Ethics for Astronomers

November 19, 2012

“Environment”

READINGS:
Outer Space
SOFIA
Hanford
Mauna Kea

Paul Kalas (UC Berkeley 2012)
Does environmental ethics play a role in astronomical education, research, and enterprise?
Case Study: The celestial navigator apprentice

- It is 1:45 PM on December 11, 1998, and you have just started your apprenticeship as a junior celestial navigator with the Mars Climate Orbiter.
- The spacecraft is launched into Earth orbit, and then the third stage of the Delta II rocket fires and sends the spacecraft toward Mars.
- However, you then calculate that the new trajectory will miss Mars by millions of kilometers.
- No one else seems to notice, and you immediately present your discovery to your mentor.
- The mentor says everything is as planned, and tests you with a question: **Why is the trajectory after the third stage burn off course?**
Outer Space Treaty

*Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies*

1967

• What ethical principles guide the Outer Space Treaty?

• Article IX: ….Parties to the Treaty shall pursue studies of outer space, including the Moon and other celestial bodies, and conduct exploration of them so as to avoid their harmful contamination and also adverse changes in the environment of the Earth resulting from the introduction of extraterrestrial matter and, where necessary, shall adopt appropriate measures for this purpose.

• Why? How is contamination harmful?
Preventing the forward contamination of Mars (2006)

• NASA should ... consider whether planetary protection policies for Mars should be extended beyond protecting the science to include protecting the planet. This workshop should focus explicitly on (1) ethical implications and the responsibility to explore Mars in a manner that minimizes the harmful impacts of those activities on potential indigenous biospheres (whether suspected or known to be extant), (2) whether revisions to current planetary protection policies are necessary to address this concern, and (3) how to involve the public in such a dialogue about the ethical aspects of planetary protection. (Recommendation 1, Chapter 8).

• Ramifications extend into the ethical and philosophical realms, beyond the purview of this committee and current international policies.

• In other words, contaminating the Mars biosphere is probably unethical, and not just because it ruins experimental conditions.

Paul Kalas (UC Berkeley 2012)
Environmental Ethics

• In ye olde days, ethical principles applied only to humans or rational beings. Only humans have *intrinsic value*. One example...

• Utilitarianism (Epicurus, Bentham, Mill): (1) **Humans** know pleasure and pain, (2) Pleasure is intrinsically good and can be measured, (3) Act to maximize pleasure to most number of **humans**, (4) Right and wrong depend solely on consequences.

• Albert Schweitzer (1875 – 1965): *Ehrfurcht vor dem Leben* – reverence for life. A human being “injures or destroys life only under a necessity he cannot avoid, and never from thoughtlessness.”

• Peter Singer (*Animal Liberation* 1975): equality of all animals, anything capable of suffering is worthy of equal consideration (not necessarily equal treatment).

• Can all life forms have intrinsic value (e.g. Swiss plants)?

• How about non-living things – the Moon?
“Perceiving individuals or groups as outside the boundary in which moral values, rules, and considerations of fairness apply. Those who are morally excluded are perceived as nonentities, expendable, or undeserving. Harming or exploiting them appears to be appropriate, acceptable or just” (Opotow 1990).

Are non-human life forms to be included or excluded from considerations of fairness, equality w.r.t. protection/harm?

How about a pristine environment with no life on it (e.g., the Moon)?

If the answers seem “obvious” and do not deserve further scrutiny, consider that another astronomer/scientist may come to different conclusions, and the general public may come to different conclusions than the scientists.

Scientists may have a given conviction about what is morally excluded, but this view may not be shared by others in society. Biomedical research has already demonstrated this rift (recall Tuskegee, Willowbrook).
Astronomers may conclude that it is scientifically irrelevant if Pluto is called a planet or not, but to others it matters. Relational value, versus Instrumental and Inherent
Case Studies

• AAS information email 2007-6: “An observatory located in eastern Washington is under threat of closure through a reassessment by the Fish and Wildlife Service of the conservation plan for the public lands where the observatory is located.” Should the observatory be removed?

• “The summit of Mauna Kea, on the Big Island of Hawai’i, is home to the largest observatory complex in the world. The summit is also home to unique plants and animals, including the Wēkiu bug. One of the principal habitats of this rare insect is directly adjacent to and below the Pu‘u Hau ‘Oki crater rim site of the W. M. Keck Observatory (WMKO).”

• Astronomers conduct their experiments from pristine sites (e.g., need dark skies). But we also need access (roads). List the number of ways that an observatory impacts the environment.

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