

IAU Commission 15 Newsletter: December 2004

Date: 27 December 2004
To: Members of IAU Commission 15
From: Ed Tedesco (with input from W. Huebner, P. Jenniskens, Organizing
Committee members, and Working Group chairs)
Subject: December 2004 Commission 15 Newsletter

As we approach the half-way mark between IAU General Assemblies XXV and XXVI we need to begin planning for Commission activities preceding, at, and beyond the next GA. A number of activities have already begun. The purpose of this Newsletter is to bring you up to date on these activities and request your help in contributing the ongoing activities and in suggesting and developing others.

To date, most routine Commission activities have been dealt with by the President with the assistance of the Vice President, Secretary, and the chairs of the Working Groups on Comets and Minor Planets. These activities included:

- 1) Preparing the IAU Commission report for the Transactions of the International Astronomical Union Volume XXIVIB, *Transactions 2003*. This report, prepared with substantial help from Walter Huebner, is essentially the minutes of the GA XXV Commission 15 Business Meetings.
- 2) Preparing the proceedings of Joint Discussions 14 and 19 held at GA XXV for publication in the IAU *Highlights of Astronomy*. These too were prepared with substantial help from Walter Huebner and, of course, from the Joint Discussion co-chairs and presenters.
- 3) Creating an updated version (with respect to those published in the *Transactions 2003*) of the GA XXV Commission 15 Business Meeting minutes (attached).
- 4) Arranging for the NASA ADS abstracting service to incorporate all available *Asteroid, Comet, Meteor* conference abstracts and (where possible) proceedings. The "*Asteroids 0*" book (Physical Studies of Minor Planets, Proceedings of IAU Colloq. 12, held in Tucson, AZ, March, 1971. Edited by T. Gehrels. National Aeronautics and Space Administration SP 267, 1971) was also submitted but only titles and citations are available from the ADS¹.
- 5) Obtaining and updating the Commission 15 membership list. This updating process is still underway. I have updated about a dozen e-mail addresses and we have found addresses for a similar number lacking them. Currently, the list contains e-mail addresses for 289 members. In addition, there are 58 members with no e-mail address. I suspect that there remain many incorrect e-mail addresses in the list. Examining the bounce messages from this Newsletter will provide data on this.
- 6) Relocating and updating the Commission web site. As noted in the GA XXV Business Meeting minutes, the Commission web site has been moved to: http://atlas.sr.unh.edu/IAU_Comm15/ and construction of Comet and Minor Planet web sites has begun.

IAU Information Bulletin 96, to be distributed in January 2005, will include an announcement regarding the new Commission 15 web site.

- 7) Supporting proposals by members of our Division for meetings unrelated to the next IAU General Assembly. These include the **Asteroid, Comet, Meteor** conference in Rio de Janeiro, Brazil, 7 - 12 August 2005, a proposed Colloquium on **Dust in Planetary Systems** to be held in Kauai, Hawaii, 26 - 30 September 2005, and a proposal by the Working Group on Astrochemistry for an IAU Symposium entitled: **Astrochemistry Throughout the Universe: Recent Successes and Current Challenges**, in Monterey, California from 29 August - 2 September 2005.
- 8) Supporting proposals by members of our Division for meetings to be held in conjunction with the next GA (XXVI). These include two Symposia, one on: **Near Earth Objects, our Celestial Neighbors:**

¹ I will follow-up on why the articles are not provided online. (These papers do not have abstracts and so it is not surprising that these do not appear.) I already submitted the only soft cover copy of this book I had. So, if anyone has a copy they are willing to sacrifice (the book is destroyed in the process of "ingesting" it) please let me know. I realize that the papers in this book are dated, however, for historical reasons if nothing else, I would still like to see them online.

