 08 Feb 2010; <http://www.foreignpolicy.com/articles/2010/02/08/prepare_for_liftoff?page=0,1>; retrieved 14 Aug 2011]

With Barack Obama's new spending proposals, the same sort of thing could happen to space travel and exploration. Critics of the new NASA budget have described the U.S. president as "cutting" manned space exploration and abandoning the hope of a return to the moon. But in fact, Obama's novel approach signals a much more far-sighted view of space travel than Washington has had to date. The U.S. government should be leading the way in rocket science and space exploration, but it should leave exploitation of those advances to the private sector.

The new space budget will provide encouragement and funding for the private sector to do what it does best -- move from technology research to technology development. To quote Rick Tumlinson , cofounder of the Space Frontier Foundation, a space advocacy group, there's no need for the government to be "driving the trucks in low-earth orbit." It should focus on opening up the far frontiers while businesspeople deliver the goods.

**OBAMA HAS SIGNALED THAT GOVERNMENT AND PRIVATE SECTOR CAN WORK TOGETHER-Wagner ‘10**

[Brian; US Space Plan May Boost Private Space Firms; Voice of America News; 16 Apr 2010; <http://www.voanews.com/english/news/economy-and-business/US-Space-Plan-May-Boost-Private-Space-Firms-91111434.html>; retrieved 16 Aug 2011]

But the president said he hopes to see bold new missions, including trips to nearby asteroids and Mars, during his lifetime. He said a key to that goal is encouraging private companies to develop new technologies and operate cargo flights and manned missions into space.

John Logsdon, a member of NASA's advisory council, says the private sector has been waiting for that kind of message. "This approach is a signal to the private space community that they can look to government partnerships, government as a user, or even government as an investment partner as they go forward," he said.

One private partner may be the Space X company, founded by Internet entrepreneur Elon Musk. On his trip to Kennedy Space Center, President Obama met with Musk and visited the company's Falcon rocket, which is set for a test launch next month.

**PERM: NASA AND PRIVATE INDUSTRY COOPERATE ON SPACE EXPLORATION-Spotts ‘05**

[Peter; staff writer; Beyond NASA: The Push to Privatize Spaceflight; Christian Science Monitor; 21 Jul 2005; <http://www.csmonitor.com/2005/0721/p14s01-stss.html>; retrieved 17 Aug 2011]

Even the president's directive to return astronauts to the moon by 2020 could help privatize spaceflight.

"We want to go about space exploration in a more sustainable way" than the Apollo program did, says Brant Sponberg, who heads NASA's awards program. "We want to bring along other sectors of America with us; this shouldn't be a NASA-only activity. My ultimate hope is that when we're sending robotic landers to the moon early next decade, there might be some robotic landers that don't have the NASA insignia on them."

**THE BEST APPROACH IS A COMBINATION OF PUBLIC AND PRIVATE SPACE-Dyson ‘10**

[Esther; Prepare for Liftoff; Foreign Policy; 08 Feb 2010; <http://www.foreignpolicy.com/articles/2010/02/08/prepare_for_liftoff?page=0,1>; retrieved 14 Aug 2011]

But in the long run, the new approach will create more jobs -- and more value -- because the United States will end up with both an innovative, long-term government space program and an energetic, fast-growing private-sector market that will transport people and cargo for the U.S. government, space tourists, and non-U.S. governments. Ultimately, the costs and risks of space transport will come down, flights will increase, and markets will grow. As with the Internet, we can't predict all the uses to which commercial innovation will put this infrastructure.

**THE MOST PROMISING SPACE FUTURE INVOLVES NASA AND PRIVATE PROJECTS-Dyson ‘10**

[Esther; Prepare for Liftoff; Foreign Policy; 08 Feb 2010; <http://www.foreignpolicy.com/articles/2010/02/08/prepare_for_liftoff?page=0,1>; retrieved 14 Aug 2011]

So now let me disclose my biases: I write as a member of the NASA Advisory Council  (for which I do not speak), and I have trained to be a cosmonaut courtesy of the Russian government's space program. (I would love to see the U.S. government open up the skies to civilians as well.) Furthermore, I have investments in a couple of "new space" companies that stand to benefit from greater private-sector involvement in space travel.

I got involved in all these pursuits because I'm an enthusiast for space exploration and its two key promises -- getting kids excited about math and science, and allowing humanity to escape the confines of this single planet and explore the rest of the universe. At a time when so much public discourse -- and public spending -- is focused on the here and now, it's inspiring to see some hope that the U.S. government can still support both long-term projects and the kind of entrepreneurial businesses whose activities are key to America's success.

**NASA HAS WORKED WITH PRIVATE CONTRACTORS SINCE ITS INCEPTION-Klotz ‘11**

[Irene; wire reporter; U.S. looks to private sector as shuttle program ends; Reuters; 05 Jul 2011; <http://www.reuters.com/article/2011/07/05/us-space-shuttle-commercial-idUSTRE7643Q620110705>; retrieved 02 Aug 2011]

The companies share NASA contracts worth $247 million to help pay development costs and all hope to win work flying crews to the space station. The U.S. space agency also has a $22 million contract with Blue Origin, a start-up owned by Amazon founder Jeff Bezos that is focusing first on suborbital flight.

"This has been painted as a revolutionary approach and it's really not as big of a deal as it's made out to be," said Garrett Reisman, a former astronaut now at SpaceX.

"NASA has been working with contractors since the very beginning. It was contractors that built the space shuttle and the Apollo rockets. What's really different this time round is something as mundane as contracting -- the way the government does business."

SOLVENCY: PRIVATE ENTERPRISE

**INTERNATIONAL REGULATORY HURDLES WILL MAKE PRIVATIZATION IMPOSSIBLE-Hertzfeld ‘11**

[Henry; Research Professor of Space Policy and International Affairs; George Washington University; *Toward a Theory of Spacepower*; <http://www.ndu.edu/press/space-Ch5.html>; 2011; retrieved 16 Aug 2011]

Looking to the future growth of commercial space companies and the multinational aspects of commercial space raises an interesting question regarding spacepower. Specifically, will it be possible for commercial interests to supersede other national interests in space? The short answer is no. Besides the clear dual use of all space products, space law, as defined by current United Nations treaties on outer space, makes nations responsible for the actions of their citizens in outer space. To get to space and to do anything there, a company will need the formal approval of a parent nation. Since each nation may be both jointly and separately liable for certain types of damage from space objects, it will be difficult, if not impossible, for a company to operate in space without supervision. Therefore, unless the major legal tenets of space activity change, commercial interests will be subservient to national interests in space and will face major regulatory controls.

**ENTREPRENEURIAL COMPANIES ALWAYS OVER PROMISE AND FAIL TO DELIVER IN SPACE-Dinerman ‘10**

[Taylor; space columnist; Space: The Final Frontier of Profit?; Wall Street Journal; 13 Feb 2010; <http://online.wsj.com/article/SB10001424052748703382904575059263418508030.html>; retrieved 27 Jul 2011]

Entrepreneurial companies have consistently overpromised and under-delivered. Over the past 30 years, over a dozen start-ups have tried to break into the launch business. The only one to make the transition into a respectably sized space company is Orbital Sciences of Dulles, Va. Building vehicles capable of going into orbit is not for the fainthearted or the undercapitalized.

The companies that have survived have done so mostly by relying on U.S. government Small Business Innovation Research contracts, one or more angel investors, or both. Big aerospace firms tempted to join NASA's new projects will remember the public-private partnership fiasco when Lockheed Martin's X-33 design was chosen to replace the space shuttle in 1996. Before it was canceled in 2001 this program cost the government $912 million and Lockheed Martin $357 million.

**DEMAND FOR SPACEFLIGHT SERVICES IS MODEST, KEEPING COSTS HIGH-Sterner ‘10**

[Eric; Associate Deputy Administrator, Policy and Planning and Acting Chief of Strategic Communications, NASA; Worthy of a Great Nation? NASA’s Change of Strategic Direction; George C. Marshall Policy Outlook; April 2010; <http://www.marshall.org/pdf/materials/798.pdf>; retrieved 18 Aug 2011]

Third, U.S. government demand for human spaceflight services is modest. Ideally, a full crew complement aboard the International Space Station is 6-7 people, each of whom stays for roughly 6 months. Each of these individuals has to be launched to orbit and returned to earth, totaling a minimum of 12- 14 round trip seats to LEO. In practice, the demand for human access to LEO is higher because the ISS partners launch more astronauts to ISS than are needed to maintain a full crew complement. Of the universe of individuals launched to orbit, some become crewmembers; some pilot spacecraft back and forth; and some simply visit. In 2010 NASA will launch four shuttle missions carrying a total of 25 people to orbit, but ISS will only be crewed by 12 people, not all of whom are Americans. So, for the sake of argument, assume that the U. S. government demand for human access to space is 25 round trips to LEO per year. NASA’s recent annual cost to own and operate the space shuttle has been about $3 billion, roughly $120 million a seat.

**TECHNICAL CHALLENGES ARE A HUGE BARRIER TO ENTRY IN SPACE-Sterner ‘10**

[Eric; Associate Deputy Administrator, Policy and Planning and Acting Chief of Strategic Communications, NASA; Worthy of a Great Nation? NASA’s Change of Strategic Direction; George C. Marshall Policy Outlook; April 2010; <http://www.marshall.org/pdf/materials/798.pdf>; retrieved 18 Aug 2011]

Second, solving those technical challenges is extraordinarily expensive, creating a high barrier to entry into the market segment by new, potential suppliers, assuming there is an expectation of an adequate payoff after such market entry. Arguably, NASA’s initial expenditures may offset this by providing “seed” money that enables private entrants to raise more private capital at a lower cost, while its demand for services theoretically creates a payoff. Still, for reasons discussed below, that “seed” money will likely be wholly inadequate. According to a study commissioned by the Commercial Spaceflight Industry, total cumulative investment committed to the commercial human spaceflight through the fall of 2009 was $1.46 billion—including government funding— of which just $838 million remained available. 25 While this may seem like a significant amount of money, in aerospace development programs it is not. For comparison purposes, Boeing (a commercial company using commercial practices to develop a commercial product for mature markets and using well understood technology) pegged the cost of developing the first three Boeing 787 Dreamliners at roughly $2.5 billion. 26 Meanwhile, revenue for actual commercial spaceflight services offered by the industry between 2006 and 2008 (inclusive), totaled $117.6 million. (Any revenue for an industry that cannot currently provide the services it offers reflects confidence on the part of those paying customers in the industry’s ability to do so in the future.) The industry derives significant other revenue from selling hardware, engineering services, and other non-commercial services, in which case they may differ insignificantly from aerospace firms not focused on commercial human spaceflight.

**THERE IS NO RESEARCH SUPPORTING IDEA THAT DEMAND WILL MAKE SPACE A PROFITABLE VENTURE-Sterner ‘10**

[Eric; Associate Deputy Administrator, Policy and Planning and Acting Chief of Strategic Communications, NASA; Worthy of a Great Nation? NASA’s Change of Strategic Direction; George C. Marshall Policy Outlook; April 2010; <http://www.marshall.org/pdf/materials/798.pdf>; retrieved 18 Aug 2011]

Some may argue that demand will be higher because the private sector will seek to go to space as well, once a private capability to take people to orbit exists. This seems to be the logic behind the administration’s plans. It hopes increased demand will lead to new suppliers, which promotes competition, which eventually lowers prices. Unfortunately, increased demand normally leads to higher prices until the market reaches a new equilibrium, a “benefit” that the administration does not advertise. Even then, there is not much evidence to support the notion that private demand will eventually lead to greater, less expensive access to space for people, largely because no compelling private rationale has been offered to engage in human spaceflight to LEO. According to material prepared for the Committee on Science and Technology in the House of Representatives, NASA did not conduct market research to assess potential demand for private access to LEO before changing its strategy for accessing LEO. Indeed, all that White House officials reportedly could point to in the way of supporting documentation for their underlying assumptions was an eight year old market survey that overestimated the 2002- 2009 demand for commercial human spaceflight by roughly 300%.

**PRIVATIZATION WILL ENRICH CORPORATIONS WITHOUT ANY REWARDS GOING TO PUBLIC-Gagnon ‘04**

[Bruce; coordinator of Global Network Against Weapons & Nuclear Power in Space; Space privatization: Road to conflict?; People’s World; 24 Jul 2004; <http://www.peoplesworld.org/space-privatization-road-to-conflict/>; retrieved 02 Aug 2011]

One organization that seeks to rewrite space law is called United Societies in Space (USIS). They state, “USIS provides legal and policy support for those who intend to go to space. USIS encourages private property rights and investment. Space is the Free Market Frontier.”

The taxpayers, especially in the U.S. where NASA has been funded with taxpayer dollars since its inception, have paid billions of dollars in space technology research and development (R&D). As the aerospace industry moves toward forcing privatization of space what they are really saying is that the technological base is now at the point where the government can get out of the way and let private industry begin to make profits and control space.

Thus, after the taxpayers have paid all the R&D, private industry now intends to gorge itself on profits. Taxpayers won’t see any return on our “collective investment.”

**THE PRIVATE SECTOR CANNOT DEVELOP COST-EFFECTIVE HUMAN FLIGHT-Dinerman ‘10**

[Taylor; space columnist; Space: The Final Frontier of Profit?; Wall Street Journal; 13 Feb 2010; <http://online.wsj.com/article/SB10001424052748703382904575059263418508030.html>; retrieved 27 Jul 2011]

President Barack Obama's proposed plan for NASA bets that the private sector—small, entrepreneurial firms as well as traditional aerospace companies—can safely carry the burden of flying U.S. astronauts into space at a fraction of the former price. The main idea: to spend $6 billion over the next five years to help develop new commercial spacecraft capable of carrying humans.

The private sector simply is not up for the job. For one, NASA will have to establish a system to certify commercial orbital vehicles as safe for human transport, and with government bureaucracy, that will take years. Never mind the challenges of obtaining insurance.

**PRIVATIZATION PLANS ARE NOT BOLD OR NEW; THEY ARE SIMPLY BUDGET CUTTING WITH NO GUARANTEE OF SUCCESS-Dinerman ‘10**

[Taylor; space columnist; Space: The Final Frontier of Profit?; Wall Street Journal; 13 Feb 2010; <http://online.wsj.com/article/SB10001424052748703382904575059263418508030.html>; retrieved 27 Jul 2011]

Recent history shows that development programs take a long time to mature, but when they do they can produce excellent results. Since it was given the go-ahead in 1984, the space station has faced delays, cost overruns and an unceasing barrage of criticism. Yet NASA kept at it. With the full-time six-person crew now operational, the range of technological and scientific work being done has increased dramatically, from fluid physics experiments to tests on the effects of microgravity on human physiology.

George W. Bush's promising Constellation human spaceflight program—which would be killed under Mr. Obama's plan—has already cost $9 billion since 2004. It is hard to imagine how the private sector can build a replacement for the spacecraft and booster rockets of Constellation, let alone a program to get America back to the moon, with the relatively paltry sum of $6 billion and the scattershot funding approach that NASA's leaders are proposing.

The Augustine Commission's recent report to the White House was entitled "Seeking a Human Spaceflight Program Worthy of a Great Nation." The space entrepreneurs may claim that they can send people into space for a fraction of the previous cost, but they have not yet proved it. NASA's policy is neither bold nor new; it is yet another exercise in budget-driven program cancellation. Until the American government can bring itself to choose a path and stick to it for more than a single administration, its claim to be worthy of a great nation will be in doubt.

**THE INCREDIBLE RISKS AND DIFFICULTY OF SPACE TRAVEL, COMBINED WITH LIMITED MARKET, MAKE PRIVATIZATION UNLIKELY-Sterner ‘10**

[Eric; Associate Deputy Administrator, Policy and Planning and Acting Chief of Strategic Communications, NASA; Worthy of a Great Nation? NASA’s Change of Strategic Direction; George C. Marshall Policy Outlook; April 2010; <http://www.marshall.org/pdf/materials/798.pdf>; retrieved 18 Aug 2011]

NASA seems to assume that buying human spaceflight services will lead to lower prices. Typically, in a free market, price falls as the result of competition among suppliers to offer better goods and services for any given number of customers. Is that a reasonable expectation in the case of commercial human spaceflight? The short answer is no. Simply put, a competitive, free-market in commercial human spaceflight is unlikely to develop for several reasons.

First, developing a spacecraft capable of safely launching people into orbit, operating there, and returning them safely to the planet is extraordinarily difficult, with extremely low tolerances for risk. For comparison purposes, launching SpaceShip 1, a privately-developed and revolutionary spacecraft capable of carrying people to suborbital space, requires roughly 2% of the total energy required to take the same mass to low-earth orbit. 24 Solving such complex problems is not beyond the wherewithal of the private sector. After all, the bulk of NASA’s spacecraft were developed by contractors, and the private sector developed, owns and operates much of the nation’s infrastructure. Human spaceflight to LEO is different, however, than developing or operating the complex terrestrial systems frequently created by the private sector. It requires the development of entirely new technologies and capabilities, for which there has been no private demand or commercial reward. So, there have not been sufficient incentives for the private sector to bring its otherwise healthy abilities to mobilize massive amounts of capital or solve complex problems to bear. There simply is no useful comparison between the public and private sector interests when it comes to human spaceflight. Indeed, to date, only three governments have been able to organize the financial, organizational, scientific, and technical resources to achieve this task. At the time, two of them were superpowers and the third appears to be on the verge of becoming one.

**EVEN THE MOST PROMISING PRIVATE ENTERPRISE WILL NOT RECEIVE INVESTMENT DOLLARS-Sterner ‘10**

[Eric; Associate Deputy Administrator, Policy and Planning and Acting Chief of Strategic Communications, NASA; Worthy of a Great Nation? NASA’s Change of Strategic Direction; George C. Marshall Policy Outlook; April 2010; <http://www.marshall.org/pdf/materials/798.pdf>; retrieved 18 Aug 2011]

The greatest potential for market growth may come from space tourism. Since 2001, 7 private individuals have traveled to the International Space Station, paying between $20- $50 million per person to collectively spend 83 days in space. 29 That represents an aggregate commercial demand of up to $350 million for access to LEO over a decade, not likely enough demand to warrant significant private investment in the provision of human spaceflight services to LEO, particularly given the extraordinary costs associated with providing those services. Private capital does not usually chase negative returns. Indeed, the only reason such a market exists is that the governments that own and operate the International Space Station and associated launch vehicles were willing to make the capability created by their taxpayers available to private, paying customers at the margins. They did not recover the full costs of creating such capabilities in the sales price of the private tickets and there was never much private capital at risk in exploiting this market. (Nobody has assessed the opportunity cost paid by those taxpayers to make such capabilities available for private gain). Without this massive government intervention in the market, the supply and demand curves for private human access to space would not have crossed.

SOLVENCY: PRIVATIZATION WILL LEAD TO SPACE WEAPONIZATION

**PRIVATIZATION WILL LEAD TO A MASSIVE SPACE MILITARY INFRASTRUCTURE-Gagnon ‘04**

[Bruce; coordinator of Global Network Against Weapons & Nuclear Power in Space; Space privatization: Road to conflict?; People’s World; 24 Jul 2004; <http://www.peoplesworld.org/space-privatization-road-to-conflict/>; retrieved 02 Aug 2011]

So let’s just imagine for a moment that this private sector vision for space comes true. Profitable mining on the moon and Mars – who would keep competitors from sneaking in and creating conflict over the new 21st century gold rush? Who will be the space police?

