

Astroenvironmentalism: The Case for Space Exploration As An Environmental Issue

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Astroenvironmentalism is a concept that applies the values of environmentalism and preservationism to developments in space exploration, commercialization, and militarization. It can be both an umbrella term to describe a variety of issues about space exploration as well as a component of the ongoing public debate about the environment. The most important struggle is to prevent space from becoming a new battleground—we need to keep nuclear energy out of space. This article discusses the responsibility of keeping space free of environmental hazards and debris. A case is made for astroenvironmentalism to be included in the public consciousness on the environment and the establishment of ethical guidelines to avoid environmental disasters in space.

Astroenvironmentalism, an argument to apply the values of environmentalism and preservationism to developments in space exploration, militarization and commercialism, is not a new idea. But recent developments in space exploration suggest this perspective is not widely acknowledged enough by those who envision taking steps to enter space. Environmentalists did not take a stand on these issues over the last few years, which was unfortunate because this was a topical time to argue that space should be an environmental issue. Astroenvironmentalism is an addition to present efforts, but also an umbrella term to describe a variety of related concerns held by many players in the environmental arena. Since mankind made such a mess of this planet and is now paying the environmental price for the damage, this topic is of extreme importance because we must avoid making the same mistakes in space as we have on earth. At issue are the environmental consequences of the steps we are about to take in entering space. The adaptation of environmental concerns to developments in the exploration and commercialization of space fit surprisingly easily. Astroenvironmentalism is another re-formulation of the associated environmental concerns involving a space wilderness to protect, rather than a "frontier" to exploit.

As I have outlined elsewhere (Miller, 1999), some of the concerns of astroenvironmentalism can include:

Keeping the space surrounding the Earth clear of pollution, debris, and garbage. Efforts are necessary so we do not add to the reservoir of human waste and machinery left behind by space explorers. Such debris could

cause damage to satellites and the space shuttles.

Remembering and teaching the lessons learned from terrestrial conservation and preservation struggles of the past and applying them to the new frontier of space, that is, considering space and the celestial bodies pristine wildernesses that need to be protected rather than frontiers to conquer.

Tracking and monitoring the environmental damage caused by the fuels used for space expeditions, that is, making space agencies adhere to the restrictions of environmental impact statements. In particular, it would be worthwhile to reduce the amount of plutonium that is being used in case of a mishap that would result in plutonium entering the atmosphere.

Treating the Moon, Mars, Venus, and other planetary bodies as wildernesses that need to be protected, that is, arguing against the idea to "terraform" these celestial bodies. Terraforming introduces atmosphere-creating life into the barren celestial bodies in the effort to make these celestial bodies more amenable to human settlement. Terraforming is presently being explored despite the fact that we have not thoroughly explored these planets for indigenous life.

Creating a set of ethical guidelines to protect the life that we encounter elsewhere, that is, study and protect rather than just study. The creation or re-publicizing of ethics applied to these concerns would be welcome.

Creating safeguards to insure there is no contamination of celestial bodies, that is, safeguarding against the introduction of non-terrestrial life to and from celestial bodies. Non-indigenous life, whether it be Zebra mussels or microbes, under conditions where there are no controlling factors, can reproduce at exponential rates thereby changing the environment in the process. These changes can harm the organisms that were dependent upon the original environmental conditions.

Counteracting the efforts of national and private agencies to terraform other planets. This idea to terraform is not just science fiction, and ecocritics can criticize science fiction writers who want terraforming to occur before a thorough search for life is conducted. This has been evident in Kim Stanley Robinson's award-winning science fiction trilogy *Red Mars*, *Green Mars* and *Blue Mars*, and recent films such as *The Ghosts of Mars* and *Red Planet*.

Prohibiting national, international, and private agencies from owning property in space, in the interest of avoiding military conflicts. There is a need for more people to be involved in the efforts to see that space does not become another battleground.

Creating the legal power to enforce these concerns. This would make more people aware of international space law and the need to enforce it. The United Nations rules on such issues through the Committee on the Peaceful Uses of Outer Space.

Environmental issues in space

The most important related efforts are those involved in trying to stop the militarization of space and the use of nuclear power in space. Karl Grossman, author of *The Wrong Stuff* (1997), and William E. Burrows, in *This New Ocean* (1998), point out that space is likely to become our next war zone. Space will become the new high ground from which battles are fought. We have ignored the Moon so that we can focus more on the immediate high ground in the satellite belt. Thankfully, we are focusing on international cooperation for the new space station, but Grossman and Burrows emphasize the need for a greater worldwide participation.

Over the years there have been many people who have been concerned with this issue, but they would not necessarily call themselves astroenvironmentalists. I put forth astronenvironmentalism as an argument that space should be considered an environmental issue and the term can function as an umbrella term for the related concerns.

Astroenvironmentalism seems to fill a void, because there are no widely known organizations that focus on this issue. There is no widely known Mars First or Venus First organization arguing against terraforming. There is no Greenspace or Spacepeace. Most environmental groups are focused on more immediate issues and are more concerned with immediate and down-to-Earth issues. Leopold's *Land Ethic*, which focused on protecting life, is not easily applicable to the barren territories of space. But the argument of protecting space from exploitation is not solely about protecting rocks; it is also about making a statement about human behavior. If one succeeds in making the argument about protecting celestial bodies, we are also making the argument about protecting habitats here on earth.

