

International Academy of Astronautics

Commission II: Life Sciences

Coordination Meeting

March 23, 2004

8:30 – 11:00 hrs

Location: Immeuble Aeroclub de France
6, rue Galilee, 75016 Paris
Bureau de President

Summary minutes

1. The meeting was chaired by **I. Koslovskaya**. When welcoming the participants I. Koslovskaya briefly reported on the activities happened since the last meeting in Bremen and outlined the objectives for the present meeting. A list of participants of the meeting is enclosed (Annex I).
2. The **draft agenda** – distributed to participants prior to the meeting – was agreed upon (Annex II). Copies of the draft minutes from last Commission II meeting in Bremen have been handed to participants for comments and amendments prior to the meeting and agreed upon. The final version of these minutes have already send to participants and is also available on the IAA website (<http://www.ianet.org/commissions/>).

3. Scientific Activities Report, last Board of Trustees

R. White informed participants on the results of the last meetings of the Board of Trustees. Discussions were held periodically – as recently in Milan and Paris - in the strategy committee on the purpose and the mission of the Academy. These attempts were undertaken to make trustee members aware about activities of IAA as of its context. In the meeting of 22 March 2004 a new discussion has been started on the idea to formulate a set of action leading to a more substantial strategic plan for the Academy in Vancouver.

Further discussion topics included financial and scientific matters as the added value of IAA to its members. A further challenging question of the still ongoing debate is on membership, its geopolitical distribution as the ratio between basic scientists and engineers. The section of life sciences has been put into question if not to be integrated in basic sciences. The further course of the debate needs to be carefully followed and might – dependent on its further evolution – request a urgent action by the life sciences section as the IAA Commission II.

The work of the scientific activities committee has reported as good end efficient. During the subsequent discussion members of the Commission II mentioned that enough attention should be paid to education and vocation, especially in geographical areas with lower space attention. Additional offer of summer schools and space courses could be an adequate tool to deal efficiently with the matter.

4. Study Group proposals/activities:

I. Koslovskaya asked the participating chairmen of study groups for a short report on the current status of the work for subsequent reporting to the scientific activities committee.

N. Kanas: Psychology and Culture in Long Duration Space Missions

This study group currently has 20 active members. Last year many of the members met at international conferences (e.g., Bremen, Moscow) to discuss out activities, and this year meetings are being planned for the ASMA and IAC meetings. The group is also communicating via e-mail. The study group is organized into several subgroups (e.g., personality, group interactions, psychiatry, psychophysiology), which will contribute sections to the planned position paper (scheduled for 2006). Stimulated by the study group, 25 abstracts were submitted to the psychology and culture session for the IAC in Vancouver, and a Plenary Session was proposed as well.

R. White: Mathematical Modeling & Physiological Simulation: The Digital Astronaut/Cosmonaut

The study group has started with a new approach one year ago and the organizational set up has been settled. One major goal of the group's work is to merge newly available technologies (e.g. in physiology and biology related to space, simulation of the space situation, future systems for exploration) with the emerging information technologies. Since intermediate results were expected not earlier than in 5-10 years, the group is working for the future by developing a circle of researchers tuned to the future. A series of workshops is envisaged to be organized in the upcoming years. Furthermore NASA is expected to launch a programme on the topic during the next year. The group has started slower than expected but is not facing particular problems

G. Horneck: Biosystems for future extraterrestrial habitats and in terrestrial applications

The study group is in state of formation. A first preparatory meeting took place last year at DLR in Cologne. Next envisaged steps include:

- Meeting with experts at the upcoming COSPAR meeting in Paris (July 2004)
- Meeting on a terrestrial Mars habitat, organized by DLR in fall 2004
- Critical assessment of existing bio-generative life support systems within specific studies

G. Horneck will deliver the verified list of study group members and an envisaged workplan after the COSPAR allowing a distribution to all IAA Commission II members in due time prior to the next meeting in Vancouver.

J. Rummel: Astrobiological Studies of Solar Systems

This study group was first proposed at the IAC in Bremen 2003, and the work of the group is intended to benefit from studies undertaken by the NASA Astrobiology Institute, the European Astrobiology Network Association, and other Astrobiology organizations and their members. An overall plan for the study has been drawn, and participants and source documents will be further identified at the Astrobiology science conference in late March 2004, with meetings envisaged at the Bio-astronomy meeting in Keland and/or at COSPAR in Paris (July 2004).

