INTERNATIONAL ASTRONOMICAL UNION

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INFORMATION BULLETIN JULY 2013

112

IAU Information Bulletin N° 112

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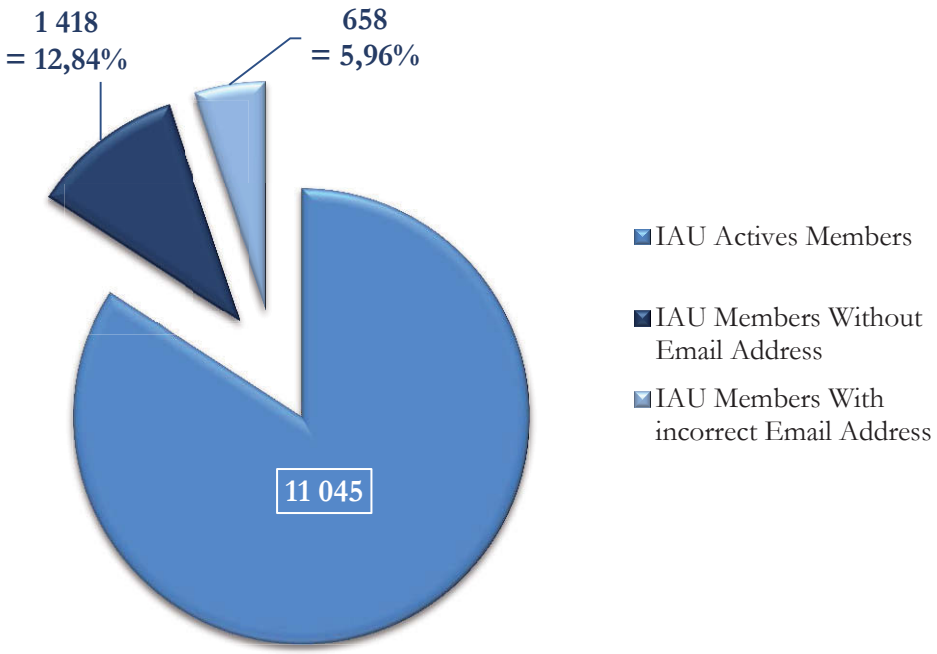
REMINDER: Please Remember to UPDATE your PROFILE on our WEBSITE



For help: iauinfos@iap.fr

Cover:

Four imaginary sacred animals regarded in China as guardian deities of the four directions from the Han dynasty on. The blue dragon Seiryū (Ch. Qinglong) is to the east, the red peacock Suzaku (Zhuque) to the south, the white tiger Byakko (Baihu) to the west and the black tortoise Genbu (Xuanhu) to the north. They were introduced to Japan in ancient times and have been found on murals at the Takamatsuzuka and Kitora mounded tombs in Nara prefecture. (Quoted from: Japanese Garden Dictionary: A Glossary for Japanese Gardens and Their History, by Ono Kenkichi and Walter Edwards, 2010).

The picture represents the peacock Suzaku. This name has also been given to the latest Japanese X-ray satellite, launched on July 10, 2005.

(Image from the National Research Institute for Cultural Properties, Nara, Japan.)

Editorial

This issue of the IAU Information Bulletin is the second of the triennium that started almost a year ago, at the end of the Beijing General Assembly. It is focused on the 2013 Executive Committee Meeting that took place in Nara, Japan, last May, and the many important decisions that were taken as a result. The main feature of that meeting was the participation of Division Presidents, who were invited to report and discuss the progress of the implementation of the new IAU Divisional structure. This was the second time in the history of the IAU that such a joint meeting between the Executive Committee and Division Presidents was organized. The first such meeting took place in 2010, and involved the previous Division Presidents, who unanimously endorsed the Divisional restructuring project presented by the Executive Committee, which ended up in a Resolution that was presented in Beijing and met the massive approval of the participants of the General Assembly.

This issue presents the first results of the implementation of this decision, as discussed in Nara. The main one is the establishment of all the "Division Steering Committees" – Divisions can now be considered as "up and running" for good. However, some organizational problems were encountered in the process, the most pressing one being the significant fraction of "missing" or "bouncing" e-mails in the IAU database used for the elections of six at-large members for each Division Steering Committee, and solving this problem is considered a high priority by the Secretariat.

A number of decisions that are important right now for all IAU members were taken in Nara, some of them already posted in the IAU web site:

- To publish in this issue the first conclusions of the Division Presidents, in particular about the evolution of Commissions and Working Groups (Sect. 3.2);
- To define of a new format for General Assembly meetings, with the merging of the "Joint Discussions" and "Special Sessions" into "Focus Meetings", and the introduction of "Division Meetings", which will take effect at the next General Assembly (Honolulu, 2015), with a deadline of next Sep.15 for Letters of Intent (Sect 2.1; see also the new Sect.3 of the "Rules & Guidelines" in the IAU web pages);
- To clarify the "Associate" status for non-IAU collaborators (Sect. 3.3);
- To select the nine IAU Symposia for 2013 (Sect. 4.3).
- To create an "Executive Committee Task Group" on "Public Naming of Planets and Planetary Satellites", to issue IAU rules in response to recent public naming campaigns that were both emotional and controversial, which all astronomers should be aware of (Sect. 1.4, item 14, and a forthcoming IAU eNewsletter).

Reports on ongoing actions (Office of Astronomy for Development, Office of Astronomy Outreach, Cooperation with other Unions and International Organizations) or on new actions (Digitization of the IAU Archives) are presented elsewhere in this Bulletin.

Thierry Montmerle

General Secretary

1. Executive Committee

1.1 EC91, 19 & 23 August, 2012, Beijing

Minutes

Present:

Officers:

Robert Williams, President

Norio Kaifu, President-elect

Ian Corbett, General Secretary

Thierry Montmerle, Assistant GS

Vice-Presidents:

Matthew Colless

Martha Haynes

George Miley

Jan Palouš

Marta Rovira

Giancarlo Setti

Catherine Cesarsky, Advisor

Karel A. van der Hucht, Advisor

IAU Secretariat

Vivien Reuter, Executive Assistant

First session: 19 August at 9:00

1. Welcome by the President of the IAU, *Bob Williams*

The President welcomed the Committee members to Beijing.

2. Approval of the agenda

The agenda was approved.

3. Executive Committee

3.1 Draft minutes EC90

The minutes were approved.

3.2 Action Items

All action items had been completed but no nominations to the Special Nominating Committee had been received from Division Presidents (DPs). This would have to be expedited as soon as possible.

4. Report on the Secretariat

The General Secretary reported that Jana Žilová had been ill for several weeks and had sent in a medical certificate covering the period to 31 August. It was not known when, or if, she would return. Her absence had increased the strain on an already very busy Secretariat, which was nevertheless coping with the heavy workload in the run-up to the GA. The EC thanked Vivien Reuter for her exceptional contribution to the IAU.

5. Division Structure

5.1 Resolution for the GA

The Committee agreed the wording of the draft Resolution.

5.2 New DPs and V-Ps

The list of proposed DP and DVP for the new Divisions, and the 'fall back' DP and DVP for unchanged Divisions was agreed.

5.3 Transitional Process for Commissions and WG

It had already been agreed that this should be carried out by the new Divisions, if approved, with guidance from the new EC, and that the initial plans should be presented by DPs at EC93 in April or May 2013.

5.4 Projected Timeline

The proposed timeline was reconfirmed. Two lunchtime 'town meetings' are organized at the GA (Friday 24 and Tuesday 28) by the AGS (TM) to explain the proposed structure and implementation to process to members before the GA vote.

6. Strategic Development Plan / OAD

GM presented his paper summarising recent progress. The Committee noted that agreements would be signed during the GA for and East Asian ROAD/LEC based in Beijing and a South East Asian ROAD based in Thailand. The Committee congratulated GM and Kevin Govender on the sustained progress in implementing the Strategic Plan

7. First and Second Sessions of the GA

Agenda item 9 was taken at this point, in view of the likely impact of the visit by the Vice-President of China, Jinping Xi, to the Inaugural Ceremony and the resulting rearrangement of the schedule for Tuesday 21.

The Committee agreed the agendas for Sessions 1 and 2, and to the moving to 13:30 of the presentation of the proposed Divisional restructuring by TM.

8. Review of Resolutions for GA

The Committee agreed the revised resolutions. IFC would now discuss them with the Resolutions Committee and return, if necessary, to the EC with any substantive changes.

This was subsequently done and no changes were requested.

9. General GA Matters

The discussion focussed on the visit by the Vice-President of China and the security and other measures being implemented, following a briefing meeting between IFC, VR and Gang Zhao. It was agreed that this was a very great honour for the IAU and for the NAOC, and that we would do everything required to make sure the event went smoothly.

10. Changes to Working Rules

These were endorsed for passing on the EC92 to approve, assuming the changes to the Statutes and Bye-Laws were approved at the first session of the GA.

11. Financial Status Report

The Committee noted the current financial situation and once again thanked VR for her work on the finances of the Union.

12. Budget for 2013-2015 and Finance Sub-Committee Report

The Committee noted that no comments had been received on the draft budget and that the FSC Report recommended approval of the accounts and of the budget for 2013-2015.

Note: the Report appears in Sect. 2.4 of this Bulletin.

13. EC Report to GA

The Committee agreed the draft EC report to the GA.

14. Proposal(s) to host 2018 XXX GA

The Committee welcomed the proposal by Austria to host the XXX 2018 GA in Vienna.

Gerhard Hensler would present the proposal to EC on 23 August.

15. National Membership

15.1 New members and Change of Status

The Committee noted that the candidates (Kazakhstan, North Korea DPRK and Ethiopia) would go forward to the General Assembly for admission, and that Vietnam would be reclassified as a 'prospective member'.

15.2 NM Dues overview

The Committee noted the information supplied by VR and re-affirmed that the Statutes should be rigorously applied to defaulting members.

16. ICSU matters

IFC reported that, accompanied by VR, he had met with Steven Wilson, the newly appointed Executive Director, in July. IFC stated that he had explained in plain terms the IAU's reservations about the relevance of ICSU to the basic science unions, and that it was important that ICSU took into account the unions' concerns and priorities in formulating its own priorities. Wilson explained ICSU's strategic priorities and noted that bodies like WDS and CODATA were important to the IAU, which is of course accepted by us. The issues are at a higher level within the ICSU Executive.

IFC invited Wilson to write an article on ICSU for IB111 to be published in January 2013.

(As a footnote, Dov Jaron from the ICSU Executive Board, gave a short talk on ICSU at the GA.)

17. KAVLI / PPGP/PPGF

17.1 Gruber Foundation Fellowship 2012

The Committee noted that the next Gruber Fellowship selection committee should be appointed at EC92.

17.2 Kavli Prize Report

The President gave a short report. Both he and IFC will be present at the award ceremony and symposium in Oslo immediately after the GA. IFC reported that the NASL had offered 5000€ in support of the Young Astronomers Lunch at the GA.

17.3 Membership of Kavli Prize Selection Committee

The IAU will be invited to offer names from those put forward by the Academy of Science, the Royal Society and the Max Planck Society.

18. EC92 at GA.

EC92 on Saturday 1 September 8.30-17.00 in the NAOC **– New EC and DPs**

19. AOB

There being no AOB, the President thanked the members for productive discussions and declared the meeting adjourned until Thursday 23 at 8:30.

Second session, Thursday 23 at 8:30.

All members present except Marta Rovira.

20. Presentation of Austria Proposal to host 30th GA in Vienna

Gerhard Hensler presented the proposal and answered a range of questions, mainly of clarification. After Hensler left the EC discussed various points arising and agreed that they preferred the Convention Centre over the Messe, and that it would be better not to have the GA in the last two weeks of August. There were some concerns over the robustness of the financial projections and cost estimates, which would have to be addressed in due course with the proposers.

The EC unanimously agreed that the 30th GA would be in Vienna and that a small team from the EC should visit Vienna as soon as possible.

21. Membership of Resolutions Committee

The committee agreed the following composition:

Ian Corbett, Bruce Elmegreen, Karel van der Hucht, Yanchun Liang, and Renée Kraan-Korteweg (as link to EC).

22. Membership of Special Nominating Committee

The DPs had been asked to submit names: a few had already been received. The names received would be discussed by the President and GS, and put to the Nominating Sub-Committee chair (Johannes Andersen) so that a reasonable slate of candidates can be put to the NM at their meeting on 29 August, before the second session of the GA on 30 August.

23. Presentation Bowl

The Committee examined the engraved crystal bowl to be presented to the LOC at the conclusion of the Closing Ceremony, and expressed their appreciation to Vivien Reuter, who proposed the idea and made all the arrangements. The meeting closed at 10:45. As this was the last meeting of this Executive Committee the President thanked all members for their contribution to the work of the EC and to the IAU.

1.2 Officers' Meeting (OM), Paris, 7 - 8 February, 2013

See IB111, p. 21

On the occasion of the Officers Meeting, the three French General Secretaries met in the exhibition hall of the Paris Observatory. *From left to right:* Jean-Claude Pecker (1963-1967), Thierry Montmerle (2012-2015), and Jacqueline Bergeron (1991-1994). (Picture by TM)

1.3 EC93, Nara, 8 -11 May 2013 - Summary

The 93rd Executive Committee Meeting (EC93) took place in Nara (Japan), from 8 to 11 May 2013, at the invitation of Prof. Norio Kaifu, IAU President.

Its main feature was the participation of all the Presidents of the new Divisions (as adopted at the 2012 Beijing GA), to the EC meeting, with one exception (F. Combes), who could be replaced. Several sessions were held, either face-to-face with EC members, or separate between the Division Presidents (DPs) themselves. This is the second time such a joint EC-DP meeting is being held; the first time was at EC89 in Prague in 2010, when the kick-off to the new IAU Divisional structure was given by the EC following the recommendation of the twelve Division Presidents (at that time). It is likely that, in the future, such joint meetings between the EC and DPs will be held at least once in the course of a triennium. A new one is already planned for the next EC meeting (EC94) in 2014, i.e., one year before the next GA (Honolulu, 2015), to follow the progress in the implementation of the new divisional structure, including Commissions and Working Groups. A first progress report, written on behalf of the nine Division Presidents specially for this Information Bulletin, is presented on p.26.

A summary of the main issues addressed and decisions taken by the EC follows. A number of documents discussed during EC93 appear in full elsewhere in this Information Bulletin, and will be referenced below as "See this IB, p.xx".

From the back, from left to right:

- Sergei Klioner (President Division A) – Robert Williams (Advisor)

- Giovanni Valsecchi (President Division F) – Matthew Colless (Vice-President) – Ian Corbett (Adivsor) – Jan Palouš (Vice-President)

- Piero Benvenuti (Assistant General Secretary) – Renée Kraan-Korteweg (Vice-President) – Ignasi Ribas (President Division G)

- Ewine van Dishoeck (President Division H) – Lidia van Driel-Gesztelyi (President Division E) – David Silva (President Division B) – Diana Worrall (President Division D) – Jayant Murthy (Representing Françoise Combes, President Division J)

- Julia Nauer (IAU Secretariat: Assistant & Database Manager) – Silvia Torres-Peimbert (President-Elect) – Marta Rovira (Vice-President) – Mary Kay Hemenway (President Division C) – Dina Prialnik (Vice-President)

- Muriel Besson (IAU Secretariat: Head of Administration) – Thierry Montmerle (General Secretary) – Norio Kaifu (President)

Excused: Xiaowei Liu (Vice-President). (Picture by H. Komiyama)

Present:

Officers:

Norio Kaifu, President

Thierry Montmerle, General Secretary

Sylvia Torres-Peimbert, President-Elect

Piero Benvenuti, Assistant General Secretary

Advisers:

Robert Williams, Past President

Ian Corbett, Past General Secretary

Vice-Presidents:

Matthew Colless

Jan Palouš

Marta Rovira

Renée Kraan-Korteweg

Xiaowei Liu (by Skype)

Dina Prialnik

Division Presidents:

Sergei Klioner (Div. A)

David Silva (Div. B)

Mary Kay Hemenway (Div. C)

Diana Worrall (Div. D)

Lidia van Driel (Div. E)

Giovanni Valsecchi (Div. F)

Ignasi Ribas (Div. G)

Ewine van Dishoeck (Div. H)

Jayant Murthy (for Div. J, replacing Françoise Combes; Comm.21 President)

IAU Secretariat:

Muriel Besson (MB), Head of Administration

Julia Nauer (JN), Assistant and Database Manager

Observers:

Masahiko Hayashi (NAOJ, Director General),

Kaz Sekiguchi (NAOJ, Director of the Office of International Relations, OIR)

Supporters:

Fumi Yosida (NAOJ, OIR),

Hiroko Komiyama (NAOJ, OIR)

1. Welcome by the President of the IAU, Norio Kaifu

President Norio Kaifu welcomed the Committee members and the Division Presidents to Nara.

2. Approval of the agenda

The agenda was approved.

3. Executive Committee

3.1 Draft minutes EC92

Published in IB111, p.19

3.2 Minutes OM-2013

Published in IB111, p.21

4. New Division Structure: Implementation

4.1 Elections, Database and web site

4.1.1 Division Steering Committee elections: general

The detailed results are given in this IB, p.19.

An important problem has been reported by the Secretariat (MB, with the help of JN): up to 15% of the IAU Individual Members (IM) could not be reached for the vote, either because their e-mails are missing from the database ("missing e-mails"), or because they are wrong ("bounced e-mails"). A campaign to improve the situation is underway by the Secretariat, with the help of the Divisions, and also of National Members.

4.1.2 Membership update

The status of IAU "Associates" has been discussed and clarified, on the basis of the decisions taken at EC89.

The revised "Associate" status is given in this IB, p.31, and will be published in the IAU web pages.

4.1.3 Commissions and Working Groups

As a result of EC-DP discussions, it has been agreed that the status and goals of Commissions will be re-examined by the Divisions in the coming months. There is now a definitive list of Working Groups (see this IB, p.29), i.e., those having responded to a questionnaire sent by the Secretariat in late 2012. The "role and goals" of the WGs will be also examined in the coming months, in particular in reference to the creation of "Functional Groups", i.e., permanent or semi-permanent WGs (see this IB, p.28).

4.2 Progress report from Divisions

All Division Presidents[1] presented the situation of their respective Division with respect to the election of the six members-at-large of their Steering Committees, and the problems encountered (number of candidates, missing e-mails, extra members, ties for the sixth seat, etc.). There was a unanimous request for more accuracy in the membership database, and for more stability and coordination in the Division web pages (common portal maintained by the IAU).

A spokesperson (E. van Dishoek) was nominated to present the conclusions of the DP internal discussions to the EC at the end of the meeting.

5. Report on the Secretariat

5.1 Personnel

There has been a complete overhaul of the Secretariat in Paris, following the departures of Vivien Reuter and Jana Žilová. The new team is composed of Muriel Besson, Head of Administration, and Julia Nauer, Assistant and Database Manager. Ginette Rude, working part time on the IAU Archives, has decided to stay and play an active role in organizing their digitization (see this IB, p.64, Altogether, the new Secretariat is highly motivated and efficient.

5.2 Contracts

The contracts with ESO (mainly for the development and maintenance of the IAU web site), and with Cambridge University Press (CUP) have been renewed. The contract with ESO is updated on a yearly basis, while the contract with CUP has been modified to be synchronized with the IAU triennium, and renewed for six years, i.e., until after the 2018 GA.

6. Scientific meetings for 2013 and accepted proposals for 2014

The lists for Symposia and Regional meetings is given in this IB, p.39.

7. Cooperation with other Unions & International Organizations

The details are given in this IB, p.53

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[1] For simplicity in this summary, J. Murthy, replacing F. Combes for Div.J, will be assimiliated to a "Division President".

8. Strategic Development Plan

The Report from the Director of the Office of Astronomy for Development (OAD), Kevin Govender, was presented at the meeting, and discussed by telecon. An update of this report appears in this IB, p.49.

9. Office for Astronomy Outreach (OAO)

9.1 Progress report

A progress report on the OAO (hosted by the National Astronomical Observatory of Japan) was presented by Sarah Reed, International Outreach Coordinator (IOC). This report is presented in this IB, p.43. It ends with the unfortunate news that, for personal reasons, Sarah had to leave and return to the UK. A new Job Opportunity will be announced as soon as possible, and publicized in various locations, including the IAU home page.

9.2 Communication with the public: New initiative

The IAU Secretariat is regularly receiving questions about astronomy, of which many are of a non-scientific nature, but are more society-oriented (religious beliefs, celestial objects naming proposals or requests, emotional reactions after tragic events, etc.). This reflects a new trend in the relations between the public and the IAU. Up to now, the relations were mainly one-way (the astronomers somehow "teach" the public), but there is now a will of the public to be involved in some decisions, the most spectacular — and controversial — being probably the issue of naming exoplanets. A new e-mail address (iaupublic@iap.fr) has been set up to handle questions from the public.

On a tentative, volunteer basis, Piero Benvenuti (AGS), Lars Christensen (IAU Press Officer), and Thierry Montmerle (GS) have devised a scheme for handling questions by category, helped by JN, and file the answers so as to build progressively an "FAQ" (Frequently Asked Questions) archive, to which the public may be referred to in most cases. The idea was that this activity would eventually be taken up by the OAO, and indeed Sarah Reed started to collaborate on this project. This activity will be included as a task in the Job Description for hiring a new IOC.