In the congressional study published in 1989 called “Military Space Forces: The Next 50 Years,” we get some inkling of the answer. The forward to the book was signed by the former Sen. John Glenn (D-Ohio) and Sen. Bill Nelson (D-Fla.), among others. The book stresses the importance of military bases on the moon and suggests that with bases there the U.S. could control the pathway, or the “gravity well,” between Earth and the moon. It notes, “Armed forces might lie in wait at that location to hijack rival shipments on return.”

Plans are now underway to make space the next “conflict zone” where corporations intend to control resources and maximize profit. The so-called private “space pioneers” are the first step in this new direction. Ultimately the taxpayers will be asked to pay the enormous cost incurred by creating a military space infrastructure that would control the “shipping lanes” on and off the planet Earth.

**DEFENDING CIVILIAN SPACE ASSETS WILL REQUIRE WEAPONIZATION OF SPACE-Dinkin ‘04**

[Sam; space columnist; Space privatization: road to freedom; The Space Review; 26 Jul 2004; <http://www.thespacereview.com/article/193/1>; retrieved 29 Jul 2011]

Some things may be worth that transportation cost. Colonization in order to assure that our species outlasts the dinosaurs is priceless. Opening Mars to colonization will also create new opportunities for religious freedom and personal freedoms as the Pilgrims found when they immigrated to the New World. Space entertainment might pay its own way, as might suborbital tourism. Orbital hotels may be viable. Space science might be able to tag along, but science would have to be heavily subsidized. Maybe astronomical observing frequencies could be sold off on Earth to pay for a site on the far side of the Moon, but that would require much lower transport prices and higher spectrum prices than we’ve seen since the 3G crash. Suborbital point-to-point service from New York to Tokyo with a flight time less than the Concorde’s New York-to-London time may emerge some time.

There are some valuable military uses to space being explored by the Pentagon with its FALCON and RASCAL programs in addition to earth observing satellites. Further weaponization of space will probably be required to defend the US in the most economical manner and to defend the new civilian space assets. If no weaponization occurs by the US, we can definitely expect terrorists or other states to do so and for space to be stunted by lack of defensive protection.

With no privatization and no military protection, there will not be much colonization. Antarctica may be free of the intellectual pollution brought by property rights, but there are also no citizens, no development and very little in the way of commercial exports. Alaska, in contrast, hands out checks to its citizens rather than charging them taxes. Antarctica is also more inaccessible, so there may be another explanation for the disparity.

**PRIVATIZATION WILL LEAD TO MASSIVE CONFLICT IN SPACE-Gagnon ‘04**

[Bruce; coordinator of Global Network Against Weapons & Nuclear Power in Space; Space privatization: Road to conflict?; People’s World; 24 Jul 2004; <http://www.peoplesworld.org/space-privatization-road-to-conflict/>; retrieved 02 Aug 2011]

After Columbus returned to Spain with the news that he had discovered the “new world,” Queen Isabella began the 100-year process to create the Spanish Armada to protect the new “interests and investments” around the world. This helped create the global war system.

Privatization does not mean that the taxpayer won’t be paying any more. Privatization really means that profits will be privatized. Privatization also means that existing international space legal structures will be destroyed in order to bend the law toward private profit. Serious moral and ethical questions must be raised before another new “frontier” of conflict is created.

SOLVENCY: DEBRIS

**PRIVATIZATION OF SPACE WILL LEAD TO MASSIVE EXPANSION OF DEBRIS-Gagnon ‘04**

[Bruce; coordinator of Global Network Against Weapons & Nuclear Power in Space; Space privatization: Road to conflict?; People’s World; 24 Jul 2004; <http://www.peoplesworld.org/space-privatization-road-to-conflict/>; retrieved 02 Aug 2011]

We’ve all probably heard about the growing problem of space junk where over 100,000 bits of debris are now tracked on the radar screens at NORAD in Colorado as they orbit the earth at 18,000 m.p.h. Several space shuttles have been nicked by bits of debris in the past resulting in cracked windshields. The International Space Station (ISS) recently was moved to a higher orbit because space junk was coming dangerously close.

As we see a flurry of launches by private space corporations the chances of accidents, and thus more debris, becomes a serious reality to consider. Very soon we will reach the point of no return, where space pollution will be so great that an orbiting minefield will have been created that hinders all access to space.

**SPACE PRIVATIZATION WILL INCREASE DEBRIS-Dinkin ‘04**

[Sam; space columnist; Space privatization: road to freedom; The Space Review; 26 Jul 2004; <http://www.thespacereview.com/article/193/1>; retrieved 29 Jul 2011]

In any case, there are two reasons that privatization will not substantially change the space debris situation. First, this debris problem will continue if space remains the preserve of big government even with business as usual. Second, regulations, such as the new FCC regulations for a minimum amount of propellant to continue broadcasting, allow the government to keep the debris situation under control.

**THE COMMERCIAL SPACE EFFORTS WILL INCREASE SPACE DEBRIS-Quarterman ‘07**

[Alistair; Q&A: Space debris; The BBC; 7 October 2007; <http://news.bbc.co.uk/2/hi/science/nature/7030785.stm>; retrieved 23 August 2011]

Ideas to reduce the amount of debris have included laser "brooms" to sweep debris back into rapid-decaying orbits. Thought has been given to pushing material together into orbital junk-yards which could be used as a resource for future missions whilst being kept out of the way.

But the priority for most international groups is to highlight preventative measures in reducing the future increase in debris and how to mitigate extant debris still in orbit.

A key proposal is the development of convenient ways in which to de-orbit satellites when they have come to the end of their operational lives.

These could either bring them into lower orbits where atmospheric drag will slow them and pull them into a fiery re-entry; or to place them in what are known as "grave yard" orbits where no satellites or spacecraft are operating.

With the growth in the commercial space industry, telecommunications, and with the real prospect of affordable space tourism on the horizon, the control and monitoring of debris will become an increasingly important factor in the planning of future space activity.

SOLVENCY: INCENTIVES/PRIZES

**IT’S HARD TO EVALUATE THE MERITS OF INCENTIVES-Kay ‘10**

[Luciano; Professor of Public Policy, Georgia Institute of Technology; Modeling incentives, R&D Activities, And Outcomes In Innovation Inducement Prizes; 12 Mar 2010; <http://www.spp.gatech.edu/faculty/WOPRpapers/Kay.WOPR10.pdf>; retrieved 07 Aug 2011]

Still, monetary incentives do not explain completely why individuals or teams decide to participate in prizes. Economic incentives are so pervasive that other variables are needed to explain what investment area is finally chosen by potential entrants (Rosenberg, 1976). Furthermore, there is some evidence that monetary rewards do not offset all the costs of technology development in prizes (Davidian, 2007; Brunt et al., 2008), which raises the question about what the weight of different types of incentives really is.

**THE EMPIRICAL EVIDENCE ON PRIZES IS WEAK-Kay ‘10**

[Luciano; Professor of Public Policy, Georgia Institute of Technology; Modeling incentives, R&D Activities, And Outcomes In Innovation Inducement Prizes; 12 Mar 2010; <http://www.spp.gatech.edu/faculty/WOPRpapers/Kay.WOPR10.pdf>; retrieved 07 Aug 2011]

The empirical evidence on the effects of prizes on R&D and innovation is rather weak. In principle, prizes may provide adequate incentives to make an invention occur, yet the invention still may never be applied or reach the market for commercialization (Kieff, 2001). That is, while patents promote both invention and commercialization (and may be also essential to avoid underuse of the technology) prize rewards may take away the benefits of commercialization, since prize participants would lack sufficient incentives to develop the invention commercially (Wei, 2007). On the other hand, prizes cannot ensure that the inventor with the best idea is motivated to participate or, if that happens, that the best idea is selected or implemented at the minimum cost (Scotchmer, 2005). Furthermore, the prize may fail to find a winner, which may signal that the technology, cost, or both were not yet up to the prize target (Macauley, 2005).

**INTELLECTUAL PROPERTY RIGHTS COULD STALL INCENTIVES-Sargeant ‘08**

[Benjamin; The Use of Innovation Prizes by the National Aeronautics and Space Administration: An Analysis of Future Possibilities for Fostering Research and Development; 28 Jul 2008; <http://www.sts.virginia.edu/wip/docs/papers/Sargeant_08_r.pdf>; retrieved 11 Aug 2011]

The possibility of international participation raises questions about protecting intellectual property rights and awarding prizes financed by American taxpayers to foreigners. The legality and political feasibility of fostering international participation from highly-qualified, individual problem-solvers also remains in doubt because of International Traffic in Arms Regulations (ITAR) restrictions on defense and national security-related technologies. NASA would have to carefully structure an international partnership in order to comply with ITAR or would have to ask the Congress for a special exemption. Furthermore, prizes of this type are typically conducted anonymously and subsequently would not generate nearly as much press coverage as other prizes (InnoCentive: About Us, 2008). In general, NASA would benefit from the broader participation and increased opportunity for innovations, but would receive less publicity and media interest. The problem-solvers would clearly benefit through receiving their cash reward, but would surrender all intellectual property rights associated with their solution.

Space Debris Disadvantage

***[Note: We’ve included three impact scenarios for this disadvantage: economy (in the shell), hegemony, and space exploration/get off the rock]***

**A. THE CURRENT THREAT TO SATELLITES IS RELATIVELY SMALL, BUT ADDITIONAL DEBRIS THREATENS SUPER-CRITICAL DEBRIS-Wright ‘07**

[David; PhD; co-director of the Global Security Program; Space debris from antisatellite weapons; Bulletin of the Atomic Scientists; 01 Oct 2007; [http://www.thebulletin.org/web-edition/features/space-debris-antisatellite-weapons;](http://www.google.com/url?q=http%3A%2F%2Fwww.thebulletin.org%2Fweb-edition%2Ffeatures%2Fspace-debris-antisatellite-weapons%3B&sa=D&sntz=1&usg=AFQjCNG2FfWLPrnSOJs9TBkM-CK8ylYUlg) retrieved 16 Jun 2011]

Fortunately, the threat to satellites remains relatively small, even in this heavily used altitude band. However, at these altitudes, the threat from debris is becoming comparable to other problems that limit a satellite's lifetime, and significant increases in debris could make it a major problem for satellite operators.

The long-term consequences of additional debris would be even worse. A recent NASA study showed that prior to the Chinese test parts of space have already reached "supercritical" debris densities. Supercritical means that the density of objects has become so large that collisions between objects are frequent enough that they produce additional debris faster than drag removes debris from the region. Those additional debris particles further increase the collision probability, leading to a cascade effect as the large objects in orbit are ground into smaller fragments.

**B. THE AMOUNT OF DEBRIS IS BUILDING TO A CRITICAL MASS, AFTER WHICH DEBRIS WILL CASCADE, CRIPPLING OUR MILITARY SPACE SYSTEMS AND COMMERCIAL SATELLITES-Doctorow ‘11**

[Cory; staff writer; Space debris to go critical, reduce all satellites to junk?; BoingBoing; 11 May 2011; <http://boingboing.net/2011/05/11/space-debris-to-go-c.html;> retrieved 16 Jun 2011]

The amount of debris in the orbits used by our communications and weather satellites is building toward critical mass, a point of no return in which debris starts to smash into active satellites, turning them into more debris that smashes more sats, and so on. There's no cost-effective solution to the space-junk problem and none are on the horizon. Marshall Kaplan (Johns Hopkins Space Department) believes that it's inevitable that all the satellites in use will be percussively decommissioned and their orbits will be unusable. He speculates that we'll replace them with lower orbit satellite constellations that relay to one another in order to achieve the coverage attained by today's high-orbit sats. Here's Gen. William Shelton, commander of USAF Space Command:

The traffic is increasing. We've now got over 50 nations that are participants in the space environment," Shelton said last month during the Space Foundation's 27th National Space Symposium. Given existing space situational awareness capabilities, over 20,000 objects are now tracked.

"We catalog those routinely and keep track of them. That number is projected to triple by 2030, and much of that is improved sensors, but some of that is increased traffic," Shelton said. "Then if you think about it, there are probably 10 times more objects in space than we're able to track with our sensor capability today. Those objects are untrackable ... yet they are lethal to our space systems -- to military space systems, civil space systems, commercial -- no one's immune from the threats that are on orbit today, just due to the traffic in space."

**C. SPACE DEBRIS COULD DESTROY OUR ABILITY TO USE SATELLITES, SENDING THE GLOBAL ECONOMY BACK TO THE 1950S, LEADING TO RESOURCE WARS AND MASSIVE STARVATION-Moore ‘08**

Mike; former editor of Bulletin of the Atomic Scientists; Twilight War: The Folly of U.S. Space Dominance; 10 Jun 2008; <http://www.carnegiecouncil.org/resources/transcripts/0048.html;> retrieved 22 Jul 2011]

Now, in a battlefield there is always debris left over, and it has to be cleaned up, and so on and so forth. But when you have debris in space it stays there. It can stay there for years, for decades, for centuries, or even forever, depending on how high above the earth it is.

If we clutter up orbital space with a conflict, with so many hundreds of thousands of pieces of debris—and I don't kid you about that—the debris problem is huge, and it wouldn't take much to make it beyond home. I've talked to physicists who believe if some country smashed, say, a dozen of our big satellites, or maybe two dozen of our big satellites, we might make space unusable, just plain unusable. And satellites that are undamaged would wear out and we couldn't replace them.

The global economy depends on these satellites. We're not in the 1980s anymore. Everything we do in terms of the global economy depends in one way or another on satellites in space. If we can't replace satellites, if we lose the use of space, then we are going to have a situation where satellites fail and we are going to drift back to a 1950s-style economy.

In the 1950s—and I grew up then, and I kind of liked it—there were only about 2 billion people in the world. Now there are 6.5 billion people If we lose the kind of global economy we have, which is space-dependent, how is that going to work? There are going to be wars for resources, there is going to be malnutrition, there is going to be mass starvation. It is going to be a very, very terrible thing. We can't go back to the 1950s.

UNIQUENESS: SPACE DEBRIS IS ON THE BRINK

**WE ARE AT THE TIPPING POINT FOR SPACE DEBRIS-Bates ‘11**

[Daniel; staff writer; Nasa to shoot lasers at space junk around Earth to prevent collisions with satellites; Daily Mail; 16 Mar 2011; [http://www.dailymail.co.uk/sciencetech/article-1366838/Nasa-use-lasers-shoot-space-junk-Earth.html;](http://www.google.com/url?q=http%3A%2F%2Fwww.dailymail.co.uk%2Fsciencetech%2Farticle-1366838%2FNasa-use-lasers-shoot-space-junk-Earth.html%3B&sa=D&sntz=1&usg=AFQjCNHJ4nr_q4VAxVGZTpUNrE_cET-yMA) retrieved 16 Jun 2011]

Some 20,000 pieces of rubbish are currently being monitored in low-Earth orbit, the majority of which are discarded bits of spacecraft or debris from collisions.

Serious accidents in recent years included the 2009 smash between the Iridium 33 satellite and the Kosmos 2251 satellite.

The communications vessels collided at more than 3,000m per second - the first major smash between two operational satellites in Earth orbit.

Nasa engineer Creon Levit said it was imperative that something was done about space junk.

‘There’s not a lot of argument that this is going to screw us if we don’t do something’ he told Wired.

‘Right now it’s at the tipping point … and it just keeps getting worse.’

**AN ACTIVE SOLAR CYCLE IS INCREASING THE DANGER PRESENTED BY DEBRIS-Fox News ‘11**

[Space Junk Threat Will Grow For Astronauts and Satellites; Fox News; 06 April 2011; [http://www.foxnews.com/scitech/2011/04/06/space-junk-threat-grow-astronauts-satellites/;](http://www.google.com/url?q=http%3A%2F%2Fwww.foxnews.com%2Fscitech%2F2011%2F04%2F06%2Fspace-junk-threat-grow-astronauts-satellites%2F%3B&sa=D&sntz=1&usg=AFQjCNHWeQSef36qEc3CXaJK-WcCucMsVw) retrieved 15 Jun 2011]

These 5,000 new fragments initially started out higher up in Earth orbit than the space station, which flies around the Earth about 220 miles (354 km) up. But they're starting to come closer to the station now, because solar activity is ramping up.

The sun is emerging from an extended quiescent period, and increased solar activity is causing Earth's atmosphere to expand, Stansbery said. As a result, the drag on high-altitude space junk is increasing, causing the stuff to spiral lower and lower.

"When the solar cycle is ramped up, that's typically when we get a lot of this rain-down from higher altitudes," Stansbery said.

Since the peak of solar activity is not expected until 2012 or 2013, astronauts aboard the station could be in for some more close calls in the near future, he added.

**THE UNITED STATES IS CURRENTLY COMMITTED TO CONTROLLING ORBITAL DEBRIS-David ‘07**

[Leonard; Senior Space Writer; China’s Anti-Satellite Test: Worrisome Debris Cloud Circles Earth; 02 Feb 2007; [http://www.space.com/3415-china-anti-satellite-test-worrisome-debris-cloud-circles-earth.html;](http://www.google.com/url?q=http%3A%2F%2Fwww.space.com%2F3415-china-anti-satellite-test-worrisome-debris-cloud-circles-earth.html%3B&sa=D&sntz=1&usg=AFQjCNFJNvcVrhEEtsdZdIrhiZ-wcMSu-g) retrieved 16 Jun 2011]

Last year's signing by U.S. President George W. Bush of a new U.S. National Space Policy addressed the topic of orbital debris. The document flagged the progress made both nationally and internationally regarding proliferation of orbital debris over the past decade - but also underscored the worrisome nature of space junk.

"Orbital debris poses a risk to continued reliable use of space-based services and operations and to the safety of persons and property in space and on Earth," the White House document stated. "The United States shall seek to minimize the creation of orbital debris by government and non-government operations in space in order to preserve the space environment for future generations."

**RIGHT NOW WE ARE AT THE TIPPING POINT FOR THE KESSLER SYNDROME-Grossman ‘11**

[Lisa; staff writer; NASA Considers Shooting Space Junk With Lasers; Wired; 15 Mar 2011; [http://www.wired.com/wiredscience/2011/03/lasering-space-junk/#more-54167;](http://www.google.com/url?q=http%3A%2F%2Fwww.wired.com%2Fwiredscience%2F2011%2F03%2Flasering-space-junk%2F%23more-54167%3B&sa=D&sntz=1&usg=AFQjCNEkApiiB7vJmrApyGGMvCZgdTCD-g) retrieved 16 Jun 2011]

Low-Earth orbit has already seen some scary smashes and near-misses, including the collision of two communications satellites in 2009. Fragments from that collision nearly hit the International Space Station a few months later. Some models found that the runaway Kessler syndrome is probably already underway at certain orbit elevations.

“There’s not a lot of argument that this is going to screw us if we don’t do something,” said NASA engineer Creon Levit. “Right now it’s at the tipping point … and it just keeps getting worse.”

