

International Academy of Astronautics

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Commission IV

Location IAA Office Rue Galilee 6, Paris

Date - Time Monday March 23 h. 14.00

Attended by:

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1. Welcome

Welcome remarks. Noting that our Commission IV Chairs, Paolo Teofilatto and Mikhail Ovchinnikov, were not able to attend the meeting, but we had discussion prior to it and they provided the draft agenda and discussion point.

2. Agenda for this meeting

- Welcome from Commission IV leadership
- Adoption of the minutes from Toronto
- Status of the approved Study Group
- Proposals for a New Study Group
- Report from the Permanent Committee
- Discussions and Concerns

3. Adoption of the Minutes of Commission IV Meeting in Toronto

Following a brief discussion, the minutes from the Commission IV meeting was adopted by the attendees.

4. IAA Cosmic Studies

4.1 STATUS OF COMPLETED STUDIES

The three studies are listed below:

SG 4.8 : Title of the Study: Space Systems Cross-Compatibility

Chair: Jaime Esper

Co-Chair: Linda Herrel

Co-Chair: Marco d'Errico

Secretary: Peter Mendham

During the Toronto Commission IV meeting it was discussed to request the authors of the report to remove the duplications and rework the content, then present the finalized and updated Report at the next Commission IV Meeting in Paris, in April 2015.

Status:

We have no additional information or update on this. None of the study participants attended the meeting to provide an update.

SG 4.9: Title of Study: International Aerospace System for Monitoring of Global Geophysical Phenomena and Forecasting of Natural and Man-Caused Disasters

Study Group Chairs: Valery Menshikov and Kuppam Sridhara Murthi

During the Toronto Commission IV meeting it was discussed that we are expecting the Final Report by 1 December 2014. A Commission IV based internal review board – composed of Balint, Holm and Teofilatto – is expected to review the manuscript by 15 January 2014, so that the authors will be able to present the revised version of the Final Report at the next Meeting in Paris, in April 2015.

Status:

We have no additional information or update on this. However, at this meeting it was stated that IAA already released this.

SG 4.11: Title of Study: Coordination and Cooperation for Global Environmental Impact

Chair: Gu Xingfa

Secretary: Zhou Xiang

During the Toronto Commission IV meeting it was discussed that we are expecting the Final Report by 1 December 2014. A Commission IV based internal review board – composed of Balint, Holm and Teofilatto – is expected to review the manuscript by 15 January 2014, so that the authors will be able to present the revised version of the Final Report at the next Meeting in Paris, in April 2015.

Status:

We have no additional information or update on this. However, at this meeting it was stated that IAA already released this.

4.2 STATUS OF THE ONGOING STUDIES

The four studies are listed below:

SG.4.16: Title of Study: the Applications of Micro-Satellites and Cube-Sats to Planetary Science and Exploration Missions

Co-Chair: Leon Alkalai

Co-Chair: Filippo Graziani

Secretary: Pierre Bousquet

Secretary: Rene Laufer

Initial presentation on the study was given in Toronto, during the IAA Commission IV meeting. The study covers both CubeSats and Nanosats. While past studies and activities looked at Earth orbiting small satellite missions, this study focuses on deep space applications.

Progress to date:

1. General programmatic and landscape definition; State of Practice, mostly NASA based (the study needs information on international efforts, e.g., CubeSats to the moon; Otto Kudelka, for example could provide information on nanosats in Europe; Leon requested information from the international community)
2. Mission design; JPL, nanosats, other activities, including JPL/Team-X CubeSats related studies
3. Avionics, C&DH, plus science, mission architectures

Status:

- draft report will be provided to IAA by the May timeframe
- final report by Jerusalem

Needs:

- information on attitude control of CubeSats and nanosats
- information on international activities related to small satellites, e.g., small sats on Hayabusha 2 (deep space comm demo; outreach; ion propulsion demo for flyby)

Questions asked:

- what is the format of the report and the case studies? For example, the mission examples will be included as one page summary sheets; a spectrum of the case studies will be identified

SG.4.17: Title of Study: Space Systems for Biomedical Research

Co-Chair: Chantal Cappelletti

Co-Chair: Filippo Graziani

Secretary: Chiara Massimiani

- The study added several new members
- Assessed a 3U CubeSat for biomedical experiments, thermo-cryogenics and others
- Sample return to Earth has an issue, currently we don't have a good solution for this
- Radiation damage to the sample is also an issue
- **Action: On the science part, looking at NSBRI... Leon to provide information to Filippo on the Biomed Research Institute**

SG.4.18: Title of Study: Definition and Requirements of Small Satellites Seeking Low-Cost and Fast-Delivery

Co-Chair: Mengu Cho

Co-Chair: Filippo Graziani

Secretary: John Polansky

- the study chair, Mangu Cho, with 24 other members assessed the definition of small satellites; the definition "lean satellite" was proposed
- the study team is proposing to deliver a preliminary draft report in November 2015, and the final report by IAC-2016

SG.4.19: Title of Study: Promoting Global Space Knowledge and Expertise in Developing Countries

Chair: Mazlan Othman

Secretary: Marcello Coradini

There was no representation for this study at the meeting. This study was transferred from Commission I to Commission IV.