10. General Assemblies

The status reports on future General Assemblies are presented in this IB, p.17.

11. Changes to the Working Rules and Related Issues

11.1 Commission Presidency

In view of the fact that the DSCs include ex-officio the Commission Presidents of the relevant Divisions, it is advisable to avoid possible conflict-of-interest situations, in which the same person holds leading responsibilities in two different IAU bodies.

Therefore, the EC has adopted the following modifications to the Working Rules:

- Unless agreed otherwise by the Executive Committee on a case by case basis, the President of a Division cannot be President of another Division or of a Commission, or be Chair of a Working Group;

- Unless agreed otherwise by the Executive Committee on a case by case basis, the President of a Commission cannot be President of another Division or of a Commission, or be Chair of a Working Group.

(These modifications have been implemented in the web site.)

11.2 Proposal by the GS to merge Joint Discussions and Special Sessions at the GA

While Joint Discussions and Special Sessions were created in the past for small groups of people, at a time when the concept of concentrating six Symposia during a two-week General Assembly did not exist, the distinction between them has become increasingly difficult to explain and a source of frustration about the right format to submit a proposal and for the Proceedings.

Furthermore, during the Symposia selection process, the practice of "demoting" Symposia just below the threshold for selection into shorter-duration Special Sessions has introduced a lot of unfairness in the competition, since such "demoted" Symposia are post facto competing with genuine Special Session proposals, submitted according to different criteria.

The proposal is twofold:

- to abolish the distinction between Joint Discussions and Special Session, and create a new category of short, specialized GA meetings (duration from 1 to 3 days): "IAU Focus meetings" ;

- at the time of their selection for the GA program, Symposia compete between themselves, and none should not be "demoted" to a shorter meeting. Similarly "Focus meetings" compete only between themselves, and not against "demoted" Symposia.

This proposal has been adopted by the EC.

(At the same time, as a result of discussions with DPs, "Division Meetings" have been introduced and also approved by the EC. The full text related to "Focus Meetings" and "Division Meetings" appears in a new Sect. 3 of the "Rules & Guidelines" for GA meetings of the IAU web pages.)

12. Implementation of the new Division structure: actions and milestones

After DP spokesperson E. van Dishoek presented the conclusions of the separate discussions held by the DPs, a general discussion took place between DPs and EC members.

The DPs decided on the following actions:

- 1. write a collective summary for this IB (lead: D. Silva, see p.26),
- 2. write a summary of database and web requirements, and interacting with the Secretariat (lead: S. Klioner),
- 3. define the roles and tasks of Commissions and Working Groups (leads: G. Valsecchi and D. Worrall),
- 4. set up the programs of the Honolulu GA "Division Meetings" (all DPs).

The first two actions were due for June 2013 (the first appears in the IB, p.26, the second is an ongoing task); the third is due before the end of 2013 (draft, October; final document for circulation, December). The deadline for the Division Meetings is Dec.15, 2014.

The conclusions on the new structures within the Divisions (Commissions and Working groups) are expected to be ready for the next EC meeting (April-May 2014).

13. The Gruber Fellowship

The Fellowship, amounting to 50 000 USD, has been awarded to Ke-Jung (Ken) Chen, an undergraduate student from Taiwan. His main expertise is Computational Astrophysics. Starting next fall, he will undertake his post-doctoral studies with Prof. S. Woosley at the University of California in Santa Cruz, on the topic of "The First Stars".

14. Issue of public naming of exoplanets

Following the IAU Press Release of last April, triggered by the initiative taken by the Uwingu company to organize a paying public vote for re-naming the closest known exoplanet (Alpha Cen Bb), and by SETI to find (charge-free) a public name for Pluto's two latest discovered satellites (P4 and P5), and also in view of the current difficulty to define a clear rule for the astronomical designation of exoplanets, the EC decided to take over the issue of the "public naming of planets and planetary satellites". It nominated a Task Group to define IAU rules for accepting public names for these objects, independently of their scientific designations, an issue currently within the purview of Comm. 53.

The composition of the Task Group (entitled "Public Naming of Planets and Planetary Satellites") is as follows:

T. Montmerle (GS), Chair

L. Christensen (IAU Press Officer and President of Comm. 51)

Xiaowei Liu (IAU Vice-President)

G. Valsecchi (President Div.F)

R. Williams (IAU Past President)

1.4 EC94, Canberra, 30 April - 2 May 2014

The next EC meeting will take place on Apr. 30-May 2, 2014, in Canberra, Australia, at the invitation of M. Colless.

2. IAU General Assemblies

2.1 New format for Scientific Meeting at the GA

Reexamining the present format of meetings at the General Assembly (GA), and taking into account the enhanced role of Divisions in the new IAU structure, the EC and Division Presidents discussed and approved a new format, summarized as follows.

1. GA Symposia are unchanged (six selected; duration: 3.5 days). Typically, they are supported by several Divisions.

2. "Focus Meetings" are introduced, and replace the traditional "Special Sessions" and "Joint Discussions", which had become essentially undistinguishable. While more specialized than Symposia ("focused"), they are still interdisciplinary in nature, and last 1-3 days. They could be supported by several Commissions of one Division, or by more than one Division. Note that, also contrary to the tradition for Special Sessions, no GA Symposia below the selection threshold may be converted into the new "Focus Meetings". Given the time available, it is expected that about 15 "Focus Meetings" will be selected.

3. "Division Meetings" are also introduced, and replace the traditional "business meetings". They will be organized by the Division Steering Committees. They will be science-based, and include a short "business session". Their duration will normally be 2 days, but may be extended to 3 days after discussion across Divisions and with the General Secretary. The third day will be allotted after specific review and if the available time allows.

The deadlines for submission of Letters of Intent and for the final proposals, both for 2015 Symposia and GA Focus Meetings, are respectively Sep.15 and Dec.15, 2013 (as before). The program deadline for Division Meetings will be Dec.15, 2014.

For more details, see Sect 3 of the IAU "Rules & Guidelines": http://www.iau.org/science/meetings/rules/#3

2.2 Preparations for the XIX th General Assembly, Honolulu, 3-14 August 2015

Kevin B. Marvel, AAS Executive Officer

Update Report (excerpts): IAU 2015 General Assembly

The following is a list of key logistical points:

1. Hotel contracts have been signed with 6 properties, representing in total 26 500 rooms-nights.

2. We are anticipating an attendance at the General Assembly approaching, if not exceeding, 4 000 people, making the GA the largest in history.

3. A contract has been signed with the Hawai'i Convention center, reserving the entire center for the two weeks of the meeting. There are ample rooms for all planned session described in the online materials on the IAU GA webpage *(http://astronomy2015.org/)*

4. The Institute for Astronomy (University of Hawai'i) is helping select and the AAS will arrange all cultural activities and tours. Contact has also been made with the telescopes on Maui and Mauna Kea to arrange tours before, during and after the General Assembly.

5. Because the exhibition floor space is sufficient, we will host both exhibitors and posters in the same physical space. This will enhance the attractiveness of the event for exhibitors and make for a dynamic and active location for posters.

6. Meetings have been held with the State Department regarding visa issues and the meeting has been registered with the Department

6.1 AAS cannot change US immigration policies.

6.2 We can, through the National Academy of Sciences, help resolve problematic cases.

6.3 We can provide detailed information on the process for meeting attendees, but it is ultimately their responsibility to walk through the process and obtain their visas.

6.4 We will have an ability to produce invitation letters on the meeting website once registration is open.

6.5 Some travelers may have problems with home-country exit permits. We cannot assist with these issues.

7. The AAS utilizes a highly functional speaker presentation system that receives speaker presentations at a central location, stores them in a database and distributes them to podium computers for each session.

8. We are exploring how to manage the meeting Newspaper.

9. We are exploring a functional communication system among the participants and will have a proposed solution before the spring 2014 meeting of the IAU Executive Committee.

10. We have begun documenting the standard operating procedure for organizing the General Assembly.

2.3 IAU XX th General Assembly, Vienna, August 2018

The Austrian National Organizing Committee has been identified, and the final site of the venue will soon be announced. Contact: G. Hensler (gerhard.hensler@univie.ac.at).

2.4 IAU XXI th General Assembly in 2021

Deadlines:

Letters of Intent to host must be received by **1 November, 2014**.

Proposals to hust must be received by **1 April, 2015**.

2.5 Finance Sub-Committee Report, General Assembly (Beijing, Aug. 2012)

Birgitta Nordström, Chair of the IAU Finance Sub-Committee

1. Accounts 2009-2011

The accounts of the IAU are in good shape. They show the usual pattern during a triennium with a loss during the IAU General Assembly year and during the other two years: surpluses of 584 k€ and 132 k€ in 2010 and 2011. The average over the triennium is roughly in balance except that the surplus is larger than budgeted due to recovery of previous losses and late payments from National Members that were outstanding during previous financial years.

The assets of the Union increased in the period, which gives room for increased educational activities. It is prudent to maintain the assets at the level of one year's turnover, in order to provide a reserve for cash flow during the triennial cycle, to cover late payments by some National Members, and to provide some investment income.

Between 2009 and 2010 the IAU has changed its unit of account from Swiss Francs (CHF) to euros (EUR). Membership dues will for the future be invoiced in euros. The FSC welcomes this change, which reflects the fact that most of the Union's expenditure is in euros and many of the Union's National Members have their currency in euros. The change reduces exchange losses overall (to the Union and to many National Members) and spreads the risk of currency fluctuations. It will also prove to be more effective and convenient that the accounts are held in Paris.

While the accounts have consistently passed the test of professional audit, investigations by the administration discovered in 2008 that the Union had been subject to systematic fraud. This was reported to the FC at the IAU GA in 2009. The administration took steps to recover from its bank unauthorized payments and much of those have now been recovered. It has implemented changes to its accounting systems and now use an electronic accounting system, SAGE, that should make recurrence of fraud more difficult to conceal in the future. Bank transactions are now completed by internet, entered by the Head of Administration and authorised by the General Secretary. All transactions are visible to both General Secretary and Head of Administration. Salaries and annual account reconciliation with the SAGE system are prepared by an external independent accountant. The final result is a robust and transparent system. The accounts for 2009-2011 have been examined and certified by the new auditor and no specific issues have been raised.

The administration has kept the FSC fully informed and consulted on the measures to be taken during the triennium. The FSC believes that the measures taken to prevent recurrence are appropriate to the scale of the Union's activities, and will bring increased effectiveness to the Union's operation. The FSC commends the GSs Karel van der Hucht and Ian Corbett as well as the former Executive Assistant, Vivien Reuter, for the work done to recover the losses. The FSC notes with satisfaction that its former bank, Crédit Lyonnais has during the triennium reimbursed IAU much of the previous losses carried by IAU. The new bank of the IAU is HSBC.

Noting the large sum of outstanding late payments from National Members, and noting the efforts of the Executive to recover what it can, the FSC recommends the acceptance of the accounts 2009-2011.

2. Members' dues

Budgets for 2013, 2014 and 2015

In the budgets, the proposed increase in the unit of contribution has been kept within inflation at a modest and realistic forecast of 2%, but the recovery of earlier losses has meant that the assets for the Union have increased. In the proposed budgets this money has been shown as expenditure on matters within the proposed educational programme, developed in the Union's Strategic Plan. The apportionment of expenditure to individual programmes will be a matter of discussion as the Strategic Plan is implemented and will depend on the degree of success of the Union in raising external funding.

The FSC recommends the adoption of the proposed unit of contribution as set out in the budgets, i.e. 2750 EUR in 2013, 2800 EUR in 2014 and 2860 EUR in 2015.

Noting the improved financial position of the Union and the ambition of the Strategic Plan to raise additional revenue for additional activities from outside sources, the FSC recommends that the budgetary provisions for 2013-2014-2015 should be accepted.

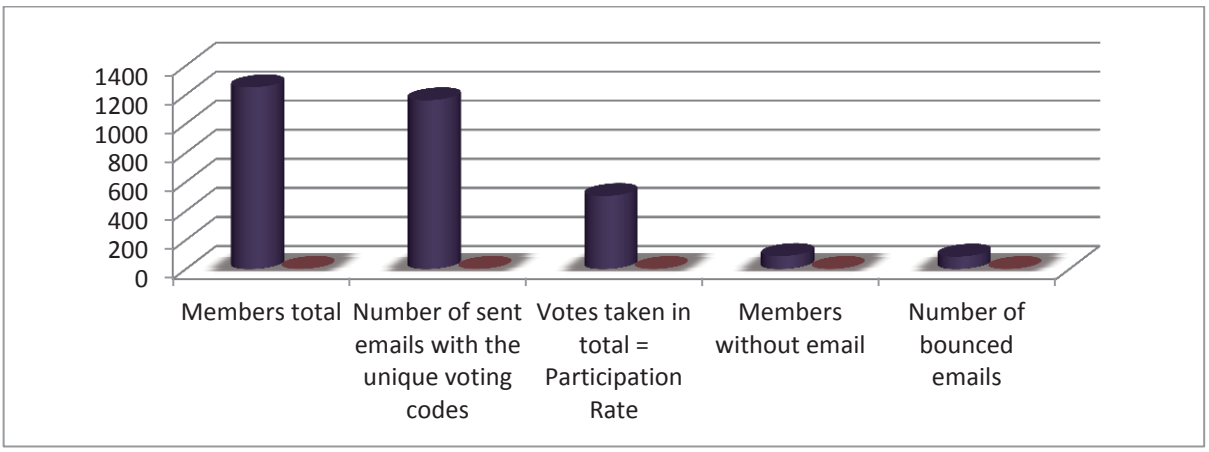
3. IAU Divisions, Commissions, Working Groups

3.1 Results of the Elections for the Division Steering Committees

The Division Steering Committees have been established for all Divisions. They are composed of the Division Presidents and Vice-Presidents, all Presidents of the relevant Commissions, and six at-large elected members.

Division A - Fundamental Astronomy

Members Total	1 250	100,00%
Number of sent emails with the unique voting codes	1 161	92,88%
Votes taken in total = Participation rate	502	40,16%
Members without email	89	7,12%
Number of bounced emails	85	6,80%



President	Sergei Klioner (Germany)
Vice-President	Jacques Laskar (France)
Secretary	Susan Gessner Stewart (USA)
Steering Committee	Alessandro Morbidelli (France) President C7
	Anthony G.A. Brown (Netherlands)
	Catherine Y. Hohenkerk (UK) President C4
	Cheng-Li Huang (China PR) President C19
	Dennis D. McCarthy (USA)
	Dimitri Pourbaix (Belgique) President C30

François Mignard (France)

Michael H. Soffel (Germany) President C52

Mizuhiko Hosokawa (Japan) President C31

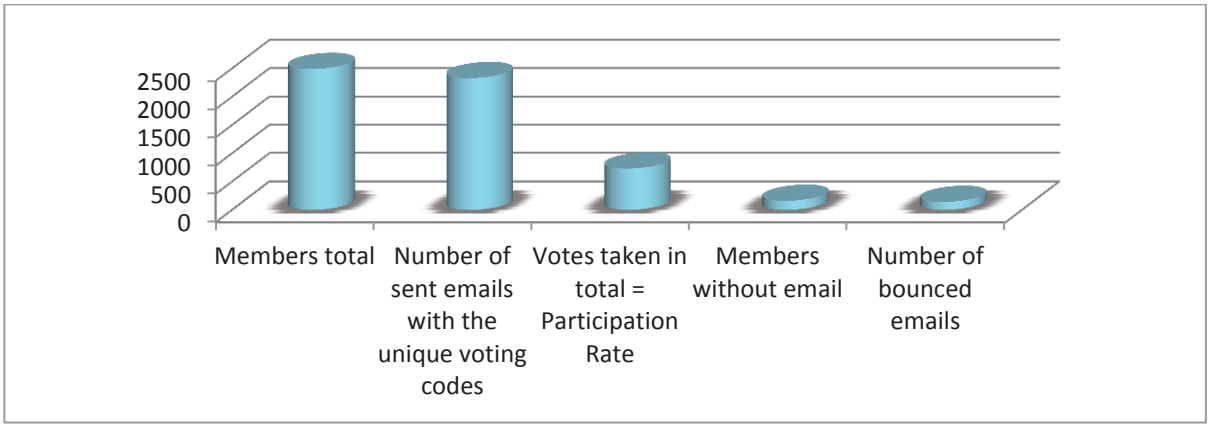
Nicole Capitaine (France)

Norbert Zacharias (USA) President C8

Sylvio Ferraz–Mello (Brazil)

Division B - *Facilities, Technologies and Data Science*

Members Total	2 493	100,00%
Number of sent emails with the unique voting codes	2 332	93,54%
Votes taken in total = Participation rate	733	29,40%
Members without email	163	6,54%
Number of bounced emails	144	5,78%

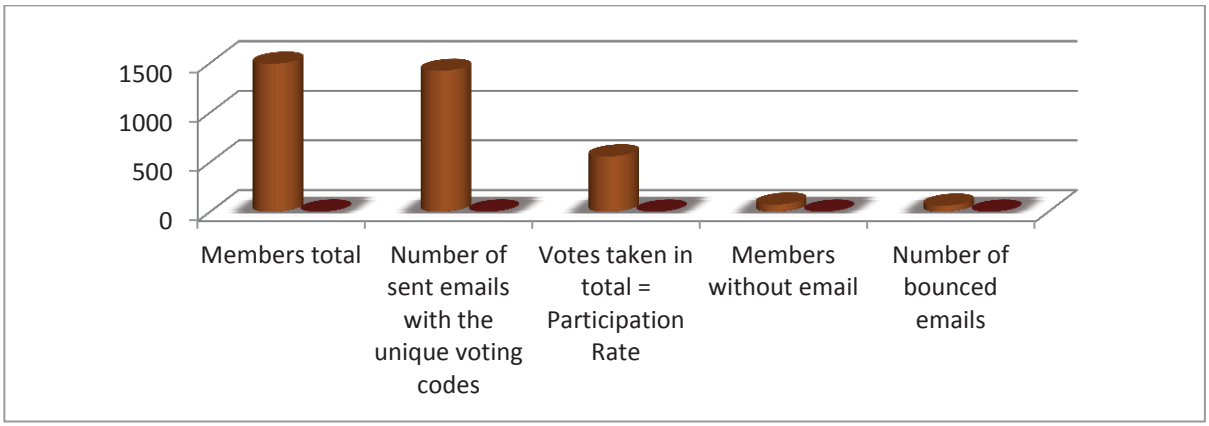


President	David R. Silva (USA)
Vice-President	Pietro Ubertini (Italy)
Steering Committee	Anthony James Beasley (USA)
	Alistair Robin Walker (Chile) President C25
	Françoise Genova (France)
	Gerard T. van Belle (USA) President C54
	Gloria M. Dubner (Argentina)
	Hitoshi Yamaoka (Japan) President C6
	Jessica Mary Chapman (Australia) President C40
	Lisa Storrie-Lombardi (USA)
	Lyudmila I. Mashonkina (Russian Federation) President C14
	Malcolm G. Smith (Chile)
	Michael G. Burton (Australia)

Richard F. Green (USA) President C50
Robert J. Hanisch (USA) President C5

Division C - *Education, Outreach and Heritage*

Members Total	1 492	100,00%
Number of sent emails with the unique voting codes	1 420	95,17%
Votes taken in total = Participation rate	557	37,33%
Members without email	72	4,83%
Number of bounced emails	61	4,09%

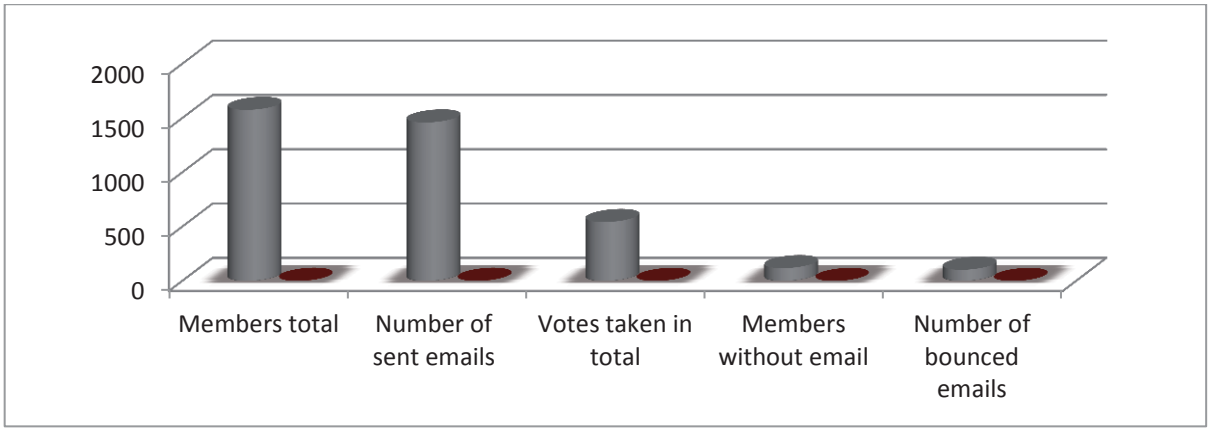


President	Mary Kay M. Hemenway (USA)
Vice-President	Hakim Luthfi Malasan (Indonesia)
Secretary	Rajesh Kochhar (India) President C41
Steering Committee	Beatriz Elena García (Argentina)
	Jean-Pierre de Greve (Belgium) President C46
	Juan Antonio Belmonte Avilés (Spain)
	Kazuhiro Sekiguchi (Japan)
	Kimberly Kowal Arcand
	Lars Lindberg Christensen (Germany) President C55
	Michèle Gerbaldi (France)
	Raymond P. Norris (Australia)