**DEBRIS IS ALREADY A PROBLEM, BUT WE’RE ON THE VERGE OF A RUNAWAY ESCALATION OF DEBRIS-Johnson ‘08**

[John; staff writer; Scientists Cite Growing Peril of Space Junk; Los Angeles Times; 16 April 2008; <http://articles.latimes.com/2008/apr/16/science/sci-spacejunk16;> retrieved 16 Jun 2011]

"Debris in space is already a problem," said David Wright, a senior scientist with the Union of Concerned Scientists in Cambridge, Mass. "But it's potentially a very big problem."

Geoffrey Forden, an MIT physicist and expert on the Chinese space program, said the danger from space debris was actually more of a worry than the threat that the Chinese, or some other country, could intentionally cripple American space assets with antisatellite weapons.

Forden argued that America's redundancy in space satellite systems made it almost invulnerable to that kind of attack, and that it would be relatively easy to spot the Chinese readying a launch.

On the other hand, he said, "We are in danger of a runaway escalation of space debris.

**THE AMOUNT OF SPACE DEBRIS IS REACHING A CRITICAL TIPPING POINT-Blake ‘10**

[Heidi; staff writer; Space so full of junk that a satellite collision could destroy communications on Earth; The Telegraph; 26 May 2010; <http://www.telegraph.co.uk/science/space/7766894/Space-so-full-of-junk-that-a-satellite-collision-could-destroy-communications-on-Earth.html;> retrieved 20 Jun 2011]

The volume of abandoned rockets, shattered satellites and missile shrapnel in the Earth’s orbit is reaching a “tipping point” and is now threatening the $250 billion (£174bn) space services industry, scientists said.

A single collision between two satellites or large pieces of “space junk” could send thousands of pieces of debris spinning into orbit, each capable of destroying further satellites.

Global positioning systems, international phone connections, television signals and weather forecasts are among the services which are at risk of crashing to a halt.

This “chain reaction” could leave some orbits so cluttered with debris that they become unusable for commercial or military satellites, the US Defense Department's interim Space Posture Review warned.

There are also fears that large pieces of debris could threaten the lives of astronauts in space shuttles or at the International Space Station.

The report, which was sent to Congress in March and not publicly released, said space is "increasingly congested and contested" and warned the situation is set to worsen.

LINKS: ASAT WEAPONS

**THE STATUS QUO HAS DANGEROUS AMOUNTS OF DEBRIS, BUT INTENTIONAL ASAT WEAPONS USE WILL MAKE THE SITUATION MUCH WORSE-Wright ‘07**

[David; co-director and senior scientist with the global security program of the Union of Concerned Scientists; Space Debris; Physics Today; February 2007; <http://ptonline.aip.org/journals/doc/PHTOAD-ft/vol_60/iss_10/35_1.shtml?bypassSSO=1;> retrieved 16 Jun 2011]

If the debris density becomes large enough at some altitudes, those regions of space can become "supercritical," meaning that collisions between objects are frequent enough that they produce additional debris faster than atmospheric drag removes debris from the region. The additional particles further increase the collision probability in the region, which leads to a slow-motion chain reaction or cascade as the large objects in orbit are ground into smaller fragments. That situation is sometimes called the Kessler syndrome after Donald Kessler, who studied the possibility.11

A study released by NASA's Orbital Debris Program Office in 2006, before the Chinese test, showed that parts of space have already reached supercritical debris densities.12 In particular, the study shows that in the heavily used altitude band from 900 to 1000 km, the number of debris fragments larger than 10 cm is expected to more than triple over the next 200 years, even assuming no additional objects are launched into the band. The study estimates that the total population of large debris in LEO will increase by nearly 40% during that time, still under the assumption of no additional launches. The debris from the Chinese test will make matters worse.

An important implication of the study is that while mitigation efforts are important for slowing the increases, only debris-remediation measures such as removing large, massive objects already in orbit can hope to prevent their consequences. Remediation efforts such as robotic missions to remove defunct satellites and rocket stages are very expensive, but are being studied.

A second implication is that the intentional destruction of satellites would add large amounts of debris at already-crowded altitudes and thus would significantly increase the collision rate and therefore the rate at which cascades would increase the debris population.

**THE INTERNATIONAL COMMUNITY IS CONTROLLING DEBRIS FROM ROUTINE LAUNCHES, BUT ASATS POSE A NEW, UNREGULATED THREAT-Wright ‘08**

[David; PhD; co-director of the Global Security Program; Space Debris from Anti-Satellite Weapons; Union of Concerned Scientists Fact Sheet; April 2008; [http://www.ucsusa.org/assets/documents/nwgs/debris-in-brief-factsheet.pdf;](http://www.google.com/url?q=http%3A%2F%2Fwww.ucsusa.org%2Fassets%2Fdocuments%2Fnwgs%2Fdebris-in-brief-factsheet.pdf%3B&sa=D&sntz=1&usg=AFQjCNEWrYbKisGrUoynJ2vAktMr4VToqA) retrieved 11 Jun 2011]

There are two main sources of orbital debris:

(1) Routine space activity and the accidental breakup of satellites and stages placed in orbit by such activity;

(2) The testing or use of destructive anti-satellite (ASAT) weapons that physically collide with satellites at high speed (also known as “kinetic energy ASATs”).

The international community is attempting to reduce the first category by developing strict guidelines to limit the debris created as a result of routine space activities. These guidelines appear to be working and can, with strict adherence, significantly reduce the growth of this type of debris.

The destruction of satellites by ASAT weapons can produce tremendous amounts of orbital debris: the destruction of a single large satellite such as a U.S. spy satellite could by itself double the total amount of large debris currently in low earth orbit (LEO), where nearly half of current satellites reside. There are currently no international restrictions on the testing or use of military systems intended to destroy satellites.

**ASAT WEAPONS WILL SIGNIFICANTLY INCREASE THE RISK AND COST OF EXPLORING SPACE-Wright ‘08**

[David; PhD; co-director of the Global Security Program; Space Debris from Anti-Satellite Weapons; Union of Concerned Scientists Fact Sheet; April 2008; [http://www.ucsusa.org/assets/documents/nwgs/debris-in-brief-factsheet.pdf;](http://www.google.com/url?q=http%3A%2F%2Fwww.ucsusa.org%2Fassets%2Fdocuments%2Fnwgs%2Fdebris-in-brief-factsheet.pdf%3B&sa=D&sntz=1&usg=AFQjCNEWrYbKisGrUoynJ2vAktMr4VToqA) retrieved 11 Jun 2011]

Debris in low Earth orbit travels 30 times faster than a commercial jet aircraft. At these speeds, pieces of debris larger than 1 cm (half an inch) can severely damage or destroy a satellite, and it is not possible to shield effectively against debris of this size.

The Chinese destruction of a relatively small satellite roughly doubled the debris threat to satellites in the most heavily used part of LEO. Fortunately, the debris threat to satellites is still relatively small, but continued testing of destructive ASAT weapons against satellites, or their use against several large satellites in a conflict, could result in a much higher risk.

ASAT weapons could therefore significantly increase the cost of using space, and could hinder using regions of space that today are widely used for a range of purposes. Beyond that, the sudden loss of a satellite due to debris during a crisis could remove important capabilities, or could lead to dangerous reactions and the escalation of the crisis, especially if the adversary was known to have an ASAT capability.

**STOPPING ASATS IS THE MOST PRESSING DEBRIS ISSUE TODAY-Wright ‘08**

[David; PhD; co-director of the Global Security Program; Space Debris from Anti-Satellite Weapons; Union of Concerned Scientists Fact Sheet; April 2008; [http://www.ucsusa.org/assets/documents/nwgs/debris-in-brief-factsheet.pdf;](http://www.google.com/url?q=http%3A%2F%2Fwww.ucsusa.org%2Fassets%2Fdocuments%2Fnwgs%2Fdebris-in-brief-factsheet.pdf%3B&sa=D&sntz=1&usg=AFQjCNEWrYbKisGrUoynJ2vAktMr4VToqA) retrieved 11 Jun 2011]

Space is uniquely suited for a range of important uses, such as communication, earth observation, and navigation, and society has becoming highly dependent on satellites. The international community has taken steps to limit the debris from routine space activity, and developing international measures to prohibit the testing or use of destructive ASAT weapons should now be a high priority. As the country by far the most dependent on space, the United States should take steps to lead this effort.

**ASAT WEAPONS WILL HAVE A DEVASTATING IMPACT ON SPACE DEBRIS ENVIRONMENT-Wright ‘07**

[David; PhD; co-director of the Global Security Program; Space debris from antisatellite weapons; Bulletin of the Atomic Scientists; 01 Oct 2007; [http://www.thebulletin.org/web-edition/features/space-debris-antisatellite-weapons;](http://www.google.com/url?q=http%3A%2F%2Fwww.thebulletin.org%2Fweb-edition%2Ffeatures%2Fspace-debris-antisatellite-weapons%3B&sa=D&sntz=1&usg=AFQjCNG2FfWLPrnSOJs9TBkM-CK8ylYUlg) retrieved 16 Jun 2011]

But more importantly, the debris created by the testing and/or use of kinetic energy ASAT weapons, which destroy satellites by colliding with them at high speed, could overwhelm these reductions, since such breakups can create enormous amounts of orbital debris. There is no legal restriction on the testing or use of such weapons, and there are no international negotiations dealing with such weapons.

Somewhat surprisingly, the enormous debris consequences of testing or using destructive ASAT weapons isn't widely understood since estimates have only recently been published, which helps account for the lack of attention the issue has received. (See "The Consequences of Using Kinetic Energy Antisatellite Weapons" and "Space Debris.")

These estimates illustrate that the destruction of a single 10-ton satellite (comparable to a U.S. reconnaissance satellite) would double the total amount of large debris currently in low Earth orbit (i.e., at altitudes below 2,000 kilometers). In particular, it could produce 250,000 pieces of debris larger than 1 centimeter and 5,000 pieces larger than 10 centimeters. Because of their military value, reconnaissance satellites are seen as potential ASAT targets during a conflict.

**ASATS ARE UNIQUELY DAMAGING IN TERMS OF SPACE DEBRIS; THEY CREATE LONG-LASTING DEBRIS IN HEAVILY TRAFFICKED AREAS-Wright ‘07**

[David; PhD; co-director of the Global Security Program; Space debris from antisatellite weapons; Bulletin of the Atomic Scientists; 01 Oct 2007; [http://www.thebulletin.org/web-edition/features/space-debris-antisatellite-weapons;](http://www.google.com/url?q=http%3A%2F%2Fwww.thebulletin.org%2Fweb-edition%2Ffeatures%2Fspace-debris-antisatellite-weapons%3B&sa=D&sntz=1&usg=AFQjCNG2FfWLPrnSOJs9TBkM-CK8ylYUlg) retrieved 16 Jun 2011]

Moreover, this debris wouldn't be spread uniformly throughout low Earth orbit, but instead it would be concentrated near the altitude at which the original satellite was orbiting, significantly increasing the debris density in that region. Because of the low atmospheric drag at high altitudes, the debris resulting from the destruction of satellites orbiting at altitudes greater than about 800 kilometers could remain in orbit for decades or centuries. Because of asymmetries in Earth's gravitational field, for a satellite in a near polar orbit (such as a spy satellite), the resulting debris would spread out into a shell around Earth over time. This debris could therefore threaten all satellites whose orbit carried them through that altitude.

The concern about ASAT weapons was highlighted by a Chinese test of such a system in January 2007. The satellite destroyed in this test--a defunct weather satellite named the Feng Yun 1C (FY-1C)--was relatively small, with a mass of less than a ton. And yet, the Chinese test appears to have increased the amount of debris (size greater than 1 centimeter) in low Earth orbit by 15 to 20 percent, becoming the worst debris-producing event on record. The satellite was orbiting at about 850 kilometers, so the resulting debris is concentrated in a region of space that's heavily used by satellites and already crowded with debris. In addition, because the atmospheric density at this altitude is so low, the debris will decay from orbit slowly, and a large fraction will remain in space for decades.

**PREVENTING ASAT WEAPONRY IS CRITICAL TO PRESERVING THE USE OF SPACE-Wright ‘07**

[David; co-director and senior scientist with the global security program of the Union of Concerned Scientists; Space Debris; Physics Today; February 2007; [http://ptonline.aip.org/journals/doc/PHTOAD-ft/vol\_60/iss\_10/35\_1.shtml?bypassSSO=1;](http://www.google.com/url?q=http%3A%2F%2Fptonline.aip.org%2Fjournals%2Fdoc%2FPHTOAD-ft%2Fvol_60%2Fiss_10%2F35_1.shtml%3FbypassSSO%3D1%3B&sa=D&sntz=1&usg=AFQjCNFietDZnwuwJ4hyWEuFhrjBbVze9Q) retrieved 16 Jun 2011]

Space is uniquely suited for a range of important uses, such as communication, Earth observation, and navigation, and in the 50 years since *Sputnik 1*, society has become highly dependent on satellites. As we start the second 50 years of the space age, failing to take steps to preserve humanity's ability to use space would be incredibly short-sighted. Controlling the production of debris is crucial to the sustainable use of space.

The international community has begun to take steps in the right direction by developing debris-mitigation guidelines for routine activity in space. However, there are no legal restrictions on the testing or use of weapons intended to destroy satellites in orbit. Given the very large quantities of debris that would be created by destroying satellites, such weapons could have a significant, long-term impact on the space environment. Developing international measures to prohibit the testing or use of kinetic-energy ASAT weapons should therefore be an international priority.

**A SINGLE ASAT TEST COULD CONTRIBUTE 15 MILLION PIECES OF SPACE JUNK-Johnson ‘08**

[John; staff writer; Scientists Cite Growing Peril of Space Junk; Los Angeles Times; 16 April 2008; <http://articles.latimes.com/2008/apr/16/science/sci-spacejunk16;> retrieved 16 Jun 2011]

Because there is already so much debris -- more than 150 million pieces, most of them less than 2 inches across -- even if nothing more is added, the amount will still increase by a factor of three in the next 200 years due to the fragmentation of pieces from collisions and other reasons.

That could be a low estimate if more antisatellite tests take place. Destruction of a single 10-ton satellite could contribute as many as 15 million pieces of junk, thousands of them more than a foot across.

Even now, a satellite orbiting Earth passes within 60 miles of a piece of junk several thousand times a day and has a 1% chance each year of getting hit.

"Space is not a big, empty place," Forden said.

LINKS: SOLAR POWER SATELLITES

**THERE ARE NO SOLUTIONS FOR ABANDONED SOLAR-POWER SATELLITES-Mardon and Balogun ‘11**

[Austin, member of the International Academy of Astronautics and Pauline; Solar Satellites Key to Green Energy; Edmonton Journal; 12 Jun 2011;<http://www.edmontonjournal.com/story_print.html?id=4933251&sponsor=;> retrieved 23 Jun 2011]

How long an SPS would survive in orbit is anybody's guess, given the maintenance due to possible damage to solar panels from solar winds and radiation. As for adding to the ever-expanding satellite graveyard in Earth's orbit, most solutions to satellite pollution remain theoretical.

**SOLAR POWERED SATELLITES WOULD HAVE TO PUT HUGE SOLAR PANELS IN SPACE, INCREASING RISK OF SPACE DEBRIS-Boswell ‘04**

[David; Whatever happened to solar power satellites?; The Space Review; 30 August 2004; <http://www.thespacereview.com/article/214/1>; retrieved 22 August 2011]

A fully-operational solar power satellite system could end up needing to be enormous. Some designs suggest creating rectangular solar arrays that are several kilometers long on each side. If we assume that enough money could be found to build something like this and that it could be run competitively against other energy options, there is the very real problem of figuring out how to get it into orbit or how to build it in orbit from separate smaller pieces.

Starting the development of such a system by building small proof of concept satellites is completely within our reach.

The largest solar panels ever deployed in space are currently being used on the International Space Station. They cover more than 830 square meters and are 73 meters long and 11 meters wide. These large panels make the ISS one of the brightest objects in the night sky. Scaling up from there to something much larger would be challenging, but the good news is that we can take one thing at a time.

For a proof of concept satellite it makes sense to use the station’s solar panels as a baseline. By taking advantage of improvements in solar cell technology we could launch a demonstration satellite of the same size that generates up to 3 times as much power. The station’s solar panels are 14% efficient, but recent advances with solar cells and solar concentrators could allow us to build panels that are up to 50% efficient.

If this demonstration system validated the theory behind generating power in space and beaming it down to Earth, the next step would be figuring out how to put even bigger solar panels in space. It may be that with our current launch options it simply isn’t possible to launch an operational solar power system into orbit. If that were the case, the concept would need to be put on hold until other lift options, such as a space elevator, are available.

**SOLAR POWER SATELLITES MUST BE FAR LARGER THAN THE ISS TO WORK-National Space Society ‘11**

[Space Solar Power; National Space Society; 2011; <http://www.nss.org/settlement/ssp/index.htm>; retrieved 22 August 2011]

To gather massive quantities of energy, solar power satellites must be large, far larger than the International Space Station (ISS), the largest spacecraft built to date. Fortunately, solar power satellites will be simpler than the ISS as they will consist of many identical parts.

LINKS: SPACE EXPLORATION

**40% OF SPACE DEBRIS COMES FROM BREAKUP OF SPACECRAFT-Lovegren ‘06**

[Stefan; Space Junk Cleanup Needed, NASA Experts Warn; National Geographic; 19 Jan 2006;

[http://news.nationalgeographic.com/news/2006/01/0119\_060119\_space\_junk.html;](http://www.google.com/url?q=http%3A%2F%2Fnews.nationalgeographic.com%2Fnews%2F2006%2F01%2F0119_060119_space_junk.html%3B&sa=D&sntz=1&usg=AFQjCNHoS6_Y6HhdN_c7WQkbsNwfuwokbg) retrieved 11 Jun 2011]

Since the launch of the Soviet Union's Sputnik I satellite in 1957, humans have been generating space junk.

The U.S. Space Surveillance Network is currently tracking over 13,000 human-made objects larger than four inches (ten centimeters) in diameter orbiting the Earth. These include both operational spacecraft and debris such as derelict rocket bodies.

"Of the 13,000 objects, over 40 percent came from breakups of both spacecraft and rocket bodies," Johnson said.

**SPACE DEBRIS IS GENERATED BY ALL KIND OF SPACE MISSIONS-McKie and Day ‘08**

[Robin and Michael; staff writers; Warning of catastrophe from mass of 'space junk'; The Guardian; 24 Feb 2008; [http://www.guardian.co.uk/science/2008/feb/24/spaceexplorationspacejunk;](http://www.google.com/url?q=http%3A%2F%2Fwww.guardian.co.uk%2Fscience%2F2008%2Ffeb%2F24%2Fspaceexplorationspacejunk%3B&sa=D&sntz=1&usg=AFQjCNEucibdTDaULYXFgHobt1o3BI3ntQ) retrieved 11 Jun 2011]

According to the space agency Nasa, there are now 9,000 pieces of orbiting junk, weighing a total of more than 5,500 tonnes: old rocket launchers, tools and instruments dropped by astronauts, and pieces of exploded spacecraft. Examples include a glove lost by astronaut Ed White during a 1965 space walk, a camera that Michael Collins let slip in space in 1966 and a pair of pliers that an International Space Station astronaut recently let slip through their fingers.

Space junk varies in size from tiny bolts and screws to huge lumps of fuselage and are to be found in two main regions: low Earth orbit, a few hundred miles above Earth, and geostationary orbit, 22,300 miles up, where communication satellites are programmed to hover above the planet.

