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# INFORMATION BULLETIN No. 81

## January 1998

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## PREFACE

Three months have passed since the XXIIIrd General Assembly in Kyoto, a memorable event that no doubt remains vivid in the minds of those who attended it. On behalf of us all, I thank again our Japanese hosts, headed by the Chairpersons of the Scientific and Local Organising Committees, Daiichiro Sugimoto and Toshio Fukushima, for their immense efforts that made such a superbly well-organised meeting possible. That the final number of participants reached nearly 2000 was due not only to the attractions of the venue and scientific programme, but also to the generous amounts of travel support our Japanese colleagues were able to provide despite the substantial cost of the meeting itself. On the IAU side, the design of the scientific programme and the solution of innumerable practical matters were due to the devoted efforts of my predecessor, Immo Appenzeller, and our Secretariat staff, Monique Orine and Julie Saucedo, to whom I also extend our most cordial thanks. Meeting the standards they have set is a daunting challenge, but I shall do my best to live up to the confidence shown me.

Among other achievements in 1997, I am pleased to note our very successful International School for Young Astronomers in Iran and our Teaching for Astronomy Development course in Vietnam (see reports in this IB). It is encouraging also that a Working Group on African Astronomy has been formed, with South African astronomers as the driving force. I hope that the IAU may thus continue, within our modest means, to help erode some of the political barriers to scientific - and other - exchanges in the world.

In Kyoto, it was decided that the XXIVth General Assembly will take place in Manchester, UK,

August 7-19, 2000. Already a few days after returning from Kyoto, I visited sunny Manchester (yes!) to discuss preparations for this event with our British hosts. I look forward to seeing a great many of you in Manchester and suggest that now is a good time to start planning an exciting scientific programme for this event.

The IAU Office has not been idle since the Kyoto GA. Letters of welcome have been sent to our ~775 new members. Contributions to the Highlights and Transactions are pouring in and being assembled into the three volumes that will record the busy activities of the GA. Our WWW home page has been restructured and moved to a new address, which can remain permanent as IAU Officers come and go. Please make sure to check your entry in the membership file, including your e-mail address, as we plan to gradually introduce electronic dissemination of the IB and other news. A variety of other useful, encouraging, or sinister matters that have kept us busy are summarised in a new Section 1, "Faits Divers".

Readers will notice that this issue of the IB is distributed by the new IAU Publisher. After 15 years, it has also been given a new cover, designed by Lars Lindberg Christensen; the beautiful photograph of Comet Hale-Bopp (March 10, 1997) is reproduced courtesy of astro-photographer Eckhard Pawlik of Waldenburg, Germany, to whom I extend my thanks.

Finally, I extend the best wishes of the IAU Officers and Secretariat to all of you for a professionally and personally rewarding 1998.

December 1, 1997

Johannes Andersen

General Secretary

## 1. FAITS DIVERS

"Faits Divers" was a daily newspaper column fondly remembered by your Editor from his days as a young postdoc in France. This was where one checked the ups and downs of everyday life; the marriages, bank robberies, births, murders, and stolen cars (e.g. your own). This item in the next IBs will serve an analogous purpose.

Among the "ups", I note with relief that at least some new initiatives to ruin the night sky with commercial displays have recently been averted. The most serious of these was no doubt the recent attempt to revive the so-called "Star of Tolerance" project, a bright artificial satellite supposedly celebrating the year 2000, which would have been a dominating feature of the night sky for several years. Accompanied by a veritable feeding frenzy of media hype, it was purported to generate vast revenues for vaguely described humanitarian and other purposes. Fortunately, both UNESCO (last year) and ESA (this year) have decided, wisely and responsibly, not to further this project which would have been deleterious not only in itself, but above all by throwing the door wide open to the proliferation of space advertising. As directed by a General Assembly resolution (p. 27), we are currently examining possible ways to propose an international treaty protecting the night sky - like, e.g. the Antarctic continent - from such activities. Meanwhile, we ask all IAU members to alert the General Secretary to any future similar menaces as early as possible: Astronomers worldwide are all in favour of tolerance, but want it extended to *all* stars -

not just the occasional artificial one!

Encouraging news is also forthcoming from the recent, month-long World Radiocommunication Conference, where the radio astronomy community turned up in force under the aegis of the Inter-Union Committee on Frequency Allocation for Radio Astronomy and Space Science (IUCAF). There seems to be a growing understanding for the need to preserve the frequency intervals most vital to radio astronomy, but great vigilance and careful preparation are needed before the next WRC conference in 1999.

Also among the "ups", we now have a permanent IAU Web address: <http://www.intastun.org/> as well as generic mail addresses for the Secretariat and Officers of the Union. It is expected that these will remain permanent as individual Officers come and go, the links behind the scenes being updated at each change of guard, but transparent to the membership. When our file of electronic addresses for IAU members is more up to date and complete, electronic communication will increasingly supplement paper mailings (e.g. of the IB) in our means of keeping in touch with members. Your comments and suggestions for improvement of our Web services, including "missing links" to Commissions, Working Groups, etc., are welcomed.

Among the "downs", the deplorable practice of some commercial enterprises to pretend that they can "sell" star names to the general public seems to continue to flourish. While the IAU cannot prevent companies from selling elaborately calligraphed "certificates" to people who wish to pay for such decorations, any references to the IAU as supporting such activities, whether accidental or deliberate, are clearly unacceptable (cf. art. 33 of the IAU Working Rules). An apparently effective argument with prospective victims of this traffic seems to be the obvious bargain of getting the entire NASA/STScI Guide Star Catalog on CD-ROM directly from the source rather than buying stars one at a time from second-hand dealers...

Finally, to end on an upbeat note, our Paris office and computers have also been given a facelift. Visitors are always welcome in our little third-floor office if your travels take you to Paris!

## 2. MAIN DEADLINES IN 1998-2000

Proposals for IAU Symposia, Colloquia, Regional Meetings, and  
co-sponsored meetings planned for **1999** should reach  
the Assistant General Secretary (see inside cover page)

**no later than May 15, 1998**

in order to be considered at the **1998** Executive Committee meeting. Proposals should be complete, with all supporting documents, and copies of proposals be sent to the Presidents of all Divisions and Commissions concerned, by that date (cf. the Rules for IAU Scientific Meetings).

Future administrative meetings and other events as currently scheduled are listed below. The list can also be consulted at the IAU WWW home page under *News and Announcements*, where it will be regularly updated.

**Officers' Meeting:**

February 19-20, 1998, in Paris.

Matters to be discussed should be communicated to the General Secretary one month before the meeting, if possible.

**IAU Information Bulletin No. 82 (June 1998):**

Contributions to appear in the next IB should reach the Secretariat no later than April 1, 1998.

**Executive Committee Meeting No. 71:**

July 2-3, 1998, in Paris, France.

Any matter to be considered by the Executive Committee should reach the General Secretary no later than May 1, 1998.

**XXVIth General Assembly:**

August 7-19, 2000, in Manchester, UK.

At the Officers Meeting in February 1998, a detailed time-table of events leading up to the General Assembly will be established. This will include submissions to the *Reports on Astronomy*, proposals for new IAU Members, proposals for items to be placed on the GA agenda, Resolutions, Symposia and other GA scientific programme, IAU Travel Grant applications, etc. The list will be published in IAU Information Bulletin No. 82 (June 1998) and posted at our Web site as soon as it is available.

**3. SCIENTIFIC MEETINGS IN 1998****3.1 Future IAU Symposia****IAU Symposium 190 New Views of the Magellanic Clouds**

13 - 19 July, 1998, Victoria, Canada

Scientific Organizing Committee: E. Brocato (Italy), Y.-H. Chu (USA, *Chairperson*), A. Cowley (USA), K. Freeman (Australia), P. Hodge (USA), M. Rubio (Chile), M. Spite (France), L. Staveley-Smith (Australia), N. Suntzeff (Chile, *Chairperson*), N. Walborn (USA), D. Welch (Canada), H. Zinnecker (Germany).