Division D - *High Energy Phenomena and Fundamental Physics*

Members Total	1 576	100,00%
Number of sent emails with the unique voting codes	1 460	92,64%
Votes taken in total = Participation rate	543	34,45%
Members without email	118	7,49%

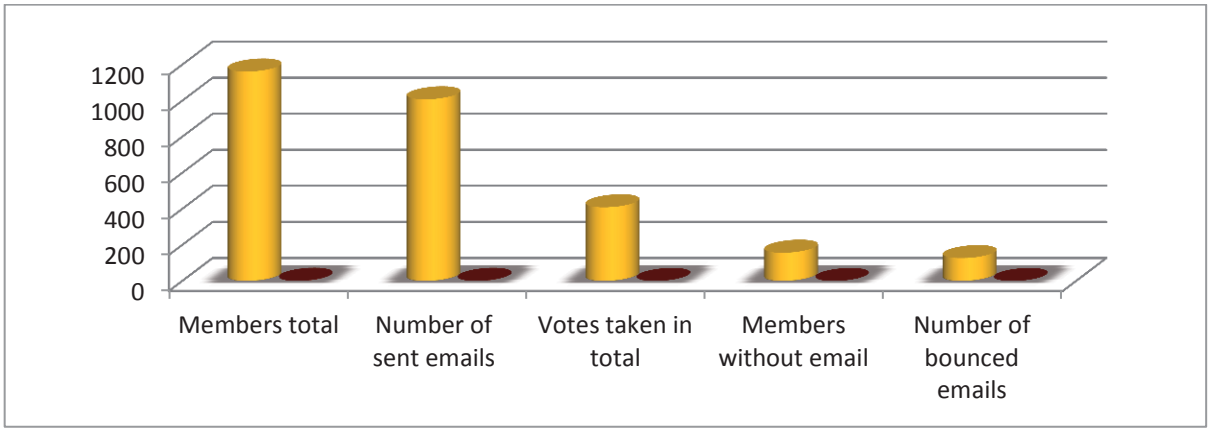
Number of bounced emails	103	6,54%



President	Diana Mary Worrall (UK)
Vice-President	Felix Albert Ahoranian (Ireland)
Secretary	Elena Pian (Italy)
Steering Committee	Anna Wolter (Italy)
	Christine Jones (USA) President C44
	Chryssa Kouveliotou (USA)
	John Kirk (Germany)
	Tadayuki Takahashi (Japan)
	Xavier Barcons (Spain)

Division E - *Sun and Heliosphere*

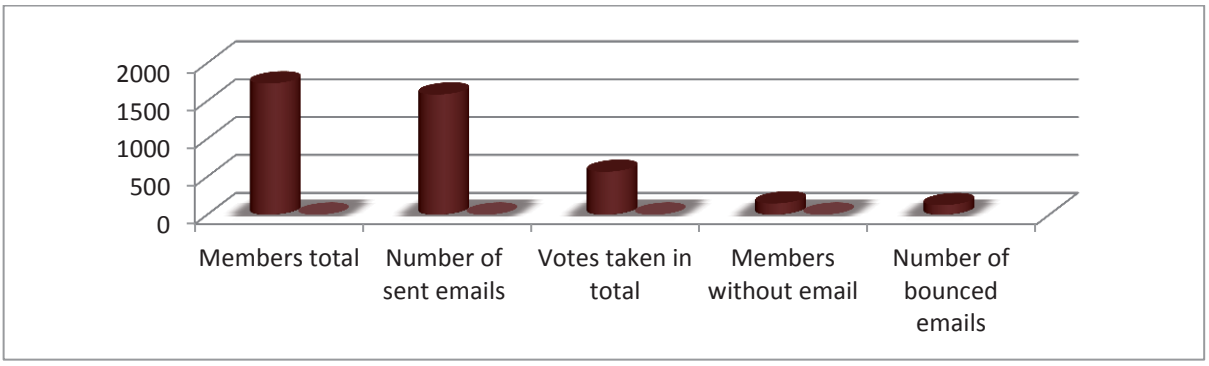
Members Total	1 162	100,00%
Number of sent emails with the unique voting codes	1 008	86,75%
Votes taken in total = Participation rate	409	35,20%
Members without email	157	13,51%
Number of bounced emails	127	10,93%



President	Lidia van Driel-Gesztelyi (UK)
Vice-President	Yihua Yan (China Nanjing)
Steering Committee	Arnab Rai Choudhuri (India)
	Gianna Cauzzi (Italy) President C12
	Ingrid Mann (Sweden) President C49
	Karel Schrijver (USA) President C10
	Lyndsay Fletcher (UK)
	Marc L DeRosa (USA)
	Peng-Fei Chen (China Nanjing)
	Rudolf von Steiger (Switzerland)
	Sarah Gibson (USA)

Division F – *Planetary Systems and Bioastronomy*

Members Total	1 731	100,00%
Number of sent emails with the unique voting codes	1 585	91,57%
Votes taken in total = Participation rate	566	32,70%
Members without email	148	8,55%
Number of bounced emails	126	7,28%

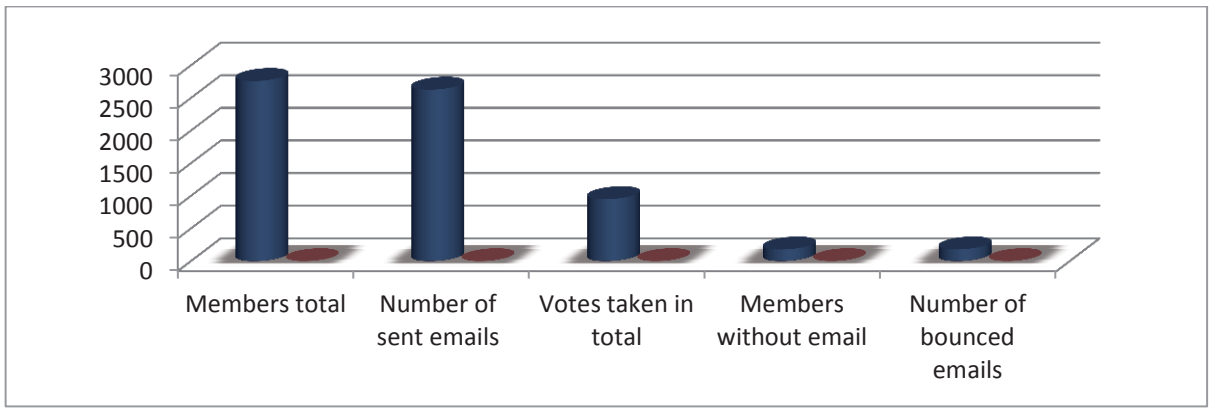


President	Giovanni B. Valsecchi (Italy)
Vice-President	Nader Haghighipour (USA)
Steering Committee	Alain Lecavelier des Etangs (France) President C53
	Alberto Cellino (Italy)
	Didier Queloz (Switzerland)
	Dominique Bockelée-Morvan (France) President C15
	Gonzalo Tancredi (Uruguay)
	Mark T. Lemmon (USA) President C16

Pascale Ehrenfreund (USA) President C51
Paul Winchester Chodas (USA)
Petrus Matheus Marie Jenniskens (USA) President C22
Ray Jayawardhana (Canada)
Steven R. Chesley (USA) President C20
William M. Irvine (USA)

Division G - *Stars and Stellar Physics*

Members Total	2 761	100,00%
Number of sent emails with the unique voting codes	2 628	95,18%
Votes taken in total = Participation rate	950	34,41%
Members without email	179	6,48%
Number of bounced emails	180	6,52%

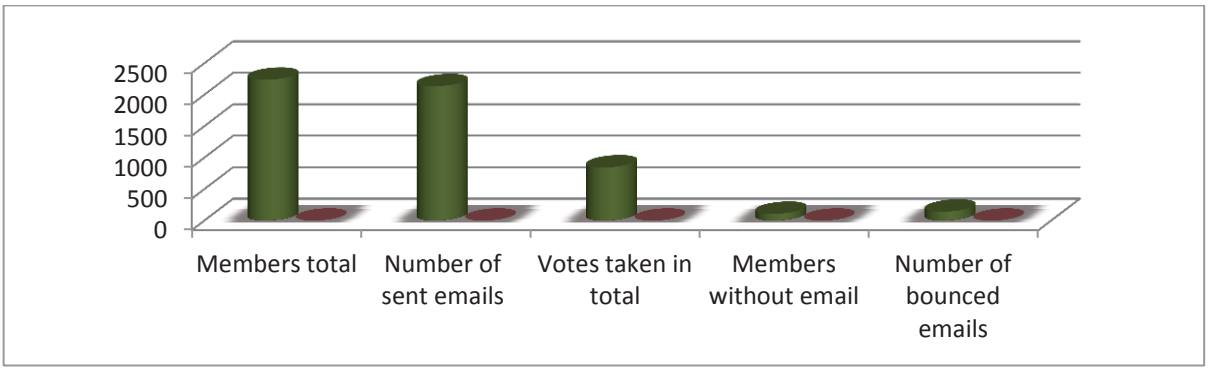


President	Ignasi Ribas (Spain)
Vice-President	Corinne Charbonnel (Switzerland)
Secretary	Virginia Trimble (USA)
Steering Committee	Beatriz Barbuy (Brazil)
	Brian D. Mason (USA) President C26
	Conny Aerts (Belgium)
	David R. Soderblom (USA)
	Francesca D'Antona (Italy)
	Joachim Puls (Germany) President C36
	Karen Pollard (New Zeland) President C27
	Katia Cunha (Brazil) President C29
	Marco Limongi (Italy) President C35
	Martin Asplund (Australia)

Mercedes T. Richards (USA) President C42
Richard O. Gray (USA) President C45

Division H - *Interstellar Matter and Local Universe*

Members Total	2 238	100,00%
Number of sent emails with the unique voting codes	2 136	95,44%
Votes taken in total = Participation rate	845	37,76%
Members without email	108	4,83%
Number of bounced emails	142	6,34%

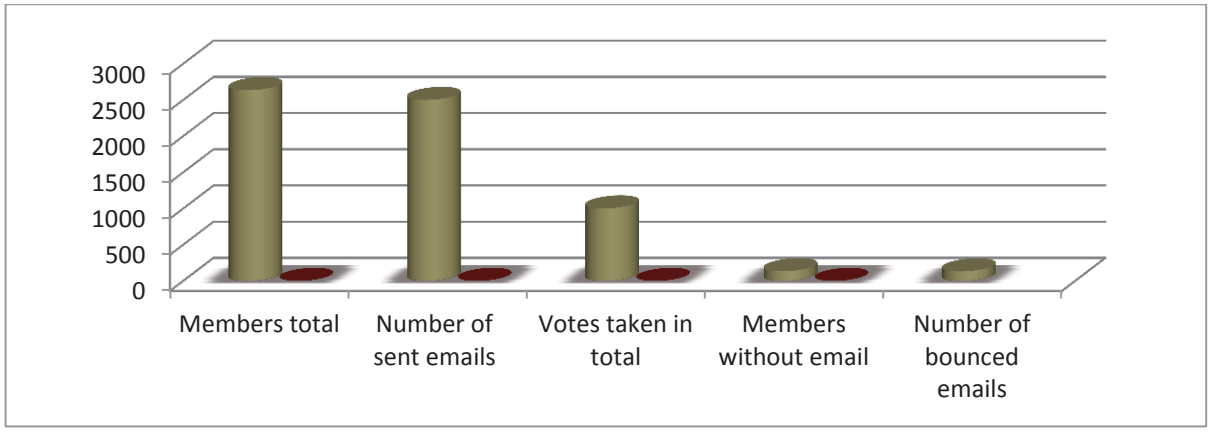


President	Ewine F. van Dishoeck (Nethherlands)
Vice-President	Jonathan Bland-Hawthorn (Australia)
Secretary	Bruce Gordon Elmegreen (USA)
Steering Committee	Annie C. Robin (France)
	Birgitta Nordström (Denmark) President C33
	Diego Mardones (Chile)
	Eileen D. Friel (USA)
	Giovanni Carraro (Chile) President C37
	Holger Baumgardt (Australia)
	Michael R. Meyer (Switzerland)
	Sun Kwok (China Nanjing) President C34
	Thomas Henning (Germany)

Division J - *Galaxies and Cosmology*

Members Total	2 635	100,00%
Number of sent emails with the unique voting codes	2 501	94,91%
Votes taken in total = Participation rate	1 002	38,03%

Members without email	134	5,09%
Number of bounced emails	132	5,01%



President	Francoise Combes (France)
Vice-President	Thanu Padmanabhan (India)
Secretary	Thaisa Storchi-Bergmann (Brazil)
Steering Committee	Andrew J. Bunker (UK)
	Brian P. Schmidt (Australia) President C47
	Elaine M. Sadler (Australia)
	Jayant Murthy (India) President C21
	John S. Gallagher III (USA) Presdient C28
	Marijn Franx (Netherlands)
	Monica Rubio (Chile)
	Ofer Lahav (UK)
	Stéphane J. Courteau (Canada)

3.2 Progress Report from Division Presidents

Face-to-face Meeting between IAU Division Presidents Held in the course of the 93rd Executive Committee Meeting, Nara, Japan

David Silva, President of Division B, on behalf of the Division Presidents

All Division Presidents were invited to the recent Executive Committee (EC93) meeting in Nara, Japan for discussions between themselves and with the EC. Most Division Presidents were able to attend in person, including Sergei Klioner (A: Fundamental Astronomy), David Silva (B: Facilities, Technologies, and Data Science), Mary Kay Hemenway (C: Education, Outreach and Heritage), Diana Worrall (D: High Energy Phenomena and Fundamental Physics), Lidia van Driel-Gesztelyi (E: Sun and Heliosphere), Giovanni Valsecchi (F: Planetary Systems and Bioastronomy), Ignasi Ribas (G: Stars and Stellar Physics) and Ewine van Dishoeck (H: Interstellar Matter and Local Universe). Although Françoise Combes (J: Galaxies and Cosmology) was unable to attend in person, she was represented by Jayant Murthy (President, Commission 21, Galactic and Extragalactic Background Radiation). Our discussions focused on issues related to clarifying and strengthening IAU re-structuring during this triennial.

Front row: (left-to-right) E. van Dishoeck (H), M. K. Hemenway (C), L. van Driel-Gesztelyi (E), and D. Worrall (D). *Back row:* J. Murthy (J), S. Klioner (A), D. Silva (B), I. Ribas (G), and G. Valsecchi (F). (Image courtesy M.K. Hemenway.)

1. Division membership

At the 2012 General Assembly (GA) in Beijing, the new Division structure was approved. It can be visualized as a four-space of science themes (D – J), fundamental quantities (A), technology (B), and education/outreach/heritage (C). Every IAU member belongs to at least one of these new Divisions. Moreover, since every IAU member can be placed at one or more positions in the divisional four-space, most IAU members belong to multiple divisions. If you wish to change your membership or join an additional Division, please send your request to the IAU Secretariat (iauinfos@iap.fr).

2. Division Steering Committees

New Steering Committees (SC) have been formed for each Division. Each SC consists of the Division President (DP), Vice President (DVP), one or more Commission Presidents (CP), and at least six at-large members elected by the Division as a whole. Election participation was strong, with 30% – 40% of each Division participating in the election of their SC. Each SC is or will be discussing how their Division will organize itself and move forward to the 2015 General Assembly in Honolulu.

SC members for each Division are listed in the preceding chapters of this bulletin, along with details about Division membership and election participation.

3. Communication

Improved and more efficient communication within each Division was a major discussion topic between the DPs and members of the IAU Secretariat. Currently, each Division is maintaining its own email lists and web pages, creating an overall situation that is very heterogeneous, hard to maintain, and hard to transfer to future Division leaders. The goal is to centralize all mail lists and Division level web pages at the IAU central web site (iau.org). Hopefully, this will be in place before the end of 2013.

These new IAU-centric tools will make it more efficient for each DP, DVP, and SC to push information out to their divisions. However, what about communication from Division members to the Division leadership team? At a minimum, each Division will have an email address for input. Moreover, to enhance community relationships within each Division, the DPs also proposed to hold science-based or topic-based Division Meetings at the next GA.

4. Division Meetings at 2015 GA in Honolulu

For the 2015 GA meeting in Honolulu, it was proposed that each Division organize a 2 – 3 day meeting to provide a board overview of the field, summarize progress since the last GA and look forward to challenges and questions over the next 3 – 6 years that have the potential for high impact results. Speakers will be encouraged to include thoughts on tools, capabilities, and facilities needed to work on those challenges and questions. To encourage diversity of insight and opinion, meeting organizing committees will seek speaker balance in gender, region, and age. The current intent is to focus on review/invited talks supported by contributed posters. A brief (less than 1 hour) business session will be included, to allow (e.g.) leadership introductions and general dialogue between the Division leadership team and Division members.

5. Functional and Working Groups: integral IAU parts

During discussions between DPs and the EC, there was unanimous consensus that working groups are an integral part of the IAU mission, perhaps even the most visible part. By their nature, working groups naturally split into two types: groups with long-term, on-going missions and groups with short-term, finite missions. Both types are task oriented with specific deliverables.

For long-term groups, a new term has been introduced: *functional group*. Obvious tasks for functional groups include development and maintenance of nomenclature, constants, standards, databases, techniques, and educational tools. Current examples include Numerical Standards in Fundamental Astronomy (Division A) and Small Bodies Nomenclature (Division F).

For short-term groups, the term *working group* shall be retained. A working group shall be formed to execute a specific, well-focused, finite task that will produce one or more specific deliverables. A recent major success was organization of the International Year of Astronomy.

However, many existing, active working groups are research topic oriented, not task oriented. What should happen to such groups? How are they associated with IAU? Should they become commissions? No clear conclusion emerged in Nara. These questions remain under active discussion.

6. Commissions: what is the path forward?

For many years, Commissions were the formal IAU backbone. When joining the IAU, every member had to join an existing Commission. Over time, some commissions have grown to contain more than 1000 members. Today, many commissions appear to be largely inactive, failing to meet or produce reports on a regular basis. Furthermore, many commissions have not communicated with their members in many years. Such inactivity can arise from several reasons, including reduced relevance of Commission core topic and/or disengaged Commission leadership.

Now that Division restructuring has been completed, each IAU member has a new home (or homes) at the Division level. Do all IAU members have to be Commission members? Logically, the answer seems to be no. By implication, Commissions going forward are likely to have fewer but more active members. So, what is the path forward for commissions?

To begin, what are the attributes of a successful, productive Commission? Most important is that each IAU Commission must be an active research group centered on a specific, well-defined research topic. Each Commission should also be a truly international forum, drawing members from many continents and countries. Commissions are the natural connection points for IAU members from developing countries who are seeking new collaborations. Most commissions will be attached to a single Division, but where reasonable, a few may be attached to multiple divisions. It is not necessary that the total ensemble of IAU Commissions span all possible research areas, even within a single Division. Newsletters that appear several times a year and triennial reports should be produced, including, for example, summaries of exciting science results, overviews of the field, announcements of meetings in related fields, etc.

The Commission leadership team (President, Vice President, and Organizing Committee) should communicate with the rest of the members at least once per year. The leadership team should be representative of the rich diversity in gender, region, and age found within the IAU. Leaders should turn over regularly, at least each triennial, to facilitate development of the next generation of Commission and IAU leaders. Finally, the Commission leaders should participate and support cross-Division activities, such as the Division Steering Committee, Division-level elections, and planning for GA Division meetings.