In low Earth orbit, pieces of debris pose particular problems. They could strike manned spacecraft and lead to fatal depressurisation, space experts warn. In 1991, a space shuttle had to carry out an emergency seven-second burn of its engines to avoid being struck by part of a Russian Cosmos satellite.

**CONTINUED PAYLOADS IN ORBIT WILL DRAMATICALLY INCREASE COLLISIONS AND DEBRIS FROM THOSE COLLISIONS-Kessler ‘09**

[Donald; PhD, 30 year researcher about orbital debris at NASA; 08 Mar 2009; [http://webpages.charter.net/dkessler/files/KesSym.html;](http://www.google.com/url?q=http%3A%2F%2Fwebpages.charter.net%2Fdkessler%2Ffiles%2FKesSym.html%3B&sa=D&sntz=1&usg=AFQjCNF6jZmFYJBoiqla5QFcdsOX0iorKw) retrieved 16 Jun 2011]

Despite the absence of random catastrophic collisions, the predicted fluxes of smaller debris in 1990 and beyond in the JGR paper are not too different from what has been measured as a result of the orbital debris program. Accidental explosions and a few intentional collisions almost certainly contributed to the similarity…. and possibly some non-catastrophic collisions involving an un-catalogued object also contributed. However, the major contributors were a number of small debris sources that were discovered since 1978. Even though these sources have produced a debris environment in the past that is about the same as predicted from collisions, past debris sources are fundamentally different from future random collisions between catalogued objects. The past sources produce debris at a rate that is proportional to the number of objects in orbit, while the future frequency of collisions will produce debris at a rate that is proportional to the square of the number of objects in orbit. For example, if one were to double the number of upper stages and payloads in orbit, each having a probability that they would explode, then the rate that debris is generated by explosions would also double. However the rate that debris is generated by collisions between these objects would increase by a factor of four.

DEBRIS CASCADES

**DEBRIS CAN SNOWBALL, SPAWNING THOUSANDS OF ADDITIONAL PIECES OF DEBRIS-Fox News ‘11**

[Space Junk Threat Will Grow For Astronauts and Satellites; Fox News; 06 April 2011; <http://www.foxnews.com/scitech/2011/04/06/space-junk-threat-grow-astronauts-satellites/;> retrieved 15 Jun 2011]

Fast-moving chunks of space debris zipped uncomfortably close to the International Space Station twice in the past week — cosmic close calls that will likely become more common over the next several years, experts predict.

For one thing, after 50 years of spaceflight there is just more junk up there than there used to be, sharing space with vehicles and their human crews. And this debris can snowball — as when satellites collide, spawning thousands of new pieces of orbiting junk.

The sun is also entering an active period, which puffs up Earth's atmosphere and increases orbital drag — causing higher-altitude space debris to rain down on spacecraft below. Solar activity shouldn't hit its peak until 2012 or 2013, so orbiting astronauts may experience some more close shaves soon.

**TOO MUCH SPACE DEBRIS COULD LEAD TO A CHAIN REACTION OF COLLISIONS, CREATING A BELT OF DEBRIS AROUND THE EARTH-Schwartz ‘10**

[Evan; The Looming Space Junk Crisis: It’s Time to Take Out the Trash; Wired; 24 May 2010; <http://www.wired.com/magazine/tag/kessler-syndrome/;> retrieved 16 Jun 2011]

On clear winter nights, when the trees are bare, Donald Kessler likes to set up a small telescope on the back deck of his house in Asheville, North Carolina, and zoom in on the stars shining over the Blue Ridge Mountains. It’s not the most advanced home observatory, but the retired NASA scientist treasures his Celestron telescope, which was made in 1978. That also happens to be the year Kessler published the paper that made his reputation in aerospace circles. Assigned to the Environmental Effects Project Office at NASA’s Johnson Space Center in Houston, the astrophysicist had gotten interested in the junk that humans were abandoning in the wild black yonder—everything from nuts and tools to defunct satellites and rocket stages the size of school buses.

In that seminal paper, “Collision Frequency of Artificial Satellites: The Creation of a Debris Belt,” Kessler painted a nightmare scenario: Spent satellites and other space trash would accumulate until crashes became inevitable. Colliding objects would shatter into countless equally dangerous fragments, setting off a chain reaction of additional crashes. “The result would be an exponential increase in the number of objects with time,” he wrote, “creating a belt of debris around the Earth.”

At age 38, Kessler had found his calling. Not that his bosses had encouraged him to look into the issue—”they didn’t like what I was finding,” he recalls. But after the paper came out, NASA set up the Orbital Debris Program Office to study the problem and put Kessler in charge. He spent the rest of his career tracking cosmic crap and forming alliances with counterparts in other nations in an effort to slow its proliferation. His description of a runaway cascade of collisions—which he predicted would happen in 30 to 40 years—became known as the Kessler syndrome.

**CONCENTRATED DEBRIS THREATENS SUPERCRITICAL REGIONS OF SPACE THAT WILL SEE CASCADING COLLISIONS-Wright ‘07**

[David; co-director and senior scientist with the global security program of the Union of Concerned Scientists; Space Debris; Physics Today; February 2007; [http://ptonline.aip.org/journals/doc/PHTOAD-ft/vol\_60/iss\_10/35\_1.shtml?bypassSSO=1;](http://www.google.com/url?q=http%3A%2F%2Fptonline.aip.org%2Fjournals%2Fdoc%2FPHTOAD-ft%2Fvol_60%2Fiss_10%2F35_1.shtml%3FbypassSSO%3D1%3B&sa=D&sntz=1&usg=AFQjCNFietDZnwuwJ4hyWEuFhrjBbVze9Q) retrieved 16 Jun 2011]

If the debris density becomes large enough at some altitudes, those regions of space can become "supercritical," meaning that collisions between objects are frequent enough that they produce additional debris faster than atmospheric drag removes debris from the region. The additional particles further increase the collision probability in the region, which leads to a slow-motion chain reaction or cascade as the large objects in orbit are ground into smaller fragments. That situation is sometimes called the Kessler syndrome after Donald Kessler, who studied the possibility.

**THE COLLISION OF TWO SATELLITES OVER SIBERIA IN 2009 DEMONSTRATES THAT THE KESSLER SYNDROME COULD COME TRUE-Schwartz ‘10**

[Evan; The Looming Space Junk Crisis: It’s Time to Take Out the Trash; Wired; 24 May 2010; [http://www.wired.com/magazine/tag/kessler-syndrome/;](http://www.google.com/url?q=http%3A%2F%2Fwww.wired.com%2Fmagazine%2Ftag%2Fkessler-syndrome%2F%3B&sa=D&sntz=1&usg=AFQjCNHqg-Ie8ShQPeaPrDBJ3I01msATng) retrieved 16 Jun 2011]

Then, on February 10, 2009—just a little more than three decades after the publication of his paper—the Kessler syndrome made its stunning debut. Some 500 miles over the Siberian tundra, two satellites were cruising through space, each racing along at about 5 miles per second. Iridium 33 was flying north, relaying phone conversations. A long-retired Russian communication outpost called Cosmos 2251 was tumbling east in an uncontrolled orbit. Then they collided. The ferocious impact smashed the satellites into roughly 2,100 pieces. Repercussions on the ground were minimal—perhaps a few dropped calls—but up in the sky, the consequences were serious. The wreckage quickly expanded into a cloud of debris, each shard an orbiting cannonball capable of destroying yet another hunk of high-priced hardware.

As Kessler received reports of the collision from former colleagues at NASA, he realized that the situation had played out pretty much as he’d foreseen. After all, he had forecast that the first satellite collision would happen around this time between objects of roughly this mass. Like an opening shot in a war, the crash served as a signal that the syndrome had gone from theory to reality. “Some people weren’t aware how fast these objects are going,” he says. “At those speeds, even something quite small can create tremendous damage.”

Almost immediately after the accident, a military unit called the Space Surveillance Network sprang into action. Run by the Joint Space Operations Center at California’s Vandenberg Air Force Base, the network uses a system of radar installations and optical sensors to monitor space junk. Before the Iridium-Cosmos incident, it had been tracking 120 active satellites and worrying about an average of five potential collisions, or “conjunctions,” per day. The crash took everyone by surprise. “It wasn’t even on their list of possibilities that day,” an Iridium spokesperson says.

**WE MUST ENSURE THAT THE COLLISIONS IN SPACE STOP TO PREVENT THE CHAIN REACTION-Grossman ‘11**

[Lisa; staff writer; NASA Considers Shooting Space Junk With Lasers; Wired; 15 Mar 2011; [http://www.wired.com/wiredscience/2011/03/lasering-space-junk/#more-54167;](http://www.google.com/url?q=http%3A%2F%2Fwww.wired.com%2Fwiredscience%2F2011%2F03%2Flasering-space-junk%2F%23more-54167%3B&sa=D&sntz=1&usg=AFQjCNEkApiiB7vJmrApyGGMvCZgdTCD-g) retrieved 16 Jun 2011]

In a paper submitted to *Advances in Space Research* and posted to the preprint server arXiv.org, a team led by NASA space scientist James Mason suggests a novel way to cope: Instead of dragging space junk down to Earth, just make sure the collisions stop.

“If you stop that cascade, the beauty of that is that natural atmospheric drag can take its natural course and start taking things down,” said William Marshall, a space scientist at NASA and coauthor of the new study. “It gives the environment an opportunity to clean itself up.”

Simply keeping new fragments from forming can make a big difference for orbital safety, Levit said. Because objects with more surface area feel more drag, the atmosphere pulls down the lightest, flattest fragments of space junk first. When big pieces of debris break up into smaller ones, the pieces become harder and harder to remove.

Worse, the pieces left behind are often the most dangerous: small, dense things like bolts.

“If one collides with a satellite or another piece of debris at the not-unreasonable relative velocity of, say 5 miles per second, it will blow it to smithereens,” Levit said.

In the new study, the researchers suggest focusing a mid-powered laser through a telescope to shine on pieces of orbital debris that look like they’re on a collision course. Each photon of laser light carries a tiny amount of momentum. Together, all the photons in the beam can nudge an object in space and slow it down by about .04 inches per second.

Shining the laser on bits of space litter for an hour or two a day should be enough to move the whole object by about 650 feet per day, the researchers show. That might not be enough to pull the object out of orbit altogether, but preliminary simulations suggest it could be enough to avoid more than half of all debris collisions.

**CATASTROPHIC BREAKUP OF SATELLITES WOULD DRAMATICALLY INCREASE SPACE DEBRIS-Wright ‘07**

[David; co-director and senior scientist with the global security program of the Union of Concerned Scientists; Space Debris; Physics Today; February 2007; [http://ptonline.aip.org/journals/doc/PHTOAD-ft/vol\_60/iss\_10/35\_1.shtml?bypassSSO=1;](http://www.google.com/url?q=http%3A%2F%2Fptonline.aip.org%2Fjournals%2Fdoc%2FPHTOAD-ft%2Fvol_60%2Fiss_10%2F35_1.shtml%3FbypassSSO%3D1%3B&sa=D&sntz=1&usg=AFQjCNFietDZnwuwJ4hyWEuFhrjBbVze9Q) retrieved 16 Jun 2011]

The catastrophic breakup of satellites in orbit could produce a dramatic increase in the amount of space debris. The NASA breakup model shows that the catastrophic breakup of a single satellite of 5–10 tons would roughly double the amount of debris larger than 1 mm currently in LEO (see the table). That scenario is particularly applicable to US reconnaissance satellites, which are often discussed as likely targets of ASAT attacks, have masses of roughly 10 tons, and orbit in LEO to allow them to collect high-resolution images of Earth.

The 3000–5000 pieces of large debris estimated to be produced in such a breakup is two to three times the roughly 1500 pieces larger than 10 cm currently in the heavily used altitude band between 800 and 900 km. If the satellite that was attacked had its orbit within that band, the resulting debris would be concentrated in the same region and would make the debris problem at those altitudes much worse. For attacks at other altitudes, the amount of debris would represent a much larger percentage increase over the existing amount.

**SPACE DEBRIS HAS NOT GONE TOO FAR YET, BUT IT COULD EASILY REACH SUPER-CRITICAL AND GET OUT OF HAND-Johnson ‘08**

[John; staff writer; Scientists Cite Growing Peril of Space Junk; Los Angeles Times; 16 April 2008; <http://articles.latimes.com/2008/apr/16/science/sci-spacejunk16;> retrieved 16 Jun 2011]

The U.S. began to recognize the threat from space junk about a decade ago, Wright said. Since then, it has been taking measures to reduce the amount of new debris. Those efforts had largely succeeded until the Chinese demonstration.

Forden said the threat of supercriticality was a warning that it was time to treat space not as a vast junkyard, but as a natural resource that must be protected the same way we were learning to protect resources on Earth.

"We're fortunate we haven't really screwed things up yet," Wright said. "But the Chinese test brought home how quickly this could get out of hand."

**RECENT INCREASE IN SPACE JUNK INCREASES CHANCE OF CASCADING SPACE DEBRIS-Broad ‘07**

[William J.; Orbiting Junk, Once a Nuisance, Is Now a Threat; New York Times; 6 February 2007; <http://www.nytimes.com/2007/02/06/science/space/06orbi.html>; retrieved 22 August 2011]

In the last decade or so, as scientists came to agree that the number of objects in orbit had surpassed a critical mass — or, in their terms, the critical spatial density, the point at which a chain reaction becomes inevitable — they grew more anxious.

Early this year, after a half-century of growth, the federal list of detectable objects (four inches wide or larger) reached 10,000, including dead satellites, spent rocket stages, a camera, a hand tool and junkyards of whirling debris left over from chance explosions and destructive tests.

Now, experts say, China’s test on Jan. 11 of an antisatellite rocket that shattered an old satellite into hundreds of large fragments means the chain reaction will most likely start sooner. If their predictions are right, the cascade could put billions of dollars’ worth of advanced satellites at risk and eventually threaten to limit humanity’s reach for the stars.

KESSLER SYNDROME WILL MAKE SPACE UNUSABLE

**THE KESSLER SYNDROME THREATENS FUTURE SPACE MISSIONS AND GLOBAL COMMERCE AND COMMUNICATION-Schwartz ‘10**

[Evan; The Looming Space Junk Crisis: It’s Time to Take Out the Trash; Wired; 24 May 2010; [http://www.wired.com/magazine/tag/kessler-syndrome/;](http://www.google.com/url?q=http%3A%2F%2Fwww.wired.com%2Fmagazine%2Ftag%2Fkessler-syndrome%2F%3B&sa=D&sntz=1&usg=AFQjCNHqg-Ie8ShQPeaPrDBJ3I01msATng) retrieved 16 Jun 2011]

Incidents like these served as clear signs from above that something must finally be done about space junk. Its proliferation threatens not only current and future space missions but also global communications—mobile phone networks, satellite television, radio broadcasts, weather tracking, and military surveillance, even the dashboard GPS devices that keep us from getting lost. The number of manufactured objects cluttering the sky is now expected to double every few years as large objects weaken and split apart and new collisions create more Kesslerian debris, leading to yet more collisions.

NASA’s Bacon puts it bluntly: “The Kessler syndrome is in effect. We’re in a runaway environment, and we won’t be able to use space in the future if we don’t start dealing with this now.”

**SCIENTISTS WARN THAT WE ARE RAPIDLY APPROACHING THE THRESHOLD FOR THE KESSLER EFFECT-Cooper ‘07**

[Sean; staff writer; Houston, We Have A Trash Problem; Wired; 24 April 2007; <http://www.wired.com/wired/archive/15.05/st_houston.html;> retrieved 16 Jun 2011]

Outer space is becoming a garbage heap. Some 15,000 pieces of debris, ranging from fingernail-sized paint flecks to 10-ton rocket stages, are hurtling through Earth's orbit at 5 miles per second — about 10 times as fast as a speeding bullet. And the junk is multiplying, *Asteroids*-like, as large objects break apart into smaller ones. (China's recent anti-satellite test has hastened the process.) Scientists warn of an approaching Kessler syndrome: the point at which flotsam from collisions makes future space ventures dangerous. How can we clean up the mess? The trick is to either grab shrapnel or coax it toward the planet, where it will burn up in the atmosphere. Several methods of trash collection have been floated. Some are cleverly low tech; others seem like fodder for the Sci Fi Channel.

**THE KESSLER SYNDROME WOULD MAKE EARTH’S ORBIT UNINHABITABLE FOR SATELLITES-Cartwright ‘11**

[Jon; staff writer; Lasers Could Nudge Orbiting Space Debris Aside; Scientific American; 15 Mar 2011; retrieved 16 Jun 2011; [http://www.scientificamerican.com/article.cfm?id=lasers-nudge-orbiting-space-debris-aside]](http://www.scientificamerican.com/article.cfm?id=lasers-nudge-orbiting-space-debris-aside%5d)

Scientists in the United States have devised a new way to avoid collisions among space debris, and possibly even reduce the amount of debris in orbit. The method uses a medium-powered, ground-based laser to nudge the debris off course -- but some are concerned that the laser could be used as a weapon.

Debris orbiting Earth is a mounting problem. Two years ago, a satellite owned by the communications provider Iridium, based in McLean, Virginia, smashed into a defunct Russian satellite at ten times the speed of a rifle bullet, putting an end to the 'big sky' theory that assumed space was too vast for chance collisions. That incident alone created more than 1,700 pieces of debris, raising the total amount by nearly 20%.

Space analysts are particularly concerned about the possible onset of Kessler syndrome, when enough debris is present to make collisions so likely there would be an avalanche effect that would leave the Earth's orbit uninhabitable for satellites.

**FAILING TO PRESERVE LONG-TERM USEFULNESS OF SPACE IS INCREDIBLY SHORT-SIGHTED-Wright ‘07**

[David; PhD; co-director of the Global Security Program; Space debris from antisatellite weapons; Bulletin of the Atomic Scientists; 01 Oct 2007; [http://www.thebulletin.org/web-edition/features/space-debris-antisatellite-weapons;](http://www.google.com/url?q=http%3A%2F%2Fwww.thebulletin.org%2Fweb-edition%2Ffeatures%2Fspace-debris-antisatellite-weapons%3B&sa=D&sntz=1&usg=AFQjCNG2FfWLPrnSOJs9TBkM-CK8ylYUlg) retrieved 16 Jun 2011]

Failing to preserve the long-term utility of space is incredibly shortsighted. While progress is being made on some aspects of this problem, the international community should prioritize outlawing destructive ASAT weapons. Banning them will require negotiations and may not be possible without broader discussions of space security. Such negotiations and discussions have been blocked for more than a decade in the Conference on Disarmament, and the United States has been a key obstacle. Given their mutual interests in space, the United States and other countries must find a way to start such a dialogue.

As we embark on the next 50 years of the space age, creating an international consensus to further develop a legal framework for space and to establish mechanisms to deal with issues such as space debris is a key challenge. Doing so will likely require a change in the way we view space.

**KESSLER SYNDROME WOULD MAKE SPACE TOO DANGEROUS TO FLY IN-Grossman ‘11**

[Lisa; NASA Considers Shooting Space Junk With Lasers; Wired Science; 15 March 2011; <http://www.wired.com/wiredscience/2011/03/lasering-space-junk/#more-54167>; retrieved 23 August 2011]

The growing cloud of space junk surrounding the Earth is a hazard to spaceflight, and will only get worse as large pieces of debris collide and fragment. NASA space scientists have hit on a new way to manage the mess: Use mid-powered lasers to nudge space junk off collision courses.