L. Young: Artificial Gravity as a Tool in Biology & Medicine

Since L. Young could not participate in the meeting, no firm information on the status of the study group proposal has been available. In the subsequent discussion I. Koslovskaya underlined the need to clarify the status of the study group. It has been agreed to seek clarification until the next meeting in Vancouver (October 2004) before taking a position on continuing or deleting the above study group proposal.

Discussion on new proposals for study groups

A proposal for a potential new study group on long-term nutrition issues has been raised in the discussion. Commission members welcomed the proposal but felt not ready to take a position on the spot. Proposals for new study groups should be in the future addressed to the Commission in writing and in due time prior to the next upcoming meeting. It should address the added value to envisaged research field, include an overview on ongoing activities and allow a fair assessment along an agreed set of criteria.

5. Programme activities

I. Koslovskaya explained the status of preparation for the next **IAC in Vancouver 2004**. The scientific programme will be finalised during the upcoming joint meetings with IAF.

Based on the status report (annex III) the commission recommended to as for an additional ½ session for G 2 and 1 full additional session for G5. A poster session could be considered as a fall back position in case the situation would not allow the additional sessions.

The plenary session proposed by N. Kanas has been not accepted for the IAC in Vancouver. Nevertheless the commission recommended to N. Kanas to post a new proposal with a more appealing title for the IAC meeting in Fukuoka (present draft title: “Preparing for Mars: Psychology and Culture in Space”).

2005 Humans in Space Symposium:

G. Horneck reported on the status of preparation for the 15th Human in Space Symposium, Graz, 22 – 25 May, 2005 (c.f. annex IV,V). In its last meeting the steering group focussed mainly on organisational matters. Up to 300 participants are expected. The participation fee is calculated with 350 € which could give a balanced funding if local sponsors will support by funding and/or providing evening events/receptions.

I. Koslovskaya tasked the participants to comment on the enclosed programme proposal (annex V) by Prof. Hinghofer. Comments should be sent via E-mail to G. Horneck, which will prepare an integrated version within the next 12 weeks. This version will then forwarded to Prof. Hinghofer.

Programme proposals for the 56th IAC 2005 in Fukuoka, Japan

The discussion of the on the programme proposals for the IAC in Fukuoka ended after discussion in SAC and with IAF in the following symposia recommendation (final programme proposal, annex VI):

Symposia: G Space Life Sciences: The mission to Mars starts on Earth
Coordinators: I. Kozlovskaya and R.J. White

G1 Gravity: Effects on Human Physiology
Chairs: I. Kozlovskaya and V.S. Schneider

G2 Going to Mars: Development of Medical Operational Systems to Ensure Human Health
Chairs: A. I. Grigoriev and J. Davies

G3 Mathematical Models, Physiology and Spaceflight
Chairs: R.J. White and M. Kushmerick

G4 Analogs Models for Microgravity
Chairs: M. Heer and Y. Kazuyoshi

G5 Psychosocial Issues during Long Duration Space Missions
Chairs: N. Kanas and G.M. Sandal

G6 Habitats, Life support and Extravehicular Activity
Chairs: G. Fogleman and R. Gerzer

G7 Robotics and Human Missions to Mars and beyond: Challenges in Astrobiology and Planetary Protection
Chairs: J.D. Rummel and G. Horneck

6. Next meeting:

The next meeting will take place during the IAC in Vancouver, October 4-8 2004, Canada. The exact meeting date and location will be communicated to the Commission II members together with a draft agenda app. 4 weeks prior to the envisaged meeting.

7. Actions:

- **All members** to provide comments on the programme proposal of 2005 Humans in Space symposium to G. Horneck by **end of April 2004**
- **K. Kreuzberg** to communicate the integrated view of Commission II on the programme proposal of 2005 Humans in Space symposium to Prof. Hinghofer by **begin of May 2004**.
- **G. Horneck** to deliver the verified list of study group 2.3 members and an envisaged workplan **6 September 2004**.
- **I. Koslovskaya** to clarify the status of study group 2.2 until **6 September 2004**.
- **M. Heer** to prepare a proposal for a potential new study group on long-term nutrition issues according to the discussed criteria until **6 September 2004**.