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Opportunity and Risk, to be held in Prague during the GA and being organized by Andrea Milani and Giovanni Valsecchi, and another on: **Advances in Comet Science** to be held the week preceding the GA (*i.e.*, between 7 and 11 August) in Dresden, Germany, being organized by Walter Huebner and Tetsuo Yamamoto. In addition, Commission 16, under the direction of Guy Consolmagno, is proposing to hold a Special Session at the GA entitled: **Progress in Planetary Exploration Missions**. See [Appendix A](#) for the rationale and tentative topics for these proposed meetings.

- 9) Preliminary planning (thus far all we have done is reserve the time!) for Commission Scientific Sessions during the next GA. Topics suggested thus far (by Alberto Cellino) for the Minor Planet sessions include the determination of the asteroid inventory and size distribution at small diameters. For example, discussions on the differences between results obtained from visual and thermal infrared surveys, and perhaps something about the improved capability to directly measure the larger asteroids by means of speckle interferometry, adaptive Optics, radar, the planned GAIA mission, *etc.* Whether to schedule scientific comet sessions is yet to be decided and depends upon whether the proposed comet Symposium takes place.

10) Future of the Commission

As I wrote in the attached minutes, regarding GA XXV:

“The restructuring of how the IAU is organized, in particular the role of Commissions, dominated the meeting. A written justification, presumably submitted to the IAU EC by the Division, giving the accomplishments and objectives of each Commission will be required by the 2009 General Assembly in order for them to remain in existence. It was unclear, at the time of the GA, whether this EC approval is to be repeated every three (or six) years for both Commissions and Working Groups, or only for Working Groups.

Since most people attending the GA learned of this proposal only after arriving in Sydney (and even then, only by hearsay since the actual proposal was unavailable), no consensus regarding what to do in practice was reached. Instead, it was decided to discuss this among the Division III membership, as well as within each of the Division III Commissions and Working Groups, during the next three years and to present the results of those discussions at the next General Assembly.”

Thus far there has been no formal discussion of this issue by the members of Division III (which includes all of us). I would like to open the discussion on this issue within C15 here. Let me start by presenting my view of this reorganization based on discussions with the officers of Commission 15, the President of Division III (Iwan Williams), and information from the IAU website, the source for the material in quotes below (<http://www.iau.org/IAU/Organization/admdoc/usersguide.html>).

It is my understanding that the IAU Executive Committee (EC) wishes to deal with, and delegate much of the authority to, fewer “entities”, *viz.*, the 12 Divisions (“*which are created, merged, or discontinued by the GA on the proposal of the EC*”) instead of the current 41 Commissions and 86 Working and Program Groups. “*Divisions may create, merge, or discontinue Commissions and Working Groups, submit proposals for IAU meetings, and propose new Individual Members. The EC can approve such initiatives by (e-)mail - i.e. rapidly, if needed.*”

With respect to Commissions: “*... the new structure has been designed especially to encourage renewal of the Commission structure. But we stress emphatically that the goal of this exercise is the progress of science, not change for its own sake.*”

In the future, Commissions are created, merged, or discontinued by the Divisions with the approval of the EC; and they may belong to two or more Divisions. The election of Commission Presidents and Organising Committees is also approved by the Division. Present and new Commissions have a default life span of six years, after which their work is reviewed; their continuation will then require explicit approval every three years (the 'sunset clause').

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Obviously, no well-functioning Commission needs to fear for its life. But science must be the focus. Reviewing the Commissions' activities and action plans regularly will encourage them and the Division to reflect anew on their scientific effectiveness. And the freedom to have new initiatives approved in a matter of weeks rather than years will encourage active people to propose them."

"Working Groups are created to study specific issues for a definite time.", and "Divisions and Commissions are now free to create such Working Groups as they need, with the approval of the next higher level (EC, Division). The parent Division/Commission itself will keep track of its Working Groups and their membership, using its web site. Working Groups are also under a 'sunset clause' and cease to exist after three years, unless their continuation is justified again and approved by its parent Division/Commission."