The U.S. military currently tracks about 20,000 pieces of junk in low-Earth orbit, most of which are discarded bits of spacecraft or debris from collisions in orbit.

The atmosphere naturally drags a portion of this refuse down to Earth every year. But in 1978, NASA astronomer Don Kessler predicted a doomsday scenario: As collisions drive up the debris, we’ll hit a point where the amount of trash is growing faster than it can fall out of the sky. The Earth will end up with a permanent junk belt that could make space too dangerous to fly in, a situation now called “Kessler syndrome.”

Low-Earth orbit has already seen some scary smashes and near-misses, including the collision of two communications satellites in 2009. Fragments from that collision nearly hit the International Space Station a few months later. Some models found that the runaway Kessler syndrome is probably already underway at certain orbit elevations.

“There’s not a lot of argument that this is going to screw us if we don’t do something,” said NASA engineer Creon Levit. “Right now it’s at the tipping point … and it just keeps getting worse.”

In a paper submitted to Advances in Space Research and posted to the preprint server arXiv.org, a team led by NASA space scientist James Mason suggests a novel way to cope: Instead of dragging space junk down to Earth, just make sure the collisions stop.

“If you stop that cascade, the beauty of that is that natural atmospheric drag can take its natural course and start taking things down,” said William Marshall, a space scientist at NASA and coauthor of the new study. “It gives the environment an opportunity to clean itself up.”

Simply keeping new fragments from forming can make a big difference for orbital safety, Levit said. Because objects with more surface area feel more drag, the atmosphere pulls down the lightest, flattest fragments of space junk first. When big pieces of debris break up into smaller ones, the pieces become harder and harder to remove.

Worse, the pieces left behind are often the most dangerous: small, dense things like bolts.

“If one collides with a satellite or another piece of debris at the not-unreasonable relative velocity of, say 5 miles per second, it will blow it to smithereens,” Levit said.

IMPACT: SPACE DEBRIS THREATENS ECONOMY

**IF A SPACE DEBRIS CHAIN REACTION GOT OUT OF CONTROL, IT COULD CRIPPLE THE US MILITARY AND GLOBAL ECONOMY-Dillow ‘10**

[Clay; Pentagon: A Space Junk Collision Could Set Off Catastrophic Chain Reaction, Disable Earth Communications; PopSci; 27 May 2010; <http://www.popsci.com/technology/article/2010-05/dod-space-junk-tipping-point-collision-could-set-catastrophic-chain-reaction;> retrieved 20 Jun 2011]

Every now and again someone raises a stern warning about the amount of space junk orbiting Earth. Those warnings are usually met with general indifference, as very few of us own satellites or travel regularly to low Earth orbit. But the DoD's assessment of the space junk problem finds that perhaps we should be paying attention: space junk has reached a critical tipping point that could result in a cataclysmic chain reaction that brings everyday life on Earth to a grinding halt.

Our reliance on satellites goes beyond the obvious. We depend on them for television signals, the evening weather report, and to find our houses on Google Earth when we're bored at work. But behind the scenes, they also inform our warfighting capabilities, keep track of the global shipping networks that keep our economies humming, and help us get to the places we need to get to via GPS.

According to the DoD's interim Space Posture Review, that could all come crashing down. Literally. Our satellites are sorely outnumbered by space debris, to the tune of 370,000 pieces of junk up there versus 1,100 satellites. That junk ranges from nuts and bolts lost during spacewalks to pieces of older satellites to whole satellites that no longer function, and it's all whipping around the Earth at a rate of about 4.8 miles per second.

The fear is that with so much junk already up there, a collision is numerically probable at some point. Two large pieces of junk colliding could theoretically send thousands more potential satellite killers into orbit, and those could in turn collide with other pieces of junk or with satellites, unleashing another swarm of debris. You get the idea.

To give an idea of how quickly a chain reaction could get out hand consider this: in February of last year a defunct Russian satellite collided with a communications satellite, turning 2 orbiting craft into 1,500 pieces of junk. The Chinese missile test that obliterated a satellite in 2007 spawned 100 times more than that, scattering 150,000 pieces of debris.

If a chain reaction got out of control up there, it could very quickly sever our communications, our GPS system (upon which the U.S. military heavily relies), and cripple the global economy (not to mention destroy the $250 billion space services industry), and whole orbits could be rendered unusable, potentially making some places on Earth technological dead zones.

**ORBITAL DEBRIS THREATENS THE SATELLITES THAT POWER THE GLOBAL ECONOMY-Moore ‘09**

[Mike; a research fellow with the Independent Institute; Space Debris: From Nuisance to Nightmare; Foreign Policy; 12 Feb 2009; <http://www.foreignpolicy.com/articles/2009/02/11/space_debris_from_nuisance_to_nightmare;> retrieved 16 Jun 2011]

And yet, no one was harmed. Space is a big place, isn't it? The reports noted that there were already thousands of pieces of space junk large enough to be tracked and catalogued. Nonetheless, no one has ever been harmed by a bit of space garbage.

At the moment, the amount of debris in low-earth orbit -- the region of space that extends a few hundred miles above the atmosphere -- is merely a nuisance. The United States tracks objects in space and shares the data with the world. Satellite handlers based in many countries use the data to slightly alter the course of their birds if a collision seems possible.

End of story? Not quite. Orbital space is a natural resource, as surely as land, air, and water. It must be protected because it is home to nearly a thousand satellites put up by many countries -- communications, geo-observation, geopositioning, weather, and other kinds of satellites. Globalization would not be possible without commercial satellites.

**UNCONTROLLED SPACE DEBRIS THREATENS GLOBAL COMMERCE-Wright ‘07**

[David; PhD; co-director of the Global Security Program; Space debris from antisatellite weapons; Bulletin of the Atomic Scientists; 01 Oct 2007; <http://www.thebulletin.org/web-edition/features/space-debris-antisatellite-weapons;> retrieved 16 Jun 2011]

The term "outer space" has always inspired visions of vast regions of nothingness. So even 50 years into the space age, people still tend to view space like the early pioneers viewed the Wild West--sparsely populated, and therefore in little need of laws or regulations, and so boundless that no one worried about ruining the environment.

Of course, over time, things changed in the Wild West. As society and commerce grew, people found that laws were essential to avoiding conflicts, resolving disputes, allowing equitable distribution of resources, and protecting the environment. In the five decades since the Soviet Union launched Sputnik I, the space around Earth inhabited by satellites has become sufficiently crowded and satellites have become important enough to modern society that a Wild-West view of space is outdated. Some 4,500 launches have taken place since Sputnik, and there are currently 850 active satellites in space, owned by some 50 countries, as well as nearly 700,000 pieces of debris large enough to damage or destroy those satellites. (For information about the satellites that are currently active, see the Union of Concerned Scientists' database.) Space commerce generates more than $100 billion a year in revenue. In every region of the globe, many aspects of society are becoming increasingly dependent on the services satellites make possible, and militaries are becoming increasingly reliant on them for a range of uses, including communication, reconnaissance, navigation, and weather monitoring.

**A CHAIN REACTION OF COLLIDING SPACE JUNK COULD THREATEN THE WORLD’S SATELLITE NETWORK-Johnson ‘08**

[John; staff writer; Scientists Cite Growing Peril of Space Junk; Los Angeles Times; 16 April 2008; <http://articles.latimes.com/2008/apr/16/science/sci-spacejunk16;> retrieved 16 Jun 2011]

A successful Chinese missile test last year that destroyed one of China's own aging satellites has substantially added to space debris around Earth, increasing the danger that a chain reaction of colliding space junk could threaten parts of the world's satellite network, scientists said Tuesday.

The threat is that debris could begin slamming into other debris, creating a cascading effect called supercriticality, according to scientists addressing the American Physical Society conference here this week.

**LOSS OF SPACE COMMUNICATIONS WOULD HAVE CATASTROPHIC IMPACTS ON THE US ECONOMY-Lord ‘05**

[Lance; Why America Needs Space: The Prerequisites for Success; High Frontier Journal; Sep 2005; pg. 2-3]

In the simplest terms, America needs Space for its National Security and the survival of our way of life. We need space just as we need land, air, and sea forces. Removing one of those components of our National Security would render us incapable of defending the Nation. Removing space from the equation not only cripples our land, air and sea forces but it would have catastrophic consequences to our entire economy. In 1998, we saw firsthand what the loss of a satellite could do to our economy and way of life. Galaxy IV lost its Earth orientation, wiping out pager traffic for 40 million pagers in the US, halting credit card transactions and ATM machines, and knocking TV and radio stations off the air. Space is beyond a joint warfighting catalyst; it is a universal necessity and must be protected as such. It is important though, to recognize there are many different perspectives on the relevance of space.

**DESTRUCTION OF SATELLITES OR LOST ACCESS TO SPACE WOULD HURT ECONOMIC GROWTH AND LEAD TO ECONOMIC DECLINE-Heritage Foundation ‘11**

[A Strong National Defense: The Armed Forces America Needs and What They Will Cost; 05 April 2011; <http://www.heritage.org/research/reports/2011/04/a-strong-national-defense-the-armed-forces-america-needs-and-what-they-will-cost;> retrieved 22 Jul 2011]

Space assets and access to those assets are essential components of military power and are vital to the prosperity of the American people. The military depends on space systems for a variety of functions, including communications, early warning of attack, battle damage assessment, intelligence, navigation, and weather forecasting.

Control of space is necessary to defend the people, territory, institutions, and infrastructure of the U.S. against ballistic missile attacks, including an EMP attack. The American economy depends on satellites for communication, financial transactions, navigation, and logistical support among other priorities to sustain the American way of life. The economy would be far less efficient and competitive if these satellite systems were degraded or lost. Accordingly, preserving freedom of access to space is a vital interest.

U.S. satellites are vulnerable to attack, and the Earth satellite orbits are becoming increasingly congested and contested. Even nations such as Iran and North Korea are pursuing space systems. In 2007, China successfully tested its direct-ascent anti-satellite (ASAT) weapon. Russia also has ASAT capabilities.

Losing access to space systems and satellites because of disruption or destruction would deprive the U.S. military of one of its most important and valuable “force multipliers.” Its loss would eliminate a major portion of the U.S. military’s technological edge over potential enemies. Economically, the loss of access to or destruction of space systems would inhibit economic growth and could push America into economic decline.

**SPACE DEBRIS POSES THREATS TO COMMUNICATION, SCIENCE, NAVIGATION AND DEFENSE-Space Mart ‘09**

[An Entrepreneur's Dream - Space Debris; Space Mart; 18 May 2009; <http://www.spacemart.com/reports/An_Entrepreneur_Dream_Space_Debris_999.html>; retrieved 23 August 2011]

There is little doubt that space must be cleaned up and the cost will be astronomical. This may be that moment in history when the first billionaire is created by developing a plan to save space for generations to come.

Entrepreneurs can smell an opportunity to make money. Some have a sixth sense and others have to work at it. But, all have something in common; they want to turn an idea into a profit. Many potential opportunities are connected to a negative event. Such events often create an imperative to correct a situation.

Today, we are on the threshold of an event that may prove to be devastating to the future of the world's access and use of space. That event is the growing cancer of space debris. Every operational satellite is already at risk of a catastrophic collision with debris, and that risk is growing.

The growth of debris poses an increasing threat to navigation, communications, defense and scientific spacecraft that must be stopped and reversed. Time is running out!

IMPACT: ECONOMY IMPACT

**A COLLAPSED ECONOMY LEADS TO MULTIPLE SCENARIOS FOR WIDESPREAD WAR- Mead ‘09**

[Walter Russell; Fellow @ the Council on Foreign Relations; Only Makes You Stronger; The New Republic; 4 February 2009; page 23]

Crisis can also strengthen the hand of religious extremists, populist radicals, or authoritarian traditionalists who are determined to resist liberal capitalist society for a variety of reasons. Meanwhile, the companies and banks based in these societies are often less established and more vulnerable to the consequences of a financial crisis than more established firms in wealthier societies.

As a result, developing countries and countries where capitalism has relatively recent and shallow roots tend to suffer greater economic and political damage when crisis strikes--as, inevitably, it does. And, consequently, financial crises often reinforce rather than challenge the global distribution of power and wealth. This may be happening yet again.

None of which means that we can just sit back and enjoy the recession. History may suggest that financial crises actually help capitalist great powers maintain their leads--but it has other, less reassuring messages as well. If financial crises have been a normal part of life during the 300-year rise of the liberal capitalist system under the Anglophone powers, so has war. The wars of the League of Augsburg and the Spanish Succession; the Seven Years War; the American Revolution; the Napoleonic Wars; the two World Wars; the cold war: The list of wars is almost as long as the list of financial crises.

Bad economic times can breed wars. Europe was a pretty peaceful place in 1928, but the Depression poisoned German public opinion and helped bring Adolf Hitler to power. If the current crisis turns into a depression, what rough beasts might start slouching toward Moscow, Karachi, Beijing, or New Delhi to be born?

The United States may not, yet, decline, but, if we can't get the world economy back on track, we may still have to fight.

IMPACT: SPACE DEBRIS THREATENS HEGEMONY

**UNCONTROLLED SPACE DEBRIS THREATENS MILITARY DOMINANCE-Wright ‘07**

[David; PhD; co-director of the Global Security Program; Space debris from antisatellite weapons; Bulletin of the Atomic Scientists; 01 Oct 2007; <http://www.thebulletin.org/web-edition/features/space-debris-antisatellite-weapons;> retrieved 16 Jun 2011]

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Of course, over time, things changed in the Wild West. As society and commerce grew, people found that laws were essential to avoiding conflicts, resolving disputes, allowing equitable distribution of resources, and protecting the environment. In the five decades since the Soviet Union launched Sputnik I, the space around Earth inhabited by satellites has become sufficiently crowded and satellites have become important enough to modern society that a Wild-West view of space is outdated. Some 4,500 launches have taken place since Sputnik, and there are currently 850 active satellites in space, owned by some 50 countries, as well as nearly 700,000 pieces of debris large enough to damage or destroy those satellites. (For information about the satellites that are currently active, see the Union of Concerned Scientists' database.) Space commerce generates more than $100 billion a year in revenue. In every region of the globe, many aspects of society are becoming increasingly dependent on the services satellites make possible, and militaries are becoming increasingly reliant on them for a range of uses, including communication, reconnaissance, navigation, and weather monitoring.

**SATELLITES ARE CRITICAL FOR AMERICAN MILITARY POWER-Moore ‘09**

[Mike; a research fellow with the Independent Institute; Space Debris: From Nuisance to Nightmare; Foreign Policy; 12 Feb 2009; [http://www.foreignpolicy.com/articles/2009/02/11/space\_debris\_from\_nuisance\_to\_nightmare;](http://www.google.com/url?q=http%3A%2F%2Fwww.foreignpolicy.com%2Farticles%2F2009%2F02%2F11%2Fspace_debris_from_nuisance_to_nightmare%3B&sa=D&sntz=1&usg=AFQjCNFnwmyjWZpCWxs-6Ut3PSldGQIATg) retrieved 16 Jun 2011]

Further, the United States' military-related birds permit the country to conduct precision war. For the first time in history, satellites provide the data and the guidance necessary to enable bombs and missiles to actually hit the targets they are fired at. That's a moral plus. If a war must be fought, it should be prosecuted in such a way that military targets are hit and civilians spared to the greatest extent possible. No other country can fight a conventional war as cleanly and humanely as the United States. Satellites make the difference.

Because of the importance of satellites to the American way of war, the United States insists that it must achieve the capability to militarily dominate space in a time of conflict. It is the only country that claims that right. Space, says international law on the other hand, is the common heritage of humankind and must be devoted to peaceful purposes.

**SATELLITES ARE A CRITICAL PART OF US MILITARY POWER ON AIR, LAND, AND SEA-Baldor ‘11**

[Lolita; staff writer; Pentagon strategy stresses the importance of satellites; Washington Post; 21 Feb 2011; <http://www.washingtonpost.com/wp-dyn/content/article/2011/02/20/AR2011022003484.html;> retrieved 22 Jul 2011]

The U.S. military needs to better protect its satellites and strengthen its ability to use them as weapons as the uncharted battlefield of space becomes increasingly crowded and dangerous, Pentagon leaders say.

A new military strategy for space, as mapped out by the Pentagon, calls for greater cooperation with other nations on space-based programs to improve the United States' ability to deter enemies.

"It's a domain, like air, land and sea," said Gen. Kevin Chilton, who led U.S. Strategic Command until he retired late last month. "Space is not just a convenience. It's become a critical part in every other [battlefield] domain."

The United States, Chilton said, needs to make sure that it protects and maintains the battlefield capabilities it gets from space, including global-positioning data, missile warning system information, and communications with fighters or unmanned drones that are providing surveillance or firing missiles against the enemy.

**SATELLITES IN ORBIT ARE CRITICAL TO AMERICAN NATIONAL SECURITY-The New Atlantis ‘03**

[The Future of Satellites; The New Atlantis; Fall 2003; <http://www.thenewatlantis.com/publications/the-future-of-satellites;> retrieved 21 Jul 2011]

Over the past four decades, satellites in orbit around the earth have become absolutely critical to commerce, communication, and national security. Military and commercial dominance of (or at least basic competence in) the satellite business will be a key to America’s success in the coming years. But recent press reports indicate that the nation’s military reconnaissance satellite program is in poor shape, and that an unprecedented proliferation of foreign-owned commercial “microsatellites” is near-at-hand.

The U.S. has spent about $200 billion on its military satellite program since its inception some four decades ago. Most estimates suggest that the American military and intelligence community now have roughly 100 satellites in orbit dedicated purely to national security reconnaissance and communication. These satellites are operated by the highly secretive National Reconnaissance Office (NRO), run out of the Pentagon and staffed jointly by Defense Department and intelligence community personnel.

**AMERICAN ECONOMIC AND MILITARY STRENGTH DEPEND ON SATELLITES-Ziegler ‘97**

[David; Safe Havens: MIlitary Strategy and Space Sanctuary Thought; USAF Air University; June 1997; pg. 7]

The United States is a spacefaring nation. It operates some 200 military and civilian satellites with a combined value of $100 billion. As impressive as these statistics appear, they do not reflect the additional billions of dollars and millions of American lives influenced every day by space communication, navigation, weather, environmental, and national security satellites. Space is big business and is inseparable from U.S. economic strength. It attracts international attention and therefore diplomatic power. It is absolutely crucial to American military operations.