K. Kreuzberg

Annex I

International Academy of Aeronautics

Commission II: Life Sciences

Coordination Meeting, 23. March 2004, Paris, France

List of Participants

Boles	Vincent C.	vincent.c.boles@aero.org
Gerzer	Rupert	Rupert.gerzer@dlr.de
Graef	Peter	peter.graef@dlr.de
Heer	Martina	Martina.Heer@dlr.de
Horneck	Gerda	gerda.horneck@dlr.de
Kanas	Nick	nick21@itsa.ucsf.edu
Kourtidou-Papadeli	Chrysoula	papadeli@koz.forthnet.gr , papadeli@med.auth.gr
Kozlovskaya	Inessa	ikozlovs@imbp.ru
Kreuzberg	Karlheinz	karlheinz.kreuzberg@esa.int
Rummel	J.D.	jrummel@hq.nasa.gov
White	Ronald	rwhite@bcm.tmc.edu

Annex II

IAA COMMISSION II

Life Sciences
Coordination Meeting

March 23, 2004 08h30 – 10h45

Location: Immeuble Aeroclub de France
6, rue Galilee, 75016 Paris

Draft Agenda

1. Welcome/ Introduction
2. Review of minutes from last Commission II meeting in Bremen
3. Scientific Activities Report, last Board of Trustees meeting
4. Study Group proposals/activities
 - 4.1 General overview
 - 4.2 Status/Progress report from Study Groups chairmen
 - 4.3 Discussion on new proposals
5. Programme preparation activities
 - 5.1 General
 - 5.2 Status for 55th IAC Vancouver 2004, 4 – 8 October
 - 5.3 Status for the 15th Human in Space Symposium, Graz, 22 – 25 May, 2005
 - 5.4 Programme proposal for the 56th IAC 2005 in Fukuoka, Japan
6. Next meeting and work between meetings
7. Any other business

Annex III

See enclosed excel file 1

Annex IV

Draft Summary of the first
15th IAA Humans in Space Symposium Steering Committee Meeting
Held on Monday, 2nd February 2004, 15.00-17.00
At the Institute for Adaptive and Spaceflight Physiology (IAP)
Graz, Austria

List of Participants :

- Gerda HORNECK (IAA)
- Helmut HINGHOFER-SZALKAY*, Andreas RÖSSLER*, Melitta UNTERLERCHNER* (IAP)
- Werner BALOGH* (ASA)
- Volker DAMANN (ESA)
- Christian BUCHMANN (City of Graz)
- Michael TEUBL (Government of Styria – standing in for Peter PIFFL-PERCEVIC)
- Gudrun JÄGER* (Graz Tourismus)
- Andrea ETZ, Sonja CHMELA (MAW)

* .. members of the Local Organizing Committee

Agenda

No specific agenda was given. The discussion centred upon budget and organisational items, as well as the scientific programme.

Budget

The original draft / proposed budget was ~145.000 € for the entire meeting cost, quite balanced with a minimum (~1.000 €) surplus, based on the assumption of 300 full participants. According to experiences from previous meetings (Santorin, Banff), this figure seems to be very optimistic. The Humans in Space meeting standard (Banff 2003 taken as a benchmark) was traditionally quite high and needs to be satisfied, which transforms into correspondingly high costs for preparation, room rental, services, catering etc. However, a solid budget needs to be tailored around a possibly lower number of attendees - about 200 as in Banff (*information provided to ASA by the Canadian Space Agency after the Steering Committee meeting*) - that would create a balanced net result even in case the number of participants does not fully meet the Committee's expectations. Otherwise, a ~60.000 € shortfall would be quite possible. Therefore, financial contributions from various sponsoring bodies are absolutely necessary in order to compensate for this budgetary gap, allowing for solid planning and guaranteeing a satisfying meeting standard. It was also discussed to form an organising society as a legal platform, this has still to be decided upon.

The following financial contributions are anticipated so far:

- ESA: €5.000 announced, with a higher contribution highly desirable, subject to negotiations
- City of Graz: €5.000 to 6.000, plus one reception
- State of Styria: €5.000 to 6.000, plus one reception
- The Austrian Ministry of Transport, Innovation and Technology (BMVIT) should be approached for co-sponsorship. ASA would support an application coming from the Local Organizing Committee. A request for co-funding at the same level of funds as provided by other co-sponsors (approx. €5000) seems reasonable.

- DLR will look at possibilities for co-sponsorship of the event (e.g. providing scholarships for students to participate in the Symposium, participation in an exhibition).

A final decision about the meeting place (presumably, Grazer Kongress) will be taken as soon as the budget draft is sufficiently bolstered by figures based upon most probable assumptions.

Exhibition

Income should be generated from companies and institutions that use the meeting for advertising purposes. Only 5 exhibitors provided 300 \$ (Canadian) each at the previous meeting (Banff). A comparably larger exhibition will be attempted for the Graz meeting, assisted by MAW's advertising activities.