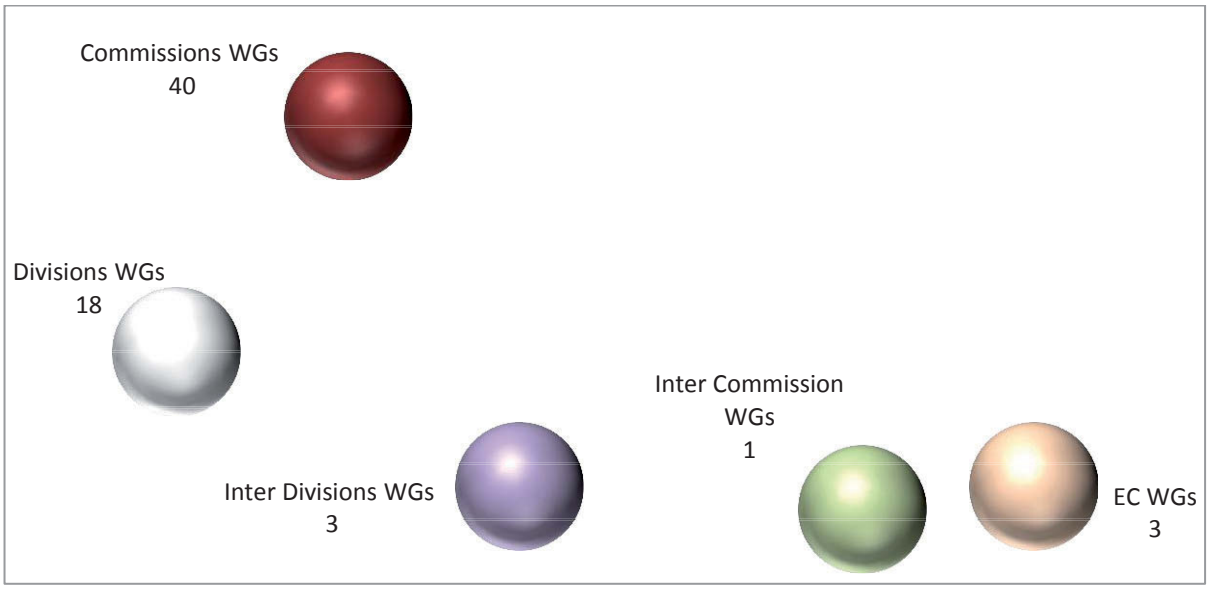
As mentioned above, many existing working groups more closely resemble ideal, successful commissions than the emerging definitions of functional and working group discussed earlier in this article. Should such working groups transform into commissions?

Overall, there was a clear sense amongst Division Presidents and the Executive Committee that significant reform is needed. Discussion of how such reform might be implemented during this triennial will continue during 2013 between the DPs and EC.

7. Conclusion

It's an exciting time for the IAU, as we re-structure ourselves to be a more active and relevant organization for the 21st century. The face-to-face discussions between Division Presidents and the Executive Committee in Nara were very productive. We left Nara with a commitment to keep working together, especially on the topics of improved communication and Commission evolution. Summaries of our on-going discussions will be included in upcoming eNewsletters and IAU Information Bulletins.

3.3 Updated Working Groups



Commission Working Group	Chair	Under
- TG On Asteroid Magnitudes	Karri Muinonen	C 15
- TG On Asteroid Polarimetric Albedo Calibration	Ricardo A. Gil-Hutton	C 15
- TG on Preservation & Digitization of Photographic Plates	R. Elizabeth M. Griffin	C 5
Archives	Ileana Chinnici	C 41
Asteroid Families	Alberto Cellino	C 15
Astrochemistry	Thomas J. Millar	C34

Astronomy and World Heritage	Gudrun Wolfschmidt	C 41
Astrophysically Important Spectral Lines	Masatoshi Ohishi	C 40
Astrostatistics and Astroinformatics	Eric D. Feigelson	C 5
Atomic Data	Gillian Nave	C 14
CAP Conferences	Ian E. Robson	C 55
CAP Journal	(To be announced)	C 55
Catolog of Orbital Elements of Spectroscopic Binary Systems	Dimitri Pourbaix	C 26
Communicating Heliophysics	Carine Briand	C 55
Coordination of Synoptic Observations of the Sun	Alexei A. Pevtsov	C 12
Data Bases for Comet Spectroscopy	Irakli Simonia	C 15
Designations	Marion Schmitz	C 5
FITS	Lucio Chiappetti	C 5
Historic Radio Astronomy	Kenneth I. Kellermann	C 40
Historical Instruments	Yunli Shi	C 41
Infrared Astronomy	Kevin Volk	C 25
Johannes Kepler	Terence J. Mahoney	C 41
Libraries	Marsha Bishop	C 5
Maintenance of the Visual Double Star Database	William I. Hartkopf	C 26
Molecular Data	Steven R. Federman	C 14
New Media	Pamela L Gay	C 55
New Ways of CAP	Michael John West	C 55
Outreach Professionalization & Accreditation	Richard T. Fienberg	C 55
Physical Studies of Asteroids	David J. Tholen	C 15
Physical Studies of Comets	Daniel Craig Boice	C 15
Planetary Nebulae	Letizia Stanghellini	C 34
Public Outreach Information Management	Lars L. Christensen	C 55
Radial-Velocity Standard Stars	Gerard Jasniewicz	C 30
Solids & Their Surfaces	Gianfranco Vidali	C 14
Standardizing Access to Ephemerides	James Lindsay Hilton	C 4
Stellar Radial Velocity Bibliography	Orlando Hugo Levato	C 30
Theory of Earth Rotation	Jose Manuel Ferrándiz	C 19
Transits of Venus	Wayne Orchiston	C 41
Virtual Observatories, Data Centers & Networks	Robert J. Hanisch	C 5
Washington Charter For CAP	Dennis Crabtree	C 55

Division Working Group	Chair	Under
Abundances in Red Giants	John C Lattanzio	D G
Active B Stars	Carol E. Jones	D G
Ap & Related Stars	Gautier Mathys	D G
Astrometry by Small Ground-Based Telescopes	Marcelo Assafin	D A
Future Large Scale Facilities	Roger L. Davies	D B
International Data Access	Robert D. Bentley	D E
Massive Stars	Artemio Herrero Davó	D G
Multi-waveband Realisations of Internl Celestial Reference System	François Mignard	D A
Near Earth Objects	Alan William Harris	D F
Numerical Standards in Fundamental Astronomy	Brian J. Luzum	D A
Planetary System Nomenclature (WGPSN)	Rita M. Schulz	D F
Pulsar-based Timescales	George Hobbs	D A
Redefinition of UTC	Dennis D. McCarthy	D A
Site Testing Instruments	Andrei A. Tokovinin	D B
Small Bodies Nomenclature (WGSBN)	Jana Tichá	D F
Solar Eclipses	Jay M. Pasachoff	D E
Standards of Fundamental Astronomy (SOFA)	Catherine Hohenkerk	D A
Third Realisation of International Celestial Reference Frame	Christopher S. Jacobs	D A

Inter-Commission Working Group	Chair	Under
Natural Planetary Satellites	Jean-Eudes Arlot	C4, C7, C8, C16, C20

Inter-Division Working Group	Chair	Under
Cartographic Coordinates & Rotational Elements	Brent A. Archinal	DA, DF
Impact of Magnetic Activity on Solar and Stellar Environments	Dibyendu Nandi	DE, DF
Solar-Type Stars	Pascal Petit	DE, DG

Executive Committee Working Group	Chair	Under
IAU General Assemblies	Gang ZHAO	EC
Public Naming of Planets and Planetary Satellites	Thierry Montmerle	EC
Women in Astronomy	Francesca Primas	EC

3.4 "Associate" Status

On the basis of the definition of the "Associate" status adopted at EC89 in Prague (2010), a revised text was discussed for implementation in the IAU database and in the web pages:

ASSOCIATES: The "Associate" status is offered by invitation exclusively, to individuals who are actively involved in the work of the IAU, usually but not always as members of a Working Group or Task Group. They retain this status as long as they are actively involved. They are nominated to the appropriate Division by the Working Group or equivalent with which they are working, and are listed on the IAU web site as "Associates". Their position is temporary, and automatically disappears when the activity with which they are associated ceases to exist.

4. Scientific Meetings

4.1 Post Meeting Reports 2012

IAU Symposium 279 « Death of Massive Stars : Supernovae and Gamma-Ray Bursts »

(March 12 – 16, 2012, Nikko, Japan)[2]

SOC

Chairs

Peter Roming (Southwest Res. Inst., USA)
Nobuyuki Kawai (Tokyo Tech., Japan)
Elena Pian (SNS Pisa, Italy)

Members

Zi-Gao Dai (Nanjing Univ., China)
Massimo Della Valle (INAF, Italy)
Johan Fynbo (Univ. Copenhagen, Denmark)
Neil Gehrels (NASA/GSFC, USA)
Sheila McBreen (Univ. Coll. Dublin, Ireland)
Maryam Modjaz (UC Berkeley, USA)
Ehud Nakar (Tel Aviv Univ., Israel)
Ken'ichi Nomoto (IPMU, Japan)
Paul O'Brien (Univ. Leicester. UK)
Sandra Savaglio (MPE, Germany)
Brian Schmidt (Australian National Univ., Australia)
Stephen Smartt (Queen's Univ. Belfast, UK)
Alicia Soderberg (CfA, USA)
Shoichi Yamada (Waseda Univ., Japan)

LOC

Keiichi Maeda (IPMU, Chair)
Katsuaki Asano (Tokyo Tech.)
Aya Bamba (DIAS/ISAS)
Kei Kotake (NAOJ)
Takeo Minezaki (IoA, Univ. Tokyo)
Takuya Ohkawa (Tokyo Tech.)
Toru Tamagawa (RIKEN)
Masaomi Tanaka (IPMU)
Yoichi Yatsu (Tokyo Tech.)

Sponsored by:

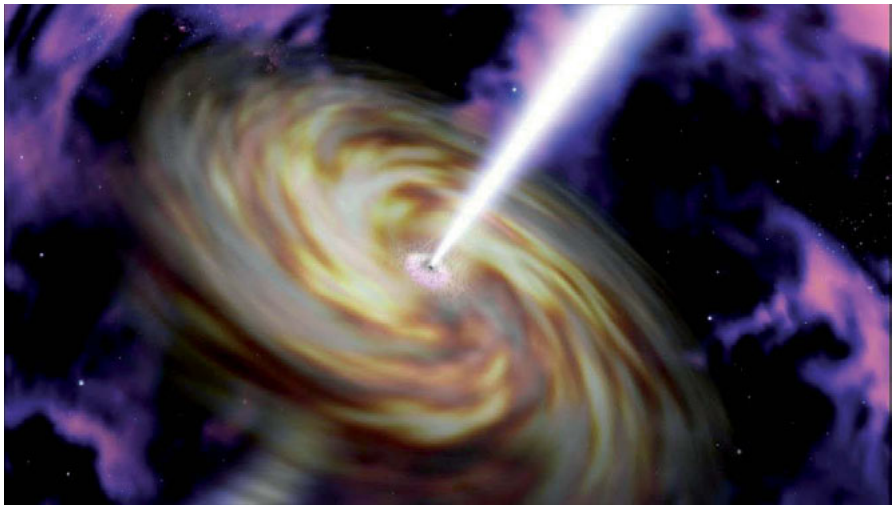
- International Astronomical Union (IAU)
- The Ministry of Education, Culture, Sports, Science and Technology (MEXT) of Japan
- Japan Society for Promotion of Science
- Grant-in-Aid for Priority Research Area "Deciphering the Ancient Universe with Gamma-Ray Bursts"
- Grant-in-Aid for Global COE Program "Nanoscience and Quantum Physics" at Tokyo Tech
- Institute for Physics and Mathematics of the Universe

[2] This meeting was postponed by one year due to the tragic tsunami of May 2011 on the east coast of Japan.

- Southwest Research Institute

Supported by:

- Astronomincal Society of Japan



Death of a rapidly rotating massive star shortly after its core collapse. A highly relativistic jet is launched along the rotation axis.

Overview

IAU Symposium 279 took place in Nikko, in the Tochigi Prefecture of Japan. The symposium was originally scheduled for the week of 18-April-2011, but was postponed due to the catastrophic earthquake, the largest in Japanese history, that hit northern Japan on 11-March- 2011. The Tochigi Prefecture is located next to the Fukushima Prefecture, the same location as the Fukushima Daiichi nuclear power plant. Due to the radiation, power grid, and other infrastructure uncertainties, it was decided to postpone the meeting until the following year (although no later than 31-March-2012 in order to benefit from the generous funding provided by the Japanese government to support this meeting). The IAU Executive Committee graciously endorsed and supported the decision. When the meeting was finally held, a moment of silence was observed at the beginning of the meeting for the 20,000 individuals who lost their lives, either to the earthquake, tsunami, or the devastating aftermath.

The science motivation for holding IAU Symposium 279 centers around the death of stars that are larger than eight solar masses. These massive stars end their lives in a fiery explosion and are manifest as core collapse supernovae (CCSNe) or gamma-ray bursts (GRBs). In rare cases, a highly stripped massive star explodes and exhibits properties of both CCSNe and GRBs. In contrast, there are clear cases in which no bright supernova is found to be associated with a GRB, and vice versa. The quest in understanding supernovae (SNe) and GRBs, and the connection between them, has raised many questions. Since the elements synthesized in the explosion of massive stars are the building blocks for much of the visible Universe, it is important to understand the life cycle of these massive stars.

This symposium brought together international leaders, in both theory and observation, who study CCSNe and GRBs to discuss the range of activities in the field. These activities include: stellar evolution and explosion; progenitors, environments, and hosts; astroparticle physics; as well as multiwavelength observations of these objects and their use as cosmological probes, particularly in the very early Universe.

The symposium was divided into eight sessions, 62 talks, and 82 posters. The 158 participants came from 25 countries with 28 invited and 34 contributed speakers, of which five and six were women,

respectively. We had the privilege of having with us for the whole meeting, Thierry Montmerle, Assistant General Secretary of the IAU Executive Committee, who also delivered a talk on the future organization of the IAU.

Scientific Highlights

Our understanding of the lives and death of stars with masses greater than eight solar masses are beginning to expand thanks to increasingly powerful diagnostic tools, models, and numerical simulations that have become available. These resources are helping identify the evolutionary channels and eventual fates of massive stars, as well as investigating how a fraction of them are able to produce high-energy emission and jets. The talks during the meeting focused on twelve primary themes:

• What are the differing models relating to the death of massive stars telling us

• X-ray and optical properties of all classes of SNe including superluminous SNe (sometimes

referred to as "Quimbies")

• What we are learning from X-ray, optical, and near-IR observations of the prompt and

afterglow phases of GRBs

• What we are learning from X-ray, UV, and optical observations of SNe and their remnants

• The challenges associated with observing and constraining the progenitors of GRBs and SNe

• Current thoughts on CCSNe theory

• Gravitational waves and GRBs

• Host galaxies and the local environment, particularly the metallicities, of GRBs and CCSNe

• Current theories in early Universe star formation including Population III stars

• Using GRBs as probes of the early Universe

• Understanding the shock break out of SNe

• The possible connection between short GRBs and magnetars

The symposium was concluded by Shri Kulkarni, who summarized the content of the meeting as well as included some of his own thoughts about our current understanding in the field. One invited talk was not given; Chris Fryer had a last minute emergency that prevented him from giving his talk on Stellar Collapse and GRB Explosion Mechanisms.

IAU Symposium 287 "Cosmic Masers: from OH to H_0"

(29 January – 3 February, 2012, Stellenbosch, South Africa)

Scientific Organising Committee:

Roy Booth (Chair), South Africa
Wouter Vlemmings (co-Chair), Sweden
Elizabeth Humphreys (co Chair), Germany
Anna Bartkiewicz, Poland
Valentín Bujarrabal, Spain
Jessica Chapman, Australia
Moshe Elitzur, USA
Simon Ellingson, Australia
Yolanda Gómez, Mexico †
Malcolm Gray, UK
Mareki Honma, Japan
Athol Kembal, USA
Kee-Tae Kim, Korea
James Moran, USA
Huib van Langevelde, Netherlands

Local Organising Committee:

Roy Booth (co-Chair)
Sharmila Goedhart (co-Chair)
Kim de Boer
Simon Fishley
Michael Gaylard
Rose Hames
Nadeem Oozeer
Sean Passmoor
Anna Schroeder
Johan van der Waalt
Patricia Whitelock

Scientific highlights

Since their discovery in 1965, cosmic masers have proved to be a valuable tool in Astrophysics, Astrometry and, more recently, Cosmology despite remaining something of an enigma in terms of the complete comprehension of their excitation mechanism and the physics of the pump source. The papers of the opening theory session reminded us of this problem but presented some new clues. Furthermore, a review of recent polarization measurements (session 2) of the Zeeman splitting of the lines added valuable new data on the role of magnetic fields.

Of special interest were several papers on the polarization of masers associated with evolved stars, which appear to enhance the hypothesis that magnetic fields play a role in answering the puzzle posed by the formation of bipolar planetary nebulae from the circularly symmetric AGB stars.

Session 3 on Masers associated with star formation began with a review of variability in (Class II) methanol masers. The quasi-sinusoidal temporal variability, first observed at the Hartebeesthoek Radio Astronomy Observatory in South Africa, remains difficult to explain but variability in either the pump source or the background continuum have been proposed. Other maser variability, intermittent and bursting was also discussed.

Nearly all the papers in the Star Formation session were on methanol class I or II. Class II methanol masers are known to be associated with young stellar objects (YSOs) and are tracers of high-mass star formation, along with OH and H_2O masers, while Class I masers (e.g., at 36 and 44 GHz) are found

in regions of both high- and low-mass star formation with pumping dominated by collisions (with molecular hydrogen). A review of new Australia Telescope Compact Array observations of class I methanol from all transitions from 9.9 to 104 GHz suggested that the shocks responsible for the class I masers could arise from a range of phenomena and not only the more established outflow scenario.

Progress in studies of circumstellar masers was the topic of the next session. Such emission arises from SiO and H2O in or near the stellar photosphere, or OH in the expanding envelope. An exciting development here is coordinated mid-infrared VLTI observations with the SiO radio spectroscopic VLBI observations with the VLBA. SiO masers lie in the extended atmosphere, as seen by infrared interferometry, possibly located with Al_2O_3 dust. Near-IR interferometry indicates a clumpy morphology, consistent with the erratic temporal structural changes found in VLBA observations of SiO.

There has been a lot interest in extragalactic masers in the past decade. Not only may strong water mega-masers be used to measure the Hubble constant, H0, as a function of red-shift, they also enable the determination of the central black-hole mass. The GBT and extremely wide band JVLA are becoming important instruments for the study of extra-galactic masers.

Some of the new instruments under discussion, even construction, have deep HI surveys as prime science drivers (MeerKAT, ASKAP, SKA). The ability of OH maser emission to confuse HI fields is a recognized problem and we heard how progress is being made in investigations of the properties of red-shifted OH, in order to deal with such problems.

Finally, maser astrometry of the Galaxy is gaining new strengths with the new interferometers VLBA, the Japanese Vera network (and its extension with the new Korean multi-frequency array), and the EVN. It seems clear that the through the work already done and that to come, maser astrometry will re-define the distance to the Galactic Centre and other established constants in astrometry.

Final comments

The fourth IAU Symposium on Astronomical masers, IAUS 287, entitled Cosmic Masers- from OH to H_0, was the second IAU symposium held in South Africa. The venue was the excellent Wallenberg Conference Centre in the beautiful old town of Stellenbosch nestling in the foothills of one of the country's foremost wine districts. The weather was perfect! Despite a strenuous programme with lively discussions, the participants found time to visit the Cape Town Water Front and take a boat trip to historical Robben Island, where the present political structure was formulated in the mid 90s. They also enjoyed an African evening at a local hospice, where they sampled truly African food, song and dance. We look forward to the next maser meeting, in another exotic venue, in another continent, in four years time.