**DESTRUCTION OF SATELLITES OR LOST ACCESS TO SPACE WOULD ELIMINATE A CRITICAL FORCE MULTIPLIER FOR THE US MILITARY-Heritage Foundation ‘11**

[A Strong National Defense: The Armed Forces America Needs and What They Will Cost; 05 April 2011; <http://www.heritage.org/research/reports/2011/04/a-strong-national-defense-the-armed-forces-america-needs-and-what-they-will-cost;> retrieved 22 Jul 2011]

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IMPACT: US HEGEMONY CRITICAL

**A FAILURE OF AMERICAN PRIMACY MEANS A POWER VACUUM AND A WORLD THAT HAS NO ABILITY TO MANAGE HUMANITARIAN DISASTERS, CLIMATE CHANGE OR TERRORISM-Edelman ‘10**

[Eric; Understanding America’s Contested Primacy; 21 Oct 2010; Center for Strategic and Budgetary Assessments; retrieved 22 Jul 2011; http://www.csbaonline.org/publications/2010/10/understanding-americas-contested-primacy/]

An additional, and extremely important, long-term factor underpinning likely continued US global economic leadership is demographics. The US fertility rates are among the highest in the developed world and are virtually at replacement. With a growing population that will be more youthful than other developed countries (or China) the United States would appear to be in a favorable position. One could also add to the long list of US advantages the political and social stability that has made it the safe haven for global investors. None of these advantages, however, including the United States’ military power, mean that the United States is destined to remain the preponderant power or that unipolarity will continue to characterize the international system indefinitely. Bad policy decisions in a number of areas could negate or squander US advantages. In addition the United States faces many of its own challenges. Despite its demographic health the United States will have to meet the unfunded pension liabilities represented by the aging of the baby boom generation. The nation’s standing has also suffered from the mismanagement of the wars in Iraq and Afghanistan. Without a concerted effort by the United States, the international system could move in the direction of nonpolarity or apolarity with no nation clearly playing a leading role in trying to organize the international system. The result would be a vacuum of leadership unable to manage the plethora of contemporary problems besetting the world like terrorism, nuclear proliferation, ethnic and sectarians wars, ­humanitarian ­disasters, crime, narcotics trafficking, pandemic disease and global climate change to name just a few.

**AMERICAN HEGEMONY IS CRITICAL FOR GLOBAL SECURITY-Gray ‘09**

[Colin; Professor of International Politics and Strategic Studies at the University of Reading; After Iraq: The Search For A Sustainable National Security Strategy; 13 Jan 2009; <http://www.strategicstudiesinstitute.army.mil/pubs/display.cfm?pubid=902>; retrieved 13 Aug 2010]

“Hegemony-light” is a policy, not a strategy. The main reason why the United States should endeavor to remain the hegemon is the need to play the dominant role in the endless struggle to support and advance a world order broadly conducive to America’s vital interests and friendly to American values, insofar as that proves feasible. In common with the slippery concept of security, order has many dimensions, including the political, the financial-economic, the environmental-ecological, and the military-strategic. In addition, world and regional order can be upset by the consequences of health crises (HIV-AIDS, most obviously), as the Spanish Flu pandemic of 1918- 19 demonstrated.104 Also, adverse climate change, uncontrolled population growth in developing countries, and increasing resource shortages—of water, food, and energy—can and most probably will incite disorder in all major dimensions of global affairs. The United States will not be equally dominant in all aspects of global order, but its policy, strategy, and actual behavior will be either regnant or at least a major player in each of those dimensions. This is what it means to be hegemonic. The world needs leadership from some sufficient source. Although U.S. policy on global issues is often resisted, sometimes effectively, Americans nonetheless are able to help shape the global agenda and generally can exercise a potent influence on the world community’s actions. Washington frequently is annoyed and frustrated by the unwillingness of others to be led by U.S. policy choices. But Americans would be far more frustrated were they either to seek to abandon the hegemonic leadership role altogether, or to resign themselves to functioning within the straitjacket of near unanimous multilateral consent. Not much would be attempted, let alone achieved, on behalf of regional and global order. American hegemonic leadership does not mean American domination. America may be dominant, indeed it will need to be dominant in its ability to persuade, bribe, and, if necessary, coerce.

**FAILURE TO MAINTAIN AMERICAN PRIMACY WILL MAKE THE US WEAK, SUBJECT TO A WORLD CONTROLLED CULTURALLY, POLITICALLY, AND ECONOMICALLY BY CHINA-Thayer ‘06**

[Bradley; Professor of Defense & Strategic Study, Missouri State University; *American Empire: A Debate*; 2006; Kindle edition]

General Douglas MacArthur said that there was no substitute for victory. Just as there is no substitute for victory, there is no alternative for leadership. For if the United States does not provide that leadership to its allies by pledging to use all of its power in their defense, then they will provide their own security. If the United States does not lead the world, another hegemon will rise to replace it. That hegemon will be China. China will then be in a position to dictate to the rest of world, including the United States. The United States would be far less secure in such a world. This is because, first, the physical security of the United States would be jeopardized. Due to its military superiority, China would have the ability to triumph over the United States in the event of war or an international crisis, like the 1962 Cuban Missile Crisis. The United States would be forced to back down, thus placing China's interests before its own. China would be able to blackmail the United States, to coerce it to do Beijing's bidding. The United States would be relegated to the role of pawn on the international chessboard. Second, the United States would lose its allies and global influence. As China's power grew, countries would look to Beijing to be their ally in order to gain security and assistance. It will be the case that countries long allied with the United States, such as Australia, will no longer be allies as their interests require them to look to Beijing and away from Washington. Third, the Chinese economy will dominate the global economy. Worldwide, both countries and businesses will look to China not simply as a market, as they do now, but the economic locomotive of the world's economy, as the lender of last resort, and as the stabilizer of economic exchange and the international trade and monetary regimes. Countries will have to appease China economically or face the consequences of its wrath. Fourth, Chinese will be the language of diplomacy, trade and commerce, transportation and navigation, the Internet, world sport, and global culture. Additionally, China will dominate science and technology, in all of its forms—the life sciences, bioengineering, computer science, and even space exploration. It will be a great blow to the pride of the United States, greater than Sputnik in 1957, when China travels to the Moon, as they plan to do, and plants the communist flag on Mars, and perhaps other planets in the future. In sum, the United States will be far less influential and subjected to the role that China, not decision-makers in Washington or the American people, wants it to play. Fundamentally, the security of the United States would be dependent on the decisions made in China. That is the world of the future if the United States does not maintain its primacy.

**AMERICAN POWER CREATES STABILITY THAT PREVENTS REGIONAL WARS WORLDWIDE-Thayer ‘06**

[Bradley; Professor of Defense & Strategic Study, Missouri State University; *American Empire: A Debate*; 2006; Kindle edition]

The fourth critical fact to consider is that the security provided by the power of the United States creates stability in international politics. That is vitally important for the world, but easily forgotten. Harvard professor Joseph Nye often compares the security provided by the United States to oxygen. If it were taken away, a person would think of nothing else. If the security and stability provided by the United States were taken away, most countries would be much worse off, and arms races, vicious security competition, and wars would result. It would be a world without NATO or other key U.S. alliances. We can imagine easily conflict between traditional rivals like Greece and Turkey, Syria and Israel, India and Pakistan, Taiwan and China, Russia and Georgia, Hungary and Romania, Armenia and Azerbaijan, and an intense arms race between China and Japan. In that world, the breakup of Yugoslavia would have been a far bloodier affair that might have escalated to become another European war. In contrast to what might occur absent U.S. power, we see that the post-Cold War world dominated by the United States is an era of peace and stability.

IMPACT: DEBRIS THREATENS SPACE EXPLORATION

**CONTROLLING THE PRODUCTION OF DEBRIS IS CRITICAL TO PRESERVE THE LONG-TERM USE OF SPACE-Wright ‘08**

[David; PhD; co-director of the Global Security Program; Space Debris from Anti-Satellite Weapons; Union of Concerned Scientists Fact Sheet; April 2008; <http://www.ucsusa.org/assets/documents/nwgs/debris-in-brief-factsheet.pdf;> retrieved 11 Jun 2011]

Space debris is any human-made object in orbit that no longer serves a useful purpose. It includes defunct satellites, discarded equipment and rocket stages, and fragments from the breakup of satellites and rocket stages.

Space debris is a concern because—due to its very high speed in orbit—even relatively small pieces can damage or destroy satellites in a collision. Since debris at high altitudes can stay in orbit for decades or longer, it accumulates as more is produced. As the amount grows, the risk of collisions with satellites also grows. If the amount of debris at some altitudes becomes sufficiently large, it could be difficult to use those regions for satellites.

Since there is currently no effective way to remove large amounts of debris from orbit, controlling the production of debris is essential for preserving the long-term use of space.

**HIGH SPEED OF DEBRIS MEANS IT CAN DISABLE SATELLITES AND SPACECRAFT-Lovegren ‘06**

[Stefan; Space Junk Cleanup Needed, NASA Experts Warn; National Geographic; 19 Jan 2006;

[http://news.nationalgeographic.com/news/2006/01/0119\_060119\_space\_junk.html;](http://www.google.com/url?q=http%3A%2F%2Fnews.nationalgeographic.com%2Fnews%2F2006%2F01%2F0119_060119_space_junk.html%3B&sa=D&sntz=1&usg=AFQjCNHoS6_Y6HhdN_c7WQkbsNwfuwokbg) retrieved 11 Jun 2011]

In addition, there are hundreds of thousands of smaller objects in space. These include everything from pieces of plastic to flecks of paint.

Much of this smaller junk has come from exploding rocket stages. Stages are sections of a rocket that have their own fuel or engines.

These objects travel at speeds over 22,000 miles an hour (35,000 kilometers an hour). At such high velocity, even small junk can rip holes in a spacecraft or disable a satellite by causing electrical shorts that result from clouds of superheated gas.

Three accidental collisions between catalogued space-junk objects larger than four inches (ten centimeters) have been documented from late 1991 to early 2005.

**SPACE DEBRIS ACCOUNTS FOR HALF OF THE CATASTROPHIC RISK ON ANY SPACE FLIGHT-Kelly ‘05**

[John; Debris is Shuttle’s Biggest Threat; Space.com; 05 Mar 2005; <http://www.space.com/792-debris-shuttle-biggest-threat.html;> retrieved 16 Jun 2011]

Tiny rocks, paint flecks and other fragments of junk whizzing around the Earth pose the greatest threat to the shuttles and the astronauts on board, according to the preliminary results of a new NASA risk study.

Engineers and scientists long have known the stuff pounding the shuttle as it flies through space can do catastrophic damage. Until now, few put space debris on the same level as the dangers seen during the shuttle's treacherous launch or its fiery plunge back through the atmosphere to land.

The internal risk assessment, still under review by the agency's experts, says space debris hitting different parts of the orbiter accounts for 11 of the 20 problems most likely to cause the loss of another shuttle and crew. Overall, space debris accounts for half of the catastrophic risk on any flight.

**SPACE DEBRIS POSED A CRITICAL THREAT TO THE SAFETY OF THE SHUTTLE-Kelly ‘05**

[John; Debris is Shuttle’s Biggest Threat; Space.com; 05 Mar 2005; [http://www.space.com/792-debris-shuttle-biggest-threat.html;](http://www.google.com/url?q=http%3A%2F%2Fwww.space.com%2F792-debris-shuttle-biggest-threat.html%3B&sa=D&sntz=1&usg=AFQjCNGA_9-kIZGrUvzNwipXSM6w2_4DaA) retrieved 16 Jun 2011]

The 2003 shuttle risk assessment is the first to incorporate the threat from orbital debris. The results: the likelihood of space junk bringing down the shuttle is far greater than widely feared failures of the powerful main engines, explosive solid rocket boosters or brittle heat-shield components.The new assessment indicates about half of the risk of disaster on any given shuttle mission involves space debris hitting the orbiter and, consequently, damaging some component needed to keep the crew alive in space or safely return them to the Earth.

Past risk assessments attributed most risk to thousands of possible mishaps during the first nine minutes of a flight: the fraction of time it takes to go from a standstill on the launch pad to the 20,000-plus mph necessary to escape the grip of Earth's gravity.

This study says space debris hits on different spots on the wing flaps are the two most likely catastrophic failures. Damage could render an elevon, or wing flap, unable to steer and slow the orbiter as it plummets through the atmosphere. Without them, the orbiter could burn up, rip apart or veer far off the planned landing course. Ten other space debris failure modes involve space junk damaging the heat shield.

**FAILURE TO ENACT BINDING REGULATION ON SPACE DEBRIS WILL POSE SERIOUS RISKS TO SPACE MISSIONS-McKie and Day ‘08**

[Robin and Michael; staff writers; Warning of catastrophe from mass of 'space junk'; The Guardian; 24 Feb 2008; <http://www.guardian.co.uk/science/2008/feb/24/spaceexplorationspacejunk;> retrieved 11 Jun 2011]

The amount of debris orbiting the Earth has reached a critical level. Old satellite parts, solar panels and the odd astronaut's lost glove now pose serious risks to space missions. A report from the International Association for the Advancement of Space Safety is calling for stringent international laws to be brought in urgently to avert a tragedy.

The threat posed by orbiting debris can only be allayed by extending civil aviation standards into space, says the report, which is to be presented to the United Nations in April. 'Failure to act now to regulate space to protect property and human life would be pure folly,' says the association's director, Tommaso Sgobba. Professor Richard Crowther, who is representing the UK at a UN space safety meeting in Vienna, agrees: 'Eventually binding international civil aviation style laws will have to come.'

**ORBITAL DEBRIS POSES A BIGGER THREAT TO SPACE SAFETY THAN LIFTOFF OR LANDING-Michaels ‘09**

[Daniel; staff writer; A Cosmic Question: How to Get Rid Of All That Orbiting Space Junk; Wall Street Journal; 11 March 2009; <http://online.wsj.com/article/SB123672891900989069.html;> retrieved 16 Jun 2011]

In the 1980s, Jim Hollopeter helped design rockets that shot into orbit. Today, some of those launchers are still cluttering up space, and he wants to wash them away with a rocket-powered water gun.

Like many aerospace engineers, Mr. Hollopeter is worried about thousands of pieces of useless equipment circling Earth. Bits of spent rocket boosters, old exploded satellites and tools dropped by space-walking astronauts are just some of the trash racing along in the near-vacuum of space.

The volume of man-made space debris has grown so large that scientists say garbage now poses a bigger safety threat to the U.S. space shuttle than an accident on liftoff or landing. The International Space Station occasionally fires thrusters to dodge junk.

**DEBRIS COULD MAKE SPACE TO DANGEROUS TO FLY IN-Grossman ‘11**

[Lisa; staff writer; NASA Considers Shooting Space Junk With Lasers; Wired; 15 Mar 2011; <http://www.wired.com/wiredscience/2011/03/lasering-space-junk/#more-54167;> retrieved 16 Jun 2011]

The growing cloud of space junk surrounding the Earth is a hazard to spaceflight, and will only get worse as large pieces of debris collide and fragment. NASA space scientists have hit on a new way to manage the mess: Use mid-powered lasers to nudge space junk off collision courses.

The U.S. military currently tracks about 20,000 pieces of junk in low-Earth orbit, most of which are discarded bits of spacecraft or debris from collisions in orbit.

The atmosphere naturally drags a portion of this refuse down to Earth every year. But in 1978, NASA astronomer Don Kessler predicted a doomsday scenario: As collisions drive up the debris, we’ll hit a point where the amount of trash is growing faster than it can fall out of the sky. The Earth will end up with a permanent junk belt that could make space too dangerous to fly in, a situation now called “Kessler syndrome.”

**FAILURE TO DEAL WITH DEBRIS COULD MAKE SPACE EXPLORATION FINANCIALLY IMPOSSIBLE-Broad ‘07**

[William; staff writer; Orbiting Junk, Once a Nuisance, is Now a Threat; New York Times; 06 Feb 2007; [http://www.nytimes.com/2007/02/06/science/space/06orbi.html;](http://www.google.com/url?q=http%3A%2F%2Fwww.nytimes.com%2F2007%2F02%2F06%2Fscience%2Fspace%2F06orbi.html%3B&sa=D&sntz=1&usg=AFQjCNHllnF-ZmS7sY_UPvEMNwJCjbB4tg) retrieved 16 Jun 2011]

If nothing is done, a kind of orbital crisis might ensue that is known as the Kessler Syndrome, after Mr. Kessler. A staple of science fiction, it holds that the space around Earth becomes so riddled with junk that launchings are almost impossible. Vehicles that entered space would quickly be destroyed.

In an interview, Mr. Kessler called the worst-case scenario an exaggeration. “It’s been overdone,” he said of the syndrome.

Still, he warned of an economic barrier to space exploration that could arise. To fight debris, he said, designers will have to give spacecraft more and more shielding, struggling to protect the craft from destruction and making them heavier and more costly in the process.

At some point, he said, perhaps centuries from now, the costs will outweigh the benefits.

“It gets more and more expensive,” he said. “Sooner or later it gets too expensive to do business in space.”

**FAILURE TO CONTROL DEBRIS WILL INCREASE THE COST OF SPACE MISSIONS OR LEAD TO POLICIES THAT LEAD TO CHEAPER, MORE DEBRIS-PRODUCING CRAFT-Kessler ‘09**

[Donald; PhD, 30 year researcher about orbital debris at NASA; 08 Mar 2009; [http://webpages.charter.net/dkessler/files/KesSym.html;](http://www.google.com/url?q=http%3A%2F%2Fwebpages.charter.net%2Fdkessler%2Ffiles%2FKesSym.html%3B&sa=D&sntz=1&usg=AFQjCNF6jZmFYJBoiqla5QFcdsOX0iorKw) retrieved 16 Jun 2011]

We are entering a new era of debris control….an era that will be dominated by a slowly increasing number of random catastrophic collisions. These collisions will continue in the 800 km to 1000 km altitude regions, but will eventually spread to other regions. The control of future debris requires, at a minimum, that we not leave future payloads and rocket bodies in orbit after their useful life and might require that we plan launches to return some objects already in orbit.

These control measures will significantly increase the cost of debris control measures; but if we do not do them, we will increase the cost of future space activities even more. We might be tempted to put increasing amounts of shielding on all spacecraft to protect them and increase their life, or we might just accept shorter lifetimes for all spacecraft. However, neither option is acceptable: More shielding not only increases cost, but it also increases both the frequency of catastrophic collisions and the amount of debris generated when such a collision occurs. Accepting a shorter lifetime also increases cost, because it means that satellites must be replaced more often….with the failed satellites again increasing the catastrophic collision rate and producing larger amounts of debris.

**AGGRESSIVE SPACE ACTIVITIES WITHOUT DEBRIS SAFEGUARDS WILL MAKE COLLISIONS FAR MORE FREQUENT-Kessler ‘09**

[Donald; PhD, 30 year researcher about orbital debris at NASA; 08 Mar 2009; [http://webpages.charter.net/dkessler/files/KesSym.html;](http://www.google.com/url?q=http%3A%2F%2Fwebpages.charter.net%2Fdkessler%2Ffiles%2FKesSym.html%3B&sa=D&sntz=1&usg=AFQjCNF6jZmFYJBoiqla5QFcdsOX0iorKw) retrieved 16 Jun 2011]

Aggressive space activities without adequate safeguards could significantly shorten the time between collisions and produce an intolerable hazard to future spacecraft. Some of the most environmentally dangerous activities in space include large constellations such as those initially proposed by the Strategic Defense Initiative in the mid-1980s, large structures such as those considered in the late-1970s for building solar power stations in Earth orbit, and anti-satellite warfare using systems tested by the USSR, the U.S., and China over the past 30 years. Such aggressive activities could set up a situation where a single satellite failure could lead to cascading failures of many satellites in a period of time much shorter than years.

As is true for many environmental problems, the control of the orbital debris environment may initially be expensive, but failure to control leads to disaster in the long-term. Catastrophic collisions between catalogued objects in low Earth orbit are now an important environmental issue that will dominate the debris hazard to future spacecraft.