Andreas Pössler (andreas.roessler@meduni-graz.at, Tel: +43-316-380-4270, FAX:+43-316-380-694270) will be in charge of organizing sponsoring activities and serve as point of contact. Potential sponsors will be approached by MAW (maw@media.co.at - Andrea Etz, Tel: +43-1-53663-42 and Sonja Chmella Tel: +43-1-53663-32, FAX: +43-1-53663-16). Prices per square meter will be proposed by MAW. A deadline for proposing exhibitors has not yet been set.

Organisation

It is acknowledged that the meeting standard regarding presentation requirements – i.e., all participants are requested to bring along their own laptop, only USB ports and beamers will be provided by the Symposium – is to be adopted for the 2005 meeting as well.

Students of the Graz Universities will be invited to participate: They might take responsibility for assisting with presentations, checking badges, and act as guides.

Registration will be open from Sunday, May 22nd, until the last Symposium day (TBD). The opening session will start Monday, May 23rd, at 9.00 hrs.

The mayor of the City of Graz, as well as a representative of the Government of Styria, is expected to deliver a welcoming address during the opening session. 2-3 keynote speeches are considered desirable for the opening ceremony.

A round table featuring several astronauts will be proposed to the Programme Committee.

A tentative meeting schedule is given below:

	Su. 22.	Mo. 23.	Tu. 24.	Wed. 25.
8.30 -10.30		Opening S	Plenary S	Plenary S
11.00-13.00		Splinter 1	Splinter 3	Splinter 5
14.30-16.30	Registration	Splinter 2	Splinter 4	Splinter 6
17.00-19.00	Registration continues Exhibit setup	Round Table 1 Working	Poster Sessions Working	Round Table 2 Exhib.

		Sessions	Sessions	break-down
evening	Welcome Party	Reception A (City Graz?)	Reception B (S. Styria?)	Cocktail Banquet

Scientific programme

In general, it is considered salient to appeal to various visions for the future of humans in space. The challenges of living on the Moon and on Mars should be one of the leading topics, as well as the problems connected to the functioning of biological life support systems. Social topics, space tourism, and the European Concordia project in the Antarctica should also be amongst the items to be dealt with.

After thorough discussion, a list of tentative session / panel titles is identified:

- Living and working on Moon and Mars
- Challenges of long term space missions
- Radiation issues
- Life support systems
- Search for life
- Psychological problems of confinement and space flight
- Gravity simulation
- Space Tourism
- History - can we learn from the past for future challenges
- Cultural aspects - mixed crew problems
- Lessons learned from the use of terrestrial test beds
- Space policy and politics
- Spaceflight and medicine

Date and place of next meeting

The Local Organizing Committee will meet according to agenda as they develop. The Steering Committee will reconvene in case items cannot be clarified over electronic media.

H. Hinghofer-Szalkay
A. Rössler

2004-03-01

Annex V

See enclosed excel file 2

Annex VI

FUKUOKA 2005

G. SPACE LIFE SCIENCES

The Mission to Mars starts on Earth (Joint with IAA Commission 2)

Coordinators:

Inessa Kozlovskaya
Institute of Biomedical Problems - Russia
Tel. (7) 095 1950033, Fax. (7) 095 1952253
E-mail: ikozlovs@mmcc.ibmp.rssi.ru

Ronald J. White
USRA – USA
Tel. (1) 281 244 2025 , Fax. (1) 281 244 2006
E-mail: white@dsls.usra.edu

G.1. Gravity: Effects on Human Physiology

The session will discuss the observed effects of spaceflight on human physiological functions, including selected or integrated aspects.

Chairs:

Inessa Kozlovskaya
Institute of Biomedical Problems - Russia
Tel. (7) 095 1950033, Fax. (7) 095 1952253
E-mail: ikozlovs@mmcc.ibmp.rssi.ru

Victor S. Schneider
NASA Headquarters – USA
Tel. 1 (202) 358 2204, Fax. 1 (202) 358 4168
E-mail: victor.schneider@hq.nasa.gov

Rapporteur:

Guenter Ruyters
DLR - Germany
Tel. (49) 228 447 214, FAX. (49) 228 447 735
E-mail: guenter.ruyters@dlr.de

G.2. Going to Mars: Development of Medical Operational Systems to Ensure Human Health

Interplanetary Missions will challenge human health. This session will discuss the effectiveness of potential medical support and countermeasures to the hazards of spaceflight.

Chairs:

Anatoly I. Grigoriev
Institute of Biomedical Problems – RUSSIA
Tel. (7) 095.195.2363, Fax. (7) 095.195.2253
E-mail: grigoriev@imbp.ru

Jeff Davies
NASA Johnson Space Center – USA
Tel., Fax.
E-mail:

Rapporteur:

Peter Graef
DLR - GERMANY
Tel. (49) 228 447 373, Fax. (49) 228 447 735
E-mail: peter.graef@dlr.de

G.3. Mathematical Models, Physiology and Spaceflight

This session focuses on the development and use of mathematical models to understand and simulate physiological and biological events underlying the changes that occur during spaceflight or altered gravity analogues.

Chairs:

Ronald J. White
USRA – USA
Tel. (1) 281 244 2025 , Fax. (1) 281 244 2006
E-mail: white@dsls.usra.edu

Martin Kushmerick
University of Washington – USA
Tel. (1) 206 543 3762, Fax: (1) 206 221 6515
E-mail: kushmeri@u.washington.edu

Rapporteur:

James E. Coolahan
Johns Hopkins University – USA
Tel. (1) 240 228 5155, Fax. (1) 240 228 5910
E-mail: James.Coolahan@jhuapl.edu

G.4. Analogs Models for Microgravity

This session will deal with study concepts like e.g. bed rest, immersion, parabolic flights etc. that serve as analog models for spaceflight factors, and their effects on the human body.

Chairs:

Martine Heer
DLR – GERMANY
Tel. (49) 2203 601 3080, Fax. (49) 2203 6 11 59
E-mail: martina.heer@dlr.de

Yajima Kazuyoshi
Company - Country
Tel. (, Fax. (,
E-mail:

Rapporteur:

Jancy C. McPhee
NSBRI – NASA JSC - USA
Tel. (1) 281 244 6434, Fax. (1) 281 483 2888
E-mail: jmcphree@bcm.tmc.edu

G.5. Psychosocial Issues during Long Duration Space Missions

This session will deal with important psychological, interpersonal and cultural issues that affect long-duration space missions on-orbit in a lunar base, or during an expedition to Mars. Information from both space analog environments and actual space missions will be included.

Chairs:

Nick Kanas

Univ. of California and Veterans Hospital, San Francisco– USA
Tel. (1) 415 750 2072, Fax. (1) 415 668 7503
E-mail: nick21@itsa.ucsf.edu

Gro M. Sandal
University of Bergen – NORWAY
Tel. (47) 55 588 685, Fax. (47) 55 589 879
E-mail: gro.sandal@psych.uib.no

Rapporteur:

Vadim Gushin
Institute for Biomedical Problems – RUSSIA
Tel. (7) 095 195 67 29, Fax. (7) 095 195 22 53
E-mail: vgushin@imbp.ru

G.6. Habitats, Life Support and Extravehicular Activity

In view of the International Plans of Human Exploratory missions, this session will discuss:

- different habitat designs for lunar bases and/or Mars habitat and terrestrial simulators
- advanced life support systems including bioregenerative systems + environmental monitoring and control
- new concepts of space suits for EVA's on planetary surfaces

Chairs:

Guy Fogleman
NASA Headquarters – USA
Tel. (1) 202 358 0220, Fax. (1) 202 358 4168
E-mail: guy.fogleman@nasa.gov

Rupert Gerzer
DLR, Institute of Aerospace Medicine - GERMANY
Tel. (49) 22 03 601-0 ext 3115, Fax. (49) 22 03 695 211
E-mail: rupert.gerzer@dlr.de

Rapporteur:

Stephen Ransom (tbc)
EADS Space Transportation – GERMANY
Tel. (49) 421 539 44 02, Fax. (49)
E-mail: stephen.ransom@space.eads.net

G.7. Robotics and Human Missions to Mars and beyond: Challenges in Astrobiology and Planetary Protection

With evidence of past water and present-day ice on Mars, oceans within Jupiter's Moons and abundant organics on Titan, there are compelling solar system targets for Astrobiology. This session will focus on astrobiology opportunities in future missions, astrobiology instrument concepts and planetary protection measure to enable future discoveries and preserve earth's biosphere.

Chairs:

John D. Rummel
NASA Headquarters – USA
Tel. (1) 202 358 07 02 , Fax. (1) 202 358 30 97
E-mail: jrummel@hq.nasa.gov

Gerda Horneck
DLR – GERMANY
Tel. (49) 22 03 601 3594, Fax. (49) 22 03 61 970
E-mail: gerda.horneck@dlr.de

Rapporteur:

Pascale Ehrenfreund (tbc)

Leiden Observatory - NETHERLANDS

Tel. (31) 715 275 812, Fax. (31) 715 275 819

E-mail: pascale@strw.leidenuniv.nl