

# **International Academy of Astronautics**

## **Commission 5**

### **Report on Meeting**

**Cape Town, South Africa  
Sunday 2 October 2011**

#### **1/ Attendance and welcome**

There were 19 participants in attendance, including 5 members of the Commission.

Max Grimard, Chairman  
Corinne Jorgenson, Vice Chairman  
Bernhard Schmidt-Tedd (acting Secretary for W. Balogh)

Elisabeth Back-Impallomeni, Frances Brown, Walter Flury, Christina Giannopapa, Henry Hertzfeld, Geir Hovmork, Claire Jolly, Nicholas Johnson, Jim Keravala, Heiner Klinkrad, Clay Mowry, Nicolas Peter, Nicola Rohner-Willsch, , Mathias Spude, Sergey Teselkin, Ray Williamson

Max Grimard presented himself as the new chair of Commission 5 and reported about the process of new membership nomination, which has been highly impacted by the sudden death of Pr Konyukhov, just after the Spring meeting. Pr Konyukhov had in mind some reforms such as the reduction of the number of Commission Members down to 7, and these points were pending. Prof Perminov has been elected as the new Vice-President Scientific Programs on mid September. IAA President Dr Nair has managed the transition phase and the Board has taken the following decisions regarding Commission membership, confirmed by a letter of the Secretary General on 15 September:

- 10 members size is kept, but decision quorum of 7 Commission members is instituted
- Enforcement of the current rules for Commission nominations: geographical balance, rotation of 1/3 of the Commission members and membership appointment by the President upon recommendation of the Vice-President Scientific Activities.

As a consequence the new membership of Commission 5 is :

Chair: Max Grimard

Vice-Chair: Corinne Jorgenson

Past-chair: Sergio Camacho

Secretary: Werner Balogh

Members: Oleg Ventskovsky, Clayton Mowry, Bernhard Schmidt-Tedd, Elisabeth Back-Impallomeni, Ciro Arevallo Yepes, and Jacques Masson

Rotated members are: K; Suzuki, J.J. Tortora, and MYS Prasad

M. Grimard thanked them for their contribution to the Commission 5, and hoped that they will continue to support its work, through participation in studies/program committees, open meetings, and conference proposals.

## Role of Commissions and way of operating

Commissions are in charge of coordinating and supervising the Academy work in their field of competence. This work is performed through two types of actions: organizing Symposia and delivering Scientific Studies. The operational bodies running these activities are the Program Committees on one hand and the Study Groups on the other hand. It is not the role of the Commission to substitute to them, especially for the Symposia organization, but the role is to foster new actions, to decide on the creation of Program Committees and Study Groups, to coordinate them, to validate their results and to report to the Scientific Activities Committee.

With the global wish to be more proactive and more interactive between the two physical meetings, the way Commission 5 leadership would like to operate is the following:

- implement Program Committees when not yet made, these PC being in charge of organizing Symposia and to formally report on their activity as the Study Groups are doing
- collect the reports from the PC and SG before the physical meetings
- use the opportunity of the physical meeting twice a year to quickly report on achievements and decided plans, but mainly to openly discuss about new ideas for actions on both Symposia and Studies, taking benefit of the open attendance
- then continue to exchange by e-mail between the physical meetings
- set decisions by Commissions Members (10 with a quorum of 7) through e-mail exchanges

H. Klinkrad expressed his interest in having a formal representative of the “space debris community” in the Commission 5. M. Grimard explained that as there are many communities within the scope of Commission 5, the representation of each community cannot be guaranteed in the membership area. However there are other means to achieve this representation, in particular for long standing communities such as Space Debris. One approach would be to propose a Permanent Committee within Commission 5, in addition to the Scientific-Legal Permanent Committee. This solution will be examined for a formal proposal before the 2012 Spring meeting in Paris.

### **2/ Adoption of the agenda**

The agenda was adopted as distributed by e-mail on 8 September 2011.

