

IAA Commission 1 'Space Physical Sciences' Meeting
23 March 2010 (Tuesday) 09h00-11h00, 6 rue Galilee (Metro Boissière)
Paris, France

Minutes of the meeting

Meeting Attendance:

Gregg Vane (vice Chair), Nickolay Smirnov (secretary), Stamatios Krimigis, Bernard Foing, Claudio Maccone, Susan McKenna-Lawlor, Ji Wu, Stephan Ulamec, David Kendall, Gerhard Schwehm, Antonio Viviani, Peter Wenzel, Lutz Richter, Angioletta Coradini.

Agenda:

1. Welcome and adoption of agenda
2. Minutes from 11 October 2009 meeting in Daegeon, see homepage
3. Study Group activities
4. Academy Day technical program for COSPAR 2010.
5. Program for 61th IAC, Prague, Czech Republic, October 2010. Plenary events.
6. Preview of Commission 1 items at 62th IAC in South Africa, October 2011
7. Next meetings
8. New business

1. Welcome and adoption of agenda

List of attendees was signed. The agenda was adopted.

2. Report on and Minutes of the meeting in Daegeon

Nickolay Smirnov reported on meeting in Daegeon. The minutes were present at the web page of the academy. They were approved.

3. Study Group activities

3.1 Ongoing studies:

3.1.1. **Study Group 1.3** Title of Study: **Search for Extraterrestrial Intelligence (SETI)** Chair: Seth Shostak, Co-Chair: Paul Shuch, Co-Chair: Claudio Maccone, Secretary: Carol Oliver

Claudio Maccone, reported on the state of the group's activities.

Two volumes of Acta Astronautica special issues were ready for publication: the 1st one to be issued in July 2010 accumulated papers presented at IAC, the 2nd one to be issued just in two-three weeks entitled "Searching for Life Signatures" accumulated best papers presented at the International SETI conference held in Paris in September 2008.

International symposium on SETI will be held after Prague IAC on Oct. 4-8 2010 in Milton Keynes, UK, 40 km from London. 4-5 October Royal Society Meeting, 6-8 October – IAA Symposium "Searching for Life Signatures".

New Declaration principles were developed and adopted by the Academy. Rationale for the Drafting of a Revised Set of Protocols to be Followed in the Event of a SETI Detection was provided by Chair, IAA SETI Permanent Study Group Dr. Seth Shostak:

The IAA SETI Permanent Study Group has, for the last three years, dealt with revisions to a set of protocols – entitled the “Declaration of Principles Concerning Activities Following the Detection of Extraterrestrial Intelligence” – that were originally drafted during the time of the NASA SETI program.

These guidelines, which were voluntarily adopted by many of the SETI researchers of the time (either as institutions or individuals), were primarily intended to assure both the public and SETI practitioners both in the U.S. and the U.S.S.R. that any signal detection would be openly shared. A copy of the protocols was approved by the IAA Board in 1989, and given to, and filed by, COPUOS.

In recent years, the IAA SETI PSG has elected to revisit these protocols with the intention of (1) streamlining both the wording and the intention, and (2) removing ambiguities and obvious impediments to utility.

As examples of the latter, note that the original Declaration was unclear as to whether there was a specified order in which groups should be notified in case of a SETI detection, and also limited confirming observations to signatories to the Declaration. In practice, of course, the latter might greatly hinder a timely proof of a true extraterrestrial signal.

The revised protocol is entitled “Declaration of Principles Concerning the Conduct of the Search for Extraterrestrial Intelligence,” and has been carefully reviewed both by practicing SETI scientists and those expert in space law.