Thus, whereas (to a great extent) the IAU EC is a "black box", the Divisions are "open". Those of you who attended the last two GAs will have noted that Division III, at least, is quite open. Therefore, I think that in the case of active Commissions and Working Groups, there should be little trouble in getting the Division (which is largely us) to sanction them. (Division III has about 1,000 members of whom about 300 are members of Commission 15.)

Hence, in my opinion, while we should spend the rest of this triennium primarily working to strengthen our Commission we should also devote some thought to "reorganizing" ourselves.

Ideas that have been suggested regarding reorganization include: 1) Having a single Commission called, e.g., simply "Comets and Minor Planets", rather than the two we have at present split between dynamics and physical properties, 2) Having two Commissions, one on the "Physical Properties and Dynamics of Comets" and a similar one for Minor Planets, and 3) a single Commission on "Small Bodies of the Solar System" that would include physical and dynamical studies of everything besides the major planets. Under most of these scenarios there would presumably be several specialized Working Groups that would come and go (or remain for extended periods, if needed).

11) Commission 15 List Server

I have created a private list server for Commission 15, the immediate purpose of which is to distribute the Commission Newsletters, and to which everyone with an e-mail address in the Commission 15 membership list is "subscribed". This message is coming to you from that list server.

Eventually, we may want to add "topics" sub-lists in which people can discuss specialized subjects. For example, we could have, "Asteroid", and "Comet" topics, or even narrower ones, e.g., "Trojan Asteroids", "Jupiter Family Comets", "the asteroid absolute magnitude system", etc. Commission-wide subjects, like that of the reorganization, would remain in the main list server.

Any member can send a message to the entire list by addressing it to: iau-c15@lists.sr.unh.edu, however, messages from anyone except me and the commission secretary (Peter Jenniskens) will require our approval before being distributed. We probably do not need to run this as a moderated list for the long term but, until we see how things go, I'd like to start out this way.

I'd like your feedback on what you think of this approach to communicating among ourselves.

Note that if you "Reply" to this message, you will be replying to the entire list server. If you wish to reply to me alone, please address your reply to Ed.Tedesco@unh.edu

If you would rather not receive future messages from the Commission 15 list server, either send me an e-mail message or go to <http://lists.sr.unh.edu/mailman/listinfo/iau-c15> to unsubscribe. You can also change your subscription options (e.g., elect to receive list mail batched in a daily digest) or read the collection of prior postings to the list from this list server page.



On behalf of the Commission officers I wish all of you a happy and productive New Year.

Ed Tedesco

Appendix A. Symposia Rationale

Proposed IAU Symposium entitled: **Near Earth Objects, our Celestial Neighbors: Opportunity and Risk**

Although the Near Earth Objects (NEOs) are the closest neighbors of the Earth-Moon system, they have been discovered and studied only in comparatively recent times. Their relative proximity allows research which is not yet possible on more distant small bodies. Thus the NEOs are an essential tool to understand the overall populations of asteroids and comets, to constrain the formation of the planetary system. This symposium will concentrate on the specific techniques of observation and modeling which are effective for NEOs, including radar, in situ exploration by spacecraft, and measurement of very subtle dynamical effects such as non-gravitational perturbations.

NEOs are important because they can strongly interact with the terrestrial planets, thus they are the physical cause of important evolutionary processes on the planetary surfaces and in the atmospheres. This includes cratering, formation/removal of atmospheres and perturbations to the biosphere. The low mass tail of the NEOs continuously interacts with the planets producing meteor phenomena and delivering meteorites. Being our closest celestial neighbors, they are most relevant for us, but also are our intermediaries to understand a wider region, such as the entire solar system, and give us a glimpse to really universal phenomena such as impacts, occurring in whatever planetary system.

The NEOs with orbits crossing that of the Earth are also a source of impact risk, and this is being successfully taken care of by astronomical observations, dynamical computations and development of deflection technology. The next generation search programs designed to discover most of the hazardous NEOs will result in an extraordinary wealth of data with scientific value, and this in synergy with other astronomical communities interested in transient phenomena. The space missions planned to develop the know-how and the technology for orbital deflection will provide information on the interior structure and on the collisional evolution better than that available for any other body.