### **3/ Adoption of the Minutes of Commission 5 Meeting in Paris, March 22, 2011**

The minutes, as distributed by e-mail on 8 September 2011, were adopted. The text is available on the IAA website

#### **4/ IAA Commission 5 Conferences**

##### **4.1 Review of IAC 2011 Cape Town (no formal Program Committee)**

Session E3.1– *National and International Space Policies and Programmes for African Development*

chairs and rapporteur are OK, number of uploaded papers : 6 over 11 planned. 1 withdrawal

Session E3.2– *International Space Exploration Policies and Programmes*

chairs and rapporteur are OK, number of uploaded papers : 6 over 12 planned. 2 withdrawal

Session E3.3– *The space economy in emerging countries*

chairs and rapporteur are OK, number of uploaded papers : 8 over 12 planned. 1 withdrawal

Session E3.4– *Assuring the Long-Term Sustainability of Outer Space Activities*

chairs and rapporteur are OK, number of uploaded papers : 4 over 8 planned

Session E3.5–*26th IAA/IISL Scientific-Legal Roundtable: Towards Space Debris Remediation*

chairs and rapporteur are OK, number of uploaded papers : papers not uploaded.

This is an issue for this session, which should not have different rules. Even if these are invited papers they should be available through IAF website.

Session E3.6–*IAA 2010 Space Summit Reporting and Way Forward*

Special session added in Spring. 4 invited papers followed by a panel discussion, to report on the 4 studies presented at the IAA Space Summit last November in Washington

The Rapporteurs are asked to deliver a summary of the sessions, highlighting the key findings of the presentations, and then a global report of the Symposium will be delivered by the coordinators.

##### **4.2 Status of Symposia for IAC 2012 Napoli**

###### **4.2.1. Symposium E3 Space Policy, Regulations and Economics**

A Programme Committee shall be formally implemented on the basis of the planned chairs and co-chairs. The content of the Symposium has been discussed in Paris and has been delivered through the IAC Call for papers (see Appendix 1). As a reminder the headlines of the sessions are:

- E3.1 National and International Space Policies and Programmes sustaining critical infrastructures
- E3.2 Data policies in support of climate change mitigation and disaster management applications
- E3.3 Space Economy : Valuing the uses
- E.3.4 Effects of space weather on GEO satellites
- E3.5./E7.6 27th IAA/IISL Scientific-Legal Roundtable: Scientific-technical and legal issues in optical communications via satellites (Invited Papers only)

#### 4.2.2. Symposium A6 Space Debris

A Programme Committee shall be formally implemented on the basis of the planned chairs and co-chairs. The structure of the Symposium has been delivered through the IAC Call for papers (see Appendix 2):

- A6.1 Measurements
- A6.2 Modelling and Risk Analysis
- A6.3 Hypervelocity Impacts and Protection
- A6.4 Mitigation and Standards
- A6.5 Space Debris Removal Issues
- A6.6 Political, Economic and Institutional Aspects of Space Debris Mitigation and Removal (joint with IAF Space Security Committee)

#### 4.3 Future Conferences

##### 4.3.1. Collection of ideas for topics to be considered for 2013 Symposia in Beijing

The chairman opened a discussion on new subjects for 2013. A general issue of commission V is its cross-section character and the need to avoid overlaps. N. Johnson underlined new developments in national programs. E. Back-Impallomeni mentioned the EU space competence and models for African regional integration. S. Teselkin highlighted the importance of bilateral cooperation agreements, e.g. more than 40 for Russia. H. Hertzfeld mentioned the need to put economic subjects in a better position. R. Williams encouraged discussions on the new space security subject.

The chairman summarized the main subjects as follows:

- Enabling commercial opportunities in space
- Space exploration and international cooperation
- Space security (or Safe and secure use of space)
- New actors and regional organizations

The participants were invited to forward a written formulation of their proposals before the end of the year.

The IAA/IISL Round Table topic will be discussed during the meeting of the IAA/IISL Scientific-Legal Liaison Subcommittee

A formal Program Committee will be proposed by Commission 5, and will have the duty to finalize the structure of the Symposium for approval at the 2012 Spring Commission meeting.

##### 4.3.2 Stand alone conferences and IAA contribution to other conferences

The SAC has requested the Commissions to prepare a list of stand-alone conferences for 2012 and 2013. The following conferences have been identified for Commission 5 :

- IAA/ISPRS session on policy aspects of monitoring treaty agreements using EO satellites, at the 22<sup>nd</sup> Congress of the ISPRS, Melbourne, Australia, 25 August – 1 September 2012, <http://www.isprs2012-melbourne.com>
- Joint IAA/IISL Conference on Space Law and Policies

M. Grimard asked the attendance to send proposals of topics to the Commission 5 leadership, for both stand alone conferences, and participation to conferences planned by other organizations. For the selected topics, Program Committee proposals shall be then finalized, validated by the Commission Members and transmitted to SAC.