It is the intention of the IAA SETI PSG, as voiced in several votes during the past three years, that this new document replace the old. To this end, we respectfully request the IAA Board’s consideration of this initiative. (Annex 1)

3.1.2. Study Group 1.4 Title of the study: **The Next Steps for Human Space Exploration: What are the Alternatives?** Study group chair: Ernst Messerschmid. Ernst Messerschmid was not present at the meeting, the study is on hold. The suggestion by Peter Wenzel supported by the other Commission 1 members: To terminate the study. After contacts with Ernst Messerschmid (Action: Gerhard Schwehm) Gregg Vane sends the letter to Dan Baker. Ask SG 1.4 to collect presentations made during their special session, which was organized within the framework of the previous Congresses, and make them publicly available as one of results of SG before terminating its activities.

3.1.3. Study Group 1.5. Particle Radiation Hazards en route to and at Mars Chair: Susan McKenna-Lawlor. The report was submitted by Susan McKenna-Lawlor containing the contents of final book. Ji Wu promised to submit a chapter on radiation in the Chinese Mars mission. The Commission set the deadline of 23 June 2010 for receipt by the Study Group Chair of all the remaining Chapters, including one by G. Reitz/S. Ulamec. The Study Group Chair is then to make the various chapters accessible for reading to all Commission members. The final draft would be discussed at the Commission 1 meeting at COSPAR.

3.1.4. Study Group 1.6. Title of the study: **Protected Antipode Circle on Lunar Farside** Chair: Claudio Maccone.

Claudio Maccone reported on the ongoing studies and of the associated paper published in *Acta Astronautica* on this topic.

Overall Goal:

Write the text of a POSITION PAPER of the Academy to Protect the Farside of the Moon for Scientific Purposes. The PAC (Protected Antipode Circle) is a circular piece of Moon land at the center of the Farside tangent to the parallels +30 and -30 degrees of latitude, respectively. The PAC was described by Claudio Maccone in the paper "Protected Antipode Circle on the Farside of the Moon" published in *Acta Astronautica Journal* (Volume 63, Issues 1-4, July-August 2008, Pages 110-118). This paper proves mathematically that the PAC is the only safe region shielded from radio waves coming from the Earth as well as coming from future space stations constructed at the Lagrangian points L4 and L5 of the Earth-Moon system.

Intermediate Goals:

The draft group should report to Commission 1 before submitting the paper further.

Final Goal:

After the completion and publication of the PAC Position Paper, the Academy would submit it to the attention of the United Nations COPUOS, which would hopefully include this issue within the new Moon Treatise.

COSPAR would also be informed about the need to have the PAC created.

Progress in past six months:

1. There was a meeting at Daejeon, South Korea, in October 2009 during the IAC, with Dr. Jean-Michel Contant, Dr. Claudio Maccone and Dr. Paul Shuch where the point was made about the 2009 status of this IAA 1.6 Study. It was decided that the preliminary DRAFT will be presented by Maccone at the March 2010 IAA Commission 1 Meeting in Paris.
2. Prof. Frans von der Dunk, of Leiden University and Member of the IISL, kindly sent to Maccone his 4-pages contribution about the LEGAL PROBLEMS related to the Farside Protection.
3. Maccone just prepared a 15-page DRAFT DOCUMENT that was sent to the IAA Office jointly with Status Report.

3.2 New study groups and leads

Gregg Vane reported on the joint (Commission 5 and 1) study group on International Cooperation on Space Weather 5X. The study is headed by Dan Baker. The study was successfully launched.

4. Academy Day technical program for COSPAR 2010.

Gregg Vane reported on the [plans for the](#) COSPAR Academy day, which will be held in Bremen on Saturday July 17, 2010

IAA Academy Day at COSPAR, Saturday, July 17, 2010

Technical Program Co-Chairs:

- Dan Baker, University of Colorado, USA
- David Kendall, Canadian Space Agency, Canada
- Gregg Vane, Caltech Jet Propulsion Laboratory, USA

Technical Program: version 2

1. Earth Science, Global Change, and the Science and Policy Implications
 - Berrien Moore III, Executive Director, Climate Central, Princeton University; and Director Emeritus, Institute for the Study of Earth, Oceans, and Space, University of New Hampshire, USA
2. Heliophysics and Space Weather
 - Daniel Baker, Director, Laboratory for Atmospheric and Space Physics; Professor,