Chairperson, Local Organizing Committee: J. Hesser.

Principal Topics:

- Recent Observations of Stars and the ISM of the Magellanic Clouds

- The Physical Properties and Structure of the Multiple-Phase ISM
- Interactions between Stars/OB Associations/Clusters and the ISM
- Stellar Evolution - Observations vs Theoretical Models
- Stellar Systems - IMFs, Abundances, Ages, Dynamics, Populations
- Star Formation History and Evolution of the Magellanic Clouds
- The Global Structure of the Magellanic Clouds - Populations, Distributions of Matter, and Dynamics
- The Distance to the Magellanic Clouds
- Connections to Other Magellanic Irregulars and Distant Universe

*Contact address:* You-Hua Chu, Astronomy Dpt, University. of Illinois, 1002 W. Green Street, Urbana, IL 61801, USA

Tel: 1 217 333 5535 E-mail: [chu@astro.uiuc.edu](mailto:chu@astro.uiuc.edu)

Fax: 1 217 244 7638 WWW: <http://cadwww.hia.nrc.ca/iau190/iau190.html>

### **IAU Symposium 191 Asymptotic Giant Branch Stars**

28 August - 1 September, 1998, Montpellier, France

Scientific Organizing Committee: A. Alksnis (Latvia), B. Gustafsson (Sweden), H. Habing (Netherlands), S. Kleinmann (USA), D. Lambert (USA), T. Le Bertre (France), D. Lepine (Brasil), M.O. Mennessier (France), A. Omont (France), D. Schönberner (Germany), X. Tielens (USA), T. Tsuji (Japan), C. Waelkens (Belgium, *Chairperson*), P. Whitelock (South Africa), P. Wood (Australia).

Chairperson, Local Organizing Committee: A. Lèbre.

Principal Topics:

- Setting the Stage (broad introductory session)
- Structure and Evolution of AGB Stars (evolution from MS to TP-ABG, nucleosynthesis, dredge-up, C and S stars, fundamental parameters and abundances, post-AGB stars)
- Pulsation, Mass, Cool Envelopes (Miras and SRs, pulsation modes, PL relations, mass loss, interaction pulsation-massloss-grains)
- Formation, Composition and Processing of Dust Grains
- Circumstellar Envelopes (models, observations, chemistry, masers)
- Binarity and Non-Spherical Mass Loss
- AGB Stars in Their Galactic Context (chemical evolution - total mass loss, chemical yields,

## AGB stars in external galaxies)

*Contact address:* C. Waelkens, Inst. voor Sterrenkunde, Celestijnenlaan 200B, B-3001 Leuven, Belgium

Tel: 32 16 327036 E-mail: christoffel@ster.kuleuven.ac.be

Fax: 32 16 327999 WWW: <http://www.dstu.univ-montp2.fr/GRAAL/agb98-1.html>

**IAU Symposium 192 The Stellar Content of Local Group Galaxies**

7 - 12 September, 1998, Cape Town, South Africa

Scientific Organizing Committee: B. Barbuy (Brasil), R. Cannon (Australia, *Chairperson*), F. Fusi Pecci (Italy), D. Hatzidimitriou (Greece), M. Irwin (UK), I. Karachentsev (Russia), J. Lequeux (France), C. Pritchett (Canada), J. Silk (USA), V. Trimble (USA), P. Whitelock (South Africa).

Chairperson, Local Organizing Committee: P. Whitelock.

## Principal Topics:

- New Data on Local Group Galaxies (colour-magnitude diagrams, multi-object spectroscopy, high-resolution spectroscopy, radio and X-ray data. Future prospects with 8m-class telescopes and other new facilities)
- Connections with Theory (stellar evolution, star formation and the initial mass function, interactions with the ISM)
- Kinematics of Local Group (dynamics and history of system, dark matter in large and small galaxies, evidence for interactions and mergers)
- Wider Implications (chemical enrichment history, synthesis of stellar populations, formation and evolution of galaxies, distance scale and other cosmological implications)

*Contact address:* P. Whitelock, South African Astronomical Observatory, PO Box 9, 7935 Observatory, Western Cape, South Africa

Tel: 27 21 470025 E-mail: paw@da.sao.ac.za

Fax: 27 21 473639 WWW: <http://www.sao.ac.za/~lgroup>

**IAU Symposium 193 Wolf-Rayet Phenomena in Massive Stars and Starburst Galaxies**

3 - 7 November, 1998, Puerto Vallarta, Mexico

Scientific Organizing Committee: P.S. Conti (USA), M.A. Dopita (Australia), F. Ferrini (Italy), T.M. Heckman (USA), K.A. van der Hucht (Netherlands, *Chairperson*), R.D. Joseph (USA), G. Koenigsberger (Mexico), D. Kunth (France), C. Leitherer (USA), A. Maeder (Switzerland), F. Matteucci (Italy), J. Melnick (Chile), F.J. Moffat (Canada), W. Schmutz (Switzerland), W.D. Vacca (USA), P.M. Williams (UK), A.J. Willis (UK).

Chairperson, Local Organizing Committee: P.R.J. Eenens.

Principal Topics:

- Basic observational properties of WR stars and other hot massive stars
- State of the art of model atmospheres for single star evolution of massive stars: winds + atmospheres + interior
- Hydrodynamical interaction of WR stars and other hot massive stars with their environment: colliding winds and ring nebulae
- Role of WR stars and other hot massive stars in the Galactic Center and giant HII regions
- WR stars and other hot massive stars in starburst galaxies. The case of WR galaxies
- Starbursts and their role in the spectral and chemical evolution of galaxies

*Contact address:* K.A. van der Hucht, Space Research Organization Netherlands, Sorbonnelaan 2, NL-3584 CA Utrecht, The Netherlands

Tel: 31 30 253 5729 E-mail: K.vanderHucht@sron.ruu.nl

Fax: 31 30 254 0860 WWW: <http://www.astro.ugto.mx/~eenens/hot/pv/>

<http://www.star.ucl.ac.uk/~hsn/pv/index.html>

### **IAU Symposium 194 Activity in Galaxies and Related Phenomena**

17 - 21 August, 1998, Yerevan, Armenia

Scientific Organizing Committee: H. Arp (Germany), F. Bertola (Italy), A. Boyarchuk (Russia), G. Burbidge (USA), E. Khachikian (Armenia, *Chairperson*), D. Kunth (France), J. Narlikar (India), D. Osterbrock (USA), R. Terlevich (UK), Y. Terzian (USA, *Chairperson*), V. Trimble (USA), D. Weedman (USA), L. Woltjer (France), A. Zasov (Russia).

Chairperson, Local Organizing Committee: H.A. Harutyunian.

Principal Topics:

- Observations of Active Galactic Nuclei
- AGN and Related Objects
- AGN Theory and Models
- AGN-Related Phenomena

*Contact address:* H. Harutyunian, Byurakan Astrophysical Obs, 378433 Byurakan, Armenia.

Tel: 324 2 521 636 E-mail: hhaik@bao.sci.am

Fax: 88 52 28 4142 WWW: <http://bao.sci.am/iau194>

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### 3.2 Future IAU Colloquia

#### IAU Colloquium 168 Cometary Nuclei in Space and Time

18 - 22 May, 1998, Nanjing, China

Scientific Organizing Committee: M.F. A'Hearn (USA, *Chairperson*), Chen D.-H. (China), A.L. Cochran (USA), J.A. Fernández (Uruguay), W.-H. Ip (Germany, *Chairperson*), H.U. Keller (Germany), A.C. Levasseur-Regourd (France), Z.-H. Qi (China, *Chairperson*), G. Schwehm (The Netherlands), J. Watanabe (Japan), I.P. Williams (UK), V. Zappalà (Italy).

Chairperson, Local Organizing Committee: Chen D.-H.

Principal Topics:

- The Properties of Cometary Nuclei - Measurement Techniques from Earth and Space
- Physical Structure
- Chemical Composition
- Dynamics and Evolution
- Implications of Cometary Studies for Our Understanding of the Early Solar System

*Contact address:* M.F. A'Hearn, Dpt of Astronomy, University of Maryland, College Park, MD 20742-2421, USA

Tel: 1 301 405 6076 E-mail: [ma@astro.umd.edu](mailto:ma@astro.umd.edu)

Fax: 1 301 314 9067 WWW: <http://www.ss.astro.umd.edu/IAU/colloq168>

#### IAU Colloquium 169 Variable and Non-Spherical Stellar Winds

15 - 19 June, 1998, Heidelberg, Germany

Scientific Organizing Committee: E. Chentsov (Russia), P.S. Conti (USA), R.M. Humphreys (USA), G. Koenigsberger (Mexico), R.P. Kudritzki (Germany), H.J.G.L.M. Lamers (Netherlands), C. Leitherer (USA), P. McGregor (Australia), A. Maeder (Switzerland), B. Wolf (Germany, *Chairperson*).

Chairperson, Local Organizing Committee: O. Stahl.

Principal Topics:

- Non-Spherical Winds from Luminous Hot Stars (rotationally modulated winds, disks and



disk winds, non-isotropic outflows)

- Variable Winds of Luminous Hot Stars
- Physical Mechanisms (pulsational instabilities, magnetic effects, wind compressed disks, corotating active regions)
- Wind Instabilities, Dust
- Evolutionary Aspects

*Contact address:* B. Wolf, Landessternwarte Königsstuhl, D-69117 Heidelberg, Germany

Tel: 49 6221 509213 E-mail: [bwolf@lsw.uni-heidelberg.de](mailto:bwolf@lsw.uni-heidelberg.de)

Fax: 49 6221 509202 WWW: <http://www.lsw.uni-heidelberg.de/iaucoll/>

### **IAU Colloquium 170 Precise Stellar Radial Velocities**

21 - 26 June, 1998, Victoria, Canada

Scientific Organizing Committee: G. Burki (Switzerland), P. Butler (USA), W. Cochran (USA), D. Dravins (Sweden), D. Gray (Canada), R. Griffin (UK), J. Hearnshaw (New Zealand, *Chairperson*), A. Irwin (Canada), D. Latham (USA, *Deputy Chairperson*), M. Mayor (Switzerland), T. Mazeh (Israel), R. McMillan (USA), L. Ramsey (USA), C. Scarfe (Canada), R. Stefanik (USA).

Chairperson, Local Organizing Committee: C. Scarfe.

Principal Topics:

- Instrumentation and Detectors for Radial Velocities
- Data Reduction Techniques
- Precise Velocities and the Analysis of Orbits (including detection of brown dwarfs and extrasolar planets)
- Precise Velocities for the Interpretation of Stellar Pulsation and Asteroseismology
- Velocity Analysis for Rotating Stars and Stars with Surface Features
- Other Astrophysical Phenomena (convection, turbulence, gravitational redshifts, effects of chromospheric activity or circumstellar material on radial velocity measurements)
- Progress on Radial Velocities for Standard Stars
- Conclusions (including historical overview and future trends and astrophysical problems relating to stellar radial velocities)

*Contact address:* J. Hearnshaw, Mt John University Observatory, University of Canterbury,

Private Bag 4800, Christchurch, New Zealand

Tel: 64 3 364 2533 E-mail: [phys012@cantua.canterbury.ac.nz](mailto:phys012@cantua.canterbury.ac.nz)

Fax: 64 3 364 2469 WWW: <http://astrowww.phys.uvic.ca/prvs/prvs.html>

### **IAU Colloquium 171 The Low Surface Brightness Universe**

6 - 10 July, 1998, Cardiff, U.K.

Scientific Organizing Committee: E. Brinks (Mexico), N. Brosch (Israel, *Chairperson*), A. Burkert (Germany), J. Davies (UK, *Chairperson*), K. Freeman (Australia), T. van der Hulst (Netherlands), C. Impey (USA), Y. Izotov (Ukraine), K. Mattila (Finland).

Chairperson, Local Organizing Committee: R. Smith.

Principal Topics:

- Observational Selection Effects
- The Baryonic Mass Density of the Universe
- Galaxy Formation Scenarios and the Evolutionary History of LSB Galaxies
- LSB Galaxies and Environment
- Optical, HI, and Near and Far Infrared Surveys
- The Properties of LSB Galaxies
- QSO Absorption Lines as Probes for LSB Galaxies
- New Instrumentation and Ways Forward

*Contact address:* J. Davies, Dpt of Physics and Astronomy, University of Wales at Cardiff, PO Box 913, Cardiff CF2 3YB, UK

Tel: 44 1222 874144 E-mail: [jid@astro.cf.ac.uk](mailto:jid@astro.cf.ac.uk)

Fax: 44 1222 874056 WWW: <http://www.astro.cf.ac.uk/IAU171/>

### **IAU Colloquium 172 The Impact of Modern Dynamics in Astronomy**

6 - 11 July, 1998, Namur, Belgium

Scientific Organizing Committee: J.J. Binney (UK, *Chairperson*), G. Contopoulos (Greece), H. Dejonghe (Belgium), S. Ferraz-Mello (Brasil, *Chairperson*), C. Froeschlé (France), J. Henrard (Belgium, *Chairperson*), H. Kinoshita (Japan), A.

Milani (Italy), A. Neishstadt (Russia), S. Peale (USA), N. Rappaport (USA), H. Rickman (Sweden), Yi-Sui Sun (China).

Chairperson, Local Organizing Committee: A. Lemaître.

Principal Topics:

- Galactic and Stellar Dynamics (stability and evolution of galaxies, self-consistent models)
- Formation and Evolution of Planetary Systems (b Pictoris systems, accretion of planetesimals, long term stability of planetary systems, planetary companions of stars)
- Formation and Evolution of the Asteroid Belts and Cometary Clouds (Kirkwood gaps, Edgeworth-Kuiper belt, Oort cloud, asteroid families)
- Formation and Evolution of Satellite Systems (capture into resonance, tidal heating)
- Planetary Rings (ring confinement, ring-satellite interactions)
- Tools in Modern Mechanics (KAM and Nekhoroshev theories, perturbation methods, symplectic mappings)

*Contact address:* J. Henrard, Dpt de Mathématique, FUNDP, 8 Rempart de la Vierge, B-5000 Namur, Belgium

Tel: 32 81 724903 E-mail: [jacques.henrard@fundp.ac.be](mailto:jacques.henrard@fundp.ac.be)

Fax: 32 81 724914 WWW: <http://www.fundp.ac.be/~iau172>

### **IAU Colloquium 173 Evolution and Source Regions of Asteroids and Comets**

24 - 28 August, 1998, Tatranská Lomnica, Slovak Republic

Scientific Organizing Committee: M.E. Bailey (UK), S. Ferraz-Mello (Brasil), I. Hasegawa (Japan), A. López-García (Spain), B.G. Marsden (USA), E.M. Pittich (Slovak Republic, *Chairperson*), H. Rickman (Sweden, *Chairperson*), H. Scholl (France), A.G. Sokolsky (Russia), G.B. Valsecchi (Italy).

Chairperson, Local Organizing Committee: E.M. Pittich.

Principal Topics:

- Formation of Asteroids and Comet Nuclei
- Dynamical Origin and Evolution of Near-Earth Objects
- Dynamical Shaping of Asteroid Populations
- Cometary Populations and Physical Evolution
- Evolutionary Effects in Distant Reservoirs

- Transfer Routes in the Solar System
- Evolutionary Links between Asteroid and Comet Populations
- Capture of Comets

*Contact address:* E.M. Pittich, Astronomical Institute SAV, Dúbravská 9, 84228 Bratislava, Slovakia

Tel: 421 7 375157 E-mail: [astropit@savba.savba.sk](mailto:astropit@savba.savba.sk)

Fax: 421 7 375157 WWW: <http://www.ta3.sk/~ne/iau1>

### **3.3. Regional Meeting**

#### **IXth Latin American Regional Meeting in Astronomy**

November 9-13, 1998, Tonantzintla, Puebla, Mexico

Scientific Organizing Committee : L. Aguilar (Mexico), A. Carramiñana (Mexico, *Chair-person*), S. Lizano (Mexico), E. Recillas (Mexico), N. Morell (Argentina), D. García-Lambas (Argentina), R. de Souza (Brazil), . de Oliveira (Brazil), M.T. Ruiz (Chile), A. Reissenegger (Chile), J.A. Fernández (Uruguay), G. Bruzual (Venezuela).

Details of the venue, accommodation, and scientific programme of this meeting are still in preparation. When final approval has been given, up-to-details will be given via the IAU Web page under *Future Scientific Meetings*, and in IB 82.

*Contact address:* Dr. E. Recillas, Instituto Nacional de Astrofísica, Óptica y Electrónica, Luis Enrique Erro No. 1, Apdo. Postal 51 y 216, MEX 72840 Tonantzintla, Puebla, Mexico

Tel: 1 52 22 47 43 06

Fax: 1 52 22 47 43 14 E-mail : [elsare@inaoep.mx](mailto:elsare@inaoep.mx)

### **3.4. Co-sponsored Meeting**

#### **32nd COSPAR Scientific Assembly and Associated Events**

July 12-19, 1998, Nagoya, Japan

*Contact Address:* COSPAR Secretariat, 51 Bd de Montmorency, 75016 Paris, France.

Tel: 33 1 45 25 0679 E-mail: [cospar@paris7.jussieu.fr](mailto:cospar@paris7.jussieu.fr)

Fax: 33 140 50 9827 WWW: <http://www.mpae.gwdg.de/COSPAR.html>

## 4. NEWS FROM DIVISIONS

### 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 in Sect. 5.

Division I Fundamental Astronomy/*Astrométrie fondamentale*

Commission 4: Ephemerides

Commission 7: Celestial Mechanics and Dynamical Astronomy

Commission 8: Positional Astronomy

Commission 19: Rotation of the Earth

Commission 24: Photographic Astrometry

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 the Heliosphere

Division III Planetary System Sciences/*Sciences du système planétaire*

Commission 15: Physical Study of Comets, Minor Planets and Meteorites

Commission 16: Physical Study of Planets and Satellites

Commission 20: Position and Motions of Minor Planets, Comets and Satellites

Commission 21: Light of the Night Sky

Commission 22: Meteors 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

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/*Galaxies et l'Univers*

Commission 28: Galaxies

Commission 47: Cosmology

Division IX Optical Techniques/*Techniques optiques*

Commission 9: Instruments

Commission 25: Stellar Photometry and Polarimetry

Commission 30: Radial Velocities

Division X Radio Astronomy/*Radioastronomie*

Commission 40: Radio Astronomy

Division XI Space and High Energy Astrophysics

*Astrophysique spatiale et des hautes énergies*

Commission 44: Space and High Energy Astrophysics

## **4.2. News from Division Presidents**

### **Division I: Fundamental Astronomy** (Ken Seidelmann)

This is an interesting time in fundamental astronomy as covered by the Commissions of Division I. There is a new fundamental reference system (International Celestial Reference System) based on extragalactic sources. There is a new optical realization of the ICRS based on the Hipparcos astrometric satellite. These provide reference frames in radio and optical wavelengths with milliarcseconds accuracies, significantly more accurate than the past. This is a challenge to build

on and improve for the future. The Commissions and Working Groups are organized to meet that challenge.

Information about the Commissions and the Working Groups is most readily available through the Division I home page. The Commission Presidents and Working Group Chairmen welcome your contributions and comments as they work during this triennium.

### **Division II: The Sun and Heliosphere** (P. Foukal)

The new Organizing Committee of Division II established in Kyoto consists of P. Foukal, USA (President of Division II, and of Comm. 12); G. Ai, PRC (President, Comm. 10); A. Benz, Switzerland (V.P., Comm. 10); O. Engvold, Norway (ex-President, Div. II); S. Solanki, Switzerland (V.P., Comm. 12); M. Vandas, Czech Rep. (V.P., Comm. 49); and F. Verheest, Belgium (President, Comm. 49).

Our divisional meeting held on August 23, 1997 in Kyoto included presentations from the Working Groups on eclipses (J. Pasachoff), on the quarterly solar activity bulletins (E. Hiei), and on the sunspot index data center, and a compilation of solar activity (P. Cugnon). O. Engvold then described the IAU's newly adopted divisional structure, its impact on the Commissions (including its helpful promotion of cooperation between them), and on structure of the IAU Reports. Discussion followed on ideas for increasing participation in the divisional IAU business meetings. J. Pecker urged that the new divisional structure not be allowed to split up the IAU, as he felt has happened at the IUGG.

At a later working lunch of the Div II OC members present in Kyoto, plans were made for presenting a strong solar and heliospheric program at the next General Assembly in Manchester, U.K. We thank the past OC of Commissions 10, 12, and 49 for their excellent work in organizing two very successful meetings on helioseismology, and on the corona and solar wind, at the Kyoto GA.

### **Division III: Planetary System Sciences** (M.F. A'Hearn)

During the General Assembly in Kyoto, the Division adopted more formal guidelines for its operation, including a minor change in Officers of the Division (including the divisional past President). The Division now has two working groups whose interests and tasks transcend those of the individual commissions to which they formerly reported. These are the Working Group on NEOs and the Small Bodies Names Committee. The division also accepted the final report of the Working Group on Interplanetary Pollution, forwarding it to the IAU Executive Committee for dissemination to other international organizations for endorsement and action. The WG, its tasks completed, was dissolved at the request of its Chairman.

We intend in the near future to post a schedule of international meetings on topics relevant to the Division in order to better coordinate future proposals for IAU Colloquia and Symposia. Since the Division must rank all such proposals sponsored by commissions in the division, we hope to avoid conflicts in the timing of the various proposed meetings. Information about the business of the Division is available on the Web at <http://www.ss.astro.umd.edu/IAU/div3/>, an address which is also linked from the IAU home page. Here you can also link to the individual Commissions and Working Groups of the Division. I welcome communications from members regarding activities that the Division should undertake.

**Division V: Variable Stars (M. Jerzykiewicz)**

The Division's WWW home page can be found at <http://www.konkoly.hu/IAUD>. In addition to standard information such as the names and addresses of the Division officers, the page provides links to the participating Commissions, Commission 27 (Variable Stars) and Commission 42 (Close Binary Stars). The Commissions can be also accessed directly at <http://www.konkoly.hu/IAUC27> or <http://www.konkoly.hu/IAUC42>.

These pages are maintained by Andras Holl of the Konkoly Observatory (holl@ogyalla.konkoly.hu). We should all appreciate his efforts and, perhaps, help him. In a recent letter, Andras indicated how. Excerpt: "To have a successful service, it would be desirable to get more input from Commission members. I have tried (and I will continue to try) to gather information on conferences, for example, but my efforts are not enough. To have a really informative service I would need input from conference organizers. The same would apply to books, networks, newsletters etc."

One issue which may interest most members of our two commissions is the future of the General Catalogue of Variable Stars. The main problem is how to deal with the orders of magnitude increase of the number of new variable stars effected by the CCD photometric surveys. The issue was raised during our business meeting in Kyoto and is now discussed by the Organizing Committee of Commission 27. For details, look up the WWW pages.

Colleagues without access to the Internet can contact me at the address printed in this Bulletin.

**Division VIII: Galaxies and the Universe (P. Shaver)**

This Division contains two large Commissions, 28 (Galaxies) and 47 (Cosmology). In order to assure continuity and coordination, the Board of Division VIII includes the Presidents F. Bertola (28) and A. Szalay (47), the Past Presidents V. Trimble (28) and J. Narlikar (47), and the Vice Presidents S. Okamura (28) and J. Peacock (47) of both Commissions in the Division: As specified in the revised Bye-Laws, the Division will coordinate the activities of the affiliated Commissions, including proposals for new Commissions, Working Groups, IAU Symposia and Colloquia, and Joint Discussions at General Assemblies.

The possibility of creating further Commissions within Division VIII has been discussed over the last three years. Specifically, it was suggested that there could be four Commissions within the Division: Cosmology (or Formal Cosmology), Large Scale Structure, Active Galaxies, and Normal Galaxies & Clusters. It was finally decided to keep to the original two Commissions for the time being, but this issue will be re-visited in the future, and suggestions are always welcome.

A new World Wide Web page is being set up for Division VIII, and will be linked to those of the IAU itself and the Commissions. The address is <http://www.eso.org/iaudiv/>. There is also a new web page for Commission 28, <http://www.pd.astro.it/iaucom28>. To facilitate communication, members of Commission 28 are kindly requested to send their e-mail addresses to [bertola2@astrpd.pd.astro.it](mailto:bertola2@astrpd.pd.astro.it).

**5. COMMISSION MATTERS**

Addresses of Presidents and Vice-Presidents of Commissions, and Presidents of Working Groups



of the Executive Committee, for 1997 - 2000, can be found [here](#)

## **6. MEETINGS OF THE EXECUTIVE COMMITTEE**

### **6.1 69th Meeting of the Executive Committee**

The 69th Meeting of the Executive Committee was held in Kyoto, at the venue of the XXIIIrd General Assembly on August 17 (informally), 18, 19, 20, and 25, 1997. All Members and Advisers were present, as were the proposed new Assistant General Secretary, Hans Rickman, and the IAU Administrative Assistant, Monique Orine. As a new feature, adding substance to the new Division structure, as many Division Presidents as possible, or their substitutes, were invited to attend. The meeting was chaired by the President, L. Woltjer.

The EC reviewed the affairs of the Union extensively. Recommendations to the GA regarding national and individual membership were decided upon, based on the advice of the Nominating Committee (see Sect. 12). The finances were examined and found to be in excellent health, and dues for earlier years from a few countries with economic problems could be waived. On the publication policy, the new IAU publishing contract (see IB 80) will substantially reduce costs to astronomical libraries. The Information Bulletin will gradually be offered in an electronic version as an alternative to the printed format, also helping to reduce mailing costs. Finally, the EC was pleased that the ISYA and TAD educational programmes in Iran and Vietnam had been so successful (see Section 9), and congratulated the organisers on this result.

Much time was devoted to discussing how to optimise relationships with the Divisions in the future, taking advantage of the presence of most Division Presidents or their representatives. The experience of the past three years was reviewed and ideas formulated how to strengthen ties throughout the IAU through the Divisions, using both personal and electronic communications. While it may not be possible to invite all Division Presidents to EC meetings between General Assemblies, the Agendas for Officers' and EC meetings will be forwarded to them for comment and contributions invited, and they will also receive the Minutes of such meetings. The IAU Web page will be restructured (cf. Sect. 1) to more deliberately direct the flow of information through the Division Web pages which all Divisions will establish, with a long-term view to establishing similarly structured e-mail connections to all IAU members. Finally, proposals for IAU Scientific meetings should in the future be collected by Division Presidents and forwarded by them, with advice on their priority, to the EC for final decision.

The EC reviewed the detailed arrangements for the opening and closing sessions of the XXIIIrd General Assembly (see Section 7), including recommendations and resolutions to be submitted to the GA. The EC itself decided to propose a resolution on measures against the increasing adverse environmental impacts on astronomy by commercial activities at all wavelengths. A request had been received from the French National Committee for Astronomy that the EC recommend to the General Assembly that interval between GAs be increased from three to four years, to save money and avoid overlaps with other meetings. After carefully considering the perceived benefits in the light of the new GA format and the timescales needed for proper planning of IAU GAs, the EC unanimously decided to not forward this proposal to the GA.

Finally, the EC reviewed the official invitations received to hold the XXIVth GA in Manchester, UK, in August 2000 and the XXVth GA in Sydney, Australia, in August 2003. Reaffirming its

earlier position, the EC decided to propose to the GA to accept both invitations at this time (see Section 8).

### **6.2 70th Meeting of the Executive Committee**

The 70th meeting of the EC was also held in Kyoto at the GA venue, on August 28, 1997. Following the elections at the second session of the GA on August 27, the EC met in its new composition (cf. inside cover page) except N. Kardashev, who was unable to attend. IAU President Robert P. Kraft chaired the meeting. Again, all Division Presidents were present or represented, and the IAU Administrative Assistant, Monique Orine, also attended.

The EC received reports from Prof. D. Sugimoto and Dr. T. Fukushima, NOC and LOC Chairs, respectively, for the XXIIIrd GA, on their experience with the organisation of the GA. This very large and complex task had, on the whole, been accomplished very smoothly and successfully through the devoted efforts of our Japanese hosts, and the EC expressed its warm compliments and thanks to the organisers.

The future organisation of the cooperation between the Divisions and the IAU Officers and Secretariat was again the subject of a long and constructive discussion. Basically, it was agreed to proceed along the lines discussed at the 69th EC meeting (see above). Division Presidents were strongly encouraged to review the internal (Commission or other) organisational structure of the Divisions in the light of the scientific needs of the future. The EC would look favourably at proposals to try out new structures on an informal basis before possibly proceeding to the formal creation or merger of Commissions or similar bodies.

The format of the *Reports on Astronomy* had been keenly debated by Commission Presidents, who divided about equally in two camps: One found the past, comprehensive, printed format to be outdated and inordinately time-consuming, better to be replaced by more nearly real-time news services on Division and Commission Web sites. The other basically found the present format valuable and satisfactory, but constrained by the page limits imposed. It was decided to give Commissions, for the coming triennium, the choice between summary reports of perhaps two pages with specified format and contents, to be proposed by the General Secretary, and the traditional format, in the hope that an appropriate balance would be reached.

On financial matters, the EC accepted with thanks the offer of the Finance Sub-Committee to remain in function for the coming triennium, to advise the General Secretary and to assist in the preparation of the budget for 2001-2003. The function of Treasurer was then no longer needed.

The last major Agenda item was the selection of IAU sponsored scientific meetings in 1998 from the large slate of proposals. The final choice comprised five Symposia, six Colloquia, one Regional Astronomy Meeting, and one Co-Sponsored Meeting (cf. Section 3). Some changes to the future procedure for submitting proposals for IAU sponsored scientific meetings would be implemented in the revised Rules for Scientific Meetings (now available from the Secretariat, the Assistant General Secretary, and from the IAU Web page.

### **6.3 71st Meeting of the Executive Committee**

The 71st meeting of the EC will take place on July 2-3, 1998, at Observatoire de Paris, France, at the invitation of Vice-President C. Césarsky. Major items on the Agenda will be the preparations for the XXVth GA and the selection of IAU sponsored meetings in 1999. Any matters to be placed

on the agenda of the meeting should reach the General Secretary before *May 1, 1998*.

## 7. XXIIIrd GENERAL ASSEMBLY

### 7.1. Report on the General Assembly

The XXIIIrd General Assembly of the IAU was held in the Kyoto International Conference Hall in Kyoto, Japan, from August 17 to August 30, 1997, at the invitation of the Science Council of Japan and the Astronomical Society of Japan. Nearly 2000 Members and Invited Participants from 59 countries took part in the scientific programme, and the nearly 200 Registered Guests enjoyed the rich cultural attractions of the old Imperial capital of Kyoto and its surroundings. The efforts of the 40-strong Local Organising Committee, Chaired by Toshio Fukushima, and many helpers, ensured that a very pleasant and trouble-free meeting was enjoyed by all.

The opening session of the General Assembly itself took place on August 20, 1997, and was honored by the presence of their Majesties, the Emperor and Empress of Japan, an expression of their Majesties' interest in scientific matters which was amplified in the Emperor's address (the full text of which will appear in *Trans. XXIIIB*). Among several administrative matters, the proposed revisions of the Statutes and Bye-Laws which formally introduce the Divisions in the IAU organisational structure were approved (available from IAU the Web page).

An exceptionally rich scientific programme was offered during these two weeks, including six Symposia (IAU Symposia Nos. 183 - 188), 23 Joint Discussions and 3 Special Scientific Sessions (on the Galileo and ISO space missions, and on Comet Hale-Bopp). Programmes of these meetings were published in IB 78. In addition, well over 100 Commission and Working Group meetings were also held. The three Invited Discourses were given by R.E. Williams (*The Hubble Deep Field*), B. Warner (*Cataclysmic Variable Stars*), and I.D. Novikov (*Black Holes in the Universe*). Overall, a total of nearly 800 oral and 1100 poster papers were presented during the XXIIIrd General Assembly.

Proceedings of the six scientific Symposia will be published in the regular IAU Symposium Series under separate editorship for the individual Symposia. Condensed Proceedings of the Invited Discourses, Joint Discussions, and Special Scientific Sessions will be published in *Highlights of Astronomy*, Vol. 11A&B (two volumes), edited by the IAU General Secretary. These volumes, and the *Transactions*, will all be published by Kluwer Academic Publishers.

At the second session of the General Assembly, on August 27, 1997, two new Associate Members were admitted (Bolivia, and the Central American Assembly of Astronomers representing the astronomers in Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama). The admission of 774 new Individual Members was announced, bringing the total membership to 8,562 (see Sect. 12). The proposed Budget for 1997-2000 (published in IB 80) was approved, and new Officers and a new Executive Committee as listed on the inside cover of this IB was elected. Invitations to hold the XXIVth General Assembly in Manchester, UK, in 2000 and the XXVth General Assembly in Sydney, Australia, in 2003, were presented and accepted.

The Resolutions adopted by the General Assembly are reproduced below and will, together with the new Statutes, Bye-Laws and Working Rules, full records of the other administrative business conducted at Kyoto, and the administrative and financial reports for the triennium 1994 - 1997,

be published in the Proceedings of the General Assembly (*Trans. XXIII B*).

## **7.2 Resolutions of the General Assembly**

### **RESOLUTIONS A**

#### **RESOLUTION A 1**

#### **PROTECTION OF THE NIGHT SKY**

The XXIIIrd International Astronomical Union General Assembly,

*Considering that*

Proposals have been made repeatedly to place luminous objects in orbit around the earth to carry messages of various kind and that the implementation of such proposals would have deleterious effects on astronomical observations,

*and that*

the night sky is the heritage of all humanity, which should therefore be preserved untouched,

*Requests the President*

to take steps with the appropriate authorities to ensure that the night sky receive no less protection than has been given to the world heritage sites on earth.

#### **RESOLUTION A2**

#### **FOR REGISTERING A NEW ACRONYM**

Proposed by Commission 5

The XXIIIrd International Astronomical Union General Assembly,

*Recognizing*

the many benefits that would follow from the clear and unambiguous identification of all astronomical objects outside the solar system to which reference is made in astronomical journals and other sources of data,

*and noting*

that the "Memorandum on Designations" (which accompanied Resolution C3 - New Delhi) presented the basic FORM for designations, namely:

acronym sequence (e.g. NGC 6334, PSR J1302-6350)

that since the "Memorandum on Designations" was issued in 1985, much progress has been made which includes:

the latest version, IAU Recommendations for Nomenclature, on the World Wide Web (WWW) with URL: <http://cdsweb.u-strasbg.fr/iau-spec.html>

and the on-line "Second Reference Dictionary of the Nomenclature of Celestial Objects" on the WWW with URL: <http://astro.u-strasbg.fr/cgi-bin/Dic>

*and realizing*

that much confusion still exists with duplicate acronyms and non-conforming designations appearing in the literature,

*acknowledges*

the need for a voluntary registry of new acronyms where the entries are reviewed by the Task Group on Designations before publication to facilitate the discovery and elimination of potentially confusing and inadvertently non-conforming designations **BEFORE** they appear in print or in data archives,

that registering an acronym would be especially advantageous for large, on-going surveys where images and source lists may be produced in stages and/or may be published in electronic form **BEFORE** the final printed catalogue,

that registering the acronym ensures the availability of a suitable, unique acronym for the survey and that the proposed designation conforms to the IAU Recommendations,

*endorses*

the continued development by members of the Task Group on Designations of the Experimental Acronym Registry which is now part of the on-line "Second Reference Dictionary",

*and supports*

the efforts of the Task Group to encourage authors, referees, and editors to use this new tool to help guarantee that designations in future papers conform to IAU recommendations.

### **RESOLUTION A3**

#### **ON THE NEED FOR ARCHIVING ASTRONOMICAL DATA**

Proposed by Commission 5

The XXIIIrd International Astronomical Union General Assembly,

*Considering*

the continuing important role of astronomical data from the past, including bibliographical information,

*Considering*

the phenomenal increase in these data,

*Considering*

the importance of their safeguarding and of their accessibility to the entire astronomical community,

*recommends*

that the archiving of these data be an integral part of all major research projects and be taken into account by the editors of journals. The IAU recommends that astronomy archives be coded in the FITS format,

*supports*

supports the continued maintenance of the Data Centers whose role in the distribution of information is of prime importance for astronomy, and supports their collaboration.

#### **RESOLUTION A4**

#### **ON THE MODIFICATION OF DATE VALUES ON FITS SOFTWARE**

Proposed by Commission 5

The XXIIIrd International Astronomical Union General Assembly,

*Recognizing*

that the two-digit year numbers in the date values of keywords such as DATE-OBS='31/12/99' in FITS files will become ambiguous on the day 2000-01-01,

*And noting*

that the IAU FITS Working Group has adopted new rules for DATExxxx value strings which specify that the previous convention applies only to dates in the range 1900-1999 and that the new convention DATE-OBS='1999-12-31' is to be used in data interchange and in data archives beginning 1998-01-01,

*Urges all IAU members*

to ensure that their FITS writing and reading software is modified before 1998-01-01 to support both the new convention and the old convention, in accordance with the rules specified by the IAU FITS Working Group.

## RESOLUTIONS B

### RESOLUTION B1

#### ON THE USE OF JULIAN DATES

The XXIIIrd International Astronomical Union General Assembly,

*recognizing*

- a. the need for a system of continuous dating for the purpose of analyzing time-varying astronomical data, and
- b. that both Julian Dates and Modified Julian Dates have been employed for this purpose in astronomy, geodesy, and geophysics.

*recommends*

- a. that Julian Date (as defined in the appendix) be used to record the instants of the occurrences of astronomical phenomena,
- b. that for those cases where it is convenient to employ a day beginning at midnight, the Modified Julian Date (equivalent to the Julian Date minus 2 400 000.5) be used, and
- c. that where there is any possibility of doubt regarding the usage of Modified Julian Date, care be exercised to state its definition specifically,
- d. that, in all languages, Julian Date be abbreviated by "JD" and Modified Julian Date be abbreviated by "MJD".

#### APPENDIX: PROPOSED DEFINITIONS

The following definitions are recommended

##### *1. Julian day number (JDN)*

The Julian day number associated with the solar day is the number assigned to a day in a continuous count of days beginning with the Julian day number 0 assigned to the day starting at Greenwich mean noon on 1 January 4713 BC, Julian proleptic calendar -4712.

##### *2. Julian Date (JD)*

The Julian Date (JD) of any instant is the Julian day number for the preceding noon plus the fraction of the day since that instant. A Julian Date begins at 12h 0m 0s UT and is composed of 86400 seconds. To determine time intervals in a uniform time system it is necessary to express the JD in a uniform time scale. For that purpose it is recommended that JD be specified as SI seconds in Terrestrial Time (TT) where the length of day is 86,400 SI seconds.

In some cases it may be necessary to specify Julian Date using a different time scale. (See

Seidelmann, 1992, for an explanation of the various time scales in use). The time scale used should be indicated when required such as JD(UT1). It should be noted that time intervals calculated from differences of Julian Dates specified in non-uniform time scales, such as UTC, may need to be corrected for changes in time scales (e.g. leap seconds).

An instant in time known in UTC can be converted to Terrestrial Time if such precision is required. Values of TT-UT are available using tables in McCarthy and Babcock (1986) and Stephenson and Morrison (1984, 1995). Table 1 (*not included in the IB version*) provides the difference between TAI and UTC from 1961 through 1 January 1996. The difference between TT and UTC can be calculated knowing that  $TT = TAI + 32.184s$ . The Annual Reports of the International Earth Rotation Service should be consulted for dates after 1996. The data of Table 1 are also available electronically at

<http://hpiers.obspm.fr> or <ftp://hpiers.obspm.fr/iers/bal/bulc/TC-TAI>

or at

<http://maia.usno.navy.mil> or at <ftp://maia.usno.navy.mil/ser7/tai-utc.dat>.

## RESOLUTION B2

### ON THE INTERNATIONAL CELESTIAL REFERENCE SYSTEM (ICRS)

proposed by the IAU Working Group on Reference Frames

The XXIIIrd International Astronomical Union General Assembly

*Considering*

- (a) That Recommendation VII of Resolution A4 of the 21st General Assembly specifies the coordinate system for the new celestial reference frame and, in particular, its continuity with the FK5 system at J2000.0;
- (b) That Resolution B5 of the 22nd General Assembly specifies a list of extragalactic sources for consideration as candidates for the realization of the new celestial reference frame;
- (c) That the IAU Working Group on Reference Frames has in 1995 finalized the positions of these candidate extragalactic sources in a coordinate frame aligned to that of the FK5 to within the tolerance of the errors in the latter (see note 1);
- (d) That the Hipparcos Catalogue was finalized in 1996 and that its coordinate frame is aligned to that of the frame of the extragalactic sources in (c) with one sigma uncertainties of  $\pm 0.6$  milliarcseconds (mas) at epoch J1991.25 and  $\pm 0.25$  mas per year in rotation rate;

*Noting*

That all the conditions in the IAU Resolutions have now been met;



*Resolves*

- (a) That, as from 1 January 1998, the IAU celestial reference system shall be the International Celestial Reference System (ICRS) as specified in the 1991 IAU Resolution on reference frames and as defined by the International Earth Rotation Service (IERS) (see note 2);
- (b) That the corresponding fundamental reference frame shall be the International Celestial Reference Frame (ICRF) constructed by the IAU Working Group on Reference Frames;
- (c) That the Hipparcos Catalogue shall be the primary realization of the ICRS at optical wavelengths;
- (d) That IERS should take appropriate measures, in conjunction with the IAU Working Group on reference frames, to maintain the ICRF and its ties to the reference frames at other wavelengths.

*Note 1:* IERS 1995 Report, Observatoire de Paris, p.II-19 (1996).

*Note 2:* "The extragalactic reference system of the International Earth Rotation Service (ICRS)", Arias, E.F. et al. A & A 303, 604 (1995).

**RESOLUTION B3****ON THE ESTABLISHMENT OF A RELATIVISTIC COHERENT FRAMEWORK**

The XXIII General Assembly of the IAU,

*considering that*

- the IAU Resolution A4 (1991) has set up a general relativistic framework to define reference systems centered at the barycenter of the solar system and at the geocenter,
- the Sub Working Group on Relativity in Celestial Mechanics and Astrometry, established by IAU Resolution C6 (1994), reports that relativity has to be taken into account for all astronomical and geodynamical observations but that the framework of IAU Resolution A4 (1991) is not sufficient for some applications, and that the current terminology should be changed to be consistent in the general relativistic framework,
- a consistent system of notations is desirable and should be used in all fields of astronomy, geodesy and metrology that deal with space-time references,

*noting that*

- work on these matters is also being carried out in several other organizations of different types; in the BIPM (an intergovernmental organization), in the IAG (an international association of scientific unions), in the IERS (a service of IAU and IUGG),

- it is of utmost importance that all interested parties adopt consistent definitions and conventions in a coherent general relativistic framework,
- the BIPM has proposed a collaboration with the IAU to realize this goal,

*recommends that*

- a Joint Committee of the BIPM and the IAU be formed, its tasks being to establish definitions and conventions, to provide a coherent relativistic frame for all activities in space-time references and metrology at a sufficient level of uncertainty, to establish a uniform system of notations for quantities and units, and to develop the adopted definitions and conventions for practical application by the user,
- the IUGG be invited to participate in this Joint Committee to ensure that a coherent system is agreed by the scientific community,
- the organizations taking part in the Joint Committee adopt Resolutions or Recommendations, each following its own procedures, with the aim of having identical definitions, conventions and notations based on the conclusions of the Committee.

BIPM: Bureau International des Poids et Mesures

IAG: International Association of Geodesy

IERS: International Earth Rotation Service

IUGG: International Union for Geodesy and Geophysics

## **RESOLUTION B4**

### **ON NON-RIGID EARTH NUTATION THEORY**

proposed by Joint Discussion N. 3

and endorsing the conclusions of the IAU-IUGG Working Group

The XXIIIrd International Astronomical Union General Assembly

*Recognizing*

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 goal by identifying the remaining geophysical and astronomical phenomena that must be modeled before an accurate theory of nutation for a non-rigid Earth can be adopted, and

that, as instructed by IAU Recommendation C1 in 1994, the International Earth Rotation Service (IERS) has published in the IERS Conventions (1996) an interim precession-nutation model that matches the observations with an uncertainty of  $\pm 1$  milliarcsecond (mas),

*endorses*

the conclusions of the IAU-IUGG WG on Non-rigid Earth Nutation Theory given in the appendix,

*requests*

the IAU-IUGG WG on Non-rigid Earth Nutation Theory to present a detailed report to the next IUGG General Assembly (August 1999), at which time the WG will be discontinued,

*and urges*

the scientific community to address the following questions in the future:

- completion of a new rigid Earth nutation series with the additional terms necessary for the theory to be complete to within  $\pm 5$  microarcseconds, and
- completion of a new non-rigid Earth transfer function for an Earth initially in non-hydrostatic equilibrium, incorporating mantle inelasticity and a Free Core Nutation period in agreement with the observations, and taking into account better modeling of the fluid parts of the planet, including dissipation.

*APPENDIX*

The WG on Non-rigid Earth Nutation Theory has quantified the problems in the nutation series adopted by the IAU in 1980 by noting:

- (1) that there is a difference in the precession rate of about -3.0 milliarcseconds per year (mas/year) between the value observed by Very Long Baseline Interferometry (VLBI) and Lunar Laser Ranging (LLR) and the adopted value,
- (2) that the obliquity has been observed (by VLBI and LLR) to change at a rate of about -0.24 mas/year, although there is no such change implied by the 1980 precession-nutation theory,
- (3) that, in addition to these trends, there are observable peak-to-peak differences of up to 20 milliarcseconds (mas) between the nutation observed by VLBI and LLR and the nutation adopted by the IAU in 1980,
- (4) that these differences correspond to spectral amplitudes of up to several mas, and
- (5) that the differences between observation and theory are well beyond the present observational accuracy.

The WG has recognised the improvements made in the modeling of these quantities, and recommends, in order to derive a more precise nutation model, at the mas level in spectral amplitudes and at a few mas level in the peak to peak analysis, the use of models:

The WG recognises that this new generation of models still has some imperfections, the principal one being poor modeling of the dissipation in the core and of certain effects of the ocean and the atmosphere, and urges the scientific community to address these questions in the future.

The WG recognises that, due to the remaining imperfections of the present theoretical nutation models, the nutation series published in the IERS Conventions (1996), following 1994 IAU recommendation C1, still provides the users with the best nutation series. This IERS model being based on observations of the celestial pole offset, the WG supports the recommendation that the scientific community continue VLBI and LLR observations to provide accurate estimations of nutation, precession and rate of change in obliquity.

## **RESOLUTION B5**

### **ON THE INTERNATIONAL CELESTIAL REFERENCE SYSTEM (ICRS)**

#### **AND THE HIPPARCOS CATALOGUE**

proposed by Joint Discussion N. 3

The XXIIIrd International Astronomical Union General Assembly

*considering*

(1) that the International Astronomical Union (IAU) has adopted an International Celestial Reference System (ICRS) in which the axes are fixed relative to the distant background as implied by observations of extragalactic sources,

(2) that the realization of the ICRS is based on observations made from the Earth, the axes of which precess and nutate relative to the ICRS,

(3) that there are significant differences between the nutation adopted by the IAU in 1980 and astronomical observations,

(4) that a rate of variation of the obliquity is observed, which is not predicted by the 1980 IAU precession-nutation theory,

(5) that there is a difference in the precession rate of about -3.0 milliarcseconds per year (mas/year) between the observed and adopted values,

*recommends*

(1) that Division I form a new Working Group to report to the IAU General Assembly in 2000 which will

- a. examine and clarify the effects on astrometric computations, of changes such as the adoption of the International Celestial Reference System, the availability of the Hipparcos catalogue, and the change expected in the conventional precession-nutation model, and
- b. make recommendations regarding the algorithms to be used,

(2) that this Working Group study these questions jointly with the International Earth Rotation Service (IERS) and maintain a close connection with the IAU Working Group on Reference Frames, the IAU Working Group on Astronomical Constants, and the IAU-IUGG Working Group on Non-rigid Earth Nutation Theory (up to its

discontinuation at the 1999 IUGG General Assembly), through exchange of representatives.

## RESOLUTION B6

### ON RELATIVITY IN CELESTIAL MECHANICS AND IN ASTROMETRY

#### endorsing the conclusions of the Working Group on Relativity in Celestial Mechanics and Astronomy (RCMA),

Sub-Working Group of the Working Group on Astronomical Standards (WGAS)

The XXIIIrd General Assembly of the International Astronomical Union

*considering that*

- a relativistic solar system barycentric four-dimensional coordinate system with its coordinate time scale TCB was defined by International Astronomical Union (IAU) Resolution A4 (1991),
- a relativistic geocentric four-dimensional coordinate system with its coordinate time scale TCG was defined by IAU Resolution A4 (1991) and International Union of Geophysics and Geodesy (IUGG) Resolution 2 (1991), and
- the basic physical units of space-time in all coordinate systems were recommended by IAU Resolution A4 (1991) to be the SI second for proper time and the SI meter for proper length,

*noting that*

- practical realization of barycentric and geocentric coordinate systems in many groups (see International Earth Rotation Service (IERS) Standards, 1992) is based on time scales TDB and TT instead of TCB and TCG, respectively, and involves the scaling factors  $1-L_B$  and  $1-L_G$  for the spatial coordinates and mass factors GM in barycentric and geocentric systems, respectively,  $L_B$  and  $L_G$  being given in IAU Resolution A4 (1991),
- even more complicated scaling factors are introduced in the VLBI (Very Long Baseline Interferometry) model of IERS Conventions (1996), and
- astronomical constants and currently employed definitions of fundamental astronomy concepts are based on Newtonian mechanics with its absolute space and absolute time leading to ambiguities in dealing with relativistic effects,

*recommends that*

- the spatial coordinates of the Barycentric and Geocentric Reference Systems as defined by the IAU (1991) resolutions be used for celestial and terrestrial reference frames, respectively, without any scaling factors,

- the final practical realizations of the coordinate systems for use in astronomy and geodesy be implementations of the systems defined by IAU-IUGG (1991) resolutions,
- the use of TT for convenience of observational data analysis not be accompanied by scaling of the spatial geocentric coordinates,
- algorithms for astronomical constant determination and definitions of fundamental astronomy concepts be explicitly given within the basic reference systems envisaged by IAU-IUGG (1991) resolutions, and
- the IAU Working Group on Astronomical Standards (WGAS) continue the consideration of relativistic aspects of the concepts, algorithms and the constants of fundamental astronomy.

## **RESOLUTION B7**

### **ENCOURAGING VLBI AND LLR OBSERVATIONS**

The XXIIIrd International Astronomical Union General Assembly

*noting*

- 1) resolution B5
- 2) resolution B6

*considering*

- 1) that regular observation by Very Long Baseline radio Interferometry (VLBI) is the only way to maintain the International Celestial Reference Frame (ICRF),
- 2) that observation by Lunar Laser Ranging (LLR) is important to connect the solar system reference system with the ICRF, and
- 3) that VLBI and LLR are the basic observational techniques for determination of the precession and nutation of the Earth,

*Recommends*

that high-precision astronomical observing programs be organized in such a way that

- 1) astronomical reference systems can be maintained at the highest possible accuracy for both northern and southern hemispheres, and
- 2) high accuracy observations of precession-nutation will be made available for comparison with geophysical models and for astronomical and geodetic applications.

## **8. FUTURE GENERAL ASSEMBLIES**

### **8.1. The XXIVth General Assembly**

At the second session of the XXIIIrd General Assembly, an invitation to hold the XXIVth General Assembly in Manchester, UK, during the period August 7-19, 2000, was extended by M. Longair on behalf of the Royal Society and the British astronomical community. The General Assembly unanimously voted to accept this invitation.

The XXIVth General Assembly will be held on the campus of the University of Manchester and the facilities of the nearby Royal Northern College of Music. The plenary sessions of the General Assembly will be held in the large new Bridgewater Concert Hall, the home of the Hallé Orchestra. The General Secretary visited Manchester again on September 11, 1997 (in splendid weather) to re-visit the premises and review the planning with LOC Co-Chairmen R.D. Davies and D. Walsh.

Contrary to some traditional perceptions, the centre of Manchester is a teeming site of urban renewal, old buildings being newly cleaned (unrecognisable to former Manchester graduates!) and attractive modern buildings going up everywhere. The XXXIVth General Assembly will make use of the facilities of the Main Building and the Schuster Institute of Physics & Astronomy and adjoining institutes for other sciences, as well as the large concert and convention halls at the new Royal Northern College of Music, within easy walking distance. This will provide a combination of the large rooms needed for the Symposia and major Joint Discussions and a large number of smaller lecture and meeting rooms for Working Group and Commission meetings.

An attractive feature of the Manchester venue is the availability of over 5000 low-cost University dormitory rooms, ranging from traditional to brand new modern apartments with all conveniences. We trust that this will help to bring a large audience to the meeting and thus fulfill the essential purpose of IAU General Assemblies, to get astronomers from all over the world together to discuss and further the progress of our common science.

Our British hosts are addressing their daunