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Three months ago the XXIVth General Assembly was going on in Manchester, and many of us share pleasant memories of a great event that was very well organised and hosted on a nice university area that appeared fitting to the various aspects of our science. On behalf of us all, I extend the warmest thanks to our British hosts, in particular Rodney Davies, Dennis Walsh and Carole Jordan for their invaluable efforts.

With a multitude of Symposia and Joint Discussions that had been chosen to represent the real highlights of Astronomy with most of the hottest topics covered, we of course had a very tasty smörgåsbord (I just had to use that word!) where, unfortunately, some dishes had to be skipped for lack of time. I hope that the next GA will offer just as rich a programme though, with the aid of improved advance planning, one with less time conflicts. In particular, I encourage everyone who has ideas or wishes about the GA25 programme to submit them as soon as possible to the appropriate Division President or directly to the undersigned. This IB contains an update on the preparation for the XXVth GA in Sydney 2003, (see §8.1) and I am happy to include also a first announcement by our Czech hosts for the XXVIth GA in Prague, 2006 (see §8.2). The choice of this excellent site was nonetheless difficult due to hard competition from an equally attractive invitation offered by our Canadian colleagues.

One of the items of interest from the 2nd session of GA 24 is covered in this IB, i.e. GA Resolution B3 on “Safeguarding the information in photographic observations”(see §7.3). Due to the somewhat unusual circumstances under which it was passed, i.e., in front of unanimous opposition by the EC, I publish here both an explanation of the events that occurred and the reasons for the EC’s points of view, and a description of the ways in which the resolution will be enacted. I personally share the view that the rules and procedures around GA Resolutions are in need of continued attention and possible revision.

Another special event during GA 24 was the announcement of the Cosmology Prize of the Peter Gruber Foundation (PGF) for scientific advances in our understanding and perception of the Universe, the first two of which were recently awarded to Allan Sandage and James Peebles. Starting from 2001, the IAU will contribute to the selection of the prize winners, and also, award two PGF fellowships to especially brilliant postdocs in all fields of astrophysics. Information is found in this IB (see §9.2)

With 703 new members recently welcomed, our individual membership now reaches almost 9000. We will continue to rely more and more on electronic means of communication, and the IAU web page, <http://www.iau.org>, will soon evolve in order to include more information while continuing to be easily accessible. Suggestions and advice from members are always welcome. May I ask everyone to please check his/her entry in our electronic membership file and notify us of any errors.

The IAU Officers and Secretariat wish you all a professionally and personally rewarding 2001!

Hans Rickman
General Secretary

1. FAITS DIVERS

I am happy to inherit this column from my predecessor, Johannes Andersen, who started it three years ago. In fact, the first thing I want to write here is a word of thanks to him for his superb running of the IAU during the past triennium that has set a very easy stage for me to work on, and for his continued interest in IAU matters which I value very much in my obvious need for good advice.

As I watch the leaves on the tree tops outside the IAU office set in motion by a gentle breeze, with rain drifting in over Paris from the English Channel on a gloomy November day, my thoughts go to another natural phenomenon of much lower occurrence rate, namely, major impacts onto Earth by its tiny fellows in heliocentric orbits. There was recently a case, called 2000 SG344, of an object that temporarily presented a set of astrometric observations compatible with an impact in 2030, with a likelihood that placed it near the lower boundary of class 1 on the Torino Scale. The risk was estimated at about 1/500, but the object was so small and its encounter velocity so low that the energy released would certainly be smaller than that of the Tunguska impact in 1908.

We published our assessment with many words of caution that further observations were, of course, likely to remove the risk altogether, and within a day such observations had indeed been identified with the expected result. The impact risk of SG344 in 2030 is essentially zero. I cannot agree with those who claim the IAU caused a fiasco. We have to get accustomed to situations where a publicly stated non-zero impact risk drops to zero, because such is the nature of the game. This will happen even after we refine our procedures to minimise the risk of “false alarm”, but we are gradually learning to do things better.

I find the ongoing developments in the field of exoplanet detections to be among the most exciting of all current astronomical events. The Division III Working Group on Extra-Solar Planets (recently endorsed by the EC) under the able leadership of Alan Boss of the Carnegie Institution, Washington D.C., is having a busy time evaluating all the new data. One important issue is of course the very meaning of the word planet, facing discovery of objects that may span the whole mass range from Jupiter to red dwarf stars whereof some are not even gravitationally bound to any single star. The WG ESP has been and is still discussing a working definition applicable to all substellar objects whether inside or outside the Solar System.

It is sometimes difficult for laymen or journalists to understand that science is a learning process and that it is not useful for the IAU to lay down a crystal clear definition of “planet” while the learning is still in progress. But, we should all do our best to make that point. Just as one new observation may turn a hazardous asteroid into a harmless one, another one may upset our current concepts about what to call a planet. Such is the situation for all the frontiers of astronomical research, of course.

2. MAIN DEADLINES AND EVENTS IN 2001

Proposals for IAU Symposia, Colloquia, Regional Meetings, and co-sponsored meetings planned for 2002 must reach the President of the appropriate Division (or Commission for Commissions not attached to a Division)

no later than March 15, 2001!

in order to be considered at the 75th Executive Committee meeting.

See <http://www.iau.org/meetings.html>.

Proposals and ideas for GA Symposia and Joint Discussions at GA 25 are also welcome at this time. Please submit via Division or Commission Presidents as stated above, for preliminarily discussion at EC75.

Date	Action Item/Event
<u>2001</u>	
04-08	Jan. IAU Colloquium 183, Kenting National Park, Taiwan, China
*15	Jan. Propose Items for discussion at Officers' Meeting
08-09	Feb. Officers' Meeting, Paris, France
05-10	March IAU Symposium 206, Rio de Janeiro, Brazil
12-16	March IAU Symposium 207, Pucon, Chile
*15	March Proposals due for IAU Meetings in 2002
*01	April Contributions due for Information Bulletin 89
*15	April Submit matters for discussion at 75 th EC meeting
*30	April Submit applications for Peter Gruber Foundation (PGF) Fellowships
*30	April Submit nominations for PGF Cosmology Prize
14-15	June 75 th Executive Committee Meeting, Copenhagen, Denmark
18-22	June IAU Colloquium 184, Byurakan, Armenia
10-13	July IAU Symposium 208, Tokyo, Japan
26-31	July IAU Colloquium 185, Leuven, Belgium
17-21	Sept. IAU 10 th Latin-American Regional Meeting, Cordoba, Argentina
*15	Oct. Contributions due for Information Bulletin 90
19-23	Nov. IAU Symposium 209, Canberra, Australia

*Denotes Final Deadline

3. SCIENTIFIC MEETINGS

3.1. Future IAU Symposia

IAU SYMPOSIUM 206 COSMIC MASERS: FROM PROTO-STARS TO BLACK HOLES

March 5-10, 2001, Rio de Janeiro, Brazil

Scientific Organizing Committee: Jessica Chapman (Australia), Jim Cohen (UK), Moshe Elitzur (USA), Makato Inoue (Japan), Victor Migenes (Mexico, Co-chair), Mark Reid (USA, Co-chair), Luis F. Rodriguez (Mexico), Slava Slysh (Russia)

Chair, Local Organizing Committee: Everton Lüdke

Principal Topics:

- Maser physics
- Masers as probes for studying
- The physical conditions in star forming regions
- Stellar evolution
- Interstellar medium and other galaxies
- Other subtopics such as: magnetic fields, pumping mechanisms: ISM scattering, distance determinations, protostellar disks, central engines in AGNs and black holes.
- Promote better collaboration between observers and theoreticians in order to obtain better understanding of some of the more difficult and complicated issues.

Contact address: Dr. Victor Migenes, University of Guanajuato, Department of Astronomy, Apdo. Postal 144, Guanajuato, GTO. CP36000, Mexico

Tel: 52 4 732 9548

Email: vmigenes@astro.ugto.mx

Fax: 52 4 732 025

<http://maser2001@lynx.ccne.ufsm.br>

IAU SYMPOSIUM 207 EXTRAGALACTIC STAR CLUSTERS

March 12-16, 2001, Pucon, Chile

Scientific Organizing Committee: Beatriz Barbuy (Brazil), Jean Brodie (USA), Gary Da Costa (Australia), Bruce Elmegreen (USA), Uta Fritze-von Alvensleben (Germany), Juan Forte (Argentina), Doug Geisler (Chile, Co-chair), Eva Grebel (Germany, Co-chair), Luis Ho (USA), Rob Kennicutt (USA), Myung-Gyoon Lee (Korea), Georges Meylan (USA)

Chair, Local Organizing Committee: Doug Geisler

Principal Topics:

- Formation of star clusters
- Dynamical evolution and destruction
- Open clusters and associations; nuclear stellar clusters, super star clusters
- Globular clusters; GS systems of giant ellipticals, spirals, dwarf galaxies and their formation, multiple populations, luminosity functions, ages and abundances, models, implication for galaxy formation, distance indicators
- Interacting/merging galaxies, young globular clusters, starburst clusters
- Formation scenarios, evolutionary and population synthesis, future prospects

Contact address: Prof. Eva K. Grebel, Max Planck Institute for Astronomy (MPIA), Koeningstuhl 17, D-69117, Heidelberg, Germany
 Tel: 49 6221 528 0 Email: grebel@mpia-hd.mpg.de
 Fax: 49 6221 528 246 <http://www.mpia-hd.mpg.de/~starclus>

IAU SYMPOSIUM 208 ASTROPHYSICAL SUPERCOMPUTING USING PARTICLE SIMULATIONS

July 10-13, 2001, Tokyo, Japan

Scientific Organizing Committee: Lia Athanassoula (France), James Binney (UK), Ken Freeman (Australia), Douglas Heggie (UK), Piet Hut (Co-chair, USA), Jun Makino (Co-chair, Japan), Steve McMillian (USA), Rainer Spurzem (Germany), Matthias Steinmetz (USA), Daiichiro Sugimoto (Japan), Simon White (Germany)

Chair, Local Organizing Committee: Toshiyuki Fukushige

Principal Topics:

- Dynamics of star clusters
- Dynamics of galactic nuclei
- Dynamics of galaxies and clusters of galaxies
- Large-scale N-body simulation of cosmology
- Theory and simulation of planetary formation
- SPH/MHD simulation of star formation
- Direct simulation of gravitational lensing
- Algorithms for N-body simulation

Contact address: Prof. Jun Makino, Department of Astronomy, School of Science, University of Tokyo, 7-3-1 Hongo, Bunkyo-ku, Tokyo 113-0033, Japan
 Tel: 81 3 5841 4276 Email: makino@astron.s.u.-tokyo.ac.jp
 Fax: 81 3 5841 7644 <http://grape.astron.s.u.-tokyo.ac.jp/iau208/>

IAU SYMPOSIUM 209 PLANETARY NEBULAE: THEIR EVOLUTION AND ROLE IN THE UNIVERSE

November 19-23, 2001, Canberra, Australia

Scientific Organizing Committee: Agnes Acker (France), Magda Arnaboldi (Italy), Bruce Balick (USA), Michael Barlow (UK), Shuji Deguchi (Japan), Michael Dopita (Co-chair, Australia), George Jacoby (USA), Sun Kwok (Co-chair, Canada), Walter Maciel (Brazil), Arturo Manchado (Spain), Mario Perinotto (Italy), Stuart Pottasch (Netherlands), Detlef Schönberner (Germany), Yervant Terzian (USA), Silvia Torres-Peimbert (Mexico), Romuald Tylenda (Poland), Peter Wood (Australia)

Chair, Local Organizing Committee: Michael A. Dopita

Principal Topics:

- PN surveys and their distribution in the galaxies
- PN in the scheme of stellar evolution
- Central stars and their atmospheres
- Nebular properties of PN
- PN as galaxy probes

Contact address: Prof. Michael A. Dopita, Research School of Astronomy and Astrophysics, Private Bag, Weston Creek P.O., ACT2611, Australia
 Tel: 61 262 49 0212 Email: michael.dopita@anu.edu.au
 Fax: 61 262 49 0233

IAU SYMPOSIUM 210 MODELING OF STELLAR ATMOSPHERES

June 17-21, 2002, Uppsala, Sweden

Scientific Organizing Committee: France Allard (France), Kwing Lam Chan (China PR), Henny Lamers (Netherlands), Dimitri Mihalas (USA), Nikolai Piskunov (Sweden), Fiorella Castelli (Italy), Sami Solanki (Germany), Kozo Sadakane (Japan), Javier Bueno Trujillo (Spain), Werner W. Weiss (Chair, Austria)

Chair, Local Organizing Committee: Nikolai Piskunov

Principal Topics:

- 3D hydrodynamic calculations with 3D energy transport
- Convection modeling
- Inclusion of magnetic fields
- Surface structures: Doppler and Zeeman-Doppler Imaging
- Vertical structures: Stratification by diffusion
- N-LTE radiative transfer
- Dynamic atmospheres: pulsations and winds
- Atomic and molecular data
- Observations
- Bringing it all together: self-consistent determination of abundances and atmosphere models in Sun and stars

Contact address: Prof. Nikolai Piskunov, Uppsala Astronomical Observatory, Box 515 S-751 20 Uppsala, Sweden
 Tel: 46 471 5958 Email: piskunov@astro.uu.se
 Fax: 46 471 5999 <http://www.astro.uu.se/iau210>

3.2. Future IAU Colloquia

IAU COLLOQUIUM 183 SMALL-TELESCOPE ASTRONOMY ON GLOBAL SCALES

January, 4-8, 2001, Kenting National Park, Taiwan, China R

Scientific Organizing Committee: Charles Alcock (USA), Yong-Ik Byun (Korea), Wen-Ping Chen (China R, Co-chair), Alex Filippenko (USA), Syuzo Isebe (Japan), Don Kurtz (South Africa), Joanna Mikołajewska (Poland), Bohdan Paczynski (USA, Co-chair), John Percy (Canada), Hui-Song Tan (China PR), Shyam N. Tandon (India), Andrzej Udalski (Poland)

Chair, Local Organizing Committee: Wen-Ping Chen

Principal Topics:

- Telescope Networking
- Sky- and Time-Coveraged Surveys by Small Telescopes
- Observations of Transient Events
- Challenges in Data Archiving, Processing, and Communications
- Future of Small-Telescope Astronomy

- New Trends in Hardware Design and Manufacturing

Contact address: Dr. Chen Wen-Ping, c/o IAUC183, Graduate Institute of Astronomy
National Central University, Chung-Li, 32054 Taiwan, China R
Tel: 886 3 426 2302 Email: iauc183@joule.phy.ncu.edu.tw
Fax: 886 3 426 2304 <http://www.astro.ncu.edu.tw/iauc183>

IAU COLLOQUIUM 184 AGN SURVEYS

June 18-22, 2001, Byurakan, Armenia

Scientific Organizing Committee: Francesco Bertola (Italy), Brian Boyle (Australia), Richard Green (USA), Guenther Hasinger (Germany), Edward Khachikian (Co-chair, Armenia), Areg Mickaelian (Armenia), Dieter Reimers (Germany), Brigitte Rocca-Volmerange (France), David Sanders (Co-chair, USA), Govind Swarup (India), Yervant Terzian (USA), Phillipe Véron (France), Daniel Weeman (USA)

Chair, Local Organizing Committee: Areg Mickaelian

Principal Topics:

- Spectral and colorimetric surveys for AGN
- Surveys for UV-excess galaxies
- AGN from IR/submm surveys: IRAS, ISO, SCUBA, SIRT
- AGN from radio surveys: NVSS, FIRST, and others
- AGN from X-ray surveys: ROSAT, ASCA, BeppoSAX, Chandra, XMM
- AGN statistics and cross-correlation of multiwavelength surveys
- Physics and Cosmological Evolution of AGN
- Study of unique AGN
- Digital surveys and their advantage
- Future giant projects

Contact address: Dr. Areg M. Mickaelian, Byurakan Astrophysical Observatory,
Byurakan 378433, Aragatzotn province, Republic of Armenia
Tel: 374 2 53 2751 Email: aregmick@obs-hp.fr / iauc184@bao.sci.am
<http://bao.sci.am/iauc184>

IAU COLLOQUIUM 185 RADIAL AND NONRADIAL PULSATIONS AS PROBES OF STELLAR PHYSICS

July 26-31, 2001, Leuven, Belgium

Scientific Organizing Committee: Conny Aerts (Belgium), Tim Bedding (Australia), Mike Berger (Austria), Jørgen Christensen-Dalsgaard (Chair, Denmark), Wojciech Dziembowski (Poland), Joyce Guzik (USA), Steve Kawaler (USA), Eric Michel (France), Ennio Poretti (Italy), Dimitar Sasselov (USA), Hiromoto Shibahashi (Japan), Mike Thompson (UK), Patricia Whitelock (South Africa)

Chair, Local Organizing Committee: Conny Aerts

Principal Topics:

- The importance of pulsating stars as probes of their internal properties
- Hydrodynamic processes
- Stellar pulsations in a broad context
- Stellar pulsations in rotating stars
- Non-linear effect in pulsating stars

- Mass loss in pulsating stars
- The interaction between convection and pulsation
- Asteroseismology from space and from the ground

Contact address: Prof. Conny Aerts, Katholieke Universiteit Leuven, Instituut voor Sterrenkunde, Celestijnenlaan 200 B, B-3001 Leuven, Belgium
Tel: 32 16 327028 Email: conny@ster.kuleuven.ac.be
Fax: 32 16 327999 <http://www.ster.kuleuven.ac.be/~iau185/>

3.3. Latin-American Regional Meeting

IAU 10TH LATIN-AMERICAN REGIONAL MEETING

September 17-21, 2001, Cordoba, Argentina

Scientific Organizing Committee: Omar Benvenuto (Argentina), Alberto Carramiñana (Mexico), Juan Jose Claria (Argentina), Irene Cruz Gonzales (Mexico), Pierre Kaufmann (Brazil), Diego Garcia Lambas (Chair, Argentina), Hugo Levato (Argentina), Dante Minniti (Chile), Felix Mirabel (Argentina), Mirinai Pastoriza (Brazil), Antonio Parravano (Venezuela), Monica Rubio (Chile), Gonzalo Tancredi (Uruguay)

Chair, Local Organizing Committee: Carlos J. Donzelli

Principal Topics:

- Dynamics of the solar system
- Stars; binary systems, supernova progenitors and compact stars
- Solar physics
- Interstellar medium; star formation, stellar ejecta and their interaction with ISM
- Stellar systems; stellar populations, clusters and stellar associations
- Extragalactic astronomy; galaxies, clusters, active nuclei
- High energy astrophysics
- Cosmology; Formation and evolution of structure
- Instrumentation

Contact address: Dr. Carlos J. Donzelli, Laprida 854, 5000 Cordoba, Argentina
Tel: 56 41 203092 /204500 Email: charly@oac.uncor.edu
Fax: 56 41 224520 <http://axp2.oac.uncor.edu/~xrrla/>

4. DIVISION MATTERS

4.1 Composition of the Divisions

The current composition of the IAU Divisions is listed below. Division Presidents' addresses are given on the inside back cover as well as on the IAU Web page. Names and addresses of the new Commission Presidents and Vice-Presidents are given on pp. 13-21.