Astrophysical and Planetary Sciences; and Professor, Department of Physics, University of Colorado, USA

3. The Joint ESA-NASA Herschel/Planck mission(s): Two Lectures

- Jan Tauber and/or G. Pilbratt (TO BE CONFIRMED by David Kendall)

4. The Europa-Jupiter System Mission (EJSM): Science from NASA's Jupiter

Europa Orbiter

- Louise Prockter, Applied Physics Lab, EJSM Science Co-Leader and Planetary Exploration Group Supervisor, Applied Physics Laboratory, Johns Hopkins University, USA

5. The Europa-Jupiter System Mission: Science from ESA's Jupiter

Ganymede Orbiter

- Michele Dougherty, Imperial College London, Professor of Space Physics. European Lead of the Joint Science Definition Team for EJSM
- Each lecture to be 30 minutes in length, with 10 minutes for discussion and 5 minutes of schedule margin
- Total technical program 3 hours, 45 minutes
- One additional hour for IAA Chairman and Executive Director topics
- Lunch break 90 minutes
- Total program: Six hours

5. Program for 61th IAC, Prague, Czech Republic, October 2010. Plenary events.

Nickolay Smirnov reported that proposal for Highlight Lecture was submitted by the Commission 1 and accepted by the IPC of the 61st IAC in Prague.

5.1. Title of the event: "SETI Progress and Prospects"

5.2. Type: Highlight lecture by Seth Shostak.

5.3. Short description of the event including objective and rationale.

In 2010, it will be exactly a half-century since the first modern experiment in the field known as SETI, the Search for Extraterrestrial Intelligence. For two decades, SETI has been represented in the International Academy of Astronautics (currently in Commission 1). Its present incarnation – the IAA SETI Permanent Study Group – is the world's only SETI organization with a broadly international membership.

Each year, the SETI PSG organizes two sessions, one on the science and technology of the search, and a second dealing with the social consequences of this bold exploratory endeavor. These sessions invariably draw large audiences, a testimony to the widespread interest in the possibility of discovering sentient life beyond our solar system. Papers presented here over the past few years are now being readied for publication in a special edition of *Acta Astronautica*.

Despite the fact that SETI has yet to find a compelling signal that would indicate that we're not alone, it is a highly dynamic field. Discoveries of extrasolar planets, the strong indications of liquid water on a half-dozen other worlds in our solar system, and the very early genesis of life on Earth all suggest that life is not a highly rare phenomenon. In addition to these encouraging results from other fields of astronomy and planetary science, the speed of SETI searches has been growing exponentially – following Moore's Law, which recognizes the fact that the speed of digital electronics doubles each 18 months. In addition, new telescopes for both radio and optical SETI experiments have been constructed in the last few years – instruments that can conduct searches 24 hours a day, 7 days a week.

In view of the widespread interest in SETI – now entering its second half-century – and the profound consequences for society that would attend a detection, it seems more than reasonable that a highlight lecture on this subject be presented at the 2010 Prague IAC

(the subject has almost never been the subject of either highlight or plenary IAC sessions). Such a presentation could briefly recap the accomplishments of the IAA SETI Permanent Study Group, but also consider some of the very promising developments in this field that are foreseen for the coming decade. Much of space science is about exploration, and SETI is one of the most exciting and ambitious explorations by science today.

6. Preview of Commission 1 items at 62th IAC in South Africa, October 2011

The following Symposia are relevant: A1 Space life Science. A.2 – Microgravity Science and processes. A.3 – Space exploration. A.5 – Human exploration of the Moon and Mars, A6 – Space Debris.

Plenary event should be suggested to the IPC on results of orbiting Mars and Mars missions. The event should be a panel meeting with several participating specialists. Suggestions must be prepared by Commission meeting in Prague 2010 and finalized during the meeting to be submitted in November 2010. Responsible – Gerhard Schwehm.