**TO PRESERVE THE LONG-TERM USE OF SPACE, IT’S CRITICAL TO CONTROL THE DEBRIS PROBLEM-Wright ‘07**

[David; PhD; co-director of the Global Security Program; Space debris from antisatellite weapons; Bulletin of the Atomic Scientists; 01 Oct 2007; [http://www.thebulletin.org/web-edition/features/space-debris-antisatellite-weapons;](http://www.google.com/url?q=http%3A%2F%2Fwww.thebulletin.org%2Fweb-edition%2Ffeatures%2Fspace-debris-antisatellite-weapons%3B&sa=D&sntz=1&usg=AFQjCNG2FfWLPrnSOJs9TBkM-CK8ylYUlg) retrieved 16 Jun 2011]

To preserve the long-term use of space, it's particularly important to address how to control the production of orbital debris. Due to their high speed in orbit, even small pieces of orbiting debris can damage or destroy a satellite. Since debris at high altitude can remain in orbit for decades or longer, it accumulates as more is produced, expanding the risk of collisions with satellites. If the amount of debris at some altitudes becomes large enough, it could become difficult to use those regions for satellites. Currently, there isn't an effective way to remove large amounts of debris from orbit; as a result, controlling the production of debris is essential for preserving the long-term use of space.

There are two main sources of orbital debris: (1) The accidental breakup of objects placed in orbit by routine activity; and (2) the creation of debris by the testing or use of destructive antisatellite (ASAT) weapons.

The international community is addressing the first issue by developing debris mitigation guidelines. The United States wrote and released its own guidelines in 1997, which call for measures such as designing satellites and rocket stages to limit the release of debris when placing satellites in orbit and depleting propellant from nonoperational satellites or stages to reduce the risk of explosions. By calling for spent stages and satellites to be removed from orbit, the guidelines also attempt to control the number of large objects in space that could break up due to collisions.

**SPACE DEBRIS FILLS ORBIT, THREATENING THE ENTIRE SPACE ENTERPRISE-Dickens ‘10**

[Peter; professor @ Universities of Brighton and Cambridge; The Humanization of the Cosmos--To What End?; Monthly Review; November 2010; retrieved 28 Jun 2011

[http://monthlyreview.org/2010/11/01/the-humanization-of-the-cosmos-to-what-end]](http://monthlyreview.org/2010/11/01/the-humanization-of-the-cosmos-to-what-end%5D)

Note, for example, that there are now around fourteen thousand tracked objects circling around the earth, known as “space debris” or “space junk.” Improved tracking systems will increase the number of smaller, observable tracked objects to around thirty thousand, many of these causing potential damage. Even whole satellites may collide. Such collisions are estimated at millions or even billions to one. But on February 10, 2009, such a collision actually happened. A defunct Russian satellite crashed into an American commercial satellite, generating thousands of pieces of orbiting debris. Space junk poses a serious threat to the whole enterprise of space colonization, and plans are now afoot to launch even more satellites, designed to drag older satellites out of orbit in order to avoid collisions.

**SPACE WARFARE WILL LEAD TO DEBRIS THAT PREVENTS THE PEACEFUL EXPLORATION OF SPACE-Williams ‘10**

[Lynda; Physics Instructor, Santa Rosa Junior College; Irrational Dreams of Space Colonization; Peace Review, A Journal of Social Justice; Spring 2010]

Since the space race began 50 years ago with the launch of Sputnik, the space environment around Earth has become overcrowded with satellites and space debris, so much so, that circumterrestrial space has become a dangerous place with an increasing risk of collision and destruction. Thousands of pieces of space junk created from launches orbit the Earth in the same orbit as satellites, putting them at risk of collision. Every time a rocket is launched, debris from the rocket stages are put into orbital space. In 2009 there was a disastrous collision between an Iridium satellite and a piece of space junk that destroyed the satellite. In 2007 China blew up one of its defunct satellites to demonstrate its antiballistic missile capabilities, increasing the debris field by 15%. There are no

international laws prohibiting anti-satellite actions. Every year, since the mid 1980s, a treaty has been introduced into the UN for a Prevention of an Arms Race in Outer Space (PAROS), with all parties including Russia and China voting for it except for the US.

How can we hope to pursue a peaceful and environmentally sound route of space

exploration without international laws in place that protect space and Earth environments and guarantee that the space race to the moon and beyond does not foster a war over space resources? Indeed, if the space debris problem continues to grow unfettered or if there is war in space, space will become too trashed for launches to take place without risk of destruction.

**SPACE POLLUTION CERTAIN TO THREATEN EXPLORATION-Kendall ‘06**

[Anthony; Pollution In Space: Debris Threatens Exploration; Anthonares; 20 January 2006; <http://www.anthonares.net/2006/01/pollution-in-space-debris-threatens.html>; retrieved 23 August 2011]

In an analysis published yesterday in Science magazine, two NASA scientists report that the threat of space junk will steadily increase even if no new satellites or rockets are launched [citation]. We have reached a critical threshold at which the density of debris and junk at certain altitudes is high enough to guarantee collisions resulting in many more debris fragments. What’s more, by 2050 (again without launching anything new), the number of new debris fragments created each year by collisions will outnumber those whose orbits decay and fall back to the Earth. In fewer than 50 years we have managed to create a self-sustaining, semi-permanent cloud of orbital “pollution” that threatens all future commercial and exploration activities within certain altitude ranges.

Those altitude ranges just happen to be the commercially, militarily, and scientifically valuable 600-1000 km and 1400-1500 km windows. GPS, spy satellites, weather satellites, and other polar-orbiting satellites commonly orbit at these altitudes. It’s not as if other altitude ranges can be selected arbitrarily; if one desires the orbital period of the satellite to be sun synchronous, observing the same place on the globe at the same time of day every day, the altitude must be between 600-800 km.

The debris clouds we’ve created in these two shells surrounding the Earth by no means form a prison through which we cannot pass; the danger in those areas falls mainly on the satellites or facilities that have orbits there. In fact, the clouds of debris would be all but invisible to human eyes because of the sheer vastness of orbital space. The image on the left (credit: NASA) shows the low-earth orbit (LEO) debris cloud as is being tracked by the NASA Debris Office.

The authors of the Science policy paper cited above go on to discuss the options we have for preventing this steady build-up. Proposed ideas, summarized nicely over at Wikipedia, include attaching ion engines or electromagnetic drag-inducing tethers, robotic tug removal, vaporization or perturbation with ground-based lasers, and even placing large chunks of aerogel in orbit that would deorbit much more quickly than the smaller debris would. However, at this point none of these options are both proven and economically viable.

IMPACT: SPACE EXPLORATION CRITICAL FOR HUMAN SURVIVAL

**SPACE COLONIZATION OFFERS A HEDGE AGAINST HUMAN EXTINCTION AND THE LOSS OF ALL OTHER LIFE ON EARTH, PASSING BOTH A COST-BENEFIT ANALYSIS AND MORAL TEST-Baum ‘09**

[Seth; Professor of Geography; Penn State University; Cost-Benefit Analysis of Space Exploration: Some Ethical Considerations*;* Space Policy; 2009; <http://sethbaum.com/ac/2009_CBA-SpaceExploration.pdf;> retrieved 16 Jul 2011]

While space colonization would provide a hedge against these very long-term astronomical threats, it would also provide a hedge against the more immediate threats that face humanity and other species. Such threats include nuclear warfare, pandemics, anthropogenic climate change, and disruptive technology [30]. Because these threats would generally only affect life on Earth and not life elsewhere,3 self- sufficient space colonies would survive these catastrophes, enabling life to persist in the universe. For this reason, space colonization has been advocated as a means of ensuring long- term human survival. Space exploration projects can help increase the probability of long-term human survival in other ways as well: technology developed for space exploration is central to proposals to avoid threats from large comet and asteroid impacts. However, given the goal of increasing the probability of long-term human survival by a certain amount, there may be more cost-effective options than space colonization (with costs defined in terms of money, effort, or related measures). More cost-effective options may include isolated refuges on Earth to help humans survive a catastrophe [36] and materials to assist survivors, such as a how-to manual for civilization [37] or a seed bank [38]. Further analysis is necessary to determine the most cost- effective means of increasing the probability of long-term human survival. A related question also relevant to space exploration is how to make tradeoffs between increases in survival probability and other benefits. This question treats survival not as a constraint for cost-effectiveness analysis but as a benefit that can be compared with other benefits. Such comparisons require a measure of the value of human survival. However, the value of survival lacks a precise figure. In traditional money-based CBA, it is not unreasonable to assign humanity’s survival an infinite value, or a value that is sufficiently large that it dominates everything else in CBA as if it were infinite. In Catastrophe: Risk and Response [39], US Court of Appeals judge Richard Posner gave human survival a value of $600 trillion; Posner described this as a crude underestimate intended to show that, even with such an underestimate, extensive effort to avoid human extinction passes CBA. Thus, following the common approach to non-market valuation, any reasonable estimate for the value of human survival suggests that this may be an important factor in space exploration CBA.

It is of note that the priority of reducing the risk of human extinction persists in forms of CBA which value nature in an ecocentric fashion, i.e. independently of any consideration of human interests. The basic reason is that without humanity leading long-term survival efforts (which would most likely include space colonization), the rest of Earth life would perish as a result of the astronomical processes described above. This point is elaborated by futurist Bruce Tonn, who argues on ecocentric grounds for reorienting society to focus on avoiding human extinction through both immediate avoidance of catastrophe and long-term space colonization . Tonn dubs this process of surviving beyond Earth’s eventual demise ‘‘transcending oblivion.” There is thus some convergence in the recommendations of the common anthropocentric, money-based CBA and the ecocentric CBA described here. This convergence results from the fact that (in all likelihood) only humans are capable of colonizing space, and thus human survival is necessary for Earth life to transcend oblivion.

A/T: CLEAN THE DEBRIS

**THE TECHNOLOGY TO REMOVE DEBRIS REMAINS OUT OF REACH-Fox News ‘11**

[Space Junk Threat Will Grow For Astronauts and Satellites; Fox News; 06 April 2011; [http://www.foxnews.com/scitech/2011/04/06/space-junk-threat-grow-astronauts-satellites/;](http://www.google.com/url?q=http%3A%2F%2Fwww.foxnews.com%2Fscitech%2F2011%2F04%2F06%2Fspace-junk-threat-grow-astronauts-satellites%2F%3B&sa=D&sntz=1&usg=AFQjCNHWeQSef36qEc3CXaJK-WcCucMsVw) retrieved 15 Jun 2011]

NASA and the U.S. Department of Defense work together to keep tabs on space junk. They also coordinate as much as they can with other nations, since space debris is a global problem.

"There is a lot of cooperation internationally on this topic," Stansbery said.

If it's hard to keep track of millions of pieces of space trash, it's even tougher to get rid of them. Removing the threatening junk would be nice, but at the moment doing so on a large scale remains out of reach.

"Our feeling is, that's still a long way off," Stansbery said. "It's a very difficult technological problem."

So as a result, prevention may be the best cure for the space-debris problem right now.

**NASA HAS NOT SUFFICIENTLY STUDIED SPACE DEBRIS-Kelly ‘05**

[John; Debris is Shuttle’s Biggest Threat; Space.com; 05 Mar 2005; [http://www.space.com/792-debris-shuttle-biggest-threat.html;](http://www.google.com/url?q=http%3A%2F%2Fwww.space.com%2F792-debris-shuttle-biggest-threat.html%3B&sa=D&sntz=1&usg=AFQjCNGA_9-kIZGrUvzNwipXSM6w2_4DaA) retrieved 16 Jun 2011]

In 1997, the National Research Council warned the shuttle program to devote more attention to the danger.

"NASA appears to have put much less effort into understanding and reducing the risk than other comparable risks (such as the risk of catastrophic failure of the space shuttle main engine)," the report said. The authors, who included former astronauts and space vehicle engineers, recommended NASA do more to study the risk, avoid it and strengthen the orbiter.

**WHILE TECHNOLOGY TO REMOVE DEBRIS IS BEING EVALUATED, THE MOST IMPORTANT STEP IS NOT TO CREATE MORE DEBRIS-Michaels ‘09**

[Daniel; staff writer; A Cosmic Question: How to Get Rid Of All That Orbiting Space Junk; Wall Street Journal; 11 March 2009; [http://online.wsj.com/article/SB123672891900989069.html;](http://www.google.com/url?q=http%3A%2F%2Fonline.wsj.com%2Farticle%2FSB123672891900989069.html%3B&sa=D&sntz=1&usg=AFQjCNHjcyRFxzQrUfkx2i9RV7U6_KlxWA) retrieved 16 Jun 2011]

Still, such ideas floundered because the risk of space junk seemed small compared to the cost of removing it. The threat ballooned on Jan. 11, 2007, when China demonstrated its ability to eliminate potential military threats in space by firing a ballistic missile at its Fengyun-1C weather satellite. Instantly, the projectile and the one-ton spacecraft were reduced to roughly 3,000 fragments, increasing the estimated volume of orbiting debris around Earth by about 25%.

The Feb. 10 collision almost 500 miles above Siberia added at least 600 more big fragments, specialists say, and refocused attention on the problem.

"Debris removal is moving to the front of the agenda," says William Ailor, director of the Center for Orbital and Reentry Debris Studies at the Aerospace Corporation in Los Angeles. One unlikely proposal he frequently hears is using "catchers' mitts and such" -- launching a big ball of foam or clay that could sponge up debris. One hitch is that the blob would have to be huge to make a difference, and so would itself become a threat to live satellites, Mr. Ailor says.

With such complexities dogging most space-cleaning ideas for at least the near future, space-debris expert Dr. Klinkrad says the best solution is to follow earthly advise: "Don't litter."

**LASERS ARE NOT A SOLUTION; WE MUST STOP CREATING NEW SPACE JUNK-Grossman ‘11**

[Lisa; staff writer; NASA Considers Shooting Space Junk With Lasers; Wired; 15 Mar 2011; [http://www.wired.com/wiredscience/2011/03/lasering-space-junk/#more-54167;](http://www.google.com/url?q=http%3A%2F%2Fwww.wired.com%2Fwiredscience%2F2011%2F03%2Flasering-space-junk%2F%23more-54167%3B&sa=D&sntz=1&usg=AFQjCNEkApiiB7vJmrApyGGMvCZgdTCD-g) retrieved 16 Jun 2011]

However, “I don’t think this is a long-term solution,” Weeden said. “It might be useful to buy some time. But I don’t think it would replace the need to remove debris, or stop creating new junk.”

Don Kessler, from whom the Kessler syndrome takes its name, agrees, and points out that laser light isn’t forceful enough to divert the biggest pieces of junk.

“The only complete solution to is to prevent collisions involving the most massive objects in Earth orbit,” he said.

**THERE IS NO SHORT-TERM REMEDIATION TECHNIQUE THAT CAN CLEAN DEBRIS-Broad ‘07**

[William; staff writer; Orbiting Junk, Once a Nuisance, is Now a Threat; New York Times; 06 Feb 2007; [http://www.nytimes.com/2007/02/06/science/space/06orbi.html;](http://www.google.com/url?q=http%3A%2F%2Fwww.nytimes.com%2F2007%2F02%2F06%2Fscience%2Fspace%2F06orbi.html%3B&sa=D&sntz=1&usg=AFQjCNHllnF-ZmS7sY_UPvEMNwJCjbB4tg) retrieved 16 Jun 2011]

A solution to the cascade threat exists but is costly. In his Science paper and in recent interviews, Mr. Johnson of NASA argued that the only sure answer was environmental remediation, including the removal of existing large objects from orbit.

Robots might install rocket engines to send dead spacecraft careering back into the atmosphere, or ground-based lasers might be used to zap debris.

The bad news, Mr. Johnson said in his paper, is that “for the near term, no single remediation technique appears to be both technically feasible and economically viable.”

**EFFORTS TO REMOVE DEBRIS CAN’T SUCCEED AND WE ARE APPROACHING A CRITICAL THRESHOLD-Kessler ‘09**

[Donald; PhD, 30 year researcher about orbital debris at NASA; 08 Mar 2009; [http://webpages.charter.net/dkessler/files/KesSym.html;](http://www.google.com/url?q=http%3A%2F%2Fwebpages.charter.net%2Fdkessler%2Ffiles%2FKesSym.html%3B&sa=D&sntz=1&usg=AFQjCNF6jZmFYJBoiqla5QFcdsOX0iorKw) retrieved 16 Jun 2011]

The hazard from the debris that was too small to catalogue had already exceeded the hazard from the natural meteoroid environment. The sources of that debris included not only explosions, but paint flecks from spacecraft surfaces, exhaust from solid rocket upper stages, and leaks of coolant from nuclear reactors.

Better data and more accurate modeling by NASA and the international community support the conclusion that the long-term threat to the environment is collision cascading, as predicted in 1978.

Modeling results supported by data from USAF tests, as well as by a number of independent scientists, have concluded that the current debris environment is “unstable”, or above a critical threshold, such that any attempt to achieve a growth-free small debris environment by eliminating sources of past debris will likely fail because fragments from future collisions will be generated faster than atmospheric drag will remove them.

Although the rate of growth in the catalogued population has been reduced as a result of new operational procedures that minimize the possibility of explosions in orbits and leaving non-operational upper stages and payload in orbit for periods longer than 25 years, the catalogued population continues to increase, but at a lower rate than it was increasing prior to the 1978 paper.

Answers

NON UNIQUE: SPACE IS ALREADY FILLED WITH DEBRIS

**THERE ARE ALREADY 20,000 PIECES OF SPACE DEBRIS LARGER THAN A SOFTBALL-Fox News ‘11**

[Space Junk Threat Will Grow For Astronauts and Satellites; Fox News; 06 April 2011; [http://www.foxnews.com/scitech/2011/04/06/space-junk-threat-grow-astronauts-satellites/;](http://www.google.com/url?q=http%3A%2F%2Fwww.foxnews.com%2Fscitech%2F2011%2F04%2F06%2Fspace-junk-threat-grow-astronauts-satellites%2F%3B&sa=D&sntz=1&usg=AFQjCNHWeQSef36qEc3CXaJK-WcCucMsVw) retrieved 15 Jun 2011]

Pieces of space trash — which may be defunct spacecraft, abandoned launch vehicles, or fragments from satellite collisions — zip around Earth at speeds up to 17,500 mph (28,163 kph).

That's so fast that even orbiting paint flecks can damage a spacecraft. And there's a lot of this stuff — much of it larger and far more dangerous than paint flecks.

There are more than 20,000 pieces bigger than a softball, for example, and more than 500,000 bigger than a marble, according to NASA officials. Researchers are tracking more than 22,000 chunks of space debris in Earth orbit, but they can't watch it all.

The 2007 Chinese anti-satellite test added about 3,000 pieces of space junk to the orbiting population, NASA officials said. The 2009 collision — between a defunct Russian satellite and a U.S. Iridium communications satellite — contributed another 2,000 or so.

**EVEN WITHOUT ADDITIONAL LAUNCHES, THE AMOUNT OF DEBRIS WILL BE HIGH-Lovegren ‘06**

[Stefan; Space Junk Cleanup Needed, NASA Experts Warn; National Geographic; 19 Jan 2006;

<http://news.nationalgeographic.com/news/2006/01/0119_060119_space_junk.html;> retrieved 11 Jun 2011]

A growing amount of human-made debris—from rocket stages and obsolete satellites to blown-off hatches and insulation—is circling the Earth.

