

## **COSPAR Panel on Planetary Protection Report on the Business Meeting held 20 July 2010, Bremen, Germany**

The Panel on Planetary Protection held its business meeting in the evening after an excellent planetary protection oral session (PPP1), the night before two other 1/2 day sessions (PPP2 and PPP3). The Panel sessions have been well-attended (with over 35 people in all cases and occasionally over 50), and the Panel business meeting was attended officially by 34 persons (attendance sheet attached), and unofficially by several additional persons who did not wish to be accounted in the attendance.

The business meeting agenda was arranged according to the following topics:

- Proposals for COSPAR Meetings I
  - Next COSPAR Meeting (Mysore, India)
- COSPAR UN Report
- Resolutions and Recommendations
- Proposals for COSPAR Meetings II
  - COSPAR Workshops
  - COSPAR Colloquium

## **PPP1 COSPAR Planetary Protection Policy and Implementation Guidelines**

**Main Scientific Organizer: Rummel, John Deputy Organizer: Kminek, Gerhard**

### **Development of Common International Specifications to Support Future Joint Missions**

Kminek, Gerhard; Rummel, John; Conley, Catharine

### **Review of COSPAR Mars Special Regions Parameter Definition**

Cockell, Charles; Kminek, Gerhard; Perfumo, Amedea; Kelly, Laura

### **Planetary Protection Requirements for Mars Sample Return Missions: Recommendations from a 2009 NRC Report**

Race, Margaret; Farmer, Jack

### **COSPAR Workshop on Planetary Protection for Outer Planet Satellites and Small Solar System Bodies**

Ehrenfreund, Pascale; Rummel, John; Peter, Nicolas

### **Report of the December 2009 Titan Planetary Protection workshop**

Raulin, Francois; Rummel, John; Kminek, Gerhard; Conley, Catharine; Ehrenfreund, Pascale

### **Report of Ethical Considerations Workshop**

Race, Margaret; Conley, Catharine; Kminek, Gerhard; Rummel, John

### **Proposed Updates to the COSPAR Planetary Protection Policy, 2010**

Rummel, John

## **PPP2 Planetary Protection Mission Implementation and Status**

**Main Scientific Organizer: Spry, James A. Deputy Organizer: Viso, Michel**

### **Planetary Protection for Current NASA Missions**

Conley, Catharine

### **General mission status wrt planetary protection ESA**

Kminek, Gerhard

### **Phobos-Grunt mission planetary protection issues and how to solve them (the approaches based on the exobiological experiments results)**

Novikova, Nataliya; Orlov, Oleg; Deshevaya, Elena; Sychev, Vladimir; Khamidullina, N.; Aleksashkin, Sergey; Martynov, Maxim

### **Mars Science Laboratory Planetary Protection Status**

Koukol, Robert; Morales, Fabian; Benardini, James Nick; Schubert, Wayne

### **Europa Planetary Protection for Juno Jupiter Orbiter**

Bernard, Douglas; Abelson, Robert; Johannesen, Jennie; Lam, Try; Mcalpine, William; Newlin, Laura

### **ExoMars: Planetary Protection Status and Update**

Guarnieri, Vincenzo

### **Quality Assurance Specifications for Planetary Protection Assays**

Baker, Amy

## **PPP2 Planetary Protection Mission Implementation and Status (cont.)**

**The methodology developed to record, handle and statistically treat the Bioburden Assay data for the NASA Mars Science Laboratory projec**

Beaudet, Robert

**Planetary protection for an outer planet flagship mission to the jovian system**

Spry, James A.; Newlin, Laura; Clark, Karla; Lewis, Kari

## **PPP3 Planetary Protection Research and Development Activities**

**Main Scientific Organizer: Conley, Catharine Deputy Organizer: Schwehm, Gerhard; Stabekis, Pericles**

**Resistance of spacecraft isolates to outer space for planetary protection purposes - first results of the experiment PROTECT of the EXPOSE-E mission.**

Horneck, Gerda; Moeller, Ralf & Team: PROTECT

**The resistance of bacterial isolates from spacecraft assembly cleanrooms against physical and chemical treatments**

Rettberg, Petra; Kloss, Maria; Barczyk, Simon; Reitz, Guenther

**Microbial diversity in European and South American spacecraft assembly clean rooms**

Moissl-Eichinger, Christine; Stieglmeier, Michaela; Schwendner, Petra

**Development of a model community to evaluate efficient removal of genetic signatures from spacecraft surfaces: issues pertaining to sampling, sample processing, and molecular analyses**

La Duc, Myron; Kwan, Kelly; Cooper, Moogega; Stam, Christina; Vaishampayan, Parag; Benardini, James Nick; Moissl-Eichinger, Christine; Andersen, Gary; Spry, James A.; Venkateswaran, Kasthuri

**Microbial contamination detection at low levels by <sup>[125]</sup>I radiolabeling**

Summers, David; Karouia, Fathi

## **PPP3 Planetary Protection Research and Development Activities**

### **Developing CO2 Cleaning Technologies for Planetary Protection and Contamination Control Applications**

Lin, Ying; Zhong, Fang; Chung, Shirley

### **Planetary Protection Alternate Protocol Certification**

Baker, Amy; Barengoltz, Jack; Tisdale, David

### **Development of a Complimentary Low Temperature Decontamination Technique for Spacecraft Materials**

Pottage, Thomas; Bennett, Allan; Walker, James; Fowler, Chantal; Weber, Christina; Rohr, Thomas; Kminek, Gerhard

### **Vapor Hydrogen Peroxide Sterilization Certification**

Chen, Fei; Chung, Shirley; Barengoltz, Jack

### **Research supporting potential modification of the NASA specification for dry heat microbial reduction of spacecraft hardware**

Spry, James A.; Beaudet, Robert; Schubert, Wayne

## **PPP Posters**

### **Reassessment of Planetary Protection Requirements for Mars Sample Return Missions**

Smith, David; Race, Margaret; Farmer, Jack

### **Validation of the nylon flocked swab for planetary protection applications**

Moissl-Eichinger, Christine; Probst, Alexander

### **In Search of The Limits of Microbial Tolerance to Ammonia**

Kelly, Laura; Cockell, Charles; Kminek, Gerhard; Perfumo, Amedea

### **Bioethics of Universal Knowledge: How Space Science is Transforming Global Culture**

Perkins, Kala

### **Rough spacecraft surfaces – a threat to Planetary Protection issues**

Probst, Alexander; Facius, Rainer; Wirth, Reinhard; Moissl-Eichinger, Christine

### **Spore-forming Paenibacillus isolates and the relationship to Planetary Protection**

Schwendner, Petra; Stieglmeier, Michaela; Wirth, Reinhard; Moissl-Eichinger, Christine

### **Bioburden release of Ariane 5 Fairing Acoustic Protection Panels**

Stieglmeier, Michaela; Rohr, Thomas; Schmeitzky, Olivier; Rumler, Peter; Kminek, Gerhard

### **Dry heat microbial reduction at various humidity conditions**

Haberer, Klaus; Schuehlein, Karl-Heinz

## **Proposals for COSPAR Sessions in 2012**

The Panel agreed to use the same scheme for half-day sessions at Mysore as the one that was used in Bremen. Three half-day sessions have been proposed, per the attached Event Proposals. The Panel will also work with SC B to sponsor an event focused on active natural satellites in the solar system.

### **PPP1 - COSPAR Planetary Protection Policy and Implementation Guidelines**

MSO: J.D. Rummel DSO: G. Kminek

The session will report on recent planetary protection colloquia, workshops, and agency activities affecting the COSPAR planetary protection policy and implementation guidelines. Proposed revisions for the policy and implementation guidelines will be reported to the Planetary Protection Panel prior to addressing the COSPAR Bureau and Council.

### **PPP2 - Planetary Protection Mission Implementation and Status**

MSO: J. Andrew Spry DSOs: G. Schwehm, M. Viso

This session will report on the planetary protection implementation and status of ongoing and planned missions. The session will focus on techniques and procedures applied to spacecraft, instruments and other hardware in order to meet planetary protection requirements. Papers are desired which describe the strategies used for spacecraft integration to achieve the contamination level constraints required by planetary protection policy, and/or navigation strategies for meeting planetary protection requirements, and/or the planetary protection compliance status of missions in the operations phase.

### **PPP3 - Planetary Protection Research and Development**

MSO: P. Stabekis DSO: P. Rettberg

The session will report on planetary protection research and development activities to support policy revisions and in preparation for new mission concepts.

## **COSPAR UN Report**

Dr. Catharine Conley of NASA Headquarters agreed to continue as the Panel UN Report Coordinator until 2012.

## **Resolutions for Consideration by the Bureau**

1) A **Resolution on Technical Changes to the COSPAR Policy of July 2008** was developed, to include the following provisions that neither change the scope nor the nature of the requirements to be imposed on missions:

- the precise definition of Categories II, III, and IV, as clarified at the *Vienna Workshop on Planetary Protection for Outer Planet Satellites and Small Solar System Bodies*
- the inclusion of a greater number of satellites and small bodies in the “Category-Specific Listing of Target Body/Mission Types” found in the Appendix to the current policy
- the required calculation of contamination probabilities to support Category II assignment of certain satellites and small bodies as clarified at both *Vienna Workshop on Planetary Protection for Outer Planet Satellites and Small Solar System Bodies* and the *Pasadena Workshop on Planetary Protection for Titan and Ganymede*
- guidelines on the preparation of an organic inventory for missions to bodies where such an inventory is required, to be included in the Appendix to the current policy
- a clarification of the trajectory biasing requirement for Mars to include a timeframe for the requirement, and a simplification/correction of the Category IVb requirement for Mars
- a clarification of the requirement for containment of unsterilized samples returned from Mars to the Earth.
- an amplification of the reporting requirement to recommend that COSPAR members inform COSPAR when establishing planetary protection requirements for planetary missions
- replace the term “bioload” with the term “bioburden” where found in the policy.

*Consideration of this resolution was continued until the March 2011 Bureau meeting.*

## Category-Specific Listing of Target Body/Mission Types

Category I: Flyby, Orbiter, Lander: Undifferentiated, metamorphosed asteroids; Io; others TBD

Category II: Flyby, Orbiter, Lander: Venus; Moon (with organic inventory); Comets; Carbonaceous Chondrite Asteroids; Jupiter; Saturn; Uranus; Neptune; Ganymede\*; Callisto; Titan\*; Triton\*; Pluto/Charon\*; Ceres; Kuiper-Belt Objects > 1/2 the size of Pluto\*; Kuiper-Belt Objects < 1/2 the size of Pluto; others TBD

Category III: Flyby, Orbiters: Mars; Europa; Enceladus; others TBD

Category IV: Lander Missions: Mars; Europa; Enceladus; others TBD

Category V: Any Earth-return mission.

“Restricted Earth return”: Mars; Europa; others TBD;

“Unrestricted Earth return”: Venus, Moon; others TBD.

- \* The mission-specific assignment of these bodies to Category II must be supported by an analysis of the “remote” potential for contamination of the liquid-water environments that may exist beneath their surfaces (a probability of introducing 1 viable terrestrial organism of  $<1 \times 10^{-4}$ ), addressing both the existence of such environments and the prospects of accessing them.

## **2) Resolution on Enhancing Awareness of the COSPAR Planetary Protection Policy** (solicited by the Bureau/Finance Committee after the Panel Meeting)

### Program Operations and Budget

- Initial year is a startup year at >10,000 Euros
- 5 year follow-on with a funding level totalling ~50,000 Euros over six years
- Reports to, and reviews by, the Bureau on an annual basis, with complete program continuation review at year 5 (can allow certain year-6 efforts to continue if program is modified/terminated)
- Funds to be allocated for each task by COSPAR HQ, via PP Panel Chair reimbursement or directly to implementors/contractors, as needed
- Deliverables and milestones shown in attached spread-sheet
- Independent website outside of CNES firewall, but accessible by COSPAR HQ, will be provided by hosting it at a US university with excellent data connectivity and security
- Priority for initial visits are space agencies and others in India, China, and Japan, where awareness of COSPAR Planetary Protection Policy is emerging, and national/agency Planetary Protection apparatus does not yet exist/coordinate through COSPAR

*Consideration of this resolution was continued until the March 2011 Bureau meeting.*

### **Resolutions for Eventual Consideration**

A number of resolutions related to the *COSPAR Workshop on Ethical Considerations for Planetary Protection in Space Exploration* (Princeton, 2010) were reviewed. Further discussion of the workshop and development of those resolutions is planned for 2012 and intervening activities/workshops.

### **Proposals for COSPAR Meetings**

Two meetings for further development of the COSPAR Planetary Protection Policy were proposed (requesting baseline funding from COSPAR of 3,000 Euros, each):

- A workshop on *Development of Foundational Ethical Principles Applicable to Planetary Protection and Space Exploration*, to take place in 2011

*Approved for 3,000 Euros*

- A colloquium on *Establishing risk levels for a Mars Sample Return mission*, to take place in 2012

*Approved for 1,000 Euros*

## **Panel Leadership**

Chair: Rummel re-appointed until 2014 Assembly

Vice Chair: Kminek continues until 2012 Assembly

We were requested to nominate two new Vice Chairs for appointment by the President, in order to ensure that COSPAR activities in this area have continuity after 2012/2014.