4.2 Meetings in 2013

IAUS 301 Precision asteroseismology - Aug. 19-23 – Wroclaw, Poland Oct. 7-11

End date/time: August 23, 2013

Contact Jadwiga Daszynska-Daszkiewicz daszynska@astro.uni.wroc.pl

Event website http://iaus301.astro.uni.wroc.pl/index.php

SOC Co-Chairs: Hiromoto Shibahashi (Japan)

SOC Members: Annie Baglin (France), William Chaplin (UK), Jørgen Christensen-Dalsgaard (Denmark), Gilles Fontaine (Canada), Joyce Guzik (USA), Marcella Marconi (Italy), Margarida Cunha (Portugal), Karen Pollard (NewZealand), Juan Carlos Suárez (Spain), Werner Weiss (Austria)

Editors of Proceedings: William Chaplin (UK), Joyce Guzik (USA), Gerald Handler (Poland), Andrzej Pigulski (Poland)

Topics:

Photometric and spectroscopic data,

Space observations, data analysis,

Stellar structure and evolution,

Pulsating stars, convection, rotation,

Mass loss, microphysics data, public outreach

IAUS 302 Magnetic fields throughout stellar evolution - Aug. 25-30, Biarritz, France

End date/time: August 30, 2013

Contact : Pascal Petit - ppetit@irap.omp.eu

Event website: http://iaus302.sciencesconf.org/

SOC Co-Chairs: Moira Jardine (UK), Pascal Petit (France), Henk Spruit (Germany)

SOC Members: Gibor Basri (USA), Matthew Browning (UK), Corinne Charbonnel (France), José-Dias do Nascimento (Brazil), Siraj Hasan (India), Oleg Khochukov (Sweden), Renada Konstantinova-Antova (Bulgaria), Hiroaki Isobe (Japan), Stephen Marsden (Australia), Sami Solanki (Germany), Henk Spruit (Germany), Klaus Strassmeier (Germany), Asif Ud-Doula (USA), Gregg Wade (Canada)

Editors of Proceedings: Pascal Petit (France), Moira Jardine (UK), Henk Spruit (Germany)

Topics:

Stellar structure and evolution

Magnetized accretion and outflows in young stellar objects

Magnetic braking of PMS stars

Solar and stellar activity in photospheres, chromospheres and coronae, and stellar cycles

Magnetism in very low-mass stars and brown dwarfs

Star-planet interaction

Stellar dynamos across the HR diagram

Magnetic field origin and stability in massive stars

Magnetically-confined winds of massive stars

Dynamo and mass-loss in giant and supergiant stars

Final phases of stellar evolution : magnetism in compact objects

IAUS 303 The galactic center: Feeding and feedback in a normal galactic nucleus - Sep. 30-Oct. 4, - Santa Fe, NM - USA

End date/time: October 4, 2013

Contact: Jürgen Ott - jott@nrao.edu

SOC Co-Chairs: Cornelia Lang (USA), Michael Burton (Australia), Sera Markoff (Netherlands)

SOC Members: Roland Crocker (Germany), Lorant Sjouwerman (USA), Masato Tsuboi (Japan), Sungsoo Kim (Korea), Paul Ho (China Taipei), Mark Morris (USA), Jesus Martín-Pintado (Spain)

Editors of Proceedings: Lorant Sjouwerman (USA), Jürgen Ott (USA), Cornelia Lang (USA)

Topics:

Large-scale feeding/feedback:

The role of the Galactic bar in feeding the Galactic nucleus

The ISM and star formation in the Central Molecular Zone

The Galactic Center stellar population

3-D large-scale structure of the Galactic nucleus and comparisons to other nuclear regions I

Small-scale feeding/feedback:

Astrophysics of feeding and feedback near supermassive nuclear black holes like Sgr A*

Nuclear Feedback: Stellar, magnetic and high energy processes

IAUS 304 Multiwavelength AGN surveys and studies - Oct. 7-11 – Byurakan, Armenia

End date/time : October 11, 2013

Contact: Areg Mickaelian - aregmick@aras.am

Event website: http://iaus304.aras.am/

SOC Co-Chairs: Felix Aharonian (Germany), David Sanders (USA)

SOC Members: Roger Blandford (USA), George Djorgovski (USA), Malcolm Longair (UK), Laura Maraschi (Italy), Enrico Massaro (Italy), Felix Mirabel (France), Ray Norris (Australia), Paolo Padovani (Germany), Bradley Peterson (USA), Elaine Sadler (Australia), Hélène Sol (France), Tadayuki Takahashi (Japan), Yervant Terzian (USA), Megan Urry (USA), Lutz Wisotzki (Germany)

Editors of Proceedings: Areg Mickaelian (Armenia), Felix Aharonian (Germany), David Sanders (USA)

Topics:

Historical surveys: spectral and colorimetric surveys for AGN, surveys for UV-excess galaxies

AGN from IR/submm surveys: 2MASS, IRAS, ISO, AKARI, SCUBA, SST, WISE, Herschel

AGN from radio/mm surveys: NVSS, FIRST, ALMA, Planck, and others

AGN from X-ray/gamma-ray surveys: ROSAT, ASCA, BeppoSAX, Chandra, XMM, INTEGRAL, Fermi, HESS, MAGIC, VERITAS

Multiwavelength AGN surveys, AGN statistics and cross-correlation of multiwavelength surveys

Unification models of AGN, other AGN models, accretion modes

Understanding of the structure of nearby AGN from IFUs on VLT and other telescopes

Study of unique AGN and AGN variability

Future large projects

The Phenomena of Activity

4.3 List of approved Symposia for 2014

IAUS 305 (B. Lites) Polarimetry: from the Sun to Stars and Stellar Environments –
Supporting Divisions: E, B, F, G - Punta Leona, Costa Rica - Jan 19-24

IAUS 306 (A. Heavens) Statistical challenges in 21st Century Cosmology (SCCC 21) -
Supporting Divisions: B, J - Lisbon, Portugal - May 25-29

IAUS 307 (G. Meynet) New windows on Massive Stars, Asteroseismology, Interferometry and Spectropolarimetry
Supporting Division: G - Geneva, Switzerland - Jun 23-27

IAUS 308 (S. Shandarin) The Zeldovich' Universe: Genesis and Growth of the Cosmic Web Supporting Division: J - Tallin, Estonia - Jun 23-28

IAUS 309 (B. Ziegler) Galaxies in 3D across the Universe
Supporting Divisions: J, B, H - Vienna, Austria - Jun30 - Jul 4

IAUS 310 (A. Lemaitre) Complex Planetary Systems
Supporting Divisions : A, F - Namur, Belgium - Jul 7-11

IAUS 311 (M. Cappellari) Galaxies Masses as Constraints of Formation Models
Supporting Divisions: J, B, G, H - Oxford, UK - Jul 14-18

IAUS 312 (R. Spurzem) Star Clusters and Black Holes in Galaxies across Cosmic Time
Supporting Divisions: H, D, G, J - Beijng, China Nanjing - Aug 25-29

IAUS 313 (F. Massaro) Extragalactic Jets from every angle
Supporting Divisions: D, B, J - Puerto Ayora, Ecuador - Sep 15-20

4.4 Regional Meetings

MEARIM 2014: Third Middle-East and Africa IAU Regional Meeting

From: April 22, 2014 **to** April 27, 2014

Place: Beirut, Lebanon

Contact: Roger Hajjar - rhajjar@ndu.edu.lb

Proposer details: Roger Hajjar rhajjar@ndu.edu.lb
Address: Task Force Astronomy & Astrophysics - L-CNRS - 59, Zahia Salmane Street - Jnah- Beirut – Lebanon & Department of Physics & Astronomy - Notre Dame University – Louaize - PoBox 72 Zouk Mikael - Zouk Mosbeh - Lebanon
Telephone or fax: 961-9-208726 & 961-3-269405

Chairs of SOC:
Edward Sion (Villanova University, USA) and George Helou* (California Institute of Technology, USA)

Chairs of LOC:
Task Force Astronomy & Astrophysics** (L-CNRS, Lebanon)

Topics :

1. Galaxies & Cosmolgy
2. Stars and Environments
3. Sun, Heliosphere, and Space Weather
4. Solar System & Exoplanets
5. Astronomical Projects with small telescopes
6. Archives and Virtual Observatories
7. Telescopes & Instrumentation
8. Astronomy for Development

Rationale :

Following on the success of the first two meeting, all participants expressed the need to meet on a regular basis to assess the development of astronomy and astrophysics in the region, increase regional and international networking and collaboration, and provide opportunities to take stock of the international development of astronomy and astrophysics.

The region witnessed exciting developments in astronomy and astrophysics since MEARIM II in April 2011. The Office of Astronomy for Development (OAD) was officially launched, and the first call for proposals announced a few weeks ago. A number of Regional Offices of Astronomy for Development (ROAD) is expected to be created in the region in the next few years, providing added development opportunities.

Furthermore, the Square Kilometer Array (SKA) was officially attributed to South Africa and will be developed in the southern part of the continent. An important number of Middle-Eastern and African countries have burgeoning astronomy and astrophysics programs and are working on establishing national observatories.

Lebanon is graduating astronomy and astrophysics masters degree holders and PhD will soon follow. The number of PhD holding astronomers and astrophysicists in Lebanon increased to 9. An observatory is soon to be completed in the country and is already scheduled to contribute to an international campaign to monitor Wolf-Rayet stars in 2013. In 2014, the planned year of the meeting, Lebanon will have been an interim member of the IAU for 8 years, with the requirement to ask for full membership the following year.

A third MEARIM in 2014 will be at the right time to discuss research and observational facilities that are and will become available, propose science that would benefit from these facilities, and network with international, cutting-edge research and facilities around the world. It will also be an opportunity

to learn from the first few years of the operation of the OAD by reviewing impact on the development of astronomy and astrophysics in the region, and enhance the operation of its ROADs.

MEARIM III in the Middle-East will also provide an important boost to the participation of MENA region astronomers and astrophysicists to the meeting while maintaining and enhancing the strong participation of African astronomers and astrophysicists to it.

* Currently awaiting confirmation from Dr. George Helou
** The Chair of the LOC will be selected from among the Task Force members who are Lebanese astronomers, astrophysicists and scientists

APRIM 2014: 12th Asia-Pacific IAU Regional Meeting

From: August 19, 2014 **to** August 22, 2014

Place: Seoul, Korea, Rep of

Contact: Young Chol Minh - minh@kasi.re.kr

Proposer details: Young Chol Minh (minh@kasi.re.kr)
Address: Korea Astronomy and Space Science Institute - 776 Daedeok-daero, Yuseong 305-348, Korea
Telephone: +82-42-865-3263

Chairs of SOC
Young Chol Minh (Korea Astronomy and Space Science Institute, Korea)
Young-Woon Kang (Sejong University, Korea)

SOC Members
Mhd Fairos Asillam (National Space Agency of Malaysia, Malaysia)
Michael Burton (University of New South Wales, Australia)
Shuhrat A. Ehgamberdiev (Ulugh Beg Astronomical Institute, Uzbekistan)
Gregory Fahlman (the NRC Herzberg Institute of Astrophysics, Canada)
Masahiko Hayashi (University of Tokyo, Japan)
Wing-Huen Ip (National Central University, China Taipei)
Young-Woon Kang (Sejong University, Korea)
Nguyen Quynh Lan (Hanoi National University, Viet Nam)
Steve Maddox (University of Canterbury, New Zealand)
Hakim L. Malasan (Institute of Technology, Indonesia)
Young Chol Minh (Korea Astronomy and Space Science Institute, Korea)
Chingis Omarov (The Center of Astrophysical Researches, Kazakhstan)
Tushar Prabhu (Indian Institute of Astrophysics, India)
Boonrucksar Soonthornthum (National Astronomical Research Institute of Thailand, Thailand)
Irina Voloshina (Moscow State University, Russia)
Gang Zhao (National Astronomical Observatories, China Nanjing)
Ho-Il Kim (Korea Astronomy and Space Science Institute, Korea)

LOC Members
Ho-Il Kim (Korea Astronomy and Space Science Institute, Korea)
Sungki Cho (Korea Astronomy and Space Science Institute, Korea)
Seogu Lee (Korea Astronomy and Space Science Institute, Korea)
Yangnoh Yoon (Korea Astronomy and Space Science Institute, Korea)
Ahchim Kim (Korea Astronomy and Space Science Institute, Korea)
Young Chol Minh (Korea Astronomy and Space Science Institute, Korea)
Young-Woon Kang (Sejong University, Korea)

Registration Fee in local currency and equivalent in EUR 270

Topics

1. Solar System and Sun-Earth Interactions
2. Interstellar Matter, Star Formation and the Milky Way
3. Stars, Exoplanets and Stellar Systems
4. Galaxies, AGN and Cosmology
5. Compact Objects and High Energy Astrophysics
6. Large Observing Facilities and Instruments
7. Historical Astronomy, Astronomy Education and Public Outreach

Rationale

The 12th Asian-Pacific Regional IAU Meeting (APRIM 2014) will bring together the diverse range of astronomical activity taking place in the Asian-Pacific region. During the meeting for 3.5 day meeting, the latest scientific achievements and technical development from the region will be introduced. The principal disciplines in astronomy being carried out by researchers in this region will be covered. The meeting will also include presentations and discussions to promote regional collaboration with special regard to involvement in global astronomy projects.

Today large astronomical projects are invariably international in nature. This makes collaboration among countries an essential element for involvement in leading-edge astronomical activities. The Asian-Pacific region contains Astronomical Societies of a variety of sizes and activity levels. The more developed Societies in the region may need to encourage and assist the scientific activities of the emerging Societies in this region. On the whole, astronomical activities are growing rapidly in the Asian-Pacific region, and the emerging Societies will be important institutions in the future not only for the facilities they may provide, but also for their human resources. This meeting will provide an opportunity to promote scientific activities as well as friendship among countries in this Asian-Pacific region. Therefore, we will prepare this meeting as a forum to promote regional collaborations and manpower exchanges. Public outreach programs will also be included to promote astronomy for general public. Discussions and presentations on the astronomical education programs in the region will also be an important part of this meeting.

The Korea Astronomy and Space Science Institute (KASI) hosts and supports the APRIM 2014 to celebrate its 40th anniversary since it began as the National Observatory of Korea. It is the largest government-funded astronomical institute in Korea. KASI has just completed the construction of the Korean VLBI Network (KVN), consisting of three 21m diameter radio telescopes. This will be operated full scientific mode from 2013. KASI is also actively undertaking a variety of astronomical projects, such as the construction of the Space Laser Ranging system for space geodesic studies and the Gravitational Lensing Telescope project, building 3 telescopes in the southern hemisphere for an exoplanet search. We expect their first results will be available at for the APRIM meeting in 2014. In addition, KASI is involved in the global project, Giant Magellan Telescope (GMT), as one of founder members. KASI has been putting great effort into working in close cooperation with institutes and universities from around the Asian-Pacific region.

Outline Program

The program will include 3.5 days of scientific sessions and a 0.5 day conference excursion (Thursday afternoon), a conference banquet (Wednesday evening) and a welcoming reception (Monday evening). There will be 4 plenary sessions and 3-4 parallel sessions from Tuesday to Friday. Two public lectures will also be included.

We list here the major themes for the meeting, together with the topics for presentations within them.

- Solar System and Sun-Earth Interactions

- Solar Activities and Space Weather Research
- Solar Magnetic Field, Neutrinos and Energetic Particles
- Solar Planets: Formation and Evolution
- Solar Telescopes and Space Weather StationsInterstellar Matter, Star Formation and the Milky Way
- Low and High Mass Star Formation
- Astronomical Masers
- Circumstellar Envelopes and Planetary Nebulae
- Interstellar Dust Grains
- Interstellar Gas Dynamics Stars, Exoplanets and Stellar Systems
- Binary and Multiple Stellar Systems
- Exoplanets
- Stellar Clusters and Stellar Populations
- Photometric and Spectroscopic Observing FacilitiesGalaxies, AGN and Cosmology
- Cosmology
- Evolution of Galaxies
- Active Galactic Nuclei and Radio JetsCompact Objects and High Energy Astrophysics
- Gamma-ray Bursts
- X-ray Binaries, Pulsars and Supernova Remnants
- Cosmic-raysLarge Observing Facilities and Instruments
- GMT, TMT and Large Optical/IR Telescopes
- ALMA, SKA, VLBI and Space VLBI
- LIGO and Gravitational Wave Detectors
- Instruments for Small Telescopes
- Observing Facilities for High Energy AstrophysicsHistorical Astronomy, Astronomy Education and Public Outreach
- Historical Astronomy
- Regional Astronomical Education Programs
- Activities of Museums and Planetariums
- International Astronomical Olympiads
- Young Astronomers in the Asian-Pacific Region
- Training Teachers in Astronomy
- Public Outreach Programs

5. Report on the OAO (Office for Astronomy Outreach)

Sarah Reed, International Outreach Coordinator: Excerpts

Background information:

The IAU Office for Astronomy Outreach (OAO, formerly known as the IAU Office for Public Outreach) began operations in September 2012, under the leadership of the organisation's International Outreach Coordinator (IOC), Sarah Reed. The OAO is hosted by the National Astronomical Observatory of Japan (NAOJ) until 31 March 2017, based in its headquarters in Mitaka, Tokyo.

Funding for OAO is provided by:

- National Astronomical Observatory of Japan
- International Astronomical Union
- Academia Sinica
- Indian Institute of Astrophysics
- Japanese Aerospace Exploration Agency
- Korea Astronomy and Space Science Institute
- National Astronomical Observatories, Chinese Academy of Sciences
- National Astronomical Research Institute of Thailand

What is OAO?

OAO is a hub for coordinating public outreach activities around the world. The aim is to make it easier for the public to access information about our Universe and local and global astronomy events, while building networks to support and disseminate information to the amateur astronomy and public outreach communities.

Goals

1) Increase public awareness and knowledge of astronomy and related sciences
2) Connect people with astronomy through the excitement of sky-observing experiences
3) Facilitate new networks and strengthen existing ones
4) Ensure that astronomy outreach resources and events are accessible to everyone
5) Promote best practices in astronomy communication and public outreach

Activities of OAO (from September 2012 – April 2013)

1. Strategic planning and setting up the office:

- Purchasing office furniture
- Defining the strategy for OAO (with comments invited from the OAD's Task Force 3 and IAU Commission 55 during a telecon)
- Creating a corporate identity (logo and the slogan 'Bringing the Universe Down to Earth')
- Building synergies between OAO and the IAU Office of Astronomy for Development (visit to Cape Town in December 2012)
- Web development

2. For Communicators

2.1 Establishing a National Outreach Contact (NOC) network

2.1.1 Rationale

The OAO is currently a one-person office, with the IOC tasked with promoting and coordinating public outreach activities around the world. The International Year of Astronomy 2009 (IYA2009) demonstrated that the success of such an endeavour hinges on the support of a network of volunteers to coordinate activities at a national level. For IYA2009, this network was called Single Points of Contact (SPoCs). Now, the OAO is implementing a similar approach and establishing a network of IAU National Outreach Contacts (NOCs). The NOCs will support the implementation of the OAO goals and act as the go-to point to find out what is happening in astronomy outreach at a national level.

2.1.2 Role of a NOC

It is anticipated that the work of a NOC will take about 2-3 days per month, under the supervision of the IOC. This work will involve:

- To compile and manage a mailing list of people and organisations involved in astronomy outreach within their country.
- To manage the OAO calendar for public astronomy events at a national level. This will include posting events on the calendar and collating the results from an evaluation survey (sent automatically to the event organisers) to create a short annual report on the impact of astronomy outreach in their respective countries. The online infrastructure for the calendar will be provided by the OAO.
- To support the implementation of global astronomy outreach projects at a national level
- To support the OAO in building a database of amateur astronomy clubs.
- (Not a requirement) To be invited to attend IAU Regional Meetings and General Assemblies for a face-to-face meeting with the IOC and other NOCs. The IOC will invite some NOCs to present their work at outreach sessions in the meetings. (Expenses incurred in attending meetings will not be covered by the IAU or OAO.)

2.1.3 Selection procedure

NOCs will be appointed for a three-year term (although they can be re-selected, based on the NOC's previous commitment to the role), in phase with the IAU General Assemblies. (The term will be slightly shorter for the first NOCs, to align with the next General Assembly in 2015.)

The selection of NOCs will follow the same procedure used to appoint the IYA2009 SPoCs. Therefore, in the first instance, IAU National Members have been asked to advertise the call for NOC applications and to nominate a single NOC for their respective countries on behalf of the OAO. National Members are not expected to manage the NOCs – this will be the responsibility of the IOC. However, to assist in future selections only, the IOC will inform National Members of NOCs whom are excelling in their roles and those whom are not fulfilling their tasks.

The selection criteria for NOC candidates:

- A CV that demonstrates a strong background in astronomy, preferably working full-time in the field in a position that will support the NOC's outreach work as part of their daily duties.
- Evidence of evaluation of three astronomy outreach activities organised by the applicant.
- Positive recommendations from two referees. (No personal references.)

2.1.4 Responses from National Members

Of the 67 national members that were emailed on 23 March 2013 (since contact details for Cuba, Democratic People's Republic of Korea, Egypt, Honduras, Lithuania and Portugal are missing from the IAU database), 19 have responded.

There are currently 16 NOCs appointed in the following countries: Austria, Bulgaria, China, Germany, India, Italy, Malaysia, the Netherlands, the Philippines, South Africa, Ethiopia, Thailand, Turkey, Ukraine, United States and Vatican City State. There have been correspondences from the following countries, confirming that they will select their NOCs soon: Australia, Saudi Arabia and Spain.

2.1.5 Next steps

In addition to following up on National Members that have failed to respond, the former IYA2009 SPOCs can now be contacted, as their email addresses were recently extracted from www.astronomy2009.org. (The mailing list used during IYA2009 had been deleted.) While it is expected that many of the SPOCs will no longer have the time available to commit to a similar role, this mailing list provides a good starting point for finding NOCs in countries that are not IAU National Members.

2.2 IAU Outreach Newsletter

During IYA2009, a mailing list of more than 4000 people working in astronomy education and public outreach was built. The list had been maintained afterwards as part of the Beyond IYA2009 efforts, and the OAO took over as administrator in November 2012. Since then, monthly newsletters (plain text emails) have been created, with a warm response from several members of the community.

The newsletters have continued to feature a mixture of education and outreach news and events, since there is no IAU Office for Education. Indeed, Beatriz Elena Garcia, Vice-President of IAU Commission 46 (C46), made a request to re-publish the newsletter on the homepage for C46 (www.iaucomm46.org). Originally, PDF versions of the email newsletters were created, using the OAO logo, and uploaded to the C46 webpage. However, the newsletter links now direct visitors to the OAO website.

It is regrettable that it is impossible to know how many people are receiving the newsletter and how many are ending up in spam folders. In the future, it would be worthwhile migrating over to a service like MailChimp, which employs an advanced delivery infrastructure – minimising how many emails end up in someone's spam folder.

There is also a need to promote the resource further, as only about 20 people have joined the mailing list over the past few months.

2.3 Communicating Astronomy with the Public (CAP) journal

The first issue of CAP journal with Sarah Reed as Editor-in-Chief (issue number 13), was published in April 2013. The editorial provided a great platform to promote OAO to CAP journal readers.