Division I Fundamental Astronomy/*Astronomie fondamentale*

Commission 4:	Ephemerides
Commission 7:	Celestial Mechanics and Dynamical Astronomy
Commission 8:	Astrometry
Commission 19:	Rotation of the Earth
Commission 31:	Time

Division II The Sun and Heliosphere/*Soleil et héliosphère*

Commission 10:	Solar Activity
Commission 12:	Solar Radiation and Structure
Commission 49:	The Interplanetary Plasma and Heliosphere

Division III Planetary Systems Sciences/*Sciences des systèmes planétaires*

Commission 15:	Physical Study of Comets and Minor Planets
Commission 16:	Physical Study of Planets and Satellites
Commission 20:	Positions and Motions of Minor Planets, Comets and Satellites
Commission 21:	Light of the Night Sky
Commission 22:	Meteors, Meteorites and Interplanetary Dust
Commission 51:	Bioastronomy: Search for Extraterrestrial Life

Division IV Stars/*Etoiles*

Commission 26:	Double and Multiple Stars
Commission 29:	Stellar Spectra
Commission 35:	Stellar Constitution
Commission 36:	Theory of Stellar Atmospheres
Commission 45:	Stellar Classification

Division V Variable Stars/*Etoiles Variables*

Commission 27:	Variable Stars
Commission 42:	Close Binary Stars

Division VI Interstellar Matter/*Matière interstellaire*

Commission 34:	Interstellar Matter
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Division VII Galactic System/*Système galactique*

Commission 33:	Structure and Dynamics of the Galactic System
Commission 37:	Star Clusters and Associations

Division VIII Galaxies and the Universe/ *Les Galaxies et l'Univers*

Commission 28:	Galaxies
Commission 47:	Cosmology

Division IX Optical & Infrared Techniques/*Techniques optiques et infrarouges*

Commission 9:	Instrumentation and Techniques
Commission 25:	Stellar Photometry and Polarimetry
Commission 30:	Radial Velocities

Division X Radio Astronomy/*Radioastronomie*

Commission 40:	Radio Astronomy
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Division XI Space and High Energy Astrophysics/ *Astrophysique spatiale et des hautes énergies*

Commission 44:	Space and High Energy Astrophysics
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4.2. News from Divisions

Division I: Fundamental Astronomy (Nicole Capitaine)

New resolutions have been adopted during the General Assembly in Manchester among which resolutions B1 and B2 are of special interest to Division I; they have been prepared and discussed at IAU Colloquium 180 in Washington (March 2000) and then discussed again at Joint Discussion 2 "Models and Constants for Sub-microarcsecond Astrometry" during the GA. Resolution B1 provides definitions, standard algorithms and parameters for modern realisations and transformations of space and time reference systems within the framework of General Relativity; this resolution, which is based on the adoption of the International Celestial Reference System (ICRS) as the IAU celestial reference system, from 1 January 1998, results from the proposals of Working Groups of the Division. Resolution B2 recommends to investigate possible changes in the current definition of UTC, which concerns especially time and Earth rotation studies. Working Groups of Division I have been organized to implement these resolutions.

In order to follow the evolution of astrometry, Commissions 8 "Positional Astronomy" and 24 "Photographic Astrometry" have merged at the GA into one new Commission 8 "Astrometry".

The new Organizing Committee of Division I consists of Presidents of Commissions 4, 7, 8, 19 and 31 and the past President of the Division. Information about the Division, the Commissions and Working Groups is available at the Division I home page <http://danof/obspm.fr/iaudiv1/> for which contributions and comments are welcomed.

Division II: The Sun and Heliosphere (Arnold Benz)

Division II has initiated a Working Group to study the archiving, retrieval and distribution of solar data. The immediate reason is considerations on the future of the Quarterly Bulletin of Solar Activity (QBSO), which has been supported by the IAU for many years. The need for a review of existing means of data distribution is obvious in view of the revolution in digital data storage and communication.

The intent of the Working Group is to survey the existing and growing data exchange through the Internet and to propose guidelines at an international level. The existing structures at the national levels should not be replaced nor duplicated.

The Working Group studies electronic means to support

- Finding characteristic parameters of solar activity, solar events and active regions (lists similar to today's QBSO and Solar Geophysical Data (SGD))
- Finding available data from the various observatories and satellites
- Finding quick-look data (such as in today's SOHO data center, Base2000 etc.)
- Finding actual raw data or calibrated data in archives located around the world
- Downloading software for the data analysis.

The goal is to facilitate the use of the available solar data that is archived in a large number of computers scattered all over the world.

Division III: Planetary Systems Sciences (Mikhail Marov)

The Division comprises six large Commissions (15, 16, 20, 21, 22, 51) as well as four divisional working groups dealing with broader topical matters. These are the WG on Near-Earth Objects (WG NEO), the WG on Planetary System Nomenclature (WG PSN), the Committee on Small Body Nomenclature (C SBN), and the WG on extrasolar planets (WG ESP). A recent change in scope of Commissions 15 (Physical Study of Comets and Minor Planets) and 22 (Meteors, Meteorites and Interplanetary Dust) reflects the Division acceptance (subject to final acceptance by EC) of a joint proposal of these Commissions to transfer the subject of meteorites from C15 to C 22.

The IAU Minor Planet Center (MPC) with its Advisory Committee (MPCAC) operates under coordination by Commission 20; its functioning will be further advanced according to the recently introduced Terms of Reference. New Terms of Reference were also defined by the EC in February 2000 for both C SBN and WG PSN, and these new procedures will come into full effect during the coming triennium. More detailed information about the business of the Division (linked also to its individual Commissions and WGs) is available on the web at the following address: <http://www.ss.astro.umd.edu/IAU/div3/>, also linked from the IAU home page.

Following the IAU formal guidelines, twelve members of the Board of the Division were elected for the next triennium, including the outgoing Division President, the new Presidents of the Commissions, and some outgoing Commission Presidents to provide continuity and corporate memory. The Division will maintain its activity before and during the next GA in Sydney through the relevant international meetings (IAU Colloquia and Symposia) sponsored by Commissions in the Division, with the hope to avoid conflicts in the selection of various proposals and timing of scientific events, ensuring their high quality and most efficient utilization of IAU financial support. The rationale to achieve this important goal involves circulation of the proposals through the divisional Board members, seeking support of the majority while minimizing conflicts of interests.

Division VIII: Galaxies and the Universe (Virginia Trimble)

Division VIII currently has a "minimal" web site at <http://www.star.bris.ac.uk/iau/> maintained by our Webmaster, Mark Birkinshaw. It contains one or more Commission newsletters, notes from the Manchester business meetings, information on future IAU activities, lists of the members of the two constituent Commissions (28 and 47), and so

forth. Please communicate information about relevant upcoming meetings and other news to: Mark.Birkinshaw@bristol.ac.uk for potential incorporation in the site.

The Board elected at Manchester consists of: Peter Shaver (past president), Virginia Trimble (president), Francesco Bertola (past president Comm. 28 and unofficial Division VP), Alex Szalay (past president Comm. 47), Sadanori Okamura (Pres. Comm. 28), John Peacock (Pres. Comm. 47), Elaine Sadler (VP Comm. 28), Simon Lilly (VP Comm. 47), Mark Birkinshaw (Webmaster).

Working Groups: Division VIII currently has none of its own, but those most likely to be of interest to members include Future Large Scale Facilities (chair, Richard Schilizzi), and "new messenger astronomy" (not the real title; it deals with dark matter, neutrinos, cosmic rays, gravitational radiation astronomy, very high energy gamma rays, and so forth) which comes under Division XI.

Commissions: The Division board, prior to the GA, and the participants at the business meeting considered two possibilities: first, that of merging Commissions 28 and 47 into a single "Galaxies and Cosmology", and, second, that of spawning a third Commission (probably Active Galaxies). In the end, it was decided to leave well enough alone.

Future Activities: Please keep us informed about meetings, initiatives, or whatever you are involved in or know about, and we will try to reciprocate. And, of course, read the rest of the IB for lots more information on what the IAU can do for you, and conversely.

Division X: Radio Astronomy (Lucia Padrielli)

A Lunar Reflective Calibration Beacon for Global Co-ordinated Radio Astronomy
The American Astronomical Society has recently funded a proposal entitled "A Lunar Reflective Calibration Beacon for Global Co-ordinated Radio Astronomy" through the "Small Research Grant Program". The project is addressed to the construction of a readily accessible, continuously available source of extra-terrestrial microwave test and calibration signals, for use by radio telescopes around the world. The transmitter, which will broadcast at a frequency of 1296 MHz, will broadcast at a maximum power of +66 dBW EIRP. However, due to Earth-Moon-Earth propagation losses and spectral spreading losses, the returned power will be at most -279 dBW/m²/Hz, below the applicable ITU-R levels.

The manager of the Low-Noise receiver group at NRAO provided this analysis to AAS at the request of the principal investigator Dr. H. Paul Shuch. The proposing Committee received from leading astronomical observatories statements confirming that the project, not only would not harm radio astronomy observations, but that it would be of use to many researchers, both amateur and professional, worldwide.

However, if members of Division X discover information contradicting this analysis, or are aware that this project is causing interference to astronomical observations, AAS may be contacted and Dr. Shuch can be asked to remedy the situation.
(from AAS)

VLA-Pie Town Link Operational

The National Radio Astronomy Observatory has completed implementation of a fiber-optic data link between the Pie Town antenna of the Very Long Baseline Array (VLBA) and the Very Large Array (VLA). Analogously intermediate-frequency data from the Pie Town antenna are transmitted to the VLA over 105 km of a commercial fiber optic line belonging to Western New Mexico Telephone Company. At the VLA, the data are demodulated from the optical carrier, fed into the normal VLA back-end rack, and correlated together with the other VLA antennas. The VLA correlator has been modified to accommodate this by adding more than 500 microseconds of additional delay to the correlator, as well as modifying the timing of signal-blanking in the correlator. The addition of Pie Town to the VLA approximately doubles the maximum resolution of the VLA, reaching 20 milliarcseconds at the highest VLA frequency of 43 GHz. Approximately 20 individual observations using the VLA-Pie Town link have been scheduled during the VLA A configuration (the largest VLA configuration) from October 2000 through January 2001. It is anticipated that this new capability of the VLA will be used in future A configuration sessions, and will help pave the way for the expansion of the VLA to longer baselines in the future. (From Jim Ulvestad)

5. COMMISSION MATTERS

5.1. Addresses of Presidents and Vice-Presidents 2000 - 2003

Comm.	President	Vice-President
4	<i>Ephemerides/Ephémérides</i> Jean Chapront Observ Paris DANOF 61 Av Observatoire F 75014 Paris, France Phone 33 1 40 51 2227 Fax 33 1 40 51 2291 jean.chapront@obspm.fr	George A. Krasinsky Inst Appl Astronomy Acad Sciences Zhdanovskaya Ul 8 197042 St Petersburg, Russia 7 812 230 7414 7 812 230 7413 kra@isida.ipa.rssi.ru
5	<i>Documentation & astronomical data/ Documentation & données astronomiques</i> Olga Dluzhnevskaya Inst of Astronomy Academy of Sciences Pyatnitskaya Ul 48 109017 Moscow, Russia Phone 7 095 231 5461 Fax 7 095 230 2081 olgad@inasan.rssi.ru	Françoise Génova Observ Strasbourg 11 rue de l'Université F 67000 Strasbourg France 33 3 88 15 0721 33 3 88 15 0760 genova@astro.u-strasbg.fr

6	<i>Astronomical telegrams/Télégrammes astronomiques</i> Brian G. Marsden CfA HCO/SAO 60 Garden St Cambridge MA 02138 - 1516 USA Phone 1 617 495 7244 Fax 1 617 495 7231 marsden@cfa.harvard.edu	Kaare Aksnes Inst Theor Astrophys Univ of Oslo Box 1029 N 0315 Blindern Oslo 3 Norway 47 22 856 515 47 22 856 505 kaare.aksnes@astro.uio.no
7	<i>Celestial Mechanics & Dynamical Astronomy/ Mécanique céleste & astronomie dynamique</i> John D. Hadjidemetriou Dept of Physics Univ Thessaloniki GR 540 06 Thessaloniki Greece Phone 30 31 99 8211 Fax 30 31 99 8211 hadjidem@physics.auth.gr	Andrea Milani Dpt Matematica Univ di Pisa Via Buonarroti 2 I 56127 Pisa, Italy 39 050 844 254 39 050 844 224 Milani@dm.unipi.it
8	<i>Astrometry/Astrométrie</i> Jin Wen-Jing Shanghai Observ CAS 80 Nandan Rd. Shanghai 200030 China PR Phone 21 6438 6191 Fax 21 6438 4618 jwj@center.shao.ac.cn	Imants K. Platais Astronomy Dpt Yale Univ Box 208101 New Haven CT 06520-8101 USA 1 203 432 3021 1 203 432 5048 imants@astro.yale.edu
9	<i>Instrumentation & Techniques/ Instrumentation & techniques</i> Su Ding-Qiang Ctr for Astronomy Instrumen Res, CAS Nanjing 210042, China PR Phone 86 25 541 1776 Fax 86 25 541 1872 dqsu@public1.ptt.js.cn	Michel Dennefeld IAP 98bis bd Arago F 75014 Paris, France 33 1 44 32 8116 33 1 44 32 8001 dennefel@iap.fr
10	<i>Solar Activity/Activité solaire</i> Arnold O Benz Inst Astronomie ETH Zentrum CH 8092 Zürich Switzerland	Donald B. Melrose Dpt Theor Physics Univ of Sydney Sydney NSW 2006 Australia

- Phone 41 1 632 4223 61 2 692 2222
 Fax 41 1 632 12 05 61 2 660 2903
benz@astro.phys.ethz.ch melrose@physics.usyd.edu.au
- 12** *Solar Radiation & Structure/Radiation & structure solaires*
 Sami K. Solanki Thomas Bogdan
 MPI Aeronomie HAO
 Max Planck Str 2 NCAR
 Postfach 20 Box 3000
 D 37191 Katlenburg-Lindau Boulder CO 80307-3000
 Germany USA
 Phone 49 5556 979 552 1 303 497 1547
 Fax 49 5556 979 190 1 303 497 1589
solanki@linmpi.mpg.de tom@hao.ucar.edu
- 14** *Atomic & Molecular Data/Données atomiques & moléculaires*
 Peter L. Smith Sveneric Johansson
 CfA Physics Dpt
 HCO/SAO MS 50 Univ of Lund
 60 Garden St Sölvegatan 14
 Cambridge MA 02138-1516 S 223 62 Lund
 USA Sweden
 Phone 1 617 495 4984 46 46 12 6097
 Fax 1 617 495 7455 46 46 222 4709
plsmith@cfa.harvard.edu sveneric.johansson@fysik.lu.se
- 15** *Physical Study of Comets & Minor Planets/
 Etude physique des comètes & des petites planètes*
 Horst Uwe Keller Edward F. Tedesco
 MPI Aeronomie TerraSystems Inc
 Max Planck Str 2 Space Sci Res Div
 Postfach 20 59 Wednesday Hill Rd
 D 37189 Katlenburg-Lindau Lee NH 03824-6537
 Germany USA
 Phone 49 5556 979 419 1 603 659 5620
 Fax 49 5556 979 141 1 603 659 5620
keller@linmpi.mpg.de etedesco@terrasys.com
- 16** *Physical Study of Planets & Satellites/
 Etude physique des planètes & des satellites*
 Dale P. Cruikshank Régis Courtin
 NASA ARC Observ Paris Meudon, DESPA
 MS 245-6 PI J Janssen
 Moffett Field CA 94035-1000 F 92195 Meudon PPL Cdx
 USA France
 Phone 1 415 604 4244 33 1 45 07 7729
 Fax 1 415 604 6779 33 1 45 07 7469
cruikshank@ssa1.arc.nasa.gov courtin@obspm.fr

- 19** *Rotation of the Earth/Rotation de la Terre*
 Nicole Capitaine Véronique Dehant
 Observ Paris Observatoire Royal
 DANOF de Belgique
 61 Av Observatoire Av Circulaire 3
 F 75014 Paris, France B 1180 Bruxelles, Belgium
 Phone 33 1 40 51 2231 32 2 373 0266
 Fax 33 1 40 51 2291 32 2 374 9822
capitaine@obspm.fr veronique.dehant@oma.be
- 20** *Positions & Motions of Minor Planets, Comets & Satellites/
 Positions & mouvements des petites planètes, des comètes & des satellites*
 Edward L.G. Bowell Giovanni B. Valsecchi
 Lowell Observ IAS
 1400 W Mars Hill Rd Rep Planetologia
 Box 1149 via Fosso del Cavaliere 100
 Flagstaff AZ 86001, USA I 00133 Roma, Italy
 Phone 1 520 774 3358 39 06 4993 4446
 Fax 1 520 774 6296 39 06 2066 0188
ebowell@lowell.edu giovanni@ias.rm.cnr.it
- 21** *Light of the Night Sky/Lumière du ciel nocturne*
 Philippe Lamy J. Mayo Greenberg
 LAS R & B Sackler Lab for Astrophysics
 Traverse du Siphon Leiden Observ
 Les Trois Lucs Box 9513
 F 13376 Marseille Cdx 12 NL 2300 RA Leiden
 France Netherlands
 Phone 33 4 91 05 5932 31 71 527 5804
 Fax 33 4 91 66 1855 31 71 527 5819
philippe.lamy@astrsp-mrs.fr greenber@strw.leidenuniv.nl
- 22** *Meteors, Meteorites & Interplanetary Dust/
 Météores, météorites & poussière interplanétaire*
 Vladimir Porubčan Ingrid Mann
 Astronomical Inst ESA
 Slovak Acad Sci Space Science Dept ESTEC
 Dubravská 9 PO Box 299
 SK 842 28 Bratislava, Slovak Rep NL 220 AG Noordwijk, Netherlands
 Phone 421 7 5477 5157 31 71 565 4380
 Fax 421 7 5477 5157 31 71 565 4697
astropor@savba.sk imann@so.estec.esa.nl
- 25** *Stellar Photometry & Polarimetry/Photométrie & polarimétrie stellaire*
 Christiaan Sterken Arlo U. Landolt
 Astrofysisch Inst Dpt Phys/Astronomy
 Vrije Univ Brussel Louisiana State Univ
 Pleinlaan 2 Baton Rouge LA 70803-4001
 B 1050 Brussel, Belgium USA

Phone 32 2 629 3469 1 225 578 1160
 Fax 32 9 362 3976 1 225 578 7701
csterken@vub.ac.be landolt@rouge.phys.lsu.edu

26 *Double & Multiple Stars/ Etoiles doubles & multiples*
 Colin D. Scarfe William I. Hartkopf
 Dpt Phys/Astronomy USNO
 Univ Victoria Astrometry Dept
 Box 3055 3450 Massachusetts Av NW
 Victoria BC V8W 3P6 Washington DC 20392-5420
 Canada USA
 Phone 1 250 721 7740 1 202 762 1478
 Fax 1 250 721 7715 1 202 762 1516
scarfe@uvphys.phys.uvic.ca wih@usno.navy.mil

27 *Variable Stars/Etoiles variables*
 J. Christensen-Dalsgaard Conny Aerts
 Inst Phys/Astronomy Inst v Sterrenkunde
 Univ of Aarhus Katholieke Univ Leuven
 Ny Munkegade Celestijnenlaan 200B
 DK 8000 Aarhus, Denmark B 3001 Leuven, Belgium
 Phone 45 89 42 3614 32 16 32 7028
 Fax 45 86 12 0740 32 16 32 7999
jcd@ifa.au.dk conny@ster.kuleuven.ac.be

28 *Galaxies*
 Sadanori Okamura Elaine Sadler
 Astronomy Dpt School of Physics
 Univ of Tokyo Univ of Sydney
 Bunkyo Ku Sydney NSW 2006
 Tokyo 113, Japan Australia
 Phone 81 358 00 6880 61 2 935 12622
 Fax 81 338 13 9439 61 2 935 17726
okamura@apsunl.astron.s.u-tokyo.jp ems@physics.usyd.edu.au

29 *Stellar Spectra/Spectres stellaires*
 Gautier Mathys Christopher A. Sneden
 ESO Astronomy Dpt
 Santiago Office Univ of Texas
 Casilla 19001 Rlm 16 324
 Santiago 19, Chile Austin TX 78712-1083, USA
 Phone 56 2 228 5006 1 512 471 1349
 Fax 56 2 228 5132 1 512 471 6016
gmathys@eso.org chris@astro.as.utexas.edu

30 *Radial Velocities/Vitesses radiales*
 Andrej Tokovinin Birgitta Nordström
 SAI Astronomical Obs, NBIfAFG
 Moscow State Univ Copenhagen Univ
 Universitetskij Pr 13 Juliane Maries Vej 30
 119899 Moscow DK 2100 Copenhagen
 Russia Denmark
 Phone 7 095 939 3318 45 35 32 5950
 Fax 7 095 939 1661 45 35 32 5989
toko@sai.msu.su birgitta@astro.ku.dk

31 *Time/L'Heure*
 Gérard Petit Demetrios N. Matsakis
 BIPM USNO
 Pavillon de Breteuil 3450 Massachusetts Av NW
 F 92312 Sèvres Cdx, France Washington DC 20392-5100, USA
 Phone 33 1 45 07 7067 1 202 653 1823
 Fax 33 1 45 34 2021
gpetit@bipm.fr dnm@orion.usno.navy.mil

33 *Structure & Dynamics of the Galactic System/
 Structure & dynamique du système galactique*
 David N. Spergel Patricia A. Whitelock
 Princeton Univ Obs SAAO
 Peyton Hall P.O. Box 9
 Princeton NJ 08544-1001, USA 7935 Observatory, South Africa
 Phone 1 609 258 3589 27 21 447 0025
 Fax 1 609 258 1020 27 21 447 3639
dns@astro.princeton.edu paw@sao.ac.za

34 *Interstellar Matter/Matière interstellaire*
 Bo Reipurth John E. Dyson
 CASA, Univ of Colorado Dept of Physics & Astron
 Campus Box 389 University of Leeds
 Boulder CO 80309-0389, USA Leeds LS2 9JT, UK
 Phone 1 303 492 4050 44 113 233 3869
 Fax 1 303 492 7178 44 113 233 3869
reipurth@casa.colorado.edu jed@ast.leeds.ac.uk

35 *Stellar Constitution/Constitution des étoiles*
 Don Vandenberg Wojciech Dziembowski
 Physics Dpt Copernicus Astron Ctr
 Univ of Victoria Polish Acad Sci
 Box 1700 Ul Bartycka 18
 Victoria BC V8W 2Y2, Canada PL 00 716 Warsaw, Poland
 Phone 1 250 721 7739 48 22 841 1086
 Fax 1 250 721 7715 48 22 841 0828
davb@uvvm.uvic.ca wd@astrouw.edu.pl

- 36** *Theory of Stellar Atmospheres/Théorie des atmosphères stellaires*
 Dainis Dravins
 Lund Observ
 Box 43
 S 221 00 Lund
 Sweden
 Phone 46 46 222 7297
 Fax 46 46 222 4614
dainis@astro.lu.se
- Monique Spite
 Observ Paris Meudon, DASGAL
 Pl J Janssen
 F 92195 Meudon PPL Cdx
 France
 33 1 45 07 7839
 33 1 45 07 7878
monique.spite@obspm.fr
- 37** *Star Clusters & Associations/Amas stellaires & associations*
 Georges Meylan
 STScI
 3700 San Martin Drive
 Baltimore MD 21218
 USA
 Phone 1 410 338 4483
 Fax 1 410 338 4767
gmeylan@stsci.edu
- Ata Sarajedini
 Wesleyan University
 Astronomy Dept
 Van Vleck Obs
 Middletown CT 06459, USA
 1 860 685 3739
 1 860 685 2131
ata@astro.wesleyan.edu
- 40** *Radio Astronomy/Radioastronomie*
 Lucia Padrielli
 Istt Radioastronomia
 CNR
 Via P Gobetti 101
 I 40129 Bologna, Italy
 Phone 39 051 639 0384
 Fax 39 051 639 9431
padrielli@astbol.bo.cnr.it
- Luis Rodriguez
 Inst Astronomia
 UNAM
 Apt 70 264
 Mexico D.F. 04510, Mexico
 52 5 622 3906
 52 5 616 0653
luisfr@astrosmo.unam.mx
- 41** *History of Astronomy/Histoire de l'Astronomie*
 F. Richard Stephenson
 Physics Dpt
 Univ of Durham
 South Rd
 Durham DH1 3LE, UK
 Phone 44 191 374 2153
 Fax 44 191 374 3749
F.R.Stephenson@durham.ac.uk
- Alexander A. Gurshtein
 Mesa State College
 Box 2674
 Grand Junction CO 81502
 USA
 1 970 241 2876
 1 970 256 1753
alex@mesastate.edu
- 42** *Close Binary Stars/Etoiles binaires serrées*
 Paula Szkody
 Dept Astronomy
 Univ of Washington
 Box 351580
 Seattle WA 98195-1580, USA
 Phone 1 425 543 1988
 Fax 1 425 685 0403
szkody@astro.washington.edu
- Alvaro Gimenez
 ESA
 Apt 50727 Villafranca
 E 28080 Madrid
 Spain
 34 91 813 1155
 34 91 813 1139
ag@laeff.esa.es

- 44** *Space & High Energy Astrophysics/Astrophysique spatiale & des hautes énergies*
 G Srinivasan
 RRI
 Sadashivanagar
 CV Raman Av
 Bangalore 560 080, India
 Phone 91 80 334 0122
 Fax 91 80 334 0492
srini@rri.res.in
- Haruyuki Okuda
 Inst Space/Astron Sci
 Univ of Tokyo
 Meguro Ku
 Tokyo 153, Japan
 81 346 71 111
 81 334 85 2904
okuda@astro.isas.ac.jp
- 45** *Stellar Classification/Classification stellaire*
 Thomas Lloyd Evans
 SAAO
 PO Box 9
 7935 Observatory
 South Africa
 Phone 27 21 447 0025
 Fax 27 21 447 3639
tle@sao.ac.za
- Christopher Corbally
 Steward Observ
 Univ of Arizona
 Vatican Obs Res Gp
 Tucson AZ 85721, USA
 1 520 621 3225
 1 520 621 1532
corbally@as.arizona.edu
- 46** *Astronomical Education & Development/Education & développement en astronomie*
 Syuzo Isobe
 Ntl Astronomical Obs
 2 21 1 Osawa
 Mitaka
 Tokyo 181, Japan
 Phone 81 422 34 3645
 Fax 81 422 34 3641
isobesz@cc.nao.ac.jp
- Jay M. Pasachoff
 Hopkins Observ
 Williams College
 Williamstown MA 01267
 USA
 1 413 597 2105
 1 413 597 3200
jay.m.pasachoff@williams.edu
- 47** *Cosmology/Cosmologie*
 John Peacock
 Royal Observ, Edinburgh
 Blackford Hill
 Edinburgh EH9 3HJ
 UK
 Phone 44 131 667 3321
 Fax 44 131 668 8356
j.peacock@roe.ac.uk
- Simon Lilly
 Astronomy Dpt
 Univ of Toronto
 60 St George St
 Toronto ON M5S 1A1, Canada
 1 416 978 2183
 1 416 971 2026
lilly@astro.utoronto.ca
- 49** *Interplanetary Plasma & Heliosphere/Plasma interplanétaire & héliosphère*
 Marek Vandas
 Astronomical Inst
 Czech Acad Sci
 Bocni II, 1401
 CZ 141 31 Praha 4, Czech R
- David F. Webb
 AF Research Lab
 Space Vehicles Directorate/VSBS
 29 Randolph Road
 Hanscom AFB MA 01731-3010, USA

Phone	420 267 10 3061	1 617 377 3970
Fax	420 272 76 9023	1 617 377 3160
	vandas@ig.cas.cz	David.Webb@hanscom.af.mil
50	<i>Protection of Existing & Potential Observatory Sites/ Protection des sites d'observatoires existants & potentiels</i>	
	Raymond J. Cohen	Malcolm G. Smith
	NRAL, Univ Manchester	NOAO
	Jodrell Bank	CTIO
	Macclesfield SK11 9DL	Casilla 603
	UK	La Serena, Chile
Phone	44 147 757 1321	56 51 20 5217/5200
Fax	44 147 757 1618	56 51 20 5212
	ric@jb.man.ac.uk	msmith@ctio.noao.edu
51	<i>Bioastronomy: Search for Extraterrestrial Life/ Bioastronomie: recherche de la vie extraterrestre</i>	
	C. Stuart Bowyer	Karen Meech
	Astronomy Dpt	Inst for Astronomy
	Univ of California	Univ of Hawaii
	601 Campbell Hall	2680 Woodlawn Dr
	Berkeley CA 94720-3411, USA	Honolulu HI 96822, USA
Phone	1 510 642 1648	1 808 956 6828
Fax	1 510 643 8303	1 808 988 2790
	bowyer@ssl.berkeley.edu	meech@ifa.hawaii.edu
WGFLSF	<i>Working Group for Future Large Scale Facilities Groupe de Travail pour les Futures Grandes Infrastructures</i>	
Chair	Richard Schilizzi	
	NFRA	
	Postbus 2, NL 7990 AA Dwingeloo, Netherlands	
Phone	31 521 59 5100	
Fax	31 521 59 7332	
	rts@nfra.nl	

5.2. Commission Reports

Commission 6: Annual Report of the Central Bureau for Astronomical Telegrams, 1999

In terms of *IAU Circulars* published, 1999 was the fifth most active year on record. With 261 issues, the count was behind those for 1991, 1992, 1997 and the record 278 of 1998. The most popular topics covered were supernovae, which were mentioned on 59 percent of the *Circulars*, and comets, mentioned on 48 percent. These were followed by novae (15 percent) and γ -ray bursters (10 percent).

1999 was a clear record year for supernovae, with 204 new discoveries. This was actually also the number of announcements of new discoveries, for although five of the 1999 were not reported until 2000, there were reports in 1999 of five new supernovae recognized from earlier years. Half a dozen of the supernovae, notably,

1999by in NGC 2841 and 1999em in NGC 1637, became as bright as magnitude 13-14, while eight others were fainter than magnitude 24.

The year was also clearly a record one for comets, of which 109 were given 1999 designations. Sixty-two of the comets were found using the white-light coronagraphs aboard SOHO, the Solar and Heliospheric Observatory spacecraft. Only 19 of these were actually found in 1999, and the remaining 43 were found in 2000. In addition 40 SOHO comets from 1996-98 were recognized in 1999. The three bright visual discoveries of comets during the year, C/1999 A1 (Tilbrook), C/1999 H1 (Lee) and C/1999 N2 (Lynn), qualified for the new Edgar Wilson Award for comet discoveries, as did the amateur CCD discoveries P/1999 DN₃, P/1999 WJ₇ (not announced until 2000), P/1999 X₁ and three comets from the second half of 1998.

There were also reports of five galactic novae and of four novae in the Small Magellanic Cloud. Brighter than third magnitude in late May, V382 Velorum was the brightest nova since V1500 Cygni in 1975. Two of the 1999 novae were in Aquila, and the remaining novae were in Sagittarius and Circinus.

The eleven γ -ray bursters mentioned on the *IAU Circulars* in 1999 represent slightly fewer than half of the total recorded during the year. More extensive information on these events is being given in the *GCN* service of NASA's Goddard Space Flight Center. This is reasonable, given that this service disseminates the communications – errors and all – automatically, in contrast to the verification and editing that has traditionally been associated with the publication of the *IAU Circulars*.

Three very faint new satellites of Uranus were reported during the year, and they were successfully recovered at the 2000 opposition. Together with the similar but somewhat brighter bodies discovered in 1997, these make a total of five irregular, outer satellites for this planet.

The number of subscribers to the printed edition of the *IAU Circulars* has continued to fall, from 337 at the start of the year to 302 at the end. The reduction in the number of paid subscribers to the e-mail version via the Computer Service that is shared with the Minor Planet Center is implicit in the report of the latter. Although many users undoubtedly consider the ready availability of the *Circulars* in the WWW (albeit after some delay) a plus, there is a cost associated with the production, and sooner or later this will have to be recognized. Even a small staff that is unsupported may eventually draw the line at being open for business 14 or more hours a day and seven days a week. As in recent years, most of the *Circulars* in 1999 were prepared by Bureau Associate Director Daniel Green, with backup from the undersigned – and from Minor Planet Center Associate Director Gareth Williams (who is routinely responsible for the Bureau's presence on the WWW) when both were away in August. Muazzez Lohmiller has efficiently taken care of the accounts and other administrative matters.