## **6/ Commission 5 Study Groups**

### **6.1 Status of Study Group on-going Activities**

#### **S5.5 Space Debris Environment Remediation (Klinkrad, Johnson)**

H. Klinkrad informed that a draft report has been provided for Peer review in July. It was transmitted to K.U. Schrögl, ... but no action since that date due to his position change, and pending nomination by Pr Perminov of a new person for study process management. M. Grimard took the action to reinitiate the process.

#### **S5.8 Space Systems as Critical Infrastructures (Piso)**

No news, no progress. The Study Group is proposed for cancellation.

#### **S5.9 International Cooperation on Space Weather (Baker, Balogh, Paxton)**

The group has 19 members. The target for publication is October 2012. W. Balogh will be asked to report in a written form on the progress of the study.

#### **S5.10 Orbital Debris Removal: Policy, Legal, Political and Economic Considerations (Hobe, Williamson)**

After a long process for approval and implementation, the study has just started.

For the future meetings of the Study Groups, M. Grimard would like to not restrict the status reports to pure administrative facts, but give the opportunity to the study chairs to deliver a short summary of the key findings and recommendations from their studies, whatever the progress of these studies. This will give more scientific content to the Commission meetings.

### **6.2 Proposed Study Groups**

The scope of Commission 5 is Policies, Law and Economics. There are some domains which have not been really addressed by Study Groups for the past few years :

- general space policy issues : where do we go in Space Exploration ? or “From Space Policies to real achievement : review of Space Agencies strategies and concrete implementation”
- economic aspects

Recalling the heads of Space Agencies Summit Declaration a prioritization of new items was discussed in March and recorded in the Minutes. This does not exclude the possibility to decide about some additional subjects for Study Groups, derived from the Summit Declaration

M. Grimard asked for proposals and volunteers : the initial proposals can be made by anybody, and should be transmitted to the Commission 5 leadership by the end of the year. Formal Study Groups will be then proposed for the selected topics.

**7/ Acta Astronautica**

Commission 5 needs a new volunteer among the Members to manage the liaison with Acta Astronautica.

**9/ Date of next meeting**

The next Commission 5 meeting will be held at the IAA, 6 rue Galilée, 75116 Paris, on **March 12, 2012; 9h – 11h00**

Being no other business the meeting adjourned.

## Appendix 1: Symposium E3 – IAC 2012 Napoli

The 25<sup>th</sup> IAA Symposium on Space Policy, Regulations and Economics will provide a systematic overview of the current trends in space policy, regulation and economics, by covering national as well as multilateral space policies and plans. Specific focus for 2012 will be on supporting recommendations made by the Summit of Heads of Space Agencies held in Washington in November 2010 and on ensuring the long-term sustainability of space infrastructures. The symposium also integrates the 27<sup>th</sup> IAA/IISL Scientific-Legal roundtable, which deals with optical communications via satellites.

### Coordinators:

Max Grimard, EADS Astrium, France  
Sergio Camacho, CRECTEALC, Mexico

- *E3.1 National and International Space Policies and Programmes sustaining critical infrastructures*

This session will provide a forum for the presentation and discussion of current space policies, programmes and initiatives of national and international organizations. A specific focus will be given to the actions sustaining the continuity of space infrastructures which are critical for economy, for security, for environment, and for quality of life.

### Chairs:

Sergio Camacho, CRECTEALC, Mexico  
Nicolas Peter, European Space Agency HQ, France

- *E3.2 Data policies in support of climate change mitigation and disaster management applications*

Climate change and Disaster management have been two important topics of the IAA Space Summit held in Washington in November 17, 2010. The discussions have revealed a common concern for the efficiency of the space applications, which is the way how data and information can be exchanged and processed. This session will discuss policies, programmes and initiatives, which guarantee that the space data which are needed to produce, on a continuous basis, the Essential Climate Variable, or which are necessary for disaster management, are made available to scientists, end-users and decision-makers, all over the world.

### Chairs:

Max Grimard, EADS Astrium, France

- *E3.3 Space Economy : Valuing the uses*

No text !!