4.3 APPROVAL OF TWO NEW STUDY GROUPS:

#1: New Study Group Proposal:

Space Information Application in Earthquake Emergency Response (SG 4.20)

Chairs: Bao Weimin, Jean-Michel Contant

The team presented a pitch to the Commission about the study. Follow up discussions brought up comments and question as follows:

- there should be an augmentation to the study charter, to expand it to research
- the study should elaborate on knowledge prior to the earthquake
- the mechanism for this is similar to other studies; we need to understand how it is different from those other studies exploring a broader set of natural disasters, beyond earthquakes only
- the Ukrainians have expertise related to earthquake monitoring, so they should be considered as contributors for the study
- it would be beneficial to include volcano monitoring to the study scope

#2: New Study Group Proposal:

Distributed, Networked, Smart, Cooperating Small Satellite Formations (SG 4.21)

Chairs: Igor Belokonov and Klaus Schilling

- the study chairs provided a brief introduction to the proposed study topic
- Question: what are the unique aspects to make this study satellite specific (when there is much work done on distributed and networked and smart systems for terrestrial applications)? Answer: affordability
- Question: other sub-areas, such as geo-location, other applications of small satellites, the number of algorithms, for coordination between lots of satellites could be addressed by the study, right? Also, DARPA/FAST could be also looked at. Answer: all of these could be considered in the study

ACTIONT: The study teams are in the process of advancing their studies. The question from the teams was that: what else they need to do about it.

Answer: Commission IV Chairs to check with IAA that both studies have been approved, and notify the study leads that this is the case.

3. Permanent committee reporting by Rene

Rene Laufer provided an overview of the permanent committee on Small Satellites. This was a follow on to the dedicated permanent committee meeting in the morning, attended by about 15-20 people affiliated with the permanent committee.

Discussion topics included the upcoming IAA Small satellites conference in Berlin; the IAC Small Satellites symposium in Jerusalem; and the UNISEC (University Space Engineering Consortium), addressing the upcoming 3rd meeting and the follow on 4th meeting and competition. Further information on this competition can be found on the following website:

<http://spacemic.net>

4. Other Business

Message from Jean-Michel Contant, to be discussed at the Commission IV meeting.

Next Heads of Space Agencies Summit

- in Mexico City, Mexico,
- on 17-18 September 2015

IAA leadership wishes us, Commission IV, to consider contribution to the preparation of the event.

Schedule:

Thursday 17 September 2015:

- will be devoted to an international conference on Climate Change and Disaster Management
- and the evening will be the occasion of a Gala dinner.

Friday 18 September 2015

- will be the Summit day.

Related to the conference:

The IAA Conference was a very successful step in the Summit preparation

- on February 25-27, 2015,
- in Thiruvananthapuram, India,
- co-sponsored by the IISL, the Ministry of Earth Sciences and ISRO
- in collaboration with the Kerala State Council for Science, Technology and Environment (KSCSTE),

The conference with one hundred papers gathered nearly 250 participants and was honored of the presence of the Heads of ISRO, ROSA, Romania, CNES, France and AEM, Mexico.

See: <http://iaaweb.org/content/view/277/416/> and <http://iaaweb.org/content/view/613/805/>
and <http://www.i3cdm.org/>

The conference has recommended 11 points (see

<http://iaaweb.org/iaa/Scientific%20Activity/kovalamrecommendations.pdf>) that may stimulate your interest.

Dr Nair and Dr Perminov are recommending that this subjects be incorporated in your meeting agenda and discussed accordingly.

Comments:

From Commission IV: From our Small Satellites permanent committee, we could provide some statement about the role of small satellites in support of Earth Sciences, and related measurements in connection with climate change research.

Furthermore, another IAA planned event is being proposed:

This year the 2015 IAA Planetary Defense Conference will be held in Frascati/Italy, April 13-17

As a follow on, the Hungarian Astronautical Society in collaboration with the Scientific Association for Infocommunications Hungary (an IEEE and IEEE ComSoc sister society) proposes to host the 5th IAA Planetary Defense Conference in Budapest in May 2017.

The bid is supported by the Hungarian Space Office at the Ministry of National Development and the BHE Bonn Hungary Ltd.

5. NEXT MEETING

The next IAA Commission IV meeting is planned during the IAC-2015 meeting in Jerusalem