This is my thirty-second and last annual report as Director of the Central Bureau for Astronomical Telegrams. At the IAU General Assembly in Manchester Dan Green will succeed me in this position, as I become Director Emeritus and President of Commission 6. I take this opportunity to remark that, like most jobs, that of the CBAT Director can be both rewarding and frustrating. I have very much appreciated the forging of friendships with numerous astronomers, professional and amateur, past and present,

in many countries around the world. I also thank all those people at the Smithsonian Astrophysical Observatory and elsewhere who have helped, in so many ways, to get the information out, in as timely a fashion as possible, particularly in the pre-e-mail era when a February blizzard could close the Observatory for several days to all but a token employee in the old Communications Center of the Satellite-Tracking Program. Actually, the frustration is low, and it is generally limited to a lack of time – whether it be the time required to put together a more complete and coherent summary of a complex situation or the time needed now on a large telescope to make some critical follow-up observation.

October 30, 2000

Brian G. Marsden, *Director of the Bureau*

Commission 20: Annual Report of the Minor Planet Center, 1999

As anticipated, the year 1999 handsomely broke all previous records for Minor Planet Center activity. The number of pages of *Minor Planet Circulars (MPCs)*, 3960, as well as the number of pages of actual observations in the *Minor Planet Circulars Supplement (MPSs)*, 4998, each exceeded the total for the previous year by more than 65 percent. The 3145 new numberings of minor planets were 85 percent more than in 1998 and more than *four times* as many as in 1997. A milestone was reached in March 1999 with the numbering of minor planets (10000). Although it had taken more than 198 years, following the discovery of Ceres, to attain this milestone, the milestone rather loses significance when one realizes that it will take less than *two years* more to reach (20000)!

The maximum subscript used for the provisional designations in a single half month, which exceeded 100 for the first time in 1998, exceeded 200 for the first time in 1999. This happened in the first half of September, when the subscript reached 214, even before the month was out. In similar fashion, the subscript for the first half of December reached 231. By the middle of 2000, the continuing processing of data from 1999 had increased these subscripts to 253 and 261, respectively – but by then the latest designation for the first half of October 1999 was up to TZ₃₂₁, corresponding to 8050 objects.

The total of *Minor Planet Electronic Circulars (MPECs)* issued, 948, was only a modest 28 percent higher than in 1999. Of these, 325 were "Daily Orbit Update" (DOU) issues listing the new orbits computed and identifications found. Although the December 9 DOU contained a record 2504 new orbits, this represented activity over 48 hours. The Dec. 29 DOU contained 2406 orbits computed and 256 identifications and double designations found during the previous 24 hours. The previous record of 48 *MPECs* in a single half month (late September 1998) was exceeded by the 55 in early May 1999 and the 65 in early October 1999.

This significantly increased activity in December was finally made possible through resolution of the "Catch 22" situation mentioned in the 1998 report. The three new computers purchased in 1998 were finally integrated into the Minor Planet Center's computing system in November 1999 and used for the preparation of that month's *MPCs*. The Minor Planet Center was very pleased to receive a gift from the

Tamkin Foundation that covered the purchase of these computers. This gift has been acknowledged by reference in the *MPCs* and *MPECs* to the clustering of the new computers into the Tamkin Foundation Computer Network.

"The NEO Confirmation Page" has continued to be an extremely useful tool for ensuring that most of the Near-Earth Objects reported are followed up reasonably satisfactorily, an activity in which an ever-increasing number of amateur astronomers participate. Although the number of NEOs found during the year was up from that of the previous year, the number of the subset of "potentially hazardous asteroids" (PHAs) found was down from 55 to 49. Nevertheless, the LINEAR program of the Massachusetts Institute of Technology yielded a record 37 PHAs. This program also yielded 20 new comets, 2 new comets initially given asteroidal designations and 3 predisccovery linkages with comets discovered at their oppositions in 2000.

The number of transneptunian objects (TNOs) and centaurs known more than doubled during the year (although many of the new images were not actually measured and orbits computed until well into 2000). Perhaps even more encouraging was a doubling of the number of such objects that have been observed at multiple oppositions, for it is only then that the orbit determinations have much meaning. The recognition of a second "scattered-disk object", 1998 XY₉₅, at its second opposition presaged a surge in the further discovery of such objects, of which one, 1999 TD₁₀, clearly showed the distinction between these objects and the centaurs to be quite nebulous. Accordingly, in the Minor Planet Center's web pages it became reasonable to combine these categories, restricting the TNO title to the more "regular" categories of cubewanos, plutinos and other Neptune-resonant objects.

The number of subscriptions to the printed *MPCs* showed a general decrease from 203 to 190 during the year. Although the number of subscribers to the Computer Service (shared with the Central Bureau for Astronomical Telegrams) remained near 565 for much of the year, it had declined to 545 at year's end. The number of subscribers to the Extended Computer Service (ECS) remained steady at around 60; one of the features of the ECS is a facility for securing the pages of the *MPS* by file-transfer protocol, since it has become prohibitive to print and mail them. The Minor Planet Center's resources were further depleted by the cessation of the grant from the U.S. National Aeronautics and Space Administration at the end of 1998, but this was replaced by a contract beginning in October 1999.

As in previous years, the bulk of the work of the Minor Planet Center has been handled by Associate Director Gareth Williams. This has included, not only the processing of the enormous number of observations received daily and the maintenance of the web pages, but also extensive computer programming and reprogramming for the new cluster of computers. Syuichi Nakano has again been the "Liaison in Japan", and Susan Russell has provided *pro bono* service editing the citations for new namings of minor planets. Timothy B. Spahr assisted operations for a while in February and again in August. Muazzez Lohmiller was responsible for the accounts and mailings, and Billy Duggan oversaw the printing, collating and stapling of the *MPCs* in the SAO's print shop.

October 30, 2000

Brian G. Marsden, *Director, Minor Planet Center*

6. MEETINGS OF THE IAU EXECUTIVE COMMITTEE

6.1. 73rd Meeting of the IAU Executive Committee

The 73rd Meeting of the IAU Executive Committee was held in Manchester at the venue of the XXIVth General Assembly on August 7, 8, 9, and 15, 2000. At the opening of the meeting, tribute was paid to the memory of Vice-President Claudio Anguita, who passed away on March 2, 2000. All the other Members were present, as were the proposed new Assistant General Secretary, Oddbjørn Engvold, and the IAU Executive Assistant, Monique Léger-Orine. The newly established policy of inviting the Division Presidents in order to benefit from their collective expertise and strengthen the role of Divisions in the running of the IAU was followed, and nearly all attended or were represented. The roles and tasks of IAU Commissions and Divisions were discussed with the Division Presidents (and also at separate meetings with the Commission Presidents). The meeting was chaired by the President, R.P. Kraft.

The EC decided to recommend to the GA that Cuba, Jordan, Morocco and the Philippines be admitted as new Associate Members. The financial affairs of the Union were reviewed on the basis of a much appreciated report of the Finance Subcommittee. This highlighted a generally healthy state with well-balanced accounts for 1997-1999 and a continued high productivity in terms of the ratio of expenditures for science and education with respect to administration. A large part of the modest expenditure was noted as being due to the EC Meetings. The budget for 2001-2003 was found adequate (subsequently confirmed at the second GA session). This notably includes a substantial increase for the educational activities which, on the administrative side, is paralleled by a reorganization of EC Commission 46 (now Astronomy Teaching and Development) with its own budget and special representation by the EC.

The draft EC report for 1997-2000 was approved. The EC reviewed the resolutions submitted to the vote of the GA at its 2nd session and decided not to support resolution B3 (see [§7.3](#)). After thorough discussions, the EC also decided to enter into a collaboration with the Peter Gruber Foundation concerning its Cosmology Prize and associated fellowship program (see [§§9.1-9.2](#)). Some attention was also paid to the IAU Meeting program. While the recent meetings have been successfully organized and good reports received, some concern for the future is caused by the progressive, recent decrease in the number of proposals. Closer links between the EC and the Division Presidents were seen as a possible remedy.

The EC reviewed the invitations for the XXVth GA in 2006 and, after extensive discussion, decided to recommend to the GA to accept the one by the Czech Republic for Prague (see [§8.2](#)). Letters of intent from Brazil and China PR to host the XXVIIth GA were also noted; a decision will be taken in 2003.

6.2. 74th Meeting of the Executive Committee

The 74th Meeting of the EC was also held in Manchester at the GA venue, on August 17, 2000. The EC met in its new composition (see inside cover page) except K.A. Pounds, who was unable to attend. IAU President Franco Pacini chaired the meeting, Again, nearly all Division Presidents were present, and the IAU Executive Assistant, Monique Léger-Orine, also attended.

The EC received short reports from Prof. R. Davies and Dr. D. Walsh, LOC Co-chairs for the XXIVth GA. While the GA was generally considered to be scientifically very successful, the lower than expected attendance and ensuing financial problems were significant concerns. Different reasons and lessons for the future were discussed. This led over into a thorough discussion of the preparations for the XXVth GA in Sydney, 2003. A presentation was made by Prof. Raymond Haynes on behalf of the NOC, stressing that early knowledge of the need for meeting rooms is of essence. This is concurrent with the EC's wish to secure a large attendance by early action on the scientific program so that it becomes the best possible. To this end, closer contacts will be held between the EC and the Division Presidents, and the letters of intent for Symposia and Joint Discussions are invited already for March 15, 2001 (see [§2](#)).

A major agenda item was the selection of IAU sponsored scientific meetings in 2001. The final choice comprised five Symposia (whereof one was later moved to 2002), two Colloquia, one Regional Astronomy Meeting, and one co-sponsored meeting, in some cases pending supplementary information or discussions with the organizers (see [§3](#)). Other matters included the final endorsement of Terms of Reference for the IAU Minor Planet Center, aimed at formalizing an IAU activity that has taken on an ever increasing importance (see [§5.2](#)) and establishing a firm basis for future attempts to secure an improved funding to respond to the increasing needs. The future development of IAU activities was finally discussed, and the EC decided to initiate a work toward a major overhaul of the Statutes, Bye-Laws and Working Rules that are constantly revised to correct inconsistencies caused by successive iterations. The GS was also advised to look for ways to overcome the shortage of staff by delegating work items and hiring special-purpose assistants.

6.3. 75th Meeting of the Executive Committee

The 75th Meeting of the EC will take place on June 14-15, 2001 at the Astronomical Observatory, University of Copenhagen, Denmark, at the invitation of former General Secretary J. Andersen. Major items on the agenda will be the preparations for the XXVth GA, including preliminary planning of the scientific program, and the selection of IAU sponsored meetings in 2002. Any matters to be placed on the agenda should reach the General Secretary before *April 15, 2001*.

7. XXIVth GENERAL ASSEMBLY

7.1. Report on the XXIVth General Assembly

The XXIVth General Assembly of the IAU was held at the University of Manchester in Manchester, United Kingdom, from August 7–18, 2000, at the invitation of the Royal Society and the British Astronomical Community. Nearly 1,800 participants from 75 countries took part in the scientific programme as well as excursions to Jodrell Bank Observatory and various tourist attractions. The Local Organizing Committee, led by Rodney Davies and Dennis Walsh, was much smaller than three years ago but managed beautifully to have the event run smoothly and pleasantly.

The opening session took place on August 9, 2000. The inaugural speeches were given, e.g., by Sir Robert May, Chief Scientific Advisor to the UK Government, and by the Lord Mayor of Manchester. Administrative matters included the admission of Cuba, Jordan, Morocco and the Philippines as associate members of the IAU and the approval of proposed revisions of the Statutes and Bye-Laws (see the IAU web page).

A rich scientific programme was offered during the two weeks, including five Symposia (IAU Symp. Nos. 201-205), 14 Joint Discussions and one Special Session (Astronomy for Developing Countries), in addition to a great number of Division, Commission and Working Group meetings that often included some science presentations beside the necessary business. The three Invited Discourses were given by R.P. Kirshner (An Accelerating Universe? Evidence from Supernovae), M. Mayor (Extrasolar Planetary Systems), and M. Perryman (The Three-Dimensional Structure of our Galaxy). Four well-attended lectures on Public Understanding of Science covering astronomical topics from the nearest to the farthest were also given.

Proceedings of the five IAU Symposia will be published in the regular Symposium series. Condensed proceedings of the Invited Discourses, Joint Discussions, and Special Session will be published in *Highlights of Astronomy*, Vol. 12. These volumes, and *Transactions XXIVB*, will all be published by the Astronomical Society of the Pacific along with a Proceedings volume for the Special Session.

At the second session of the General Assembly, on August 16, 2000, the admission of 703 new Individual Members was announced, bringing the total IAU membership to 8737 (see [§12](#)). The proposed Budget for 2000–2003 was approved and the new officers and a new Executive Committee as listed on the inside cover of this IB were elected. An invitation to hold the XXVth General Assembly in Prague, Czech Republic, in 2006 was accepted.

The Resolutions adopted by the General Assembly are reproduced in the next section and will also be published in the Proceedings of the General Assembly (*Transactions XXIVB*) together with the new Statutes, Bye-Laws and Working Rules, full records of the other administrative business conducted at Manchester, and the administrative and financial reports for the triennium 1997–2000.

7.2. Resolutions of the XXIVth General Assembly

RESOLUTIONS B

Resolution B1.1

Maintenance and Establishment of Reference Frames and Systems

The XXIVth International Astronomical Union General Assembly,

Noting

1. that Resolution B2 of the XXIIIrd General Assembly (1997) specifies that “the fundamental reference frame shall be the International Celestial Reference Frame (ICRF) constructed by the IAU Working Group on Reference Frames”,
2. that Resolution B2 of the XXIIIrd General Assembly (1997) specifies “That the Hipparcos Catalogue shall be the primary realisation of the International Celestial Reference System (ICRS) at optical wavelengths”, and
3. the need for accurate definition of reference systems brought about by unprecedented precision, and

Recognising

1. the importance of continuing operational observations made with very long baseline interferometry (VLBI) to maintain the ICRF,
2. the importance of VLBI observations to the operational determination of the parameters needed to specify the time-variable transformation between the International Celestial and Terrestrial Reference Frames,
3. the progressive shift between the Hipparcos frame and the ICRF, and
4. the need to maintain the optical realisation as close as possible to the ICRF,

Recommends

1. that IAU Division I maintain the Working Group on Celestial Reference Systems formed from Division I members to consult with the International Earth Rotation Service (IERS) regarding the maintenance of the ICRS,
2. that the IAU recognise the international VLBI service (IVS) for Geodesy and Astrometry as an IAU Service Organization,
3. that an official representative of the IVS be invited to participate in the IAU Working Group on Celestial Reference Systems,
4. that the IAU continue to provide an official representative to the IVS Directing Board,
5. that the astrometric and geodetic VLBI observing programs consider the requirements for maintenance of the ICRF and linking to the Hipparcos optical frame in the selection of sources to be observed (with emphasis on the Southern Hemisphere), design of observing networks, and the distribution of data, and
6. that the scientific community continue with high priority ground- and space-based observations (a) for the maintenance of the optical Hipparcos frame and frames at other wavelengths and (b) for links of the frames to the ICRF.

Resolution B1.2

Hipparcos Celestial Reference Frame

The XXIVth International Astronomical Union General Assembly,

Noting

1. that Resolution B2 of the XXIIIrd General Assembly (1997) specifies, "That the Hipparcos Catalogue shall be the primary realisation of the International Celestial Reference System (ICRS) at optical wavelengths",
2. the need for this realisation to be of the highest precision,
3. that the proper motions of many of the Hipparcos stars known, or suspected, to be multiple are adversely affected by uncorrected orbital motion,
4. the extensive use of the Hipparcos Catalogue as reference for the ICRS in extension to fainter stars,
5. the need to avoid confusion between the International Celestial Reference Frame (ICRF) and the Hipparcos frame, and
6. the progressive shift between the Hipparcos frame and the ICRF,

Recommends

1. that Resolution B2 of the XXIIIrd IAU General Assembly (1997) be amended by excluding from the optical realisation of the ICRS all stars flagged C, G, O, V and X in the Hipparcos Catalogue, and
2. that this modified Hipparcos frame be labelled the Hipparcos Celestial Reference Frame (HCRF).

Resolution B1.3

Definition of Barycentric Celestial Reference System and Geocentric Celestial Reference System

The XXIVth International Astronomical Union General Assembly,

Considering

1. that the Resolution A4 of the XXIst General Assembly (1991) has defined a system of space-time coordinates for (a) the solar system (now called the Barycentric Celestial Reference System, (BCRS)) and (b) the Earth (now called the Geocentric Celestial Reference System (GCRS)), within the framework of General Relativity,
2. the desire to write the metric tensors both in the BCRS and in the GCRS in a compact and self-consistent form, and
3. the fact that considerable work in General Relativity has been done using the harmonic gauge that was found to be a useful and simplifying gauge for many kinds of applications,

Recommends

1. the choice of harmonic coordinates both for the barycentric and for the geocentric reference systems,
2. writing the time-time component and the space-space component of the barycentric metric $g_{\mu\nu}$ with barycentric coordinates (t, \mathbf{x}) (t = Barycentric Coordinate Time (TCB)) with a single scalar potential $w(t, \mathbf{x})$ that generalises the Newtonian potential, and the space-time component with a vector potential $w^i(t, \mathbf{x})$; as a boundary condition it is assumed that these two potentials vanish far from the solar system,

explicitly,

$$g_{00} = -1 + \frac{2w}{c^2} - \frac{2w^2}{c^4},$$

$$g_{0i} = -\frac{4}{c^3} w^i,$$

$$g_{ij} = \delta_{ij} \left(1 + \frac{2}{c^2} w \right),$$

with

$$w(t, \mathbf{x}) = G \int d^3 \mathbf{x}' \frac{\sigma(t, \mathbf{x}')}{|\mathbf{x} - \mathbf{x}'|} + \frac{1}{2c^2} G \frac{\partial^2}{\partial t^2} \int d^3 \mathbf{x}' (t, \mathbf{x}') |\mathbf{x} - \mathbf{x}'|,$$

$$w^i(t, \mathbf{x}) = G \int d^3 \mathbf{x}' \frac{\sigma^i(t, \mathbf{x}')}{|\mathbf{x} - \mathbf{x}'|}.$$

Here, σ and σ^i are the gravitational mass and current densities, respectively.

3. writing the geocentric metric tensor G_{ab} with geocentric coordinates (T, \mathbf{X}) (T = Geocentric Coordinate Time (TCG)) in the same form as the barycentric one but with potentials $W(T, \mathbf{X})$ and $W^a(T, \mathbf{X})$; these geocentric potentials should be split into two parts - potentials W_{ext}^a and W_{ext}^a arising from the gravitational action of the Earth and external parts W_{ext}^a and W_{ext}^a due to tidal and inertial effects; the external parts of the metric potentials are assumed to vanish at the geocenter and admit an expansion into positive powers of \mathbf{X} ,

explicitly,

$$G_{00} = -1 + \frac{2W}{c^2} - \frac{2W^2}{c^4},$$

$$G_{0a} = -\frac{4}{c^3} W^a,$$

$$G_{ab} = \delta_{ab} \left(1 + \frac{2}{c^2} W \right),$$

the potentials W and W^a should be split according to

$$W(T, \mathbf{X}) = W_E(T, \mathbf{X}) + W_{\text{ext}}(T, \mathbf{X}),$$

$$W^a(T, \mathbf{X}) = W_E^a(T, \mathbf{X}) + W_{\text{ext}}^a(T, \mathbf{X}),$$

the Earth's potentials W_E and W_E^a are defined in the same way as w and w^i but with quantities calculated in the GCRS with integrals taken over the whole Earth.

4. using, if accuracy requires, the full post-Newtonian coordinate transformation between the BCRS and the GCRS as induced by the form of the corresponding metric tensors,

explicitly, for the kinematically non-rotating GCRS ($T=TCG$, $t=TCB$, $r_E^i \equiv x^i - x_E^i(t)$, and a summation from 1 to 3 over equal indices is implied),

$$T = t - \frac{1}{c^2} [A(t) + v_E^i r_E^i] + \frac{1}{c^4} [B(t) + B^i(t) r_E^i + B^{ij}(t) r_E^i r_E^j + C(t, \mathbf{x})] + O(c^{-5}),$$

$$\mathbf{X}^a = \delta_{ai} \left[r_E^i + \frac{1}{c^2} \left(\frac{1}{2} v_E^i v_E^i r_E^i + w_{\text{ext}}(\mathbf{x}_E) r_E^i + r_E^i a_E^i - \frac{1}{2} a_E^i r_E^2 \right) \right] + O(c^{-4}),$$

where

$$\frac{d}{dt} A(t) = \frac{1}{2} v_E^2 + w_{\text{ext}}(\mathbf{x}_E),$$

$$\frac{d}{dt} B(t) = -\frac{1}{8} v_E^4 - \frac{3}{2} v_E^2 w_{\text{ext}}(\mathbf{x}_E) + 4 v_E^i w_{\text{ext}}^i(\mathbf{x}_E) + \frac{1}{2} w_{\text{ext}}^2(\mathbf{x}_E),$$

$$B^i(t) = -\frac{1}{2} v_E^2 v_E^i + 4 w_{\text{ext}}^i(\mathbf{x}_E) - 3 v_E^i w_{\text{ext}}(\mathbf{x}_E),$$

$$B^{ij}(t) = -v_E^i \delta_{aj} Q^a + 2 \frac{\partial}{\partial x^j} w_{\text{ext}}^i(\mathbf{x}_E) - v_E^i \frac{\partial}{\partial x^j} w_{\text{ext}}(\mathbf{x}_E) + \frac{1}{2} \delta^{ij} \dot{w}_{\text{ext}}(\mathbf{x}_E),$$

$$C(t, \mathbf{x}) = -\frac{1}{10} r_E^2 (\dot{a}_E^i r_E^i),$$

here x_E^i , v_E^i , and a_E^i are the components of the barycentric position, velocity and acceleration vectors of the Earth, the dot stands for the total derivative with respect to t , and

$$Q^a = \delta_{ai} \left[\frac{\partial}{\partial x^i} w_{\text{ext}}(\mathbf{x}_E) - a_E^i \right].$$

The external potentials, w_{ext} and w_{ext}^i , are given by

$$w_{\text{ext}} = \sum_{A \neq E} w_A, \quad w_{\text{ext}}^i = \sum_{A \neq E} w_A^i,$$

where E stands for the Earth and w_A and w_A^i are determined by the expressions for w and w^i with integrals taken over body A only.

Notes

It is to be understood that these expressions for w and w^i give g_{00} correct up to $O(c^{-5})$, g_{0i} up to $O(c^{-5})$, and g_{ij} up to $O(c^{-4})$. The densities σ and σ^i are determined by the components of the energy momentum tensor of the matter composing the solar system bodies as given in the references. Accuracies for G_{ab} in terms of c^{-n} correspond to those of $g_{\mu\nu}$.

The external potentials W_{ext} and W_{ext}^a can be written in the form

$$W_{\text{ext}} = W_{\text{tidal}} + W_{\text{iner}},$$

$$W_{\text{ext}}^a = W_{\text{tidal}}^a + W_{\text{iner}}^a.$$

W_{tidal} generalises the Newtonian expression for the tidal potential. Post-Newtonian expressions for W_{tidal} and W_{tidal}^a can be found in the references. The potentials W_{iner} , W_{iner}^a are inertial contributions that are linear in X^a . The former is determined mainly by the coupling of the Earth's nonsphericity to the external potential. In the kinematically non-rotating Geocentric Celestial Reference System, W_{iner}^a describes the Coriolis force induced mainly by geodetic precession.

Finally, the local gravitational potentials W_E and W_E^a of the Earth are related to the barycentric gravitational potentials w_E and w_E^i by

$$W_E(T, \mathbf{X}) = w_E(t, \mathbf{x}) \left(1 + \frac{2}{c^2} v_E^2 \right) - \frac{4}{c^2} v_E^i w_E^i(t, \mathbf{x}) + O(c^{-4}),$$

$$W_E^a(T, \mathbf{X}) = \delta_{ai} \left(w_E^i(t, \mathbf{x}) - v_E^i w_E(t, \mathbf{x}) \right) + O(c^{-2}).$$

References

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Resolution B1.4

Post-Newtonian Potential Coefficients

The XXIVth International Astronomical Union General Assembly,

Considering

1. that for many applications in the fields of celestial mechanics and astrometry a suitable parametrization of the metric potentials (or multipole moments) outside the massive solar system bodies in the form of expansions in terms of potential coefficients are extremely useful, and

- that physically meaningful post-Newtonian potential coefficients can be derived from the literature,

Recommendations

- expansion of the post-Newtonian potential of the Earth in the Geocentric Celestial Reference System (GCRS) outside the Earth in the form

$$W^E(T, \mathbf{X}) = \frac{GM^E}{R} \left[1 + \sum_{\ell=2}^{\infty} \sum_{m=0}^{+\ell} \left(\frac{R^E}{R} \right)^{\ell} P_{\ell m}(\cos\theta) \left(C_{\ell m}^E(T) \cos m\phi + S_{\ell m}^E(T) \sin m\phi \right) \right].$$

Here $C_{\ell m}^E$ and $S_{\ell m}^E$ are, to sufficient accuracy, equivalent to the post-Newtonian multipole moments introduced by Damour *et al.* (Damour *et al.*, *Phys. Rev. D*, **43**, 3273, 1991). θ and ϕ are the polar angles corresponding to the spatial coordinates \mathbf{X}^a of the GCRS and $R = |\mathbf{X}|$, and

- expression of the vector potential outside the Earth, leading to the well-known Lense-Thirring effect, in terms of the Earth's total angular momentum vector \mathbf{S}_E in the form

$$W_E^a(T, \mathbf{X}) = -\frac{G}{2} \frac{(\mathbf{X} \times \mathbf{S}_E)^a}{R^3}.$$

Resolution B1.5

Extended Relativistic Framework for Time Transformations and Realisation of Coordinate Times in the Solar System

The XXIVth International Astronomical Union General Assembly,

Considering

- that the Resolution A4 of the XXIst General Assembly (1991) has defined systems of space-time coordinates for the solar system (Barycentric Reference System) and for the Earth (Geocentric Reference System), within the framework of General Relativity,
- that Resolution B1.3 entitled "Definition of Barycentric Celestial Reference System and Geocentric Celestial Reference System" has renamed these systems the Barycentric Celestial Reference System (BCRS) and the Geocentric Celestial Reference System (GCRS), respectively, and has specified a general framework for expressing their metric tensor and defining coordinate transformations at the first post-Newtonian level,
- that, based on the anticipated performance of atomic clocks, future time and frequency measurements will require practical application of this framework in the BCRS, and
- that theoretical work requiring such expansions has already been performed,

Recommendations

that for applications that concern time transformations and realisation of coordinate times within the solar system, Resolution B1.3 be applied as follows:

- the metric tensor be expressed as

$$g_{00} = -\left(1 - \frac{2}{c^2} \left(w_0(t, \mathbf{x}) + w_L(t, \mathbf{x}) \right) + \frac{2}{c^4} \left(w_0^2(t, \mathbf{x}) + \Delta(t, \mathbf{x}) \right) \right),$$

$$g_{0i} = -\frac{4}{c^3} w^i(t, \mathbf{x}),$$

$$g_{ij} = \left(1 + \frac{2w_0(t, \mathbf{x})}{c^2} \right) \delta_{ij},$$

where ($t \equiv$ Barycentric Coordinate Time (TCB), \mathbf{x}) are the barycentric coordinates,

$w_0 = G \sum_A \frac{M_A}{r_A}$, with the summation carried out over all solar system bodies

A , $\mathbf{r}_A = \mathbf{x} - \mathbf{x}_A$, \mathbf{x}_A are the coordinates of the center of mass of body A , $r_A = |\mathbf{r}_A|$, and where w_L contains the expansion in terms of multipole moments [see their definition in the Resolution B1.4 entitled "Post-Newtonian Potential Coefficients"] required for each body. The vector potential $w^i(t, \mathbf{x}) = \sum_A w_A^i(t, \mathbf{x})$, and the

function $\Delta(t, \mathbf{x}) = \sum_A \Delta_A(t, \mathbf{x})$ are given in note 2.

- the relation between TCB and Geocentric Coordinate Time (TCG) can be expressed to sufficient accuracy by

$$\begin{aligned} \text{TCB} - \text{TCG} = & c^{-2} \left[\int_{t_0}^t \left(\frac{v_E^2}{2} + w_{0\text{ext}}(\mathbf{x}_E) \right) dt + v_E^i r_E^i \right] \\ & - c^{-4} \left[\int_{t_0}^t \left(-\frac{1}{8} v_E^4 - \frac{3}{2} v_E^2 w_{0\text{ext}}(\mathbf{x}_E) + 4 v_E^i w_{\text{ext}}^i(\mathbf{x}_E) + \frac{1}{2} w_{0\text{ext}}^2(\mathbf{x}_E) \right) dt \right. \\ & \left. - \left(3 w_{0\text{ext}}(\mathbf{x}_E) + \frac{v_E^2}{2} \right) v_E^i r_E^i \right], \end{aligned}$$

where v_E is the barycentric velocity of the Earth and where the index ext refers to summation over all bodies except the Earth.

Notes

1. This formulation will provide an uncertainty not larger than 5×10^{-18} in rate and, for quasi-periodic terms, not larger than 5×10^{-18} in rate amplitude and 0.2 ps in phase amplitude, for locations farther than a few solar radii from the Sun. The same uncertainty also applies to the transformation between TCB and TCG for locations within 50000 km of the Earth. Uncertainties in the values of astronomical quantities may induce larger errors in the formulas.

2. Within the above mentioned uncertainties, it is sufficient to express the vector potential $w_A^i(t, \mathbf{x})$ of body A as

$$w_A^i(t, \mathbf{x}) = G \left[\frac{-(\mathbf{r}_A \times \mathbf{S}_A)^i}{2r_A^3} + \frac{M_A v_A^i}{r_A} \right],$$

where \mathbf{S}_A is the total angular momentum of body A and v_A^i are the components of the barycentric coordinate velocity of body A. As for the function $\Delta_A(t, \mathbf{x})$ it is sufficient to express it as

$$\Delta_A(t, \mathbf{x}) = \frac{GM_A}{r_A} \left[-2v_a^2 + \sum_{B \neq A} \frac{GM_B}{r_{BA}} + \frac{1}{2} \left(\frac{(\mathbf{r}_A^k v_A^k)^2}{r_A^2} + r_A^k a_A^k \right) \right] + \frac{2Gv_A^k (\mathbf{r}_A \times \mathbf{S}_A)^k}{r_A^3},$$

where $r_{BA} = |\mathbf{x}_B - \mathbf{x}_A|$ and a_A^k is the barycentric coordinate acceleration of body A. In these formulas, the terms in \mathbf{S}_A are needed only for Jupiter ($S \approx 6.9 \times 10^{38} \text{ m}^2 \text{ s}^{-1} \text{ kg}$) and Saturn ($S \approx 1.4 \times 10^{38} \text{ m}^2 \text{ s}^{-1} \text{ kg}$), in the immediate vicinity of these planets.

3. Because the present Recommendation provides an extension of the IAU 1991 recommendations valid at the full first post-Newtonian level, the constants L_C and L_B that were introduced in the IAU 1991 recommendations should be defined as $\langle \text{TCG}/\text{TCB} \rangle = 1 - L_C$ and $\langle \text{TT}/\text{TCB} \rangle = 1 - L_B$, where TT refers to Terrestrial Time and $\langle \rangle$ refers to a sufficiently long average taken at the geocenter. The most recent estimate of L_C is (Irwin, A. and Fukushima, T., 1999, *Astron. Astroph.* **348**, 642-652)

$$L_C = 1.48082686741 \times 10^{-8} \pm 2 \times 10^{-17},$$

From the Resolution B1.9 on "Redefinition of Terrestrial Time TT", one infers $L_B = 1.55051976772 \times 10^{-8} \pm 2 \times 10^{-17}$ by using the relation $1 - L_B = (1 - L_C)(1 - L_G)$. L_G is defined in Resolution B1.9.

Because no unambiguous definition may be provided for L_B and L_C , these constants should not be used in formulating time transformations when it would require knowing their value with an uncertainty of order 1×10^{-16} or less.

4. If TCB-TCG is computed using planetary ephemerides which are expressed in terms of a time argument (noted T_{eph}) which is close to Barycentric Dynamical Time (TDB), rather than in terms of TCB, the first integral in Recommendation 2 above may be computed as

$$\int_{t_0}^t \left(\frac{v_E^2}{2} + w_{0\text{ext}}(\mathbf{x}_E) \right) dt = \left[\int_{T_{\text{epho}}}^{T_{\text{eph}}} \left(\frac{v_E^2}{2} + w_{0\text{ext}}(\mathbf{x}_E) \right) dt \right] / (1 - L_B)$$

Resolution B1.6

IAU 2000 Precession-Nutation Model

The XXIVth International Astronomical Union General Assembly,

Recognising

1. that the International Astronomical Union and the International Union of Geodesy and Geophysics Working Group (IAU-IUGG WG) on 'Non-rigid Earth Nutation Theory' has met its goals by
 - a. establishing new high precision rigid Earth nutation series, such as (1) SMART97 of Bretagnon *et al.*, 1998, *Astron. Astroph.* **329**, 329-338; (2) REN2000 of Souchay *et al.*, 1999, *Astron. Astroph. Suppl. Ser* **135**, 111-131; (3) RDAN97 of Roosbeek and Dehant 1999, *Celest. Mech.* **70**, 215-253,
 - b. completing the comparison of new non-rigid Earth transfer functions for an Earth initially in non-hydrostatic equilibrium, incorporating mantle anelasticity and a Free Core Nutation period in agreement with observations,
 - c. noting that numerical integration models are not yet ready to incorporate dissipation in the core, and
 - d. noting the effects of other geophysical and astronomical phenomena that must be modelled, such as ocean and atmospheric tides, that need further development,
2. that, as instructed by IAU Recommendation C1 in 1994, the International Earth Rotation Service (IERS) will publish in the IERS Conventions (2000) a precession-nutation model that matches the observations with a weighted rms of 0.2 milliarcsecond (mas),
3. that semi-analytical geophysical theories of forced nutation are available which incorporate some or all of the following - anelasticity and electromagnetic couplings at the core-mantle and inner core-outer core boundaries, annual atmospheric tide, geodetic nutation, and ocean tide effects,
4. that ocean tide corrections are necessary at all nutation frequencies, and
5. that empirical models based on a resonance formula without further corrections do also exist,

Accepts

the conclusions of the IAU-IUGG WG on Non-rigid Earth Nutation Theory published by Dehant *et al.*, 1999, *Celest. Mech.* **72**(4), 245-310 and the recent comparisons between the various possibilities, and

Recommends

that, beginning on 1 January 2003, the IAU 1976 Precession Model and IAU 1980 Theory of Nutation, be replaced by the precession-nutation model IAU 2000A (MHB2000, based on the transfer functions of Mathews, Herring and Buffett, 2000 - submitted to the *Journal of Geophysical Research*) for those who need a model at the 0.2 mas level, or its shorter version IAU 2000B for those who need a model only at the 1 mas level, together with their associated precession and obliquity rates, and their

associated celestial pole offsets at J2000.0, to be published in the IERS Conventions 2000, and

Encourages

1. the continuation of theoretical developments of non-rigid Earth nutation series,
2. the continuation of VLBI observations to increase the accuracy of the nutation series and the nutation model, and to monitor the unpredictable free core nutation, and
3. the development of new expressions for precession consistent with the IAU 2000A model.

Resolution B1.7

Definition of Celestial Intermediate Pole

The XXIVth International Astronomical Union General Assembly,

Noting

the need for accurate definition of reference systems brought about by unprecedented observational precision, and

Recognising

1. the need to specify an axis with respect to which the Earth's angle of rotation is defined, and
2. that the Celestial Ephemeris Pole (CEP) does not take account of diurnal and higher frequency variations in the Earth's orientation,

Recommends

1. that the Celestial Intermediate Pole (CIP) be the pole, the motion of which is specified in the Geocentric Celestial Reference System (GCRS, see Resolution B1.3) by motion of the Tisserand mean axis of the Earth with periods greater than two days,
2. that the direction of the CIP at J2000.0 be offset from the direction of the pole of the GCRS in a manner consistent with the IAU 2000A (see Resolution B1.6) precession-nutation model,
3. that the motion of the CIP in the GCRS be realised by the IAU 2000 A model for precession and forced nutation for periods greater than two days plus additional time-dependent corrections provided by the International Earth Rotation Service (IERS) through appropriate astro-geodetic observations,
4. that the motion of the CIP in the International Terrestrial Reference System (ITRS) be provided by the IERS through appropriate astro-geodetic observations and models including high-frequency variations,
5. that for highest precision, corrections to the models for the motion of the CIP in the ITRS may be estimated using procedures specified by the IERS, and
6. that implementation of the CIP be on 1 January 2003.

Notes

The forced nutations with periods less than two days are included in the model for the motion of the CIP in the ITRS.

The Tisserand mean axis of the Earth corresponds to the mean surface geographic axis, quoted B axis, in Seidelmann, 1982, Celest. Mech. 27, 79-106.

As a consequence of this resolution, the Celestial Ephemeris Pole is no longer necessary.

Resolution B1.8

Definition and use of Celestial and Terrestrial Ephemeris Origins

The XXIVth International Astronomical Union General Assembly,

Recognising

1. the need for reference system definitions suitable for modern realisations of the conventional reference systems and consistent with observational precision,
2. the need for a rigorous definition of sidereal rotation of the Earth, and
3. the desirability of describing the rotation of the Earth independently from its orbital motion, and

Noting

that the use of the "non-rotating origin" (Guinot, 1979) on the moving equator fulfills the above conditions and allows for a definition of UT1 which is insensitive to changes in models for precession and nutation at the microarcsecond level,

Recommends

1. the use of the "non-rotating origin" in the Geocentric Celestial Reference System (GCRS) and that this point be designated as the Celestial Ephemeris Origin (CEO) on the equator of the Celestial Intermediate Pole (CIP),
2. the use of the "non-rotating origin" in the International Terrestrial Reference System (ITRS) and that this point be designated as the Terrestrial Ephemeris Origin (TEO) on the equator of the CIP,
3. that UT1 be linearly proportional to the Earth Rotation Angle defined as the angle measured along the equator of the CIP between the unit vectors directed toward the CEO and the TEO,
4. that the transformation between the ITRS and GCRS be specified by the position of the CIP in the GCRS, the position of the CIP in the ITRS, and the Earth Rotation Angle,
5. that the International Earth Rotation Service (IERS) take steps to implement this by 1 January 2003, and
6. that the IERS will continue to provide users with data and algorithms for the conventional transformations.

Note

The position of the CEO can be computed from the IAU 2000A model for precession and nutation of the CIP and from the current values of the offset of the CIP from the pole of the ICRF at J2000.0 using the development provided by Capitaine et al. (2000).

The position of the TEO is only slightly dependent on polar motion and can be extrapolated as done by Capitaine et al. (2000) using the IERS data.

The linear relationship between the Earth's rotation angle θ and UT1 should ensure the continuity in phase and rate of UT1 with the value obtained by the conventional relationship between Greenwich Mean Sidereal Time (GMST) and UT1. This is accomplished by the following relationship:

$$\theta(UT1) = 2\pi(0.7790572732640 + 1.00273781191135448 \times (\text{Julian UT1 date} - 2451545.0))$$

References

Guinot, B., 1979, in D.D. McCarthy and J.D. Pilkington (eds.), Time and the Earth's Rotation, D. Reidel Publ., 7-18.
Capitaine, N., Guinot, B. and McCarthy, D.D., 2000, *Astron. Astrophys.*, 335, 398-405.

Resolution B1.9

Re-definition of Terrestrial Time TT

The XXIVth International Astronomical Union General Assembly,

Considering

1. that IAU Resolution A4 (1991) has defined Terrestrial Time (TT) in its Recommendation 4, and
2. that the intricacy and temporal changes inherent to the definition and realisation of the geoid are a source of uncertainty in the definition and realisation of TT, which may become, in the near future, the dominant source of uncertainty in realising TT from atomic clocks,

Recommends

that TT be a time scale differing from TCG by a constant rate: $dTT/dTCG = 1 - L_G$, where $L_G = 6.969290134 \times 10^{-10}$ is a defining constant,

Note

L_G was defined by the IAU Resolution A4 (1991) in its Recommendation 4 as equal to U_G/c^2 where U_G is the geopotential at the geoid. L_G is now used as a defining constant.

Resolution B2

Coordinated Universal Time

The XXIVth International Astronomical Union General Assembly,

Recognising

1. that the definition of Coordinated Universal Time (UTC) relies on the astronomical observation of the UT1 time scale in order to introduce leap seconds,
2. that the unpredictability of leap seconds affects modern communication and navigation systems, and
3. that astronomical observations provide an accurate estimate of the secular deceleration of the Earth's rate of rotation,

Recommends

1. that the IAU establish a working group reporting to Division I at the General Assembly in 2003 to consider the redefinition of UTC,
2. that this study discuss whether there is a requirement for leap seconds, the possibility of inserting leap seconds at pre-determined intervals, and the tolerance limits for UT1-UTC, and
3. that this study be undertaken in cooperation with the appropriate groups of the International Union of Radio Science (URSI), the International Telecommunications Union (ITU-R), the International Bureau for Weights and Measures (BIPM), the International Earth Rotation Service (IERS), and relevant navigational agencies.

Resolution B3

Safeguarding the Information in Photographic Observations

The XXIVth International Astronomical Union General Assembly,

Consequent upon

its Recommendation C13 (1991) of the XXIst General Assembly to create accessible archives of the large quantities of observational material collected during the 20th Century and currently stored on photographic plates,

Recognising

that unless action is taken, this unique historical record of astronomical phenomena will be lost to future generations of astronomers,

Considering

the important efforts made by the Working Groups on (i) Sky Surveys, (ii) Carte du Ciel plates and (iii) Spectroscopic Data Archives, as well as by the Centre for European Plates recently launched at the Royal Observatory of Belgium, in locating and cataloguing plates, in defining the tools needed to safeguard them, and in negotiating the means to preserve their recorded information in digital form in the public domain, and

Realising

that the cataloguing, storage and safeguarding of the photographic plates is an important aspect for the implementation of the possible future digitisation processes needed for selective media transfer of high quality data,

Recommends

the transfer of the historic observations onto modern media by digital techniques, which will provide worldwide access to the data so as to benefit astronomical research in a way that is well matched to the tools of the researcher in the future.

7.3. Explanations Concerning GA Resolution B3

A Comment on General Assembly Resolution B3

General Assembly (GA) resolution B3 was forwarded to the GA by the Resolutions Committee and printed in the "Northern Lights" for August 15. At the second session of the GA, the Executive Committee unanimously recommended against its adoption; yet, it was approved by a small majority of the GA. As the persons most directly responsible for the organization of the GA, we have been asked by a number of colleagues to clarify this somewhat unusual event.

First, the rules for processing IAU Resolutions seem still unclear to many. Briefly, proposed resolutions are submitted ahead of the GA to the Resolutions Committee (RC) which examines them for suitability, wording, and consistency with previous IAU resolutions. The RC "may refer a resolution back to the proposers for reconsideration or withdrawal, but can neither withdraw or modify the substance of a Resolution on its own initiative." The RC must, however, notify the EC of any perceived problems with substance, on which the EC subsequently advises the GA.

Resolution B3 was processed strictly according to this procedure: The RC informed the EC of its contents already on Monday, August 7, when the EC expressed its unanimous opposition to its substance. It was subsequently discussed between the RC and the proposer and modified, but not withdrawn, and the RC accordingly forwarded it to the GA with the other proposed Resolutions. The EC discussed the modified proposal on August 15 but maintained its opposition and informed the GA accordingly. On both occasions, all Division Presidents present agreed with the rest of the EC.

After discussion, the GA voted according to the rules for scientific matters, i.e. each individual member having one vote; 130 were in favour and 110 against its approval. While both numbers were uncertain by 1-2 votes, and in the absence of any rules on quorum, abstentions, etc., the only scientifically reasonable conclusion was that Resolution B3 had been adopted by the GA.

There is no discussion that valuable photographic records should be preserved and an easily accessible inventory compiled: GA Resolution C13 from 1991 says exactly so and still stands; indeed, Resolution B3 quotes it. The EC objects to an IAU recommendation to 'transfer' them to digital form for three reasons, two of which are scientific: (i) not all information is preserved in the digitisation, so a digital copy is not a substitute for the original; and (ii) no digital medium is yet known to be a safer long-term depository of the information than the photographic plates themselves. The third, and main, objection, is on matters of principle: 'Importance' or 'priority' are not absolute but relative quantities, and recommending one specific project is necessarily at the expense of something else, which has not been discussed.

While it was correctly pointed out at the GA that the IAU has made many such gratuitous recommendations in the past, the outgoing EC felt strongly and unanimously that this tradition should not be carried into the 21st century. Given that less than 3% of the membership took part in the vote, it would appear that our scientific decision making processes need another overhaul.

Johannes Andersen
IAU General Secretary, 1997-2000

Robert P. Kraft
IAU President, 1997-2000

The Enactment of General Assembly Resolution B3

In view of the disquiet unanimously felt by the Executive Committee and those who voted against the acceptance of Resolution B3, "Safeguarding the information in photographic observations", at the 24th GA, I would like to thank Hans Rickman for this opportunity to enlarge upon the purpose of the Resolution B3.

The wording of B3 is intentionally general, and its precise enactment will need to be evolved and guided by a new Working Group in consultation with holders of plate archives. The purpose of B3 is not to dictate where, or by whom, digitization is to be carried out; those are details to be decided according to the type and quality of individual plate collections if and when a suitable scanning facility is set up somewhere. Nor is it to urge the wholesale digitization of all photographic observations; selection is an important element in this particular exercise, and priorities according to quality, object and re-useability of information content are vital; they are in any case essential if the overall objective is to be achieved at the desired level of finesse within a (suggested) time-scale of 5–10 years.

There is also no intended implication that digitization be an acceptable alternative to preservation of the originals. More than a few observatories regard (and seem likely to continue to regard) their plate archives as an integral part of their own heritage, and may only lend plates for digitizing on the condition that they are returned. Other observatories which have neither the wish nor the means to store their plates in suitable conditions indefinitely may prefer to be relieved of that duty, and since B3 specifically expresses the community wish that plates be preserved, it will then be incumbent upon the WG to help those observatories negotiate an alternative long-term solution (such as a repository in a local or national museum).

There is, however, a need to stress the timeliness of this activity because (a) the plates themselves are deteriorating with time, and (b) the necessary equipment and expertise are becoming lost and are not being replaced.

The new Working Group for the Preservation and Digitization of Photographic Plates (PDPP) is planned to be established under the auspices of Commission 5 at the 25th IAU GA in Sydney 2003. Until then it will exist as a Task Group of the same Commission, working in close contact with the WG on Astronomical Data. It will act as a general watchdog and agent in matters relating to the Resolution, while in areas of preservation and digitization it will advise, co-ordinate, and cross-fertilize ideas. It will include a core membership of those with working experience of preserving and (or) digitizing photographic observations, and it will keep contacts with astronomers from each country that has holdings of photographic plates of research quality.

Interested individuals are invited to contact the undersigned

Elizabeth Griffin
Chair, WG for Spectroscopic Data Archives
(remg@astro.ox.ac.uk).

7.4. Accounts for the Period 1997-1999 (CHF)

AS APPROVED BY NATIONAL REPRESENTATIVES (August 16, 2000)

INCOME	1997	1998	1999	2000 Budget*
<i>Unit of contribution</i>	2820	2880	2950	3040
<i>Number of units of contribution</i>	254	254	254	254
Adhering Organizations	780730	659475	875528	772160
Special Contributions	131187		556	
ICSU/UNESCO	28400	21150	17490	40000
Publications: Royalties	6110	85546	66173	30000
Bank Interests	37351	15283	10623	15000
Other Income	1038	20321	2539	
TOTAL INCOME	984816	801775	972909	857160
EXPENDITURE	1997	1998	1999	2000 Budget*
Scientific Activities				
<i>General Assembly</i>				
Grants	508978			180000
Commission Presidents				40000
Operation	31474	1294	6360	45000
<i>Sub-total General Assembly</i>	540452	1294	6360	265000
<i>Meetings</i>				
Symposia/Colloquia	43456	218339	278012	264000
Co-sponsored Meetings		5000	10000	
Regional Meetings		25000		
<i>Sub-total Meetings</i>	43456	248339	288012	264000
<i>Commissions & Working Groups</i>				
Telegram Bureau (06)	4000		4000	4000
Minor Planet Center (20)		6000	6000	
Meteor Data Center (22)		1100	2200	1100
EC WGs	2506	7072	1631	18000
Commission WGs	4432	683	3176	15000
<i>Sub-total Commissions & Working Groups</i>	10938	14855	17007	38100
Total Scientific Activities	594845	264488	311379	567100

EXPENDITURE	1997	1998	1999	2000 Budget*
Educational Activities				
ISYA (46)	32085		31314	
VLP/TAD (46)	29591	23929	39060	30000
Astronomy Teaching (46)				5000
Exchange of Astronomers (38)	27729	12825	28124	25000
UN/ESA Workshop			2293	
Total Educational Activities	89405	36754	100791	60000
Delegates to other Unions	15083	8272	16159	10000
Dues to other Unions/Organizations				
ICSU	14542	14409	16500	17000
IERS/FAGS	7500	7500	7500	7500
IUCAF	7500	7500	7500	7500
Total Dues to other Unions/Organizations	29542	29409	31500	32000
Executive Committee				
Executive Committee meetings	82031	40239	50476	65000
Officers meetings	9662	8729	2498	5200
General Secretary expenditure	22329	34305	27919	27500
President expenditure	2363	3588	4245	3500
Asst General Secretary expenditure	333			3000
Archives	14473	11230	7519	
Total Executive Committee	131191	98091	92657	104200
Publications	30084	59523	76181	53000
Administration/Secretariat				
Salaries & Charges	169886	185133	184496	164000
Training courses			2946	4500
General office expenses	62087	59135	50579	72000
Audit fee	2035	2378	2503	2000
Bank	13912	10276	3989	8500
Total Administration/Secretariat	247920	256922	244513	251000
TOTAL EXPENDITURE	1138070	753459	873180	1077300
Excess of Income over Expenditure	-153255	48316	99729	-220140
General Fund, end of year	836394	884710	984439	

(*) 2000 budget as approved at the XXIIIrd General Assembly

7.5. Budget 2001-2003 (CHF)

AS APPROVED BY NATIONAL REPRESENTATIVES (August 16, 2000)

INCOME	2000*	2001	2002	2003
<i>Adjustment for inflation</i>		2%	2.4%	2.7%
<i>Unit of contribution</i>	3040	3100	3175	3260
<i>Number of units of contribution</i>	254	260	260	260
Adhering Organizations	772160	806000	825500	847600
ICSU/UNESCO	40000	15000	15000	15000
Publications: royalties	30000	25000	25000	25000
Bank Interest	15000	25000	25000	25000
TOTAL INCOME	857160	871000	890500	912600
EXPENDITURE	2000*	2001	2002	2003
Scientific Activities				
<i>General Assemblies</i>				
Grants	180000			180000
Commission Presidents	40000			40000
Operation	45000	5000	5000	45000
Sub-total General Assemblies	265000	5000	5000	265000
<i>Meetings</i>				
Symposia/Colloquia	264000	240000	240000	240000
Regional Meetings		25000	25000	
Sub-total Meetings	264000	265000	265000	240000
<i>Commissions & Working Groups</i>				
Telegram Bureau (06)	4000	4000	4000	4000
Meteor Planet Center (20)		6000	6000	6000
Meteor Data Center (22)	1100	1100	1100	1100
EC WGs	18000	5000	5000	5000
Commission WGs	20000	5000	5000	5000
Sub-total Commissions & Working Groups	43100	21100	21100	21100
Total Scientific Activities	572100	291100	291100	526100

EXPENDITURE	2000*	2001	2002	2003
Educational Activities				
ISYA (46)		30000	30000	
TAD (46)	30000	40000	40000	40000
Exchange of Astronomers (38)	25000	20000	20000	20000
Other activities		10000	10000	10000
Total Educational Activities	55000	100000	100000	70000
Delegates to other Unions	10000	10000	10000	10000
Dues to other Unions/Organizations				
ICSU	17000	17000	17000	17000
IERS/FAGS	7500	7500	7500	7500
IUCAF	7500	7500	7500	7500
Total Dues to Unions/Organizations	32000	32000	32000	32000
Executive Committee				
Executive Committee meetings	65000	36000	37000	75000
Officers meetings	5200	6000	6000	6000
General Secretary expenditure	27500	30000	30000	30000
President expenses	3500	1000	1000	1000
Assist General Secretary expenses	3000	2000	2000	2000
Total Executive Committee	104200	75000	76000	114000
Publications				
Information Bulletin	34000	30000	42000	30000
Free Distribution	19000	10000	10000	10000
Total Publications	53000	40000	52000	40000
Administration/Secretariat				
Salaries & Charges	164000	175000	175000	175000
Training courses	4500	5000	5000	5000
General office expenses:)			
Mail, Telephone, Office supplies,) 72000	70000	72000	72000
Rental (INSU/IAP), Furniture, Computers)			
Audit fee	2000	2500	2500	2500
Bank charges	8500	4000	4000	4000
Total Administration/Secretariat	251000	256500	258500	258500
TOTAL EXPENDITURE	1077300	804600	819600	1050600
Excess/Loss of Income over Expenditure	-220140	66400	70900	-138000

(*) 2000 budget as approved at the XXIIIrd General Assembly

8. XXVth AND XXVIth GENERAL ASSEMBLIES

8.1. Report on the Planning of the IAU XXVth General Assembly

The National Organising Committee (NOC) for IAU 2003 has had a busy 6 months both preparing the exhibit to promote IAU 2003 at the Manchester IAU 2000 Congress, and in a process to learn from the experiences of Manchester in 2000.

The display mounted in Manchester was the first of its kind to promote a forthcoming congress at the immediately preceding one. Through the two weeks in Manchester, we provided not only a pictorial display of the Sydney facilities and Australian tourism to encourage IAU members to come to Sydney in 2003, but also encouraged attendees to fill in pre-registration forms to help us plan the Australian congress.

Some 475 people filled in the forms and since Manchester's congress a further ~200 have filled in the form via our IAU web site (<http://www.iau-ga2003.org/>), indicating a significant degree of interest in attending. If you intend coming to Sydney or are wondering about what Australia offers in the way of tourist options before and after the Sydney Congress (to be held between 13-26 July 2003) we urge you to fill in a pre-registration form at the IAU 2003 web site.

It is clear from the pre-registration forms that all of the proposed adventure tours to be organised both before and after the Sydney GA have enough potential participants that we will now be undertaking detailed planning to organize all of the tours for IAU members and their families or friends. As a reminder, we propose to run tours to: i) The Great Barrier Reef; ii) a painters and photographers tour to the Desert areas of Central Australia; iii) to the McDonald Ranges, Uluru and the Olgas; iv) to Kakadu and the Kimberleys in north-west Australia; and v) to the rain forests and mountains of Tasmania. For those that have not seen the wonders of Australia this is a life-time opportunity to experience Australia and participate in what we hope to be the best ever IAU Congress.

The NOC is just now in the process of establishing a number of sub-committees to handle the complex logistics of running the large Congress in Sydney. The Australian astronomy community is also devoting considerable effort to promoting an exciting scientific program of 6 Symposia and all the associated Joint Discussions, Commission meetings and business meetings and encouraging the Divisions and Commissions to plan early. By the end of November the sub-committees will all have been formed and each will be starting the detailed planning that will go into IAU 2003 over the next two or so years.

13 November, 2000

Raymond Haynes, Harry Hyland for the National Organising Committee, IAU 2003
Sydney, Australia

Professor A. R. (Harry) Hyland, Deputy Vice-Chancellor,
James Cook University, Townsville Queensland 4811, Australia
Tel : 61 7 4781 5451 Fax : 61 7 4781 5452
Email: Harry.Hyland@jcu.edu.au

8.2. IAU XXVIth General Assembly

After almost forty years, the 26th IAU General Assembly in 2006 will come back again to Prague, the city that was proud to organize the 13th IAU General Assembly in 1967. The world has changed a lot since that time and so has Prague, especially after the 'velvet revolution' in 1989. In addition to historical monuments dating back one millennium and a rich scientific past (Charles University was founded by the Roman Emperor and King of Bohemia Charles IV in 1348; astronomical celebrities such as Tycho Brahe, Johannes Kepler, Christian Doppler and Albert Einstein lived and worked in Prague), a modern Congress Center and many new hotels, restaurants, metro, etc. are now in place for hosting international congresses. Czech astronomers are very happy that the invitation by the Astronomical Institute, Academy of Sciences of the Czech Republic, and the Czech National Committee for Astronomy has been accepted by the IAU, and they are looking forward to warmly welcome all participants of the 26th IAU General Assembly in 2006.

September 30, 2000

Jan Vondrák, Jan Palouš

9. SPECIAL ANNOUNCEMENTS

9.1. The Cosmology Prize of the Peter Gruber Foundation

The IAU Executive Committee decided at its 73rd meeting to enter into a collaboration with the Peter Gruber Foundation (PGF) concerning its Cosmology Prize. This prize is awarded annually to scientists of any nationality working in the fields of astronomy, physics, mathematics and philosophy of science for scientific advances in our understanding of the Universe and how we perceive it. The Prize recipients are selected by an International Advisory Board of seven members nominated by the IAU and other scientific unions. The Prize consists of a medal and a cash sum of 150,000 USD. The Prizes for the year 2000 were recently awarded to Allan Sandage and James Peebles.

Nominations for the 2001 Cosmology Prize may be submitted by individuals, organizations and institutions (comprising individual IAU members and astronomical institutions) and are hereby invited. For this purpose a nomination form, available at <http://www.iau.org/cosprize.html> or by fax from the IAU Secretariat, should be used. It should reach the Secretariat no later than April 30, 2001. Nominators should also include a concise letter of motivation and brief description of the nominee's achievements in addition to the required data in the form.

9.2. The Peter Gruber Foundation Fellowships

Thanks to funding from the PGF, the IAU is pleased to announce the availability of two fellowships to be awarded during the year 2001, and again at three-year intervals beginning in 2003. Each fellowship amounts to USD 37,500 and will be given as a stipend covering travel, subsistence and research expenses during a postdoctoral appointment for a period which is typically of one year duration but may be extended to

two years. The Awards will be given to extremely promising, young astrophysicists working in any field of astrophysics - either theoretical, observational or experimental. There are no limitations on the nationality, but preference will be given to applicants from countries in difficult economic conditions.

The host institution of the postdoctoral appointment shall be a center of excellence in the applicant's field of research, located in a country different from that of the applicant's current country of residence. The host institution must agree to administer the stipend and to offer the basic facilities such that the PGF stipend is not used as a replacement for those. The stipend is primarily intended to cover living and research expenses, but upon agreement between the host institution and the IAU, part of it can also be used for salary.

Applications for PGF Fellowships to be awarded in 2001 are hereby invited. They must contain (a) a research plan for the period during which the stipend will be used, and a draft budget for the use of the money; (b) a CV with a list of publications; (c) letters of support from 2-4 people who know the applicant's work; and (d) a letter of acceptance from the host institution. These should be submitted to the IAU Secretariat with a strict deadline for receipt on 30 April, 2001. Applicants will be notified about the outcome before 31 May, 2001, and the first PGF fellows and host institutions will be announced in the next issue of the IAU Information Bulletin, to appear in June-July, 2001.

9.3. News from "Astronomy and Astrophysics"

The Board of Directors of "Astronomy and Astrophysics" has the pleasure of informing you of two important decisions. First, from 1st January 2001, the "Supplement Series" will be merged with the Main Journal and secondly, the new merged journal will be published by EDP Sciences who has been publishing the Supplement Series since 1980.

The new merged Journal will appear four times per month. Library subscriptions for the new Journal per 100 pages will be significantly lower than for the old Main Journal and Supplement Series. A library which subscribed in the year 2000 to both Journals will pay less in 2001. A library which in 2000 took only the Main Journal will pay a little more for the merged Journal. The merged Journal will publish 400 pages weekly.

In addition to the existing web sites, there are now three new web sites available for the Journal. The Board of Directors of "Astronomy and Astrophysics" now has its own domain and web site <http://www.aanda.org>. On this web site you can find details of the Board of Directors and their work. The Editorial Offices have web sites which give instructions to authors about submitting their papers. They are: <http://www.obspm.fr/aanda> and <http://www.strw.leidenuniv.nl/~aanda>.

In order to ensure a smooth transition of the subscriptions, we recommend that institutes inform EDP Sciences of their subscriptions by sending an email to subscribers@edpsciences.org. If your subscription to "Astronomy and Astrophysics" is on a standing order basis, this information is needed now so that your renewal subscription is in effect right from the beginning. Online access to the Journal will continue through the IP number to institutes that have paid an institutional subscription.

Finally, we would like to take this opportunity to thank you for your fidelity to "Astronomy and Astrophysics" and to assure you of our continuing endeavour to produce a journal of the highest scientific quality, constituting an invaluable contribution to the international community of astronomers and astrophysicists.

Aa. Sandqvist (Chairman), A.G. Hearn (Vice-Chairman) for the Board of Directors

10. EDUCATIONAL ACTIVITIES

The Revised IAU Commission 46

The new IAU Commission 46 Astronomy Education and Development has already been discussed in previous IBs and was approved at the 24th General Assembly last August. The commission is now composed of 9 Program Groups : Advance Development (AD), Teaching for Astronomy Development (TAD), Collaborative Programs (CP), International Schools for Young Astronomers (ISYA), Exchange of Astronomers (EA), National Liaison, Newsletter, Public Understanding of Science at the Time of Solar Eclipses, and Exchanges of books, journals, etc.

Details of the activities of each PG can be referred to at the IAU Commission 46 web site <http://physics.open.ac.uk/IAU46>.

Commission 46 is expected to organize all educational activities in the future - 'from the cradle to the grave'. To achieve this target, we set up the above mentioned 9 PGs, however, these may not be able to cover all the above expectations. Therefore proposals for new PGs to fill these gaps from IAU members are welcome.

Because of the reorganization of Commission 46, its budget for the triennium 2001-2003 is increased to CHF 270,000, which is approximately 10% of the total IAU budget. This sum reflects substantial support from the EC to Commission 46, but its activities still rely on voluntary efforts by individual PG members.

PG for Exchange of Astronomers

The previous Commission 38 Exchange of Astronomers is now one of the PGs of the new Commission 46. However, its function is carried over to the PG of Exchange of Astronomers. All information on applications for grants to enable such exchanges is available at the IAU Commission 46 web site. All correspondence should be directed to the Chair and Vice-Chair of the PG to the following addresses:

Chair
Dr. Richard West
ESO
Karl Schwarzschildstr. 2
D 85724 Garching Munchen
Germany
Phone 49 89 320 06276
Fax 49 89 320 2362
e-mail rwest@eso.org

Vice - Chair
Dr. Charles Tolbert
Univ Station
Univ of Virginia
Box 3818
Charlottesville VA 22903-0818, USA
1 804 924 7494
1 804 924 3104
tolbert@virginia.edu

PG for Collaborative Programs

The IAU has a long history in work on Teaching of Astronomy. In recent years, some related organizations have started similar work. The Committee on Peaceful Use of Outer Space of the United Nations has organized a meeting on Basic Space Science for developing countries every year since 1989; the International Astronautical Federation held a Scientific Symposium, Bringing Space into Education, at Strasbourg, in April, 2000; COSPAR held a Special Symposium, Public Understanding of Space Science, at Warsaw in July, 2000; and the International Council for Science held an International Conference on Primary School Science and Mathematics Education at Beijing, in November, 2000. Some IAU Commission 46 members attended all these meetings and contributed significantly. We started this PG to help to use the resources of each organization efficiently, and include a representative from each as our liaison member.

PG for Public Understanding of Science at the Time of Solar Eclipses

This PG is active on all occasions of solar eclipses. It distributes material on request, and partly on the web site : <http://www.williams.edu/astronomy/eclipses>

Others

Information on PGs for Teaching for Astronomy Development and International Schools for Young Astronomers was given in IB 86 and 87, and there is no further change here. Newsletter 53, issued in October, 2000, is also available on the web site of IAU Commission 46, <http://physics.open.ac.uk/IAU46>.

November 13, 2000
Syuzo Isobe

11. IAU REPRESENTATIVES TO INTERNATIONAL ORGANIZATIONS 20002003

Acronym	Organization	Representative(s)
ICSU	International Council of Scientific Unions General Committee	<i>O. Engvold</i>
BIPM	Bureau International des Poids et Mesures	<i>J. Kovalevsky</i>
CCTF	International Consultative Committee for the Time Frequency	<i>T. Fukushima</i>
CCU	Comité Consultatif des Unités	<i>S. Débarbat</i>
CIE	Compagnie Internationale de l'Eclairage	<i>S. Isobe</i>
CODATA	Committee on Data for Science & Technology	<i>R. Norris</i>
COPUOS	Committee on the Peaceful Uses of Outer Space Scientific and Technical Subcommittee	<i>J. Andersen</i>

COSPAR	Committee on Space Research COSPAR SC B COSPAR SC D COSPAR SC E COSPAR Sub. Committee E1 COSPAR Sub. Committee E2	<i>H. Rickman</i> <i>C. de Bergh</i> <i>M. Vandas</i> <i>W. Wamsteker</i> <i>G. Srinivasan</i> <i>O. Engvold</i>
COSTED	Committee on Science & Technology in Developing Countries	<i>O. Engvold</i>
FAGS	Federation of Astronomical & Geophysical Services	<i>P. Pâquet/</i> <i>E. Tandberg-Hanssen</i>
IAF	International Astronautical Federation	<i>J. Tarter (2000-01)</i>
IERS	International Earth Rotation Service	<i>J. Vondrak</i>
IGBP	International Geosphere-Biosphere Programme	TBA
ISES	International Space Environment Service	<i>H. Coffey</i>
ITU	International Telecommunication Union ITU-R Radiocommunication Bureau	<i>T. Gergely/</i> <i>M. Ohishi</i>
IUCAF	Inter-Union Commission on Frequency Allocation for Radio Astronomy & Space Science	<i>K. Tapping</i> <i>I. Kawaguchi</i> <i>D. Emerson</i> <i>R.J. Cohen</i>
IUPAP	International Union of Pure & Applied Physics IUPAP C4 Commission on Cosmic Rays	<i>H. Rickman</i> <i>H. Voelk</i>
IVS	International VLBI Service	<i>N. Capitaine</i>
QBSA	Quarterly Bulletin on Solar Activity	<i>I. Kawaguchi</i>
SCOSTEP	Scientific Committee on Solar-Terrestrial Physics	<i>B. Schmieder</i>
URSI	Union Radio-Scientifique Internationale	<i>L. Padrielli</i>

12. MEMBERSHIP

At the XXIVth General Assembly the Union welcomed as New Associate Members Cuba, Jordan, Morocco and The Philippines. At its 73rd meeting on August 15, 2000, the Executive Committee, upon the advice of the Nominating Committee, admitted 703 new individual members to the Union. At the second session of the General Assembly, on August 16, 2000 a moment of silence was observed in remembrance of the members deceased since the XXIIIrd General Assembly, as their names were read by the General Secretary (a complete list of these individual's names will be published in Transactions XXIVB). In all, the IAU had a total of 8737 individual members as of that date.

All membership lists will appear in the Proceedings of the XXIVth General Assembly (IAU Transactions Vol. XXIVB) and the full current membership directory as a separate publication. In addition, the online membership directory remains available on the web, as always with some inaccuracies that we would like to correct. Therefore, please check your entry and inform the Secretariat of all changes required.

It is with great sadness that we note the recent death of former IAU member Hendrik van de Hulst, prof. em. at Leiden University, Netherlands, who was one of the most prominent astronomers of the 20th century. The news was learnt during the 24th GA in Manchester and reported in the "Northern Lights" newspaper. Finally, the General Secretary regrets to report the names of former and current IAU members whose death has been communicated to the Secretariat since the previous list published in IB 87.