### Chairs:

Thierry Le Goff, EADS Astrium, France  
Henry Hertzfeld, Space Policy Institute, GWU, USA  
Rapporteur :  
Bertrande Hauteclouque, BETA, France

- *E.3.4 Effects of space weather on GEO satellites*

This session will discuss case histories and mechanisms of the effects of space weather on GEO satellites, and policies, models for prediction and mitigation approaches. Other papers will discuss the effects of space weather on MEO and LEO satellites as well as on power grids on Earth. The papers presented will support the IAA Study Group on Space Weather and the discussions on the item by the Scientific and Technical Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space by exploring the policy guidelines that will be needed to assure long-term sustainability of satellites.

Chairs:

Werner Balogh, UN OOSA, Austria

- *E3.5./E7.6 27th IAA/IISL Scientific-Legal Roundtable: Scientific-technical and legal issues in optical communications via satellites (Invited Papers only)*

This session discusses the scientific-technical status of optical communications via satellites (inter satellites and with Earth terminals). This technology poses great economic opportunities for satellite applications. At the same time, regulatory developments have still to be put in place (foremost by the International Telecommunication Union, ITU). This relates for example to frequency use and the protection from interception during data transmission. The Roundtable will provide insight in these issues and charter the perspectives for the use of this technology.

Chairs:

Masahiko Sato, JAXA, Japan

Pierre Molette, France

Rapporteur:

Nicola Rohner-Willsch, DLR, Germany



## Appendix 2 : Symposium A6 – IAC 2012 Napoli

The symposium will address the complete spectrum of technical issues of space debris: measurements, modeling, risk assessment in space and on the ground, reentry, hypervelocity impacts and protection, mitigation and standards, and Space Surveillance.

Coordinators:

Nicholas L. Johnson, NASA, United States

Christophe Bonnal, CNES, France

- *A6.1 Measurements*

This session will address advanced ground and space-based measurement techniques, relating processing methods, and results on the derived spatial and temporal distribution of debris.

Chairs:

Patrick Seltzer, University of Michigan, United States

Vladimir Agapov, Keldysh Institute of Applied Mechanics, Russia

Rapporteur:

Thomas Schildhnecht, Astronomical Institute University of Bern, Switzerland

- *A6.2 Modelling and Risk Analysis*

This session will address the characterization of the current and future debris populations and methods for in-orbit and on-ground risk assessments. The in-orbit analysis will cover collision risk estimates based on statistical population models and deterministic catalogues, and active avoidance.

Chairs:

Luciano Anselmo, ISTI-CNR, Italy

Carsten Wiedermann, Technical University of Braunschweig, Germany

Rapporteur:

Tshiya Hanada, Kyushu University, Japan

- *A6.3 Hypervelocity Impacts and Protection*

The session will address passive protection, shielding and damage predictions. Shielding aspects will be supported by experimental and computational results of HVI tests. Use of HVI techniques for debris mitigation.

Chairs:

James Hyde, Barrios Technology/ESC Group, NASA, United States

Alessandro Francesconi, University of Padova, Italy

Rapporteur:

Frank Schaefer, Fraunhofer Institut für Kurzzeltdynamik, Ernst-Mach-Institut, Germany

- *A6.4 Mitigation and Standards*

This session will focus on the definition and implementation of debris prevention and reduction measures and vehicle passive protection. The session will also address space debris mitigation guidelines and standards that already exist or are in preparation at the national or international level.

Chairs:

Fernand Alby, CNES, France

John, W. Hussey, United States

Rapporteur:

Akira Kato, KAXA, Japan

- *A6.5 Space Debris Removal Issues*

This session will address active removal techniques “ground and space based”.

Chairs:

Heiner Klinkrad, ESA, Germany

Darren McKnight, Integrity Applications Incorporated, United States

Rapporteur:

Seishiro Kibe, JAXA, Japan

- *A6.6 Political, Economic and Institutional Aspects of Space Debris Mitigation and Removal (joint with IAF Space Security Committee)*

This session will deal with the non-technical aspect of space debris mitigation and removal. Economic issues including financial benefit and insurance, political aspects such as the role of UNCOPUOS are important issues to pass in the future. The role of international cooperation in addressing these issues will be considered.

Chairs:

Kazuto Suzuki, Hokkaido University, Japan

Holger Krag, ESA, Germany

Rapporteur:

Michael Yakovlev, Central Research Institute of Machine Building (TSNIIMASH), Russia

Charlotte Mathieu, ESA, France