7. Next meetings

Next Commission meetings were planned for COSPAR July 2010, and 61-st IAC, Prague, September 2010.

Gregg Vane takes the action to organize Commission 1 meeting during the COSPAR Scientific Assembly. Peter Wenzel advised to contact the Bremen organizers early for a room allocation.

8. New Business

Gregg Vane informed on forthcoming event: “ Low cost mission” conference to be held at APL, USA in May-June 2011.

Bernard Foing informed of Global Luna conference to be held in Beijing 31 May-7 June 2010.

Gregg Vane suggested to organize a table with all Commission 1 relevant events for 2-3 years in advance to facilitate planning and to avoid overlapping. All Commission members should send their data to the secretary for being included in the table.

Annex 1.

Declaration of Principles Concerning the Conduct of the Search for Extraterrestrial Intelligence

Preamble

The parties to this declaration are individuals and institutions participating in the scientific Search for Extraterrestrial Intelligence (SETI).

The purpose of this document is to declare our commitment to conduct this search in a scientifically valid and transparent manner and to establish uniform procedures for the announcement of a confirmed SETI detection.

This commitment is made in recognition of the profound scientific, social, ethical, legal, philosophical and other implications of a SETI detection. As this enterprise enjoys wide public interest, but engenders uncertainty about how information collected during the search will be handled, the signatories have voluntarily constructed this declaration. It, together with a current list of signatory parties, will be placed on file with the International Academy of Astronautics (IAA).

Principles

1. *Searching*: SETI experiments will be conducted transparently, and its practitioners will be free to present reports on activities and results in public and professional fora. They will also be responsive to news organizations and other public communications media about their work.

2. *Handling candidate evidence*: In the event of a suspected detection of extraterrestrial intelligence, the discoverer will make all efforts to verify the detection, using the resources available to the discoverer and with the collaboration of other investigators, whether or not signatories to this Declaration. Such efforts will include, but not be limited to, observations at more than one facility and/or by more than one organization. There is no obligation to disclose verification efforts while they are underway, and there should be no premature disclosures pending verification. Inquiries from the media and news organizations should be responded to promptly and honestly.

Information about candidate signals or other detections should be treated in the same way that any scientist would treat provisional laboratory results. The Rio Scale, or its equivalent, should be used as a guide to the import and significance of candidate discoveries for the benefit of non-specialist audiences.

3. *Confirmed detections*: If the verification process confirms – by the consensus of the other investigators involved and to a degree of certainty judged by the discoverers to be credible – that a signal or other evidence is due to extraterrestrial intelligence, the discoverer shall report this conclusion in a full and complete open manner to the public, the scientific community, and the Secretary General of the United Nations. The confirmation report will include the basic data, the process and results of the verification efforts, any conclusions and interpretations, and any detected information content of the signal itself. A formal report will also be made to the International Astronomical Union (IAU).

4. All data necessary for the confirmation of the detection should be made available to the international scientific community through publications, meetings, conferences, and other appropriate means.

5. The discovery should be monitored. Any data bearing on the evidence of extraterrestrial intelligence should be recorded and stored permanently to the greatest extent feasible and practicable, in a form that will make it available to observers and to the scientific community for further analysis and interpretation.

6. If the evidence of detection is in the form of electromagnetic signals, observers should seek international agreement to protect the appropriate frequencies by exercising the extraordinary procedures established within the World Administrative Radio Council of the International Telecommunication Union.

5. *Post Detection:* A Post-Detection Task Group under the auspices of the IAA SETI Permanent Study Group has been established to assist in matters that may arise in the event of a confirmed signal, and to support the scientific and public analysis by offering guidance, interpretation, and discussion of the wider implications of the detection.

6. *Response to signals:* In the case of the confirmed detection of a signal, signatories to this declaration will not respond without first seeking guidance and consent of a broadly representative international body, such as the United Nations.