Preparation for issue 14 is underway, with a planned publication date this fall.

2.4 Twitter account

The content of the Tweets on the OAO's account (@IAU_Outreach) are intended for the astronomy outreach community. The account has gained 193 followers since it was launched in January 2013. While this pales in comparison to the IYA2009 account (@astronomy2009), which currently has more than 13,000 followers, it is still early days for OAO, and more time is needed to promote the office and its resources.

The IOC has the login details for @astronomy2009, and Tweets have been made to encourage people to migrate over to @IAU_Outreach and @Astro4Dev, but with little success. It follows that either most of the followers of @astronomy2009 no longer read the Tweets, or that they aren't incentivised to start following @IAU_Outreach and @Astro4Dev.

2.5 IAU Education and Public Outreach Calendar

Based on personal experience, the IOC recognised a need for a calendar for the education and public outreach (EPO) community, where conferences, workshops and hack days, et cetera, could easily be found. This was quick and easy to accomplish using a Google Calendar, with the various types of events given different labels in a drop-down menu. (See www.universedowntoearth.org/events/)

3. For the Public

3.1 FAQ service

An FAQ section about astronomy is advertised on the OAO website as a resource that will be 'coming soon'. The IAU General Secretary, Thierry Montmerle, and Assistant General Secretary Piero Benvenuti, recognised that such a resource would be beneficial, since members of the public submit questions to the IAU Secretariat every day. Previously, these questions from the public were ignored.

A small task group was formed to create a workflow for dealing with questions from the public: Piero Benvenuti, Thierry Montmerle, Sarah Reed and Lars Lindberg Christensen (IAU Press Officer). A new mailbox was created for the public to submit their questions to iaupublic@iap.fr and this email address has been added to the contacts page on the IAU website.

It was decided that template answers to FAQs should be created. To this end, if members of the task group respond to a question that they think could be asked again by someone else, then that answer is added to a shared Google Doc. Eventually, these template answers should be added to a searchable database and available on the IAU website.

The IOC volunteered to manage the mailbox, to answer the questions from members of the public, and to forward other queries to the appropriate person in the task group. About 70 questions have been answered between mid-March 2013 (when the service first launched) and 30 April 2013.

3.2 Factsheet on 'Open Science'

As part of the OAO's vision of acting as a hub for coordinating public outreach activities around the world, a webpage that gives an overview of the various ways that the public can engage in astronomy research was created for the OAO website. It gives definitions and useful links for citizen science projects, crowd-funding platforms, image processing using data from professional telescopes, pro-am collaborations and hack days. (Please see www.universedowntoearth.org/citizen-science-projects/)

This is planned to be the first in a series of factsheets, which will give an overview of useful astronomy outreach resources for educating children, and for astronomers with physical disabilities, for example.

4. For Astronomy Clubs

The idea behind the IAU Astro Clubs Portal is to create a web community for amateur astronomers. During IYA2009, amateur astronomers took part in a large proportion of the outreach events that were held, so it would be an asset to build a network of amateur associations – as valuable as the mailing list for the IAU Outreach Newsletter.

The main goals of the IAU Astro Clubs Portal are:

- To create an effective communication channel for disseminating information about public outreach activities to amateur astronomy clubs.
- To enable clubs to network more effectively at a national and a global level, with the aim of sharing resources, best practices and details of previous guest speakers at club nights. National networks already exist in the United States (Night Sky Network) and Japan (Japanese Amateur Astronomers Association).
- To provide resources to support new clubs, particularly those in developing countries. Examples include a 'starter kit' for new clubs, a club twinning programme with an established club, and hosting a single webpage about a club if it doesn't have a website.

Since 1 March, when the IAU Astro Clubs Portal was launched, 44 amateur astronomy clubs have registered. While this number is modest, the geographical spread of the clubs is reassuring, with clubs in the list from Africa, Asia, Europe and North America. Furthermore, some of these are national clubs or networks; in total, these clubs have about 17,700 amateur astronomers as registered members. This is clearly a valuable mailing list for astronomy outreach purposes.

Most of the clubs joined following the publication of adverts about the IAU Astro Clubs Portal in issue 13 of CAP journal and the newsletter for the Night Sky Network.

Website development:

The IOC created a temporary website using WordPress. This was created at zero cost to OAO, as the services of a web developer and graphic designer were not needed, and it is hosted on the servers of the South African Astronomical Observatory, by invitation of the OAD.

The aim of the temporary website was two-fold:

1. To give OAO an online home, quickly
2. To act as a tester site and to showcase ideas

The URL for the website was chosen so that it would be easy to remember, and to reinforce the slogan of OAO: www.UniverseDownToEarth.org For astronomy communicators, the URL www.iau.org/outreach is used (which redirects to www.UniverseDownToEarth.org), in order to give OAO instant recognition as an IAU office.

Looking ahead, it was agreed by participants at the IAU/ESO/UNAWE/ESA Web Development and Information Management Workshop, held at ESO's headquarters in March 2012, that the activities of OAO should reside within the IAU website (using the existing URL www.iau.org/outreach), following a restructure and redesign. The IAU website already has an 'Astronomy for the Public' section, and the resources featured there should be incorporated within the new 'Outreach' section. A full proposal will be submitted to the IAU General Secretary shortly.

Priorities for the FY 2013/14

- Manage and continue to build the global network of NOCs
- Visit the institutes in Asia that are financially contributing to OAO and build a strong working relationship with them
- Manage the integration of OAO into the IAU website as part of a proposed restructuring of the IAU website. (Proposal developed at the IAU/ESO/UNAWE/ESA Web Development and Information Management Workshop, held at ESO's headquarters in March 2012, and submitted to the IAU General Secretary)
- Manage and continue to build the IAU's FAQ service for the public
- Ensure that CAP journal is published on a regular basis (schedule of three issues per year)

- Continue to build the database of amateur astronomy clubs and provide additional resources to the IAU Astro Clubs Portal
- Create promotional materials for the OAO and give presentations at key conferences (with the aim of attracting more visitors to the website – or the 'Outreach' section of the proposed IAU website redesign – more followers on Twitter and build the mailing list for the IAU Outreach Newsletter)

If the submitted proposal is accepted by the IAU General Secretary, to begin planning for IAU involvement in the International Year of Light 2015

Change of Leadership for OAO

Personal message from Sarah Reed:

It is with regret that I have decided to leave OAO, for personal reasons. My final day in my role as IOC will be 24 May 2013. I hope that OAO continues to grow, and that I have created a strong foundation for its future activities. I will continue to support the IAU's outreach activities as a member of Commission 55 and the OAD's Task Force 3.

6. Report on the OAD (Office of Astronomy for Development)

Kevin Govender, OAD Director (19 July 2013)

1. Background and Overview:

The IAU Office of Astronomy for Development (OAD) was established in March 2011 in order to drive the implementation of the IAU Strategic Plan adopted at the 2009 General Assembly. The OAD is hosted at the South African Astronomical Observatory (SAAO) in Cape Town, South Africa. The last IAU Information Bulletin (IB111) reported on OAD activities until January 2013. Since then the OAD has appointed its third staff member, OAD Project Officer Dr Jean-Christophe Mauduit. Highlights of the OAD activities from January to July 2013 are described here. The OAD also now releases a quarterly newsletter which is available on the OAD website or via the OAD mailing list. Any queries on the OAD and its activities can be directed to info@astro4dev.org – comments, suggestions, ideas and input are always most welcome.

2. OAD Call for Proposals:

Since the approval of 2013 projects by the IAU's Extended Development Oversight Committee (EDOC) at the end of 2012, the OAD has developed grant agreements and completed payments for 16 of the 18 selected projects. The remaining 2 projects have had some logistical challenges but should still see completion within the 2013 year. The funding for these projects are provided by the IAU (for 2013 projects there was an allocation of €90000) with the OAD tasked with finding additional funds for projects on the wish list. The projects are monitored by the OAD and individual project reports/updates are available on the OAD website. By early July 2013 three projects had reached completion. The next Call for Proposals, for projects to be implemented in 2014, was released on 1st July 2013 with a new online submission system and a deadline of 31st August 2013. The new system allows for electronic submissions and automatic confirmations, with email redundancy to reduce any risk of data loss. The proposals are stored on a database which can easily be accessed to prepare the evaluation package for the Task Forces. This new system has addressed all the concerns and lessons from the previous Call for Proposals and represents a significant upgrade to the calls process. We invite proposals from IAU membership and beyond – send us your ideas to use astronomy for a better world! Please spread the word about the call which is available at www.astro4dev.org/cfp

3. Regional Nodes and Language Expertise Centres:

The OAD's continued efforts to establish regional nodes and language expertise centres across the world saw three more full proposals being developed (Ethiopia for East Africa, Nigeria for West Africa, and Armenia for Eastern Europe/Middle East) with strong interest from Zambia for Southern Africa and Colombia for the Andean Region. These proposals were evaluated by the IAU EDOC in April 2013 *(reminder: the EDOC consists of the OAD Steering Committee, the IAU President, IAU General Secretary and President of the IAU's Division C)*. The EDOC approved the establishment of a regional node in Ethiopia which will focus on the East African region – at the time of writing this a draft agreement is awaiting approval from the relevant Ethiopian authorities. The OAD has also been working on an instruction by the EDOC to follow up on the proposals from Nigeria and Armenia in order to develop the respective regional communities with the intention of eventually establishing nodes once the support of the region is obtained. Efforts towards the development of a proposal for the Andean region in Latin America are also ongoing with several exchanges taking place during this quarter, led by Cecilia Scorza on behalf of the OAD. A highlight has been a workshop held in Colombia to develop plans towards the establishment of the node. Input is requested from IAU membership for anyone who is from or has experience/contacts in these regions. Existing nodes are progressing well: the South East Asian node in Thailand has appointed a full time coordinator (Prof. Wayne Orchiston); the East Asian node in China has been coordinating various activities in the region including translation of resources into Chinese. Both nodes should have websites operational in the near future listing their activities.

4. OAD Collaborations:

Several opportunities ranging from funding for travel to scholarships to sponsorship for workshops are available through OAD collaborations such as those with ICTP, RAS, NWO, UCLan and IUCAA. More information on these can be found on the OAD website. During this period the OAD also partnered with the Universe Awareness Programme and several other institutions to submit a lengthy proposal to the Africa-Caribbean-Pacific call for funding. This is funded through the European Union and the proposal involved South Africa, the Netherlands, Ethiopia, Rwanda and Ghana. The OAD's role was to look at the long terms sustainability and further dissemination of the activities which were focussed on using astronomy to inspire young children. Unfortunately this proposal was not successful but the OAD will continue to seek funds to implement the intended plans. The OAD continues to invite institutions to partner with us on areas of common interest.

5. Pilot Project Highlights:

In exploring new ways of using astronomy and astronomy technology for development the OAD hosted a "Raspberry Pi Hack Session" at its offices where technology-related staff at SAAO were invited to work on educational applications of the Rasberry Pi (this is a small computer, slightly larger than a credit card, which runs Linux and can be used on an average television set). The modest cost of the RPi (~€40) opens up opportunities to providing access to computers in remote/under-resourced areas. The outcome of the workshop was the development of a useable setup for a teacher or student to access educational content via this device, as well as the establishment of a wiki page which could be used to continue developing educational materials, especially astronomy education tools, for this device. The OAD also participated in an educational film-making project in an advisory role. The film, entitled "My room at the Centre of the Universe" sees collaboration between artists, astronomers and archaeologists and revolves around a young boy in a rural village who is exploring these respective fields of study. This film has already gained international attention and will be released by the end of 2013 along with an educational resource that can be used by school teachers.

6. Events Highlights:

On 16th April 2013 the OAD, together with the SAAO, hosted the South African Parliamentary Portfolio Committee on Science and Technology at the SAAO headquarters in Cape Town. The event focussed on "Astronomy for Development" and highlighted activities using astronomy for education, outreach and community development. Subsequent to this visit the OAD was invited to the Science and Technology budget vote at the South African Parliament in Cape Town where there was specific mention made by the Members of Parliament of activities discussed during their visit to the OAD. The OAD also hosted two "community gatherings" at its offices during this quarter – one for the education/outreach community and one for the post doctoral/post graduate researchers. The purpose of these meetings is to bring together people who work within the close vicinity of the OAD and engage with them about the OAD's work that could be closely related to theirs. In this way the OAD benefits from relevant skills and experience in its local vicinity while building relations that could be very valuable in the long term.

7. Meetings and Conferences:

During January 2013 the OAD hosted its Steering Committee in Cape Town for their 4th face-to-face meeting. Also in attendance was the IAU General Secretary as well as the SAAO Director. This meeting was useful in planning the way forward in terms of OAD strategies for fundraising and general implementation of the IAU strategic plan.

There were three international trips during this period: One was to the European Parliament in Brussels in March 2013 by the OAD Director to attend an event titled "EU Global Challenges, Global Collaboration." At this event the OAD, through George Miley, hosted a parallel session and conducted several side meetings with various Members of the European Parliament (MEPs). A very productive (and unpredicted) outcome was that there were two "parliamentary questions" that arose as a result of our meetings. These are questions asked by MEPs to the European Commission and can sometimes influence respective policies or funding decisions. The second international trip was to Germany (ESO Headquarters) by the OAD Project Officer, to attend a workshop with various IAU stakeholders to discuss the possibility of a common web platform that could serve all IAU projects. The outcome was a proposal to revamp the IAU website and incorporate the Office for Astronomy Outreach into the new website. The third trip was to Europe by the OAD Director for two meetings: one to attend and present at a conference in the Netherlands in honour of George Miley; and the other to attend a workshop in Brussels on the Africa-European Radio Astronomy Platform (AERAP). This workshop in Brussels was part of an ongoing high level effort to build partnerships in astronomy between Europe and Africa.

Events within South Africa included: (i) attendance of Scifest Africa in Grahamstown which sees the annual coming together of education and outreach professionals from around the sub-continent; (ii) a presentation by the OAD at Africa Day celebrations in Johannesburg; (iii) A workshop coordinated by the DST's Astronomy Desk looking at the development of a 10 year plan for astronomy in South Africa; (iv) A presentation about the OAD to its funders at the South African National Research Foundation headquarters in Pretoria delivered jointly by the OAD Director and OAD Project Officer; (v) A round-table meeting in Pretoria with the International Council for Science (ICSU) president Prof Yuan Tseh Lee where the OAD had the opportunity to engage with other ICSU bodies about "science for development."

8. Publicity:

The Director of the OAD was invited to give a TEDx talk at a local event (TEDx AIMS) and the topic chosen was "Astronomy for Humankind." The talk was very well received and although it was more about the bigger picture of astronomy impacting on society, it did highlight the OAD and the IAU's strategic plan. Such events are a significant opportunity to promote the OAD activities. The talk remains available online with a link on the OAD website. During this quarter the OAD was also invited to an event called "Talking Heads" which brings together various people in leadership roles to engage with the public in conversation about their areas of specialisation. This is a highly

publicised event organised by the Africa Centre in Cape Town and provided a high level platform for the OAD to promote its work. Another opportunity to publicise the OAD came in the form of an interview with Peter Cox from Voice of America. The outcome of that interview has been unexpectedly far reaching including an article on Voice of America and recently a translation of that interview into Amharic for Ethiopian audiences.

9. OAD Staffing:

Around the middle of February 2013 the third staff member, OAD Project Officer Dr Jean-Christophe Mauduit, started work in Cape Town. This position had been open for a very long time and his appointment brings the OAD to a point where it is now fully staffed (according to its business plan). Dr Mauduit holds a PhD in Astrophysics from the Paris Observatory and participated in ESA & NASA satellite missions as a postdoctoral researcher at the Observatoire de la Côte d'Azur and the California Institute of Technology. He has been involved in many international education and outreach programs (Hands on Universe, UNAWE, Caltech & Spitzer outreach) as well as various science development projects around the world. The OAD looks forward to a significant increase in the productivity through this appointment.

Highlights from OAD interns: (i) Laure Catala is working on an evaluation of the impact of astronomy on the community in Sutherland as a case study, as well as leading a workshop to be held at the South African Institute of Physics conference, using astronomy instruments to enhance Physics teaching; (ii) Eli Kasai has implemented the use of educational videos in Sutherland and is now working on Task Force 2's AstroPack (consolidating educational materials from around the world) as well as the local production of UNAWE's Universe in a Box resource package; (iii) Rajin Ramphul is developing a Python programming workshop which will be presented to senior students from a variety of science disciplines in order to explore how this programming tool, which is used so well in astronomy, could help tackle problems in other disciplines; (iv) Maya Barlev (who left us in April) worked on astronomy presentations that can be freely distributed to teachers and astronomy outreach staff globally. More information on our interns and their projects on the OAD website.

10. Message to OAD Volunteers:

The OAD would like to express its gratitude to the many volunteers who have registered on the OAD website and who have provided input and assistance over the course of the OAD's existence. A challenge that we have had at the OAD has been to fund the travel and expenses for volunteers who wish to engage in activities in other parts of the world. The Call for Proposals and the OAD's various partners are seen as opportunities for volunteers to register their ideas so that the OAD can find ways to make them happen. The OAD has also set up a "request" system on its website for people around the world to request volunteers, where requesters will provide the costs where necessary. Volunteers are contacted based upon these requests and the respective volunteer's registered skills and interests.

11. Future Outlook:

With the release of the next Call for Proposals, the OAD will, in the short term, coordinate the receipt and evaluation of proposals with the assistance of its Task Forces. The OAD is also in the process of developing a funding framework which will be used for an intensive fund-raising campaign in the short to medium term, both to fund "wish list" projects arising from the Call for Proposals, as well as large global projects initiated by the Task Forces and long term OAD operational requirements. The OAD will also be working to finalise agreements for more regional nodes and language expertise centres before the next IAU General Assembly.

12. More information/Contact:

For more information or to provide suggestions and input, please visit the OAD website (www.astro4dev.org) or contact any of the OAD team: (i) Kevin Govender (kg@astro4dev.org); (ii) Jean-Christophe Mauduit (jcm@astro4dev.org); or Nuhaah Solomon (ns@astro4dev.org).

7. Cooperation with other Unions & International Organisations

7.1 ICSU Unions Meeting 28-30 April

Ian Corbett, Advisor, IAU Representative to ICSU

1. The meeting was held in Paris at the IAP on 29-30 April.

2. It was preceded by a meeting of the Geo-Unions Cluster (8 Unions) on Sunday 28 April. The agenda and minutes of this meeting will soon be posted on the ICSU web site.

3. The principle points arising were:

a. The agenda of the main meeting was a vast improvement over previous meetings, allowing much more Union involvement in discussion and policy advice.

b. The "Integrated Research on Disaster Risk" programme has lofty aims and a huge number of participants but needs to be focussed more clearly. Some sort of 'scoping document' is needed to set out how IRDR moves forward and what the roles of UNESCO and UN International Strategy for Disaster Reduction (UNISDR) will be (they are essentially 'talking shops'). It was noted that Near Earth Objects – despite recent events – do not figure highly on the agenda. IRDR was discussed further on day 2 of the Unions Meeting.

c. A short discussion on 'open access publishing' resulted in a decision to ask a small ad hoc group to consider issues and report back at next ICSU GA in August 2014.

d. The other topics were interesting and no doubt valuable in their own fields, but of little direct concern to the IAU.

e. It was suggested that the Geo-Union should create their own cluster web pages, which could be hosted by ICSU as part of the 'union involvement and visibility in ICSU's agenda.

4. The next Geo-Unions meeting will be in November in Antalya, Turkey.

5. The agenda for the main meeting is attached. To the best of my knowledge all the Union members of ICSU were represented.

6. Some general background information can be found in the ICSU Annual Reports –

http://www.icsu.org/publications/annual-reports/annual-report-2011/ and the latest Strategic

Plan http://www.icsu.org/publications/reports-and-reviews/icsu-strategic-plan-2012-2017/

7. There was nothing new in the introductory talks. The dominant themes are still "what is ICSU for"? and "who or what is ICSU's audience"? However, the use of break-out groups for discussion was new and warmly welcomed.

8. It's worth noting that ICSU talks a lot about 'interdisciplinary', as distinct to 'multidisciplinary', programmes. This means programmes which involves a wide range of science groupings – physical, biological, medical, sociological etc. Astronomy is seen as 'multidisciplinary' because it involves pure and applied physics, chemistry, mathematics, Earth sciences etc. but is firmly rooted in the physical sciences grouping. The science of almost all Unions is multidisciplinary, of course.

9. Since I chaired one of the groups on Monday I cannot really comment on what went on in the other groups.

10. The report from the Communication group was rather incoherent (especially for a Communication group!) and I took very little of value from it. That, however, is not ICSU's fault.

11. The 'Future Earth' group came up with some sensible comments on how the programme should be planned and structured, and how the diverse partners could be involved. More information on the programme can be found at http://www.icsu.org/future-earth.

12. The conclusions from the Science Education group can be summarised as:

a. All Unions have education and development programmes in place.

b. Most concentrate on young researchers and professional development, only a few work with schools and teachers. The IAU programme is undoubtedly the most ambitious and most comprehensive.

c. ICSU has had essentially no influence on the Unions' education activities, and there is very little cooperation (but not zero) between Unions on education.

d. While at least 3 of the Union clusters (like the Geo-Unions) are talking about cooperation in education, they see the role for ICSU per se in this to be very limited.

e. ICSU should ensure that its multidisciplinary programmes (like 'Future Earth') contained ab initio an education component stretching from schools to professional development.

f. Unions should make more use of ICSU's Regional Offices as a resource to help them in their educational programmes. This is particularly relevant to programmes in the developing world, which is where the three ICSU RO are located.

13. The further discussion added little to this.

14. IRDR

See http://www.irdrinternational.org/wp-content/uploads/2013/04/IRDR-Strategic-Plan-2013-2017.pdf for details of this hugely ambitious programme.

15. Urban Health

The goal in this 10 year programme is to generate policy relevant knowledge and communicate this to 'decision makers'. The focus will be on the major cities in the South.

16. New Interdisciplinary Horizons

The "Future Earth" programme should be the highest priority ICSU programme and ICSU should organise at least one workshop to attract 'young scientists'. It is important that 'results' are linked to 'actions', and both education and communication must be intrinsic parts of the programme.

"Pollution" is a possible future topic, clearly linked to Future Earth and Urban Health, and we must devote resources to educating public/politicians to understand results ....

There was a suggestion that we should mix unions before next GA to discuss common issues and see what turns up – the goal is to seed true 'interdisciplinary' discussion in smaller manageable groups. This was well received by ICSU.

17. Open Access

There was a general consensus that "the train has left the station" – it's happening and there's little ICSU can do or add to the debate. Note that there is a special edition of Nature on 28 March 2013 and one article in particular: http://www.nature.com/news/open-access-the-truecost-of-science-publishing-1.12676

The main concerns raised were that open access publishing favoured western, developed, nations and strongly disfavoured publication in any other language than English.

18. The meeting drifted to a close with nothing new added.

7.2 COSPAR

Jean-Claude Vial, IAU Representative to COSPAR

COSPAR has 46 National Scientific Institution members (the Republic of Korea being the latest member), 13 Scientific Union members (including IAU), approximately 8,000 individual scientists "Associates" and now 8 Associated Supporters (companies, organizations).

1. Scientific Assemblies

COSPAR held its 39th Scientific Assembly in Mysore, India, 14-22 July 2012 (http://www.cospar2012india.org/Default.aspx). Total participation exceeded 2800 with 2129 scientists, students, exhibitors and representatives of the press attending from 78 nations. Approximately 2620 authors submitted 3504 abstracts for the 114 events comprising the core Mysore scientific program.

Among the main features of this successful Assembly, let us note the Interdisciplinary Lectures (concerning Astronomy) and Plenaries. Excellent attendance (more than 800 people on average) and good media coverage were noted. The events are as follows :

"The New Face of the Moon", by J.N. Goswami, PRL, India

"The Very Early Universe", by A. Ashtekar, Penn State University, USA

"Dynamics of the Global Sun from Interior to Outer Atmosphere", K.C. Schrijver, LMSAL, USA

"The Gamma-ray Universe through Fermi", by D.J. Thompson, NASA/GSFC, USA

"Space Agency Round Table – Space Vision-2020 and Beyond" with representatives from 9 Space Agencies

Report from the COSPAR Working Group on the Future of Space Astronomy, "A Global Road Map for the Next Decades", by P. Ubertini, INAF, Italy

"Exoplanets", a COSPAR Public Lecture et the University of Mysore, by W. Benz, University of Bern, Switzerland

2. Awards (concerning Astronomy):

During this Assembly COSPAR presented the 2012 COSPAR Space Science Award to J. Luhmann (USA), its International Cooperation Medal to R-M Bonnet (France) and the Harrie Massey award to N. Gehrels (USA). Other awards were also presented (including the Jeoujang Jaw Medal awarded to R. Lin), as well as eight awards for young scientists, and twelve for young authors having published in the previous two years an outstanding paper in *Advances in Space Research*.

The 40th COSPAR Scientific Assembly will be held in Moscow, Russia, 2 -10 August 2014. The Call for Papers/Announcement will appear in August 2013. The following Assembly (in 2016) will take place in Istanbul, Turkey.

3. Other activities

COSPAR's program of Capacity Building Workshops (CBW) supported by the IAU organizes on average two regional workshops per year. These workshops aim to train young scientists in developing countries. See http://cosparhq.cnes.fr/Meetings/Workshops.htm. The latest one on High-Energy Astronomy took place in Argentina in August 2011. A CBW on infra-red astronomy is

scheduled in 2013. Another one devoted to Space Weather is in preparation. CBW proposals may be sent to Mariano Mendez (mariano@astro.rug.nl).

The Off-Assembly Year Symposium (Symposium taking place in odd numbered years between the biennial COSPAR Scientific Assemblies) will be devoted to "Planetary Systems" and take place in Thailand in November 2013.

A proposal for a roadmap on Space Weather will be prepared for consideration at the COSPAR Assembly in 2014.

COSPAR also adopted revised by-laws, the most important clause of which now mandates the election of the president by correspondence.

4. Publications

Advances in Space Research (ASR) is a fully refereed journal covering all areas of space research. It is open to all submissions and re-established in ISI. Calls for papers for **special issues** of *Advances in Space Research* are circulated regularly, and the journal now also publishes Invited Reviews. ASR is managed by an Editorial Board comprising an editor-in-chief, 3 co-editors and 22 associate editors. The journal's impact factor is now 1.178. *Space Research Today*, COSPAR's information bulletin issued three times a year, now includes more science-driven articles.

For more information: COSPAR's web site: http://cosparhq.cnes.fr/

7.3 UN-COPUOS

Karel A. van der Hucht, Past General Secretary, IAU representative to UN-COPUOS

Near-Earth Objects: Statement of the International Astronomical Union presented to the United Nations Committee on the Peaceful Uses of Outer Space (UN-COPUOS) - 50th session of the Scientific and Technical Subcommittee - Vienna, Austria, 11 – 22 February 2013

1. Introduction

The *International Astronomical Union (IAU)* welcomes the continuing progress in the implementation of the recommendations of UNISPACE III. Several of these are of great importance for the future of astronomy and for the well-being of our planet; and several require the support of the international scientific community and the international community at large. The IAU, representing the world's community of professional astronomers, is pleased to contribute to these issues together with interested delegations and other partners. While each of these issues is relevant in its own way, I will report here in particular with respect to the issue of the hazards of Near Earth Objects.

2. Near Earth Objects (NEOs): our limited knowledge

The issue of forecasting, and potentially mitigating, future impacts of Near Earth Objects (NEOs, including Near Earth Comets (NECs) and Near Earth Asteroids (NEAs)) on Earth has been before this Subcommittee repeatedly in the past. In the past decade, increasing evidence of the extent of the NEO population is building up, thanks to sky surveys by dedicated astronomical observatories, notably in the USA, and thanks to follow-up observations by professional observatories and amateur observatories around the globe. The mounting evidence of the presence of numerous asteroids in the neighbourhood of the Earth justifies an increasing awareness among all governments on Planet Earth of the hazards posed by NEOs to individual countries and to the Earth as a whole.

Near Earth Objects are asteroids and comets in our Solar System whose orbits bring them into the Earth's neighbourhood. If the orbit of a NEO is well determined, its future behaviour can be calculated and an eventual close encounter or collision with the Earth can be predicted with high accuracy in time (within a few seconds) and place (within a few kilometres). In recent years it has

been realized that Near Earth Asteroids with sizes as small as 40 meter can be potentially hazardous. Impacts of 40-m sized NEAs may happen once every 200 years, with serious consequences on a local scale. The most recent impact of a NEA with an estimated size of 40 meters happened in 1908 near Tunguska (Siberia, Russia) and had an explosive force of about 4 megaton TNT, flattening some 2000 km^2 of forest land.

Modern astronomical surveys of NEOs using digital cameras commenced in 1980 and opened our eyes for the fact that the Earth is continuously surrounded by numerous NEAs whose orbits around the Sun cross the orbit of the Earth, and occasionally fly by the Earth uncomfortably closely. Since 1998, NEA surveys discover some 900 new NEAs per year, thanks notably to dedicated observatories in the USA. On January 1st, 2013, the total number of NEAs discovered stood at 9446. About 80% of those have dimensions larger than 40 m, and thus can be hazardous. The observational detection pattern allows estimating the total number of NEAs larger than 40 m at about 300,000. This implies that our knowledge of the number of those NEAs is presently limited to less than 3%. That is clearly an undesirable situation.

In 2012, a number of 22 NEAs were seen flying by the Earth within one Lunar Distance, i.e. within 384,000 km from the Earth. We expect that this observed number is less than 10% of the real number, the other 90% having passed the Earth unnoticed. On 8 November 2011, the NEA 2005 YU55 with a diameter of 325 m passed the Earth at a distance equal to 85 % of one Lunar Distance.

On 15 February 2013 at 03:20 hr GMT, an asteroid with a size of 15 to 17 m entered the Earth atmosphere as a fireball over the Ural region of Central Russia near Chelyabinsk and exploded at an altitude of about 20 km. Several pieces of the asteroid hit the ground as meteorites, one of them making a crater with a diameter of ~ 6 m. Over 1000 people suffered minor injuries due to broken glass.

At 19:25 hr GMT the same day, the NEA 2012 DA14 with a size of 40 × 22 m, discovered a year ago by the Spanish Observatorio Astronomico de la Sagra, passed the Earth surface with a relative velocity of 7.8 km/s at a distance of only 4.3 Earth radii, or 27,684 km. This implies that the trajectory of 2012 DA14 was well within the orbits of geostationary satellites, but safely above the Earth surface.

New astronomical observatories dedicated to more comprehensive NEO surveys are foreseen, such as the U.S. *Large Synoptic Survey Telescope* in Chile with a mirror size of 8 meter and hopefully operational in 2019; and the privately funded *SENTINEL Space Telescope Mission* of the U.S. B612 Foundation, scheduled for launch in June 2016, which will observe NEOs at infrared wavelengths from a Venus-like orbit around the Sun.

It is clear that, in order to be prepared for NEO impacts, the world needs a permanent international NEO Early Warning System, combining all efforts of ground-based NEO surveys and space-based NEO surveys. The UN-COPUOS STSC Action Team 14 is working on protocols to coordinate this important issue.

3. Near Earth Objects (NEOs) and the IAU

To be of lasting value, all NEO observations are being verified, confirmed and catalogued. In this respect the IAU plays an active role by supporting the *Minor Planet Center* (MPC), operating at the Harvard-Smithsonian Center for Astrophysics (MA, USA) and being financed mainly by the NASA Planetary Science Division. The MPC is responsible for collecting, validating and distributing all positional measurements made worldwide of asteroids and comets. The MPC acts as a gateway and clearinghouse for those observations, performs identifications and orbital computations, and makes those public. As NEOs are posted on the MPC NEO Confirmation Page, their orbits are verified instantaneously by the SENTRY software of the NASA Jet Propulsion Laboratory (Pasadena, CA, USA) and by the NEODyS software of the University of Pisa (Italy), and checked for possible impacts with the Earth.

Since March 2010, the IAU maintains a NEA web page http://www.iau.org/public/nea/, presenting a chronology of milestones of Near Earth Asteroid observations and research, serving to increase awareness of NEA facts and consequences.

Also in 2010, the *IAU* established a new *Working Group on Near Earth Objects* http://www.iau.org/science/scientific_bodies/working_groups/171/. This IAU WG-NEO was charged to assess the requirements for a permanent international NEO Early Warning System. The IAU WG-NEO reported to the IAU XXVIII General Assembly in August 2012 in Beijing (China) with a Resolution addressed to all 67 IAU Member States, asking them to increase their support for NEO surveys, in their own interest and that of our planet. The Resolution B3, adopted by the IAU General Assembly, recommends *"that the IAU National Members work with the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) and the International Council for Science (ICSU) to coordinate and collaborate on the establishment of an International NEO Early Warning System, relying on the scientific and technical advice of the relevant astronomical community, whose main purpose is the reliable identification of potential NEO collisions with the Earth, and the communication of the relevant parameters to suitable decision makers of the nation(s) involved."* See: http://www.iau.org/static/resolutions/IAU2012_English.pdf.

Also organized by the IAU Working Group on Near Earth Objects, a Special Session was held at the 2012 IAU XXVIII General Assembly in Beijing, entitled *"The Impact Hazard: Current Activities and Future Plans"*, covering astronomical aspects of the hazards of Near Earth Objects http://adams.dm.unipi.it/iausps7/.

4. In conclusion

A substantial increase of NEO survey activities by astronomical observatories around the world, ground-based and space-based, is of paramount importance to determine the orbits and physical parameters of *all* 300,000 NEAs with sizes larger than 40 m, in order to reveal the full extent of the permanent hazard posed by NEAs to the Earth and all its life forms. Governments are urged to provide the necessary funds for this.

NEOs are the only astronomical objects, apart from the Sun, which are directly relevant to all human beings and other life forms on planet Earth. NEO impacts are the only natural catastrophes which can be predicted with great accuracy in time and place. NEOs constitute a clear and present danger. As the NEO expert Donald K. Yeomans states on the title page of his recent book on NEOs, the issue is *finding them before the find us*. If countries on our planet Earth do not want to be bothered by NEOs, then they have to do something about them. Notably, by increasing their support for NEO surveys.

The *International Astronomical Union* is gratified to acknowledge the progress which is being made on several UNISPACE III issues, notably on the issue of the hazards of Near Earth Objects. The IAU emphasizes its concern and efforts in the field of Near Earth Objects, both for the sake of our science and for the sake of the world in which we live and in which our descendants will live. This Sub-Committee is substantially contributing to progress in this field. It will help us all, if Delegates and Representatives would call the attention of their governments and organizations to this important issue.

7.4 Planetary Defense Conference (PDC)

Karel A. van der Hucht, Past General Secretary, IAU representative to UN-COPUOS

1. Introduction

The *2013 IAA Planetary Defense Conference*, http://www.iaaconferences.org/pdc2013/, co-sponsored by the IAU, was held in Flagstaff (AZ, USA), 15-19 April 2013. It was preceded on 14 April by a special session on the Chelyabinsk Impact event of 15 February 2013. The conference, which became part of the International Academy of Astronautics (IAA) conference series in 2009, was the fifth in the series of Planetary Defense Conferences. Previous PDCs were held in Anaheim (CA, USA, 2004), Washington, D.C. (USA, 2007), Granada (Spain, 2009), and Bucharest (Romania, 2011).

As usual, this PDC brought together world experts to discuss current understanding of asteroids and comets that might pose an impact threat to our planet, techniques that might be used to deflect or disrupt an object on collision course, the design of deflection campaigns, consequences of an impact, and political and policy issues that might affect a decision to take action. The PDC2013 was attended by over 225 individuals and sponsored by 23 organizations, including the IAU. It is relevant to note the major space agencies among the sponsors, like NASA, ESA, ROSCOSMOS, and JAXA. The involvement and sponsorship of those agencies is relevant, since planetary defense is by definition an international issue. Should an asteroid or comet be found on an Earth impact trajectory, it is likely that several space-faring nations would be involved in characterization, deflection, and/or disruption missions.

The program covered topics relevant to Near-Earth Objects (NEOs) like: (i) Discovery – the state of the art ; (ii) Physical characterization; (iii) Mitigation techniques & missions; (iv) Impact effects that inform warning, mitigation, & costs; and (v) Consequence management & education.

While preparing for the PDC2013, the world was taken by surprised by the Chelyabinsk Fireball, Airburst and Impact event on 15 February 2013. That event triggered an extra public session held one day before PDC2013, which provided a preliminary scientific analysis of the asteroid impact and implications for planetary defense in general.

2. The Chelyabinsk Fireball, Airburst and Impact

(adapted from Wikipedia, see < http://en.wikipedia.org/wiki/Chelyabinsk_meteor>.)

It was bound to happen again, someday. On 15 February 2013 at 03:20 UTC, an asteroid with an estimated diameter of 17-20 m entered the Earth atmosphere over Chelyabinsk in the southern Ural region of Russia, with an estimated speed of 18.6 km/s – about 50 times the speed of sound at explosion altitude – and quickly became a brilliant superbolide meteor. The light of the meteor was brighter than that of the Sun. It was observed over a wide area of the region and in neighboring republics. Local residents in Chelyabinsk, Sverdlovsk, Tyumen, and Orenburg Oblasts, the Republic of Bashkortostan and in neighboring regions in Kazakhstan witnessed extremely bright burning objects in the sky. Car webcams recorded a fireball streaking across the sky and a loud boom several minutes afterwards. Eyewitnesses also felt intense heat from the fireball and said that the air smelled like gunpowder.

On that morning the impacting asteroid was undetected before its atmospheric entry, because it approached the Earth along a direction within 15 degrees of the direction to the Sun. Asteroid detection telescopes cannot scan regions of the sky this close to the Sun. Analyses of the available data show that the asteroid's orbit reached from the Main Asteroid Belt between Mars and Jupiter at aphelion to near the orbit of Venus at perihelion. The asteroid had likely been following this orbit for many thousands of years, crossing the Earth's orbit every time on its outbound leg. Due to its velocity and shallow atmospheric entry angle, the object exploded in an airburst at a height of ~ 23.3 km. The atmosphere absorbed most of the object's energy, with a total kinetic energy before atmospheric impact equivalent to ~ 440 kilotons of TNT, i.e., 20 to 30 times the energy that was released by the atomic bomb detonated over Hiroshima.

About 1,500 people were injured due to the powerful shock wave minutes after the superbolide's flash, mainly from broken glass windows. Some 7,200 buildings in six cities across the region were damaged. Note that the effects on the ground would have been more severe if the object had entered at a steeper angle. Numerous related meteorites have been collected already and the search continues.

16 hours later in the day, the well predicted close approach of the 40 x 20 m asteroid 2012 DA14 occurred harmlessly, as it passed over the Earth surface at an altitude of 27,684 km. The two events were unrelated to each other.

With an estimated initial mass of about 11,000 ton and measuring 17-20 m in size, the impacting asteroid causing the Chelyabinsk Fireball and Airburst is the largest known natural object to have entered Earth's atmosphere since the Tunguska event on 30 June 1908, which destroyed a forest area of over 2000 km^2 in Siberia. The Tunguska asteroid was thought to be ~ 40 m in size before impact.

3. Background and surveys

(adapted from the PDC2013 White Paper)

PDC2013 started out with reviews about currently funded and ongoing worldwide activities that relate to planetary defense. Presentations included a history and timeline of past planetary defense activities and a summary of activities at the United Nations Committee on the Peaceful Uses of Outer Space (UN-COPUOS) in Vienna (Austria), where Action Team 14 on Near Earth Objects has been developing recommendations as to how the world community should address a potential impact. Last February, AT-14 presented its recommendations to the Science and Technology Subcommittee of UN-COPUOS, advising the establishment of three coordination groups: an International Asteroid Warning Network (IAWN), a Space Mission Planning Advisory Group (SMPAG), and an Impact Disaster Planning Advisory Group (IDPAG).

In Europe, the European Commission has approved and funded a 3.5 year study on "Prevention of Impacts from Near-Earth Objects on our Planet" under the name NEOShield. The 5.8-million-euro study, led by the German Aerospace Center (DLR) Institute of Planetary Research, was initiated in January 2012 and will investigate aspects of three potential deflection techniques: kinetic impactor, gravity tractor, and blast deflection. The study includes partners from Germany, France, UK, Spain, USA, and Russia. Details are available at <http://www.neoshield.net/en/index.htm>.

The United States has provided over 95 % of the new detections of NEOs since NASA made the commitment to the US House Committee on Science in 1998 to discover within 10 years 90 % or more of the NEOs larger than 1 km in size. It is estimated that presently ~ 95 % of the NEOs larger than 1 km have been discovered, some 900. The discovery program has also found ~ 9000 smaller objects, a number that continues to climb. Estimates are that less than 10% of objects smaller than 300 meters and less than 1% of objects less than 100 meters have been discovered so far. The surveys have retired two potential threats: that of an impact by the near-Earth asteroid Apophis in 2036, and that by near-Earth asteroid 2011 AG5 in 2040. The largest remaining known threats are a possible impact in 2182 by near-Earth asteroid 1999 RQ36 and a possible impact in 2880 by near-Earth asteroid 1950 DA. NASA has signed a Space Act Agreement to support the B612 Foundation's foreseen survey mission SENTINEL, a 50-cm IR space telescope to operate in a Venus-like orbit, due for launch in 2018. Furthermore, NASA is (a) supporting UN-COPUOUS activities as mentioned above; (b) has provided testimony to the US House Science Committee on threats from space following the Chelyabinsk Impact event; (c) led the Impact Emergency Tabletop Exercise with the US Federal Emergency Management Agency (FEMA); and (d) presented a proposal for an asteroid retrieval mission as part of the US President's FY2014 budget submittal.

Details on NASA's NEO program are available at <http://neo.jpl.nasa.gov/> and <b612foundation.org/sentinelmission/>.

The first and most critical step in planetary defense remains: finding all near-Earth objects. The most productive (US) surveys are, in order of productivity, the Catalina Sky Survey (CSS), Pan-STARRS 1, the Lincoln Near Earth Asteroid Research Program (LINEAR), and Spacewatch. The US survey capability will be enhanced in the near future by the Asteroid Terrestrial-Impact Last Alert System (ATLAS), Pan-STARRS 2, the Large Synoptic Survey Telescope (LSST), and, hopefully, B612's SENTINEL.

4. Physical characterization

A further PDC2013 session discussed the physical characterization of asteroids and how asteroids of various types might respond to deflection techniques. Specific topics included:

- What spin rates say about an asteroid's mass, density, and structure.

- Strength of small asteroids (less than ~10 km in diameter) based on spin rates and discussion of whether spin rates could be used to distinguish between monolithic rocks or rubble piles.

- What can be learned by flyby of an asteroid?

- Details of the impact hazard for 2011 AG5, keyholes for the 2023 close approach and possible mission designs for a pre-keyhole deflection, should measurements show that such a mission might be warranted. The proposed mission would use a kinetic impactor to provide the required delta-v to

the asteroid. The mission would include a precursor spacecraft that would aid in targeting and confirm a successful deflection.

-The ExploreNEOs project and the Warm Spitzer Near Earth Object Characterization Study, which has observed 600 NEOs in the infrared and measured albedos and diameters.

- Radar observations to determine physical properties of NEOs spatially resolve NEOs down to 4m resolution and as such perform better than ground-based and space-based optical observations. Radar observations also yield 3-D shape models, resolve surface features and roughness, and determine spin rates. Most importantly, orbits determined from radar measurements are very precise. As a result, uncertainties in future orbit tracks and possible Earth impacts can be substantially reduced.

5. Impacts effects that inform warning, mitigation and costs

Further PDC2013 sessions examined what might be done to prevent an impact if a threatening NEO on a collision course with the Earth is discovered. Reviews were presented of the latest research on deflection and disruption techniques and on missions and techniques that might deliver a deflection/disruption payload to the threatening NEO.

Should a threatening NEO be detected, the process for deciding the appropriate course of action will include discussions of the possible consequences of an impact. Presentations highlighted (i) existing tools that can be used to predict possible impact consequences, (ii) evidence of the nature of impacts from observations of impacts on other planets, notably Mars and Jupiter, and (iii) compared the cost of impact to the cost of an effective discovery system. Specific topics included:

- An on-line tool for estimating the damage caused by asteroid impacts (Purdue University and Imperial College, London) - ImpactEarth! <www.purdue.edu/impactearth/>.

- Impacts into Jupiter and details of the asteroid that created Meteor Crater (AZ, USA).

- Infrastructure consequences, like impacts on population, direct and cascading impacts on infrastructure, and economic effects, for a major earthquake to illustrate capabilities of existing consequence prediction tools.

6. Consequence management and education

Another one of the key challenges of managing the consequences of a potential asteroid impact is educating the public on the nature of NEO threats, their evolution, and (in the event of an actual threat) what people can do to protect themselves. In addition, organizations responsible for disaster mitigation should understand how they can best contribute to the effort. The following topics were discussed in detail:

- An international communications response plan needs to focus on educating government officials and the public on the nature of NEO threats. The recommended approach is to use all available media and include documentation from reputable space agencies, planetaria, and university programs. A successful approach will take advantage of teaching opportunities during NEO close approaches and noteworthy meteor events. An effective responsive plan will develop a clear international chain of command for dealing with NEO risks. The plan will also design a communication strategy that makes use of findings from experts in risk communications and will employ "trust agents" that have appropriate skills and credibility to communicate with non-expert audiences.

- Informing the public and decision makers that false alarms are part of the nature of NEO threats. Controversial, inaccurate, and misleading messaging should be expected and handled effectively. In the event of a severe threat, there may be a perception that technologically-advanced nations are imposing their will on others, so geopolitical concerns and perspectives are important; there could be legal challenges to proposed actions and issues of financial responsibility may be raised for losses due to false alarms. In addition to warnings about short term effects of an impact, secondary effects such as earthquakes, fires, weather effects and others must be communicated. A communications plan

must anticipate and address controversies and approach communications in phases (general, specific, imminent).

- Challenges facing communication about NEOs include the fact that mass media and, increasingly, social media play key roles in public discourse about science. As a result, and as always, communications of information about NEO threats must be open and transparent.

- Findings, results, and data are always open to different interpretations. Following conventional scientific practice, scientists should present their data, interpretations and findings with clear error bars. Communications of key findings must be communicated in a clear way to non-technical audiences.

- Journalists are compelled to clarify, avoid, or eliminate ambiguity or uncertainty, in keeping with long-standing news values and journalistic practices and conventions.

7. Conclusion

Once again, it should be emphasized that extending and improving all national and international NEO surveys is of paramount importance and should have first priority.

Further information can be found at, e.g., <http://www.iau.org/public/nea/>, and in:

D.K. Yeomans, 2012, *Near Earth Objects - Finding them before they find us* (Princeton University Press).

7.5 World Heritage of Astronomy (UNESCO)

Thierry Montmerle, General Secretary of the International Astronomical Union (IAU) and Mr Kishore Rao, Director of the UNESCO World Heritage Centre, after the signing of the MoU. (Image: UNESCO)

The International Astronomical Union (IAU) and UNESCO have renewed their Memorandum of Understanding at UNESCO's Headquarters. The agreement has been concluded in the framework of the thematic initiative Astronomy and World Heritage, which is celebrating its tenth anniversary. The purpose of the initiative is to reinforce the links between science and culture by highlighting the importance of heritage linked to astronomy.

The participants at the signing ceremony included Professor Thierry Montmerle, General Secretary of the International Astronomical Union (IAU); Mr Kishore Rao, Director of the UNESCO World

Heritage Centre; Professor Clive Ruggles, IAU Special Advisor, UNESCO Liaison, Ms Anna Sidorenko, Coordinator, thematic initiative Astronomy and World Heritage, World Heritage Centre.

Thierry Montmerle expressed the IAU's commitment to ensuring the implementation of the initiative and said: "*I would like to convey our gratitude to the UNESCO World Heritage Center for its efforts in promoting astronomical heritage. Thanks to this initiative and our collaboration astronomy exists now in the third dimension — the history of astronomy is documented both through time and across continents.*"

Mr Kishore Rao expressed appreciation for the fruitful collaboration, and congratulated the IAU on having made all the necessary efforts to enhance collaboration between the scientific and cultural communities, in support of the World Heritage Convention; and provide an opportunity to raise public awareness about this particular type of heritage.

The three-year agreement commits UNESCO and the IAU to promote astronomical sites and provide states party to the World Heritage Convention with expertise, as they prepare nominations for locations to be included in the World Heritage List of exceptional sites that bear witness to major breakthroughs in the development of scientific knowledge. This is a step towards the recognition of the importance of the worldwide astronomical heritage, and its role in enriching lives throughout history and promoting international exchange.

UNESCO and the IAU signed a first memorandum within the framework of the thematic initiative on Astronomy and World Heritage in 2008. It was renewed in 2010 and implemented through close cooperation between UNESCO's World Heritage Centre and the IAU, sparking off a series of activities entitled "Astronomy and World Heritage; across time and continents." It also led to the publication of a thematic work on astronomical heritage, compiled in cooperation with the International Council on Monuments and Sites (ICOMOS), to the creation of a web portal on the history of astronomical heritage and to the organisation of numerous seminars and conferences on the subject. The portal can be found at http://www2.astronomicalheritage.net/.

8. IAU Publications

8.1 Highlights and Transactions

The edition of the volumes has not started yet, due to the heavy workload of the GS. For the Highlights, almost all Beijing JD and SpS proceedings have been received. For the Transactions, only 13 Commissions (out of 39) have sent their triennial reports. This fact will be taken into account in the review of Commissions to be undertaken by the Divisions in the coming months.

8.2 IAU Symposium Proceedings

The Proceedings of all the Symposia of 2011 but one have been published. The remaining one (IAUS281) is being printed. Among the Symposia of 2012, the Proceedings of IAUS288 is close to be printed, those of IAUS289, IAUS290 and IAUS291 are in production. The draft files of IAUS292 have been received. The remaining ones are pending.

Latest publications

IAUS 279 The Death of Massive Stars: Supernovae and Gamma-Ray Bursts

12-16 March 2012, Nikko, Japan

Eds. Peter W.A. Roming, Nobuyuki Kawai, Elena Pian

Cambridge University Press

ISBN 9781107019799

IAUS 283 Planetary Nebulae: An Eye to the Future

25-29 July, Puerto de la Cruz, Tenerife

Eds. A Manchado, L Stanghellini, D Schönberner

Cambridge University Press

ISBN 9781107019836

IAUS 284 The Spectral Energy Distribution of Galaxies

5-9 September 2011, Preston, United Kingdom

Eds. Richard J Tuffs, Cristina C Popescu

Cambridge University Press

ISBN 9781107019843

IAUS 286 Comparative Magnetic Minima: Characterizing quiet times in the Sun and Stars

Mendoza, Argentina October 2011

Eds. David Webb and Cristina Mandrini

Cambridge University Press

ISSN: 1743-9213

IAUS 287 Cosmic Masers - from OH to H_0

29 Jan - 3 Feb, Stellenbosch, South Africa

Eds. R.S. Booth, E.M.L. Humphreys, W.H.T. Vilemmings

Cambridge University Press

ISBN 9781107032842

9. IAU Archives

9.1 Digitizing the IAU Archives: New Inititative

Thierry Montmerle, General Secretary

A new project has emerged, which aims at making real a long-time dream: to digitize the IAU Archives, here defined primarily as the IAU Publications: Symposia, Colloquia, Highlights, Transactions A and B, as well as other IAU documents of interest. While the Transactions are dating back almost from the creation of the IAU in 1919 (the first GA took place in 1922), Symposia were instated in 1953, Colloquia in 1959 (and terminated in 2005), and the Highlights in 1967. The publication history, reconstructed thanks to the hard work of Ginette Rude at the Secretariat in Paris, is complex, with many publishers (sometimes institutional, like observatories or universities), and their editors not always easily identified. However, in more recent years, the publishers have been more stable, and have printed whole series for the IAU: Cambridge University Press (CUP), Kluwer, Reidel, the Astronomical Society of the Pacific.

In parallel, the Secretariat learned by chance that Springer included IAU Publications in its "Springer Book Archive" project, which consists in digitizing all its book stock, including those of the publishers it acquired in the mean time (like Kulwer and Reidel). This means that already many IAU Publications of the recent past (from the late seventies, roughly, though not the ASP publications) are already digitized by them, without the consent of the IAU, although the IAU is the owner of the copyright of all its publications. The goal of the IAU is therefore to make these archives freely available to its members, and steps have been taken with Springer towards establishing a contract to that effect. The quest for IAU Publications possibly digitized by other publishers continues with the

help of Ginette Rude, as well as for means to digitize other archives (like internal IAU documents of potential interest to historians).

For the record (and to keep in mind !), the total number of pages represented by IAU Publications from 1922 to 2005 (IAUS 222) is 323 153. (Since 2005, all IAU Publications are available in digital form from CUP, and from ADS.) The number of pages already digitized by Springer is 124 295. In other words, for the moment the estimated number of pages yet to be digitized for the IAU Publication Archive to be complete is around 200 000.

10. Managing the Older Population of Astronomy's Data Archives

Elizabeth Griffin, Dominion Astrophysical Observatory, Victoria, Canada

Like all Earth sciences, astronomy places enormous dependence upon data that span Time, whether measured in microseconds or decades. All celestial objects are varying in some way – periodically, spasmodically, recurrently or (apparently) non-repeatingly – as well as slowly altering as they evolve. Substantial and indispensable evidence, even of very rapid evolutionary changes, can be found in our plate archives and could be readily ingested into research *if only the observations were accessible in electronic form.* But there's the rub. With very few exceptions, today's online databases can only access "born-digital" data: CCD records that were archived in real time and formatted in compliance with some standard. When the records are photographic, magnetic-tape or hand-written, do we shunt them as they are into a museum and deny astrophysics the ability to recapture the longer-term data that it so often needs? Surely the answer is "No", but Who is doing What about it?

The principles of capturing astronomy's non-digital information have featured in numerous IAU reports, Resolutions, Working-Group programmes, joint discussions, workshops and conferences. The matter came to the fore at the closing General Assembly in Manchester (2000), resulting in the creation of a Task Force for the *Preservation and Digitization of Photographic Plates (PDPP).* Now 50+ strong, the *PDPP* absorbed members from the terminating WGs for *Spectroscopic Data Archives* and *Carte du Ciel*; its occasional Newsletter, *SCAN-IT,* is available at http://atlas.obs-hp.fr/pdpp/scan-it/ . The *PDPP* is building a bibliography of papers whose results could *only* be achieved by digitizing plates, and the editor (sergio.ilovaisky@oamp.fr) warmly welcomes input. The *PDPP* acts as an advisory body and a watchdog on matters of plate archiving, and provides rapid alerts should a threatening situation arise.

However, the tasks of transforming non-digital observations *faithfully* are challenging, and behind them are those searching questions of *Who* and *How.* A digital copy of a photographic plate is an observation of an observation, so the overarching requirement is to minimize the modifications which the digitizer will make to the record's intrinsic properties. The selection of a scanner should therefore be determined, not by budget or speed alone, but by the properties of the plates too. Commercial scanners were not designed to cope with the astrometric precisions of many astronomical collections, nor with the photometry that is fundamental to most spectra (except possibly objective-prism ones); those scanners can have positional instabilities, and their photometry is almost certain to be compromised. The PDS of the 1970s and 80s, though slow, *was* purpose designed, and those that still exist and are upgraded to state-of-the-art are unsurpassed in terms of the fidelity of spectrophotometry which they can deliver. On the other hand, if direct plates have grainy emulsions like 103a, or never were of astrometric quality, then digitizing them with a high-precision scanner may be overkill.

Modern technology and improved computer performance have realized new possibilities for digitizing astronomy's photographic heritage. There are at least 3 million plates in the world, but not all need to be scanned, or not at first (or unless scans are requested). Surely astronomy can accommodate this transformation of such a unique resource? Harvard Observatory's development of a rapid digitizer, DASCH (http://dasch.rc.fas.harvard.edu/status.php), designed to deal optimally with its collection of over 500,000 large plates, is a major project and is being a major success. In Canada (Victoria), the DAO (http://www.cadc.hia.nrc.gc.ca/dao/pa.html) is unique in scanning its 100,000 spectra with an upgraded PDS. The output to date – fully reduced spectra as 1-D FITS files - are in the public domain and can be accessed via the CADC; requests can be entertained to digitize

specific plates, or ones from elsewhere (if sent). A few observatories – such as the Vatican and Maria Mitchell – have completed the scanning of their relatively modest collections, using commercial scanners, and ones in Italy, Germany and France (*inter alia*) have attempted to do likewise.

To what extent can or should other observatories follow suit? Loss of relevant expertise and evolving interests render it unrealistic for each observatory with a plate store to create its own scanning centre, but there are important efforts to establish national or regional centres. China has created an archive-grade repository for plates from its observatories, and is currently assessing the optimal parameters for a scanner. The 5 major observatories of the Ukraine are operating differently, each observatory tackling the scanning of its own plates as determined by the nature of the materials, and conjoining the results into a national "Virtual Observatory" that will provide seamless access to distributed databases, and software tools for data reductions for a number of different applications. Bulgaria has developed an indispensable Catalogue of direct plates (http://www.skyarchive.org), primarily to provide information on the various holdings in observatories world-wide and now including scans (where available) of some of those sources.

We return, however, to the basic fact that a digitization is an observation of an observation. Scanning with a commercial flat-bed machine may produce a result that is visually pleasing, and it is definitely the way to produce a database of "quick-look" scans rapidly and inexpensively, but will they bear enough of the intrinsic properties of the images as to render them of unimpeachable scientific quality too? This is a topic that still fuels debates, and will need to be settled on a case-by case basis by sending samples for scanning with different equipment and intercomparing the results against selected criteria. Building and operating a purpose-built digitizer is not trivial, and even the use of its poor relation, the commercial scanner, absorbs operating resources. Weighing the cost against the returns is never straightforward as we cannot put a price on knowledge, nor can we quantify the "value" of data. But inasmuch as substantial areas of astrophysics depend critically upon observations across decades, then bringing our heritage into the realm of digital access has to feature as an important – and indispensable – industry that serves our science every bit as much as does building a new telescope for it (and the price tag will be immensely smaller).

The starting points are ensuring that the plates are appropriately stored, that the all-important meta-data, usually in log-books but sometimes solely on plate envelopes, are preserved digitally (preferably by keying-in in order to create a searchable inventory), and that quick-look scans of plates in their original condition are prepared whenever they bear handwriting that is deemed to be of scientific usefulness or historical interest. Selecting and acquiring the most appropriate digitizing machine is *the* decision that will dictate the quality of the end results, and cannot be taken lightly. Cloning the top-end of the *DASCH* digitizer, for instance, and sending it on a peripatetic journey to world observatories, may be a possibility for the medium-term future. Demonstrating the value that has already accrued to our science through accessing historic data electronically is essential for fund-raising, and that bibliography, referred to above, of relevant research papers is going to be a very, very important carrot in those attempts.

Making astronomy's preserved observations accessible electronically should be viewed in the context of producing a new survey. While the intrinsic properties of many of the data may not match modern achievements, the irrefutable advantage is the date-stamp. Astrophysics did not commence in the 1980s when born-digital data started to become available on-line. Thanks to cataloguers and observatory logbooks, we know what the plate archives contain, and all that remains is to make the observations accessible. Preserving the raw material well is of course necessary, but is in no way sufficient; few people nowadays have the expertise, and fewer still the right equipment, to digitize photographic material for themselves. Yet it is not an open-ended task; the amount of work is finite, and has only to be done once. The bottom line is the quality and breadth of our scientific knowledge.

11. Deceased Members

The Union is saddened to learn that the following members and former members passed away, as has been reported to the IAU Secretariat:

Dr. Vladimir Razin	Russian Federation (1931-2012)
Dr. Christopher Morbey	Canada (1944-2012)
Mr. Murray Fletcher	Canada (1940-2012)
Dr. Walter Fitch	USA (1926-2013)
Dr. Elena Kostyakova	Russian Federation (1926-2013)
Prof. Bela Szeidl	Hungary (1938-2013)
Dr. Keizo Nishi	Japan (1926-2013)
Dr. Donat Wentzel	USA (1934-2013)
Prof. Keiichi Ishida	Japan (1934-2013)
Prof. Yoshio Fujita	Japan (1910-2013)
Dr. John Hadjidemetriou	Greece (1937- 2013)
Dr. Michel Henon	France (1932-2013)
Dr. Douglas Hall	USA (1942-2013)
Dr. Jozef Ziznovsky	Slovakia (1946-2013)
Prof. Vigen H Malumian	Armenia (1932-2013)
Dr. Alain Mazure	France (1948-2013)

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INTERNATIONAL ASTRONOMICAL UNION
UNION ASTRONOMIQUE INTERNATIONALE

The International Astronomical Union (IAU) was founded in 1919 to promote and safeguard the science of astronomy in all its aspects through international cooperation. Operating through its scientific bodies – 9 Divisions, 40 Commissions and some 73 Working and Program Groups, the IAU covers the whole spectrum of astronomy. The IAU currently has over 11,000 individual members distributed over 91 countries, of which 73 are National Members. The IAU is member of the International Council for Science (ICSU).

The organisation of scientific meetings is the IAU's key activity. Every year, the IAU sponsors nine international Symposia. The IAU Symposium Proceedings series is the flagship of the IAU publications. Every three years, the IAU holds its General Assembly (GA). Six of the IAU Symposia of that year are incorporated in the scientific program of the GA. Each GA further offers more specialized meetings named "Focus Meeting", the proceedings of which are published in the Highlights of Astronomy series. The reports of the GA Business Meetings are published in the Transactions of the IAU – B series. All IAU proceedings are published by Cambridge University Press.

Among the other tasks of the IAU are the definition of fundamental astronomical and physical constants and standards promotion of outreach and educational activities in astronomy and to provide a discussion forum for future international large-scale facilities. Furthermore, the IAU is the sole internationally recognized authority for assigning designations and names to celestial bodies and their surface features.

The IAU works to promote astronomical education and research in developing countries through its "Office for Astronomy Development" (OAD), though its Program Groups "International Schools for Young Astronomers" (ISYA), "Network for Astronomy School Education" (NASE), "Teaching for Astronomy Development" (TAD), and "World Wide Development of Astronomy" (WWDA), as well as through joint educational activities with COSPAR and UNESCO.

The IAU web site provides on-line information on the Union's activities and links to the web sites of the IAU Divisions, Commissions, Working Groups, and Program Groups. Contact with the IAU membership is maintained through this Information Bulletin, published twice per year, with an e-version, available via the IAU web site and via regular e-Newsletters.

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Cover picture:

The picture represents the peacock *Suzaku* associated with South direction in the Japanese mythology. This name has also been given to the latest Japanese X-ray satellite, launched on July 10, 2005. Image from the National Research Institute for Cultural Properties, Nara, Japan.

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