Scientists say the orbital debris, better known as space junk, poses an increasing threat to space activities, including robotic missions and human space flight.

"This is a growing environmental problem," said Nicholas Johnson, the chief scientist and program manager for orbital debris at NASA in Houston, Texas.

Johnson and his team have devised a computer model capable of simulating past and future amounts of space junk.

The model predicts that even without future rocket or satellite launches, the amount of debris in low orbit around Earth will remain steady through 2055, after which it will increase.

**EVEN IF THERE ARE NO ADDITIONAL LAUNCHES, DEBRIS PROBLEM WILL EXIST AND BEGIN TO ACCELERATE IN 2055-Lovegren ‘06**

[Stefan; Space Junk Cleanup Needed, NASA Experts Warn; National Geographic; 19 Jan 2006;

[http://news.nationalgeographic.com/news/2006/01/0119\_060119\_space\_junk.html;](http://www.google.com/url?q=http%3A%2F%2Fnews.nationalgeographic.com%2Fnews%2F2006%2F01%2F0119_060119_space_junk.html%3B&sa=D&sntz=1&usg=AFQjCNHoS6_Y6HhdN_c7WQkbsNwfuwokbg) retrieved 11 Jun 2011]

Previous space junk projections have assumed that new satellites and rockets would launch in the future.

The new study, in contrast, looks at what would happen to the amount of space junk if no rocket bodies or spacecraft were launched in the next 200 years.

"This is kind of a best-case scenario," said lead study author Jer-Chyi Liou, principal scientist and project manager for orbital debris with the Engineering Science Contract Group at NASA's Johnson Space Center in Houston.

The results suggest that new fragments from collisions will replace the amount of objects falling out of orbit and back to Earth. Beyond 2055, however, fragments from new collisions will exceed the amount of decaying debris.

"The debris population will continue to grow," Liou said. "We know it will only get worse."

**LIMITING THE AMOUNT OF DEBRIS WILL NOT SOLVE; EXISTING DEBRIS MUST BE REMOVED-Michaels ‘09**

[Daniel; staff writer; A Cosmic Question: How to Get Rid Of All That Orbiting Space Junk; Wall Street Journal; 11 March 2009; [http://online.wsj.com/article/SB123672891900989069.html;](http://www.google.com/url?q=http%3A%2F%2Fonline.wsj.com%2Farticle%2FSB123672891900989069.html%3B&sa=D&sntz=1&usg=AFQjCNHjcyRFxzQrUfkx2i9RV7U6_KlxWA) retrieved 16 Jun 2011]

Still, limiting the amount of new debris isn't enough. Vast quantities of junk are already parked in space for centuries to come, and many engineers are working on how to get rid of it.

Johns Hopkins University's Applied Physics Laboratory, a leading space research center, recently conducted feasibility studies into junk-zapping lasers and garbage-collecting rockets. Dr. Klinkrad at ESA is now leading an international space commission that is assessing debris-removal possibilities. He is also organizing two global conferences that will discuss ideas later this month.

**SATELLITE-DEPENDENT EARTH SPACE IS NOW POLLUTED WITH DEBRIS- Achenbach ‘09**

[Joel; staff writer @ Washington Post; Collision shows rising hazard from space debris; Boston Globe; 14 Feb 2009; <http://www.boston.com/news/nation/washington/articles/2009/02/14/collision_shows_rising_hazard_from_space_debris/;> retrieved 16 Jun 2011]

The military tracks about 18,000 pieces of orbital debris. On Tuesday, the census of space-garbage suddenly jumped by 600, the initial estimate of the number of fragments from a stunning collision of two satellites high above Siberia.

Space is now polluted with the flotsam of a satellite-dependent civilization. The debris is increasingly a hazard for astronauts and has put crafts such as the Hubble Space Telescope and communications satellites at risk of being struck by an object moving at high speed.

The military's radar can spot objects about four inches in diameter - roughly the size of a baseball - or larger. This collision, however, may have produced many thousands of small, undetectable pieces of debris that would still carry enough kinetic punch at orbital velocities to damage or destroy a spacecraft.

"We expect, when all is said and done, there will be hundreds if not thousands of pieces larger than the four inches. We expect there will be tens or hundreds of thousands of pieces down to a centimeter or a millimeter," said Nicholas Johnson, NASA's chief scientist for orbital debris.

**IF NO OTHER FRAGMENT OF DEBRIS WERE ADDED TO SPACE, IT WILL STILL TRIPLE IN THE NEXT 200 YEARS-Johnson ‘08**

[John; staff writer; Scientists Cite Growing Peril of Space Junk; Los Angeles Times; 16 April 2008; <http://articles.latimes.com/2008/apr/16/science/sci-spacejunk16;> retrieved 16 Jun 2011]

According to Wright, the Chinese shoot-down on Jan. 11, 2007, added more than 2 million pieces of debris in low-Earth orbit, where most satellites are located.

Because there is already so much debris -- more than 150 million pieces, most of them less than 2 inches across -- even if nothing more is added, the amount will still increase by a factor of three in the next 200 years due to the fragmentation of pieces from collisions and other reasons.

NON-UNIQUE: OTHER NATIONS

**20 NATIONS, LARGELY UNREGULATED, ARE LAUNCHING INTO SPACE-McKie and Day ‘08**

[Robin and Michael; staff writers; Warning of catastrophe from mass of 'space junk'; The Guardian; 24 Feb 2008; [http://www.guardian.co.uk/science/2008/feb/24/spaceexplorationspacejunk;](http://www.google.com/url?q=http%3A%2F%2Fwww.guardian.co.uk%2Fscience%2F2008%2Ffeb%2F24%2Fspaceexplorationspacejunk%3B&sa=D&sntz=1&usg=AFQjCNEucibdTDaULYXFgHobt1o3BI3ntQ) retrieved 11 Jun 2011]

The problem, according to the Association for the Advancement of Space Safety report, is that up to 20 countries are now able to launch objects into space - but very few of these have rigid safety protocols. Nor is the problem of space debris confined to near Earth, it adds. Satellites in geostationary orbit are supposed to be moved farther into space after they become defunct - but often that obligation is not met.

More than 200 dead satellites now litter this vital part of space. Within 10 years that number could increase fivefold, warns the report. The resulting chaos could lead to serious damage or loss of a spacecraft.

'Unfortunately we may have to wait for something to happen, perhaps a big near miss, before people realise we can't go on as we are,' Crowther said.

**CHINESE DEBRIS POSES A MAJOR THREAT TO AMERICAN SPACE OPERATIONS-David ‘07**

[Leonard; Senior Space Writer; China’s Anti-Satellite Test: Worrisome Debris Cloud Circles Earth; 02 Feb 2007; <http://www.space.com/3415-china-anti-satellite-test-worrisome-debris-cloud-circles-earth.html;> retrieved 16 Jun 2011]

Johnson said that the debris cloud extends from less than 125 miles (200 kilometers) to more than 2,292 miles (3,850 kilometers), encompassing all of low Earth orbit. The majority of the debris have mean altitudes of 528 miles (850 kilometers) or greater, "which means most will be very long-lived," he said.

The number of smaller orbital debris from this breakup is much higher than the 900-plus being tracked. NASA estimates that the number of debris larger than 1 centimeter is greater than 35,000 bits of riff-raff.

"Any of these debris has the potential for seriously disrupting or terminating the mission of operational spacecraft in low Earth orbit," Johnson pointed out. "This satellite breakup represents the most prolific and serious fragmentation in the course of 50 years of space operations," he said.

**CHINESE ASAT TEST HAS ALREADY RAPIDLY SPED THE PROCESS OF THE CHAIN REACTION-Broad ‘07**

[William; staff writer; Orbiting Junk, Once a Nuisance, is Now a Threat; New York Times; 06 Feb 2007; [http://www.nytimes.com/2007/02/06/science/space/06orbi.html;](http://www.google.com/url?q=http%3A%2F%2Fwww.nytimes.com%2F2007%2F02%2F06%2Fscience%2Fspace%2F06orbi.html%3B&sa=D&sntz=1&usg=AFQjCNHllnF-ZmS7sY_UPvEMNwJCjbB4tg) retrieved 16 Jun 2011]

China, experts note, has 39 satellites of its own — many of them now facing a heightened risk of destruction.

Politically, the situation is delicate. In recent years China has played a growing international role in fighting the proliferation of space junk. In 2002, for instance, it joined with other spacefaring nations to suggest voluntary guidelines for debris control.

In April, Beijing is to play host to the annual meeting of the advocacy group, known as the Inter-Agency Space Debris Coordination Committee. Donald J. Kessler, a former head of the orbital debris program at NASA and a pioneer analyst of the space threat, said Chinese officials at the forum would probably feel “some embarrassment.”

Mr. Kessler said Western analysts agreed that China’s new satellite fragments would speed the chain reaction’s onset. “If the Chinese didn’t do the test, it would still happen,” he said. “It just wouldn’t happen as quickly.”

NON-UNIQUE: KESSLER EFFECT INEVITABLE

**IT’S INEVITABLE THAT A PIECE OF DEBRIS WILL START THE CASCADE OF COLLISIONS-Broad ‘07**

[William; staff writer; Orbiting Junk, Once a Nuisance, is Now a Threat; New York Times; 06 Feb 2007; <http://www.nytimes.com/2007/02/06/science/space/06orbi.html;> retrieved 16 Jun 2011]

Today, next year or next decade, some piece of whirling debris will start the cascade, experts say.

“It’s inevitable,” said Nicholas L. Johnson, chief scientist for orbital debris at the National Aeronautics and Space Administration. “A significant piece of debris will run into an old rocket body, and that will create more debris. It’s a bad situation.”

Geoffrey E. Forden, an arms expert at the Massachusetts Institute of Technology who is analyzing the Chinese satellite debris, said China perhaps failed to realize the magnitude of the test’s indirect hazards.

Dr. Forden suggested that Chinese engineers might have understood the risks but failed to communicate them. In China, he said, “the decision process is still so opaque that maybe they didn’t know who to talk to. Maybe you have a disconnect between the engineers and the people who think about policy.”

**A CHAIN REACTION IS SURE TO START EVEN IF SPACEFARING NATIONS STOPPED LAUNCHES NOW-Broad ‘07**

[William; staff writer; Orbiting Junk, Once a Nuisance, is Now a Threat; New York Times; 06 Feb 2007; [http://www.nytimes.com/2007/02/06/science/space/06orbi.html;](http://www.google.com/url?q=http%3A%2F%2Fwww.nytimes.com%2F2007%2F02%2F06%2Fscience%2Fspace%2F06orbi.html%3B&sa=D&sntz=1&usg=AFQjCNHllnF-ZmS7sY_UPvEMNwJCjbB4tg) retrieved 16 Jun 2011]

A year later, Mr. Johnson, the chief scientist for NASA’s orbital debris program, and his colleague J. -C. Liou, published an article in the journal Science that detailed the growing threat. They said orbits were now so cluttered that the chain reaction was sure to start even if spacefaring nations refrained from launching any more spacecraft.

“The environment is unstable,” they wrote, “and collisions will become the most dominant debris-generating mechanism.”

**WE ARE AT RISK NOW FROM DAMAGE FROM SPACE DEBRIS-O’Neill ‘08**

[Ian; Space Debris May be Catastrophic to Future Missions (and Google Earth is Watching…); Universe Today; 24 February 2008; <http://www.universetoday.com/12933/space-debris-may-be-catastrophic-to-future-missions-and-google-earth-is-watching/>; retrieved 23 August 2011]

Some space debris near misses include:

Space Shuttle dodge: Space Shuttle Atlantis had to avoid collision with a piece of a Russian satellite by carrying out a seven second burn of its engines in 1991.

Aircraft scare: Bits of an Russian ex-spy satellite fell through the atmosphere coming very close to a Latin American Airbus, carrying 270 passengers in 2006.

Personal injury: fortunately there is only one documented account of someone being hit by a piece of debris on the ground. In 1997 a woman from Oklahoma was hit on the shoulder by a piece of a fuel tank from a Delta II rocket. She was unhurt and lived to tell the tail.

It is hoped that tighter controls on the rockets, satellites and spacecraft will slow the rate of junk increase, but the problem is already pretty worrying for long-term missions in orbit around the Earth. The two critical regions filling with debris are in low Earth and geosynchronous orbits, a few hundred and 22,300 miles high respectively. Low Earth orbit will cause problems for spacecraft to actually leave the atmosphere and geosynchronous orbit may hinder future communication satellite insertions.

To safeguard our access into space, and avoid an increase in debris-related incidents, action will need to be taken.

KESSLER SYNDROME IS OVERSTATED

**KESSLER HIMSELF SAYS THE THREAT OF THE KESSLER SYNDROME IS OVERBLOWN-Broad ‘07**

[William; staff writer; Orbiting Junk, Once a Nuisance, is Now a Threat; New York Times; 06 Feb 2007; [http://www.nytimes.com/2007/02/06/science/space/06orbi.html;](http://www.google.com/url?q=http%3A%2F%2Fwww.nytimes.com%2F2007%2F02%2F06%2Fscience%2Fspace%2F06orbi.html%3B&sa=D&sntz=1&usg=AFQjCNHllnF-ZmS7sY_UPvEMNwJCjbB4tg) retrieved 16 Jun 2011]

Even so, the paths of the speeding Chinese debris, following the laws of physics and of celestial mechanics, expanded in many directions, including upward and downward. As of last week, outliers from the central cloud stretched from roughly 100 miles to more than 2,000 miles above the Earth.

A solution to the cascade threat exists but is costly. In his Science paper and in recent interviews, Mr. Johnson of NASA argued that the only sure answer was environmental remediation, including the removal of existing large objects from orbit.

Robots might install rocket engines to send dead spacecraft careering back into the atmosphere, or ground-based lasers might be used to zap debris.

The bad news, Mr. Johnson said in his paper, is that “for the near term, no single remediation technique appears to be both technically feasible and economically viable.”If nothing is done, a kind of orbital crisis might ensue that is known as the Kessler Syndrome, after Mr. Kessler. A staple of science fiction, it holds that the space around Earth becomes so riddled with junk that launchings are almost impossible. Vehicles that entered space would quickly be destroyed.

In an interview, Mr. Kessler called the worst-case scenario an exaggeration. “It’s been overdone,” he said of the syndrome.

**THE KESSLER SYNDROME DOES NOT SUGGEST A CRITICAL THRESHOLD ARGUMENT NOR A QUICK TIMEFRAME-Kessler ‘09**

[Donald; PhD, 30 year researcher about orbital debris at NASA; 08 Mar 2009; <http://webpages.charter.net/dkessler/files/KesSym.html;> retrieved 16 Jun 2011]

However, not all who have used the phrase have referred to it in the context of its original meaning. It was never intended to mean that the cascading would occur over a period of time as short as days or months. Nor was it a prediction that the current environment was above some critical threshold…although the concept of a critical threshold was an important possibility that was studied in detail more than 10 years later. The “Kessler Syndrome” was meant to describe the phenomenon that random collisions between objects large enough to catalogue would produce a hazard to spacecraft from small debris that is greater than the natural meteoroid environment. In addition, because the random collision frequency is non-linear with debris accumulation rates, the phenomenon will eventually become the most important long-term source of debris, unless the accumulation rate of larger, non-operational objects (e.g., non-operational payloads and upper stage rocket bodies) in Earth orbit were significantly reduced. Based on past accumulation rates, the 1978 publication predicted that random collision would become an important debris source around the year 2000, with the rate of random collisions increasing rapidly after that, if the accumulation rate were not reduced to near zero.

TECHNOLOGY/INTERNATIONAL EFFORTS SOLVE DEBRIS

**NASA IS LOOKING AT LASER SOLUTION TO KESSLER SYNDROME-Bates ‘11**

[Daniel; staff writer; Nasa to shoot lasers at space junk around Earth to prevent collisions with satellites; Daily Mail; 16 Mar 2011; [http://www.dailymail.co.uk/sciencetech/article-1366838/Nasa-use-lasers-shoot-space-junk-Earth.html;](http://www.google.com/url?q=http%3A%2F%2Fwww.dailymail.co.uk%2Fsciencetech%2Farticle-1366838%2FNasa-use-lasers-shoot-space-junk-Earth.html%3B&sa=D&sntz=1&usg=AFQjCNHJ4nr_q4VAxVGZTpUNrE_cET-yMA) retrieved 16 Jun 2011]

Nasa is considering using lasers to deflect space junk around Earth and stop it colliding with satellites.

Lasers similar to those used for welding in car factories would be fired through telescopes to ‘nudge’ piles of rubbish left in orbit.

The gentle movement would stop them from taking out communications satellites or hitting the International Space Station.

The process could also avoid what is known as ‘Kessler Syndrome’, where there is too much space junk flying around Earth for it to be safe to fly out, leaving us trapped on our own planet.

Such a situation has been predicted by Nasa for more than 30 years and a string of recent near-misses have added urgency to the need to find a solution.

**INTERNATIONAL COMMUNITY IS BEGINNING TO LOOK TO SOLVE SPACE DEBRIS-Lovegren ‘06**

[Stefan; Space Junk Cleanup Needed, NASA Experts Warn; National Geographic; 19 Jan 2006;

[http://news.nationalgeographic.com/news/2006/01/0119\_060119\_space\_junk.html;](http://www.google.com/url?q=http%3A%2F%2Fnews.nationalgeographic.com%2Fnews%2F2006%2F01%2F0119_060119_space_junk.html%3B&sa=D&sntz=1&usg=AFQjCNHoS6_Y6HhdN_c7WQkbsNwfuwokbg) retrieved 11 Jun 2011]

Johnson, the program manager for orbital debris, says space-faring nations agree that the space junk problem needs to be addressed. There is even a special organization called the Inter-Agency Space Debris Coordination Committee, made up of space agencies from ten countries and the European Space Agency.

So far, efforts have concentrated on preventing new debris. Johnson believes it may be time to think about how to remove junk from space.

But that is a difficult proposition.

Previous proposals have ranged from sending up spacecraft to grab junk and bring it down to using lasers to slow an object's orbit to cause it to fall back to Earth more quickly.

Given current technology, those proposals appear neither technically feasible nor economically viable, Johnson admits.

But, he says, the space-junk problem needs more attention.

"It's like any environmental problem," he said. "It's growing. If you don't tackle it now, it will only become worse, and the remedies in the future are going to be even more costly than if you tackle it today."

**INTERNATIONAL COMMUNITY MUST SOLVE, WITH SPACE TRAFFIC MANAGEMENT-Ford ‘09**

[Matt; Orbiting Space Junk Heightens Risk of Satellite Catastrophes; Ars Technica; 2009; <http://arstechnica.com/science/news/2009/02/orbiting-space-junk-heightens-risk-of-satellite-catastrophes.ars;> retrieved 16 Jun 2011]

As more and more satellites are launched into orbit, the potential for debris issues is becoming widely recognized. In a press release from the Union of Concerned Scientists, issued shortly after this collision, David Wright pointed out that a number of countries have developed a set of debris mitigation guidelines that have since been adopted by the UN. One key measure was to have countries remove defunct satellites, such as Kosmos 2251, from highly polluted orbital areas. Wright also suggested that, as "space becomes more and more crowded, the international community must begin to develop and put in place measures for space traffic management, similar to what we now have with air traffic control around busy airports."