In *Beyond Space Ship Earth: Environmental Ethics and the Solar System*, probably the most thorough coverage of the subject, Hargrove (1986) writes that the only reason there are no people on the Moon or Mars is due to reduced NASA spending levels. "The attempts to apply environmental concepts to the Solar System represent a significant challenge for environmental ethics, since so far as we know at present the Solar System, except for Earth, is a collection of nonliving natural objects, the kind of entity that offers the greatest conceptual difficulties for environmental ethics." Hargrove warns, "If serious planning begins without adequate ethical and environmental input, then future NASA and associated industrial/commercial projects in the Solar System may simply produce a new environmental crisis that dwarfs our current one" (pp. x-xi). Hargrove argues that if we do nothing, the dark visions of science fiction could become true.

Space artists have been calling space "nature" for ages. David Hardy, the president of the International Space Artist Collective, has a web page under Second Nature (www.secondnature.org) that links to the Nature Conservancy. The inclusion of space into nature creates the impetus to think of it in environmental terms.

In *Fire in the Sky: Comets and Meteors, the Decisive Centuries in British Art and Science*, Olson and Pasachoff (1998) detail how astronomers were also considered naturalists in the 19th Century. Once again, space is included in the term of what environmentalists have decided to work hard to defend.

Science fiction writers have been calling space a wilderness, for instance, William F. Nolan edited a collection of short stories called *A Wilderness of Stars* in 1969. There are other science fiction short story collections that focus on environmental issues. Two of them are *Eco-Fiction*, edited by John Stadler, and *The Ruins of Earth*, edited by Thomas M. Disch.

Journalists such as Karl Grossman and Gar Smith, editor at the *Earth Island Journal*, have been focusing on the environmental implications of space exploration for years. Grossman (1997) warns about the potential danger of using plutonium in our space missions. Smith (1987) warns about space pollution, reminds people of international space law, and argues that we are not ready yet to go. Though written almost fifteen years ago, Smith's article is still timely.

Barry E. DiGregorio, a research associate of the Cardiff Centre for Astrobiology in Wales, warns against the dangers of extraterrestrial contamination. He is founder and executive director for the International Committee Against Mars Sample Return (ICAMSR) (<http://www.icamsr.org/>).

The Global Network Against Weapons & Nuclear Power in Space (www.space4peace.org) is working to keep space from becoming a new war zone. They are urging the public to protest strongly against moving the arms race to space and for avoiding the use of nuclear power in space.

Keeping space free of debris

Some concerns of astroenvironmentalism are: keeping the space surrounding the Earth clear of pollution, debris, and garbage; remembering and teaching the lessons learned from conservation and preservationist struggles of the past and applying them to the new frontier of space; tracking and monitoring the environmental damage caused by the fuels used for space expeditions; treating the Moon, Mars, and the rest of the planetary

bodies in the universe as wildernesses that need to be protected; creating a set of ethical guidelines to protect the life that we encounter in space; creating safeguards to ensure there is no contamination of celestial bodies; counteracting the efforts of national and private agencies to terraform other planets; the use of space technology to answer questions about the environment and environmental problems; disallowing private agencies to own property in space in the interest of avoiding military conflicts in space; and creating the legal power to enforce these concerns.

Many of these issues have been addressed by the United Nations Committee on the Peaceful Uses of Outer Space. It is illegal to claim property on the celestial bodies of the solar system, but what ability will the United Nations have to enforce such laws once there are private and national interests in space? The Committee has also mentioned applying environmental concerns to space, but when will they take action and how many qualified environmentalists are there to work on these issues? They have focused on space debris as a legitimate concern, but where will the funds to clean up space come from? Where will NASA find the funds to clean up the mess they have made?

The United Nations will need support if it is to achieve these goals and objectives. UNISPACE III, the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space, held in Vienna in July of 1999 (<http://www.oosa.unvienna.org/unisp-3/>), included discussion of "solutions to problems of development" and the need for adherence to existing international space treaties and principles, but preservation of the solar system was only a minor focus of the proceedings.

The first goal of astroenvironmentalism should be to lobby the United Nations and NASA to require SpaceDev, The Artemis Society, The Mars Society, and the Astrobiology Institute to agree to ethical guidelines. What leaves the Earth reflects the whole species. These agencies should be required to agree to principles of preservation or astroenvironmentalism established by the United Nations and NASA. For the meantime they should publish environmental impact statements on the Internet for the world to read. If we only allow astroenvironmentalists into space then maybe we will not have environmental battles on other celestial bodies. If we do not pay attention, we are likely to face these problems again.

To become involved read Karl Grossman and *The Earth Island Journal*, and join the Global Network Against Weapons & Nuclear Power in Space: www.space4peace.org (PO Box 90083, Gainesville, FL 32607, globalnet@mindspring.com).

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