Ravilsh Bibarsov	Robert Hjellming	John O'Keefe
Donald Billings	Erik Holmberg	Frank Orrall
Valentin Boriakoff	William Kaula	Irina Proko'eva
Izabella Brejdo	Vadim Karpinski	Victor Safronov
Woyk Chvojokova	Frank Kerr	Dusan Saletic
Petar-Kasimir Colic	Ivan Kopylov	Wagner Sessin
Imre Csada	John Kennedy	Alexander Sharov
James Cuffey	J. Kumsishvili	Jaromir Siroky
John deWitt Jr.	Nina Magnaradze	Gijsbert van Herk
Nikolaj Erpylev	Miklos Marik	Hendrik van de Hulst
John Evans	Nikolaj Mikhelson	Gennadij Vyalshin
Herbert Friedman	Freeman Miller	Joseph Weber
Virginia Gregorieva	Igor Minin	Frank Wood
Stefania Grudzińska	Paul Muller	

13. PUBLICATIONS

13.1. IAU Symposia

- 177 THE CARBON STAR PHENOMENON**
Ed. R.F. Wing
Kluwer Academic Publishers, Dordrecht, 2000, ISBN 0-7923-6346-9
- 200 THE BIRTH AND EVOLUTION OF BINARY STARS: POSTER PROCEEDINGS**
B. Reiputh & H. Zinnecker
Astrophysikalisches Institut Potsdam, 2000

13.2 IAU Colloquia

- 174 SMALL GALAXY GROUPS**
Eds. M.J. Valtonen & C. Flynn
ASP Conference Series Vol. 209, 2000, ISBN 1-58381-040-4 US\$ 52.00
- 176 THE IMPACT OF LARGE-SCALE SURVEYS ON PULSATING STAR RESEARCH**
Eds. L. Szabados & D.W.Kurtz
ASP Conference Series Vol. 203, 2000, ISBN 1-58381-030-7 US\$ 52.00
- 178 POLAR MOTION: HISTORICAL AND SCIENTIFIC PROBLEMS**
Eds. S. Dick, D. McCarthy & B. Luzum
ASP Conference Series, Vol 208, 2000, ISBN 1-58381-039-0 US\$52.00

13.3 Other Publications Received

ASP Conference Series, San Francisco, CA, USA, \$ 52.00

- 204 THERMAL AND IONIZATION ASPECTS OF FLOWS FROM HOT STARS: OBSERVATIONS AND THEORIES**
- 205 LAST TOTAL SOLAR ECLIPSE OF THE MILLENIUM IN TURKEY**
- 206 HIGH ENERGY SOLAR PHYSICS - ANTICIPATING HESSI**
- 207 NGST SCIENCE AND TECHNOLOGY EXPOSITION**
- 210 DELTA SCUTI AND RELATED STARS**
- 211 MASSIVE STELLAR CLUSTERS**

Kluwer Academic Publishers, Dordrecht, The Netherlands

INFORMATION HANDLING IN ASTRONOMY
Ed. André Heck, ISBN 0-7923-9494-5 (HB)

STAR GUIDES 2001
Ed. André Heck, ISBN 0-7923-6509-7 (HB) US\$ 465.00

THE UNIVERSE: VISIONS AND PERSPECTIVES

Eds. N. Dadhich & A. Kembhavi, ISBN 0-7923-6210-1 (HB) US\$ 150.00

COSMIC PERSPECTIVES IN SPACE PHYSICS

S. Biswas, ISBN 0-7923-5813-9 (HB) US\$ 199.00

*Cambridge University Press, Cambridge, UK***GALAXIES IN THE UNIVERSE**

Eds. L. Sparke & J. Gallagher, ISBN 0-521-59241-0 (PB) US\$ 34.95

CARL SAGAN'S COSMIC CONNECTION: AN EXTRATERRESTRIAL PERSPECTIVE

Carl Sagan, produced by J. Angel ISBN 0-521-78303-8 (HB) US\$ 24.95

AN INTRODUCTION TO THE THEORY OF STELLAR STRUCTURE

D. Prialnik, ISBN 0-521-65937-X (PB) US\$ 24.95

DYNAMICS OF GALAXIES

G. Bertin, ISBN 0-521-47855-3 (PB) US\$ 34.95

THE CAMBRIDGE HANDBOOK OF PHYSICS FORMULAS

G. Woan, ISBN 0-521-57507-7 (PB) US\$ 19.95

HANDBOOK OF CCD ASTRONOMY

S. Howell, ISBN 0-521-64834-3 (PB) US\$ 24.95

CELESTIAL SITES, CELESTIAL SPLENDORS

H. Bruillier, ISBN 0-521-66773-9 (PB) US\$ 14.95

UNSOLVED PROBLEMS IN STELLAR EVOLUTION

Ed. M. Livio, ISBN 0-521-78091-8 (HB)

COSMIC STRINGS AND OTHER TOPOLOGICAL DEFECTS

A. Vilenkin & E. Shellard, ISBN 0-521-65476-9 (PB) US\$ 49.95

TYPE IA SUPERNOVAE: THEORY AND COSMOLOGY

Eds. J. Niemeyer & J. Truran, ISBN 0-521-78036-5 (HB) US\$ 59.95

THE ORIGIN AND EVOLUTION OF PLANETARY NEBULAE

S. Kwok, ISBN 0-521-62313-8 (HB) US\$ 59.95

MAGNETIC RECONNECTION

E. Priest & T. Forbes, ISBN 0-521-48179-1 (HB) \$85.00

OBSERVING THE MOON

G. North, ISBN 0-521-622740-3 (HB) GB £25.00

*Other Publishers***ASTROMETRY OF FUNDAMENTAL CATALOGUES**

Eds. H. Walter, & O. Sovers, Springer Verlag, Berlin, 2000, ISBN 3-540-67436-5

WORLD CONFERENCE ON SCIENCE

Ed. A.M. Cetto, UNESCO, London, 2000, ISBN 1 903 598 001

14. OTHER MEETINGS ON ASTRONOMICAL TOPICS

The following is an incomplete list of major meetings in 2001 and 2002 spanning a broad range of topics. More detailed information about these meetings is obtained from the respective contact persons and/or URL addresses. A more exhaustive list can be found on the IAU web site at <http://www.iau.org/othermeet.html>.

ASTROPHYSICAL AGES AND TIME SCALES

February 5-9, 2001, Hilo, Hawaii, USA

Contact: Ted von Hippel, Gemini Observatory, 670 North A'ohoku Place,
Hilo, HI 96720, USA

Tel.: 1 808 974 2500

Fax: 1 808 935 9650

Email: timescales@gemini.edu
<http://www.gemini.edu/science/timescales/>
THE CALIBRATION LEGACY OF THE ISO MISSION

February 5 - 9, 2001, Madrid, Spain.

Contact: Leo Metcalfe. European Space Agency, Apartado 50727,
E 28080 Madrid, Spain

Tel: 34 91 8131372

Fax: 34 91 8131322

Email: helpdesk@iso.vilspa.esa.es
http://www.iso.vilspa.esa.es/meetings/calibration/2nd_announcement.html
NEW CENTURY OF X-RAY ASTRONOMY

March 6 - 8, 2001, Yokohama, Japan

Contact: Hidyō Kunieda, Institute of Space and Astronautical Science,
3-1-1 Yoshinodai, Sagamihara, Kanagawa, Japan

Fax: 81 42 759 8455

Email: newcentx@astro.isas.ac.jp
<http://www.astro.isas.ac.jp/conference/newcentx/>
JOINT SOHO/ACE WORKSHOP ON "SOLAR AND GALACTIC COMPOSITION"

March 6 - 9, 2001, Bern, Switzerland

Contact: Robert Wimmer, Physikalisches Institut of the University of Bern,
Sidlerstrasse 5, CH-3012 Bern, Switzerland

Tel: 41 31 631 4420

Fax: 41 31 631 4405

Email: robert.wimmer@phim.unibe.ch
http://www.phim.unibe.ch/soho/soho_ace/
MASS OUTFLOW IN ACTIVE GALACTIC NUCLEI: NEW PERSPECTIVES

March 8 - 10, 2001, The Catholic University of America, Washington, DC, USA

Contact: Mike Crenshaw, Catholic University of America, 200 Hannan Hall,
Washington, DC 20064, USA

Tel.: 1 301 286 0871

Fax: 1 301 286 1752

Email: Crenshaw@buckeye.gsfc.nasa.gov
<http://iaacs.cua.edu/conf.html>

BROWN DWARFS AND PLANETS

April 2 - 6, 2001, Grimentz, Switzerland

Contact: Dider Queloz, Geneva Observatory, Sauverny, Switzerland 1290

Email: dider.queloz@obs.unige.ch

<http://obswww.unige.ch/~queloz/saasfee01/preannoucement.html>

SIXTH COMPTON SYMPOSIUM

April 4 - 6, 2001, Baltimore, MD, USA

Contact: Sandra Barnes, NASA GSFC, Code 660, Greenbelt, MD 20771, USA

Tel.: 1 301 286 7780 Fax: 1 301 286 1684

Email: barnes@gssc.gsfc.nasa.gov

<http://coss.gsfc.nasa.gov/meetings/Gamma2001>

ASTEROIDS 2001: FROM PIAZZI TO THE 3RD MILLENNIUM

June 11 - 15, 2001, Palermo, Italy.

Contact: Carlo Blanco, Universita di Catania, Dipartimento di Fisica e Astronomia,

Via S. Sofia, 78, I-95125 Catania, Italy

Tel.: 39 095 733 2245 Fax: 39 095 33 0592

Email: cblanco@alpha4.ct.astro.it

SOLAR VARIABILITY, CLIMATE AND SPACE WEATHER

June 13 - 16, 2001, Longmont, Colorado, USA

Contact: Judit M. Pap, NASA Goddard Space Flight Center, Code 680.0,

Greenbelt, Maryland 20771, USA

Tel.: 1 301 286 7511 Fax: 1 301 286 1753

Email: pap@snoppy.gsfc.nasa.gov, jpap@solar.stanford.edu

GASEOUS MATTER IN GALAXIES AND INTERGALACTIC SPACE

June 19-23, 2001, Paris, France

Contact: Roger Ferlet, Institut d'Astrophysique de Paris, 98bis Bd. Arago,

F 75014 Paris, France

Tel: 33 1 44 32 8074 Fax: 33 1 44 32 8001

Email: ferlet@iap.fr

STELLAR CORONAE IN THE CHANDRA AND XMM-NEWTON ERA

June 25 - 29, 2001, Noordwijk, The Netherlands

Contact: Fabio Favata, Space Science Dept., ESA, P.O. Box 299, Noordwijk,

The Netherlands

Tel.: 31 71 565 4665 Fax: 31 71 565 4690

Email: ffavata@astro.estec.esa.nl <http://astro.esa.int/Symposia/Coronae2001>

TRACING COSMIC EVOLUTION WITH GALAXY CLUSTERS

July 3 - 6, 2001, Sesto Pusteria, Bolzano, Italy

Contact: S.Borgani, G. Giuricin, and M. Mezzetti, Dipartimento di Astronomia,

Universita di Trieste, via Tiepolo 11, Trieste, TS I-34131, Italy

Tel.: 39 040 3199 227 Fax: 39 040 3094 18

Email: sesto@daut.univ.trieste.it <http://www.daut.univ.trieste.it/Sesto>

FIFTH BIENNIAL HISTORY OF ASTRONOMY WORKSHOP

July 5 - 8, 2001, Notre Dame, IN, USA

Contact: Dr. Steven J. Dick, U.S. Naval Observatory, 3450 Massachusetts Ave NW, Washington, DC 20392-5420, USA

Tel.: 1 202 762 0379 Fax: 1 202 762 1489

Email: dick.steve@usno.navy.mil <http://www.nd.edu/histast4>

THE 12TH CAMBRIDGE WORKSHOP ON COOL STARS, STELLAR SYSTEMS AND THE SUN

July 30 - 3 August, 2001 Boulder, Colorado, USA

Contact: Thomas R. Ayres, University of Colorado, Campus box 389 (CASA), Boulder, Colorado 80309, USA

Tel.: 1 303 492 4051 Fax: 1 303 492 4052.

Email: cs12@casca.colorado.edu

METEORIDS 2001

August 6 - 10, 2001, Kiruna, Sweden

Chairperson LOC: Asta Pellinen-Wannberg

Contact: Asta Pellinen-Wannberg, Swedish Institute of Space Physics/Meteoroids

2001, Box 812, SE-981 28 Kiruna, Sweden

Tel: 46 980 79000 Fax: 46 980 79091

Email: meteoroids2001@irf.se <http://www.irf.se/Meteoroids2001/>

VARIABLE STARS-2001

August 20 - 24, 2001, Odessa Ukraine

Contact: Valentin G. Karetnikov and Ivan L. Andronov, Astronomical Observatory,

Odessa State University, T.G. Shevchenko Park, Odessa Ukraine 65014

Tel.: 38 0482 220396 Fax: 38 0482 228442

Email: astro@paco.odessa.ua

THE EVOLUTION OF GALAXIES. II-BASIC BUILDING BLOCKS

October 2001, St. Denis de la Reunion, France

Contact: Laurent Vigroux, CEA, Service d'Astrophysique, Gif-sur-Yvette, F-91191, France

Tel.: 33 1 69 08 3912 Fax: 33 1 69 08 65 77

Email: lvigroux@cea.fr <http://www.daec.obspm.fr/ThreeConf.html>

THE EVOLUTION OF GALAXIES. III-FROM SIMPLE APPROACHES TO SELF-CONSISTENT MODELS

May 2002, Kiel, Germany

Contact: Gerhard Hensler, Univ. Kiel, Olshausenstr. 40, D-24098 Kiel, Germany

Tel.: 49 431 88 04 125 Fax: 49 431 88 04 100

Email: hensler@astrophysik.uni-kiel.de <http://www.daec.obspm.fr/ThreeConf.html>

34TH COSPAR SCIENTIFIC ASSEMBLY

October 2002, Houston, TX, USA

Contact: COSPAR Secretariat, 51 Bd de Montmorency, F-75016 Paris, France

Tel.: 33 1 45 250 679 Fax: 33 1 40 509 827

Email: COSPAR@paris7.jussieu.fr

The International Astronomical Union



Information on Organisation of IAU Sponsored Scientific Meetings

- [Rules and Guidelines for IAU Sponsored Scientific Meetings](#)
- [Deadline and Submission Procedures for Proposals for Meetings in 2001](#)
- [Proposal Form for IAU Symposia](#)
- [Proposal Form for IAU Colloquia](#)
- [IAU Travel Grant Application Form \(to single Symposia/Colloquia\)](#)
- [Proposal Form for Symposia at IAU General Assemblies](#)
- [Proposal Form for Joint Discussions at IAU General Assemblies](#)
- [IAU Travel Grant Application Form \(for meetings at IAU General Assemblies\)](#)
- [Post-Meeting Report Form](#)

Future IAU Scientific Meetings

- [Future IAU Scientific Meetings](#)
- [Deadline and Submission Procedures for Proposals for Meetings in 2001](#)
- [Other Future Meetings of Interest to IAU members](#)

Links to the **Rules and Guidelines for IAU Sponsored Scientific Meetings** and all relevant application forms are found above.

Past IAU Scientific Meetings

- [Past IAU General Assemblies](#)
- [Past IAU Symposia](#)
- [Past IAU Colloquia](#)
- [Past IAU Regional Meetings](#)

Proceedings of IAU Scientific Meetings

Information on the Proceedings of IAU Scientific Meetings can be found [here](#).

The UNESCO/ICSU World Conference on Science, June 26 - July 1, 1999

This major conference in Budapest, Hungary, was convened jointly by [UNESCO](#) and [ICSU](#) to review status of world science at the end of the second millennium, and to formulate recommendations for the future. The recommendations as agreed by the participants in the meeting were expressed in the [Budapest Declaration on Science and the Use of Scientific Knowledge](#) and the [Science Agenda - Framework for Action](#), accessible through the links provided here.

It is to be noted that, subsequently, the 26th General Assembly of ICSU (September 28-29, 1999; in Cairo, Egypt) expressed concerns regarding the formulation of paragraph 26 of the "Declaration" and stressed that "empirical knowledge must be distinguished from approaches that seek to promote anti-science and pseudo-science, and which degrade the values of science as understood by the ICSU community." ICSU, at the same time, reaffirmed its support for "the values and methods of verifiable science".

The Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space

(UNISPACE III), July 19 - 30, 1999

17 years after its predecessor UNISPACE 82, the conference was convened at the Vienna International Centre, Austria, by the UN Committee on the Peaceful Uses of Outer Space (UN-COPUOS). Its purpose was to review the status of international activities in space, and to formulate priorities and recommendations for the development of these activities during the first decades of the new millennium. Organised by the UN Office of Outer Space Affairs, the conference was attended by over 100 UN Member States and numerous international organizations, including the IAU which has permanent observer status with UN-COPUOS.

In conjunction with UNISPACE III, the IAU in collaboration with COSPAR and the UN Office of Outer Space Affairs organised two meetings on subjects which are given high priority by the IAU: The **IAU/COSPAR/UN Special Environmental Symposium: "Preserving the Astronomical Sky" (IAU Symposium 196)**, and an **IAU/COSPAR/UN Special Workshop on Education in Astronomy and Basic Space Science**. As part of the "Technical Forum" of UNISPACE III, both meetings formulated "Observations and Recommendations" to the main Conference within their respective subjects. These recommendations were forwarded to the Conference and to a very large extent included in the Final Report of UNISPACE III and associated recommendations to the UN General Assembly. The General Assembly will discuss these recommendations in November/December 1999

The final documents of UNISPACE III: The **Vienna Declaration on Space and Human Development** and the **Background and Recommendations of the Conference**, as well as all background documents, including the recommendations of all meetings held as part of the "Technical Forum", are now available from the web site of the [UN Office of Outer Space Affairs](#), eventually in all six official languages of the UN.

Return to [IAU-home](#), Return to [top](#) of document.

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