Last but not least, the educational value and public outreach potential of NEO related issues are outstanding. The IAU has had in recent years an important role in putting the impact phenomena in the proper context, helping in correcting the public perception and showing that astronomy does something which is, at least potentially, important for the society at large.

Tentative Topics:

- a) Origin and dynamics of NEOs
- b) Physical properties of NEOs, including internal structure
- c) Next generation surveys and synergies with other astronomical communities
- d) Spacecraft exploration of NEOs
- e) Interactions of NEOs with planets: cratering, meteors and meteorites
- f) The astronomical aspects of the impact hazard

Proposed IAU Symposium entitled: **Advances in Comet Science**

The intent of the proposed Symposium is to pursue in greater depth a discussion that was initiated at the one-day JD14 meeting at the GA in Sydney, Australia. It involves a broad spectrum of interlinked topics of which the composition and structure of comets is a central theme. In one direction, we want to explore the link to the interstellar medium and star forming regions via the solar nebula and in the other direction, we want to investigate the link to pre-biologic molecules, the evolution of comets to inactive, asteroid-like bodies, and the connection to meteors. Comet missions such as Stardust (sample return from Comet 81P/Wild 2 in January, 2006) and Deep Impact (impact on Comet 9P/Tempel 1 on 4 July, 2005) will provide newly analyzed results. Results will be better understood one year after analysis. These results, supplemented by ground-based observations, laboratory simulations, and modeling will advance our scientific understanding about the formation of comets and their composition and structure. This information will better define the thermodynamic conditions in the regions of the solar nebula in which

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comets formed and may yield new clues about the origins of life. Specifically, results from the Stardust mission may reveal the origin of the crystalline form of comet dust, and the Deep Impact mission may reveal important data about the structure and composition of comet nuclei including more complex molecules. The Symposium will advance our knowledge about the relationship between interstellar materials (such as complex molecules) and processed solar nebula materials (such as the relationship of interstellar grains in comet dust aggregates, their organic content, and their crystalline components). It also will advance our knowledge on the role comets play in the origins of life.

Tentative Topics:

- Reports about the Stardust mission
- Observations
- Data analysis
- Relevant laboratory simulations
- Relevant Comet models
- Reports about the Deep Impact mission
- Observations
- Data analysis
- Relevant laboratory simulations
- Relevant Comet models
- Impact of the comet mission results on the physics and chemistry of solar nebula
- Impact on formation and evolution of comet nuclei (including inactive comet nuclei masquerading as asteroids).
- Impact on meteors
- Impact on pre-biological molecules and the origins of life.

Proposed IAU Special Session on: **Progress in Planetary Exploration Missions**

Results of planetary spacecraft missions that have returned results in the last triennium will be summarized by the project scientists and other principal investigators of the missions. The exact program of the meeting will depend on the outcome of many missions still in progress, but will certainly include presentations on the five missions which, as of the date of this proposal, have already produced notable new results.

We recognize that planetary astronomy extends far beyond the results of spacecraft missions alone. But by concentrating on the results from recent spacecraft missions, we hope to accomplish three goals of interest to the larger IAU community.

First and foremost, these results are intrinsically interesting, even for those of us not directly involved in planetary sciences. In addition, they provide a context in which the wider accomplishments of the planetary astronomy community can be described, results that can have an impact on other fields of astronomy ranging from nucleosynthesis, to star-formation, to the evolution of solar-type stars. And in addition, by concentrating specifically on the high-profile space missions which have already been widely publicized in the general media, this session will serve to provide in-depth information which our fellow astronomers can take back to their home institutions and help them answer the kinds of questions that the general public might ask about these missions.

Missions to be reviewed:

Spirit/Opportunity	Hayabusa
Cassini	Deep Impact
Huygens	Mars Reconnaissance Orbiter
Spirit/Opportunity	Venus Express
Cassini	LUNAR-A
Huygens	SELENE
Spirit/Opportunity	