

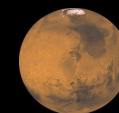
***We lost Pluto?  
Future steps in preserving planets, satellites  
and small solar systems bodies***



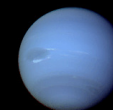
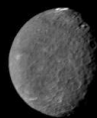
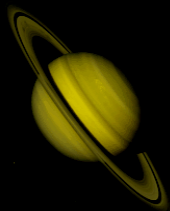
***John D. Rummel***  
***Chair, COSPAR Panel on  
Planetary Protection and  
East Carolina University, USA***



# Planetary Protection



All of the Planets, All of the Time....



# Pluto, Charon, Nix & Hydra

*Still There!*



# International Agreement on Planetary Contamination/Protection

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- Article IX of the Outer Space Treaty of 1967:  
“...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...”

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

*(entered into force, October 10, 1967)*



# Protecting the Earth from the Scum of the Universe (and *vice versa*)



**PG-13** PARENTS STRONGLY CAUTIONED

Some Material May Be Inappropriate for Children Under 13

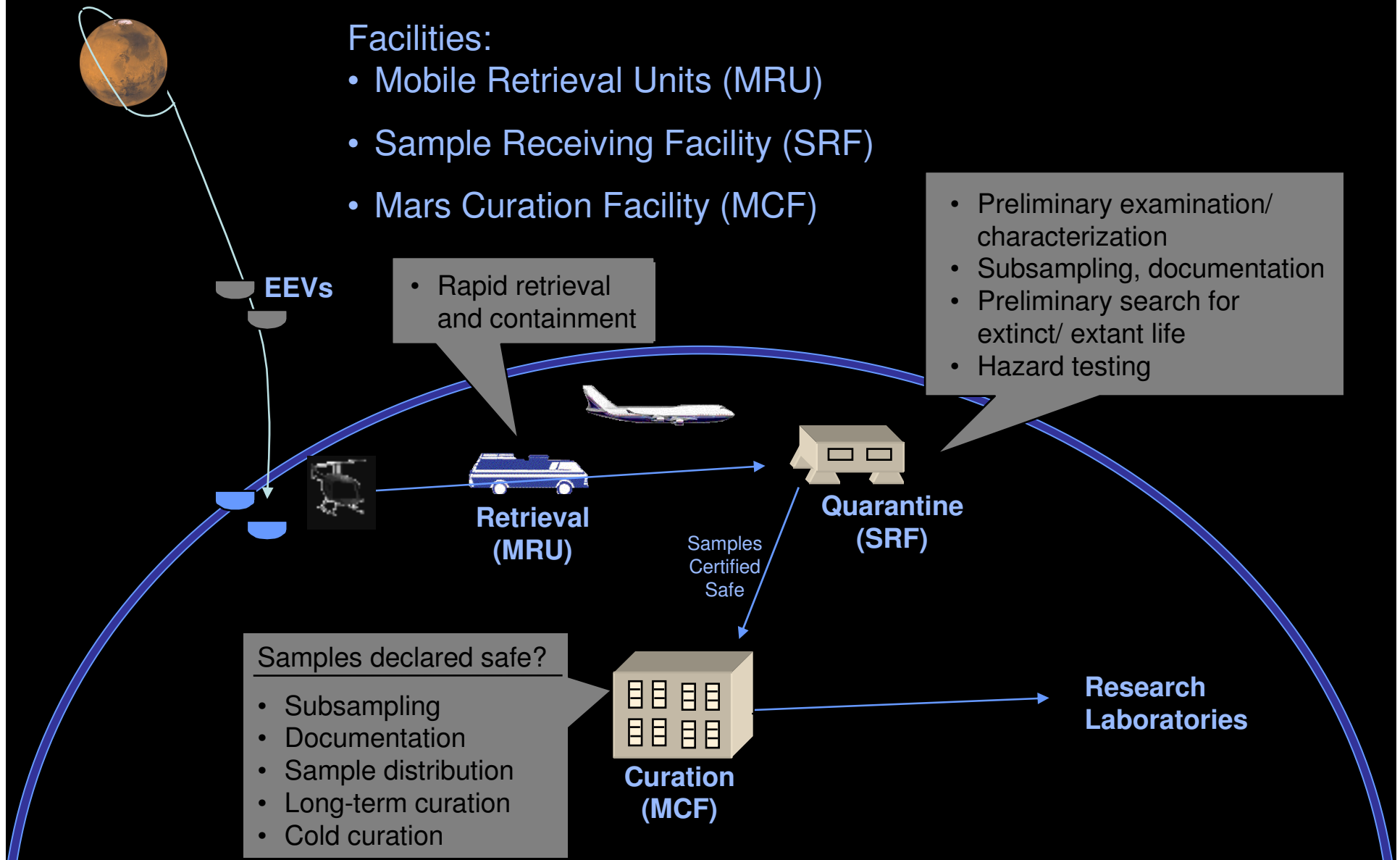
SCI-FI ACTION VIOLENCE, SOME PROVOCATIVE HUMOR

®

# Back Contamination: A Candidate Mars Sample Handling Process

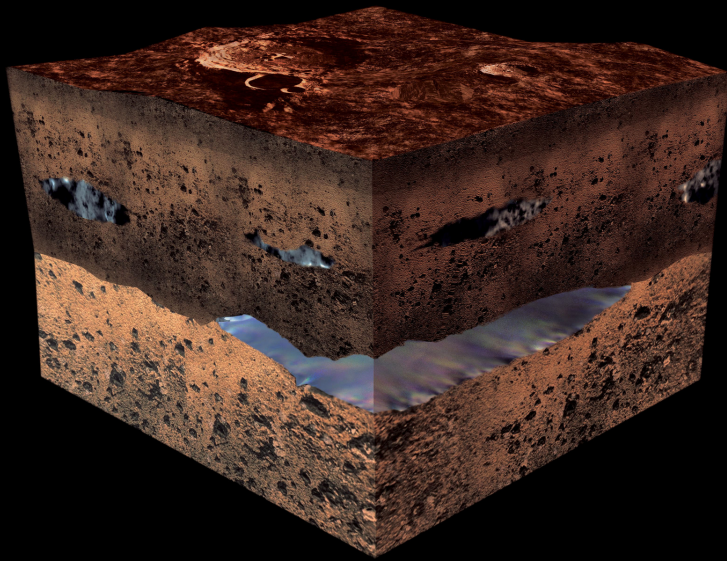
Facilities:

- Mobile Retrieval Units (MRU)
- Sample Receiving Facility (SRF)
- Mars Curation Facility (MCF)



# Humans on Mars?

- Human capabilities may be required to explore deep subsurface aquifers, if they exist beneath the martian deserts
- Requires a preliminary robotic search for life, because of the potential for human-associated contamination: both forward and backward



**Warning:**  
The Planetary Protection Officer has determined that drilling may be hazardous to your health and your future ability to return to Earth.



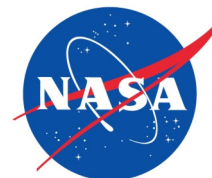


# **“Workshop on Ethical Considerations for Planetary Protection in Space Exploration”**

**Princeton, New Jersey**

*John Rummel  
Margaret Race  
Gerda Horneck*

**8-10 June 2010**



# One Workshop Recommendation

- COSPAR should elaborate management guidelines and draft regulations in interaction with other organizations such as IISL, UN-COPUOS and others to establish a framework for environmental stewardship. This should apply additionally to the accepted regulations for preventing harmful planetary contamination, which currently only consider biological and organic chemical contaminations.
- This could include the establishment of an intergovernmental mechanism and/or body that provides management of space exploration and use. COSPAR should propose management guidelines, in interaction with other organizations such as IISL and others, to the UN COPUOS for UN General Assembly consideration.

# PPP and PEX Adopt a Common Thread

(Within COSPAR. IAA is working on a similar thread through the PECB study)

- Non-State Parties are developing significant capabilities in space exploration and use
- Non-State Parties are affected by the 1967 Treaty, but enforcement is not specified there, and different launching venues may differ greatly in their implementation of the Treaty provisions
- It is becoming necessary to clarify and complement the legal regime currently regulating the exploration of the Moon and other celestial bodies

# PPP and PEX Adopt a Common Thread

- Scientific interests are paramount to COSPAR, and essential to successful human capabilities expansion
- Common regulations need to be elaborated to ensure valuable, safe, economic, and broadly-based exploration that encompass and balance a diverse set of stakeholder interests and will benefit both current and future generations
- To protect science and the future, there needs to be a focus on protection, *where it is needed*, involving both more and less stringent requirements than are now in effect
- A new policy instrument appears necessary to make this work.

# Workshop Synthesis Discussion

## *No Consensus Reached on Approach*

*Toward a convention on “harmful contamination” of Outer Space and its prevention*

- **Eventual** goal: Define, extend, and implement international law based on an elaboration of Article IX of the UN Outer Space Treaty
  - Adopted in the manner similar the Convention on Biodiversity
  - Comprehensive structure to include scientific input on one end (IPCC, IPBES), and enforcement on the other

*Study this possibility over the next several years and return with specifics*

- **Initial step:** Advocate expanded framework for COSPAR Planetary Protection policy/policies to address other forms of “harmful contamination”
  - Maintain the current policy on biological planetary protection virtually intact, under expanded framework/umbrella for overall protection policy
  - Add parallel policy construct to provide guidance on requirements/best practices for protection of non-living/non-life-related aspects of Outer Space

# Workshop Synthesis Discussion (cont.)

- **Anticipated aspects**

- Screen environmental impact assessments for activities on celestial bodies
- Could provide an intergovernmental mechanism for management of space exploration and use, applicable to all
- COSPAR and other groups would have input on management guidelines, through an Intergovernmental scientific committee/panel providing advice to the Convention
- Could designate and monitor establishment of planetary parks, and areas for other uses, both protected and not-protected
- Could also have jurisdiction over atmosphere-modification, etc., where science and other uses might be threatened

- **Could provide for a stable set of management tools and a predictable regulatory framework for future human expansion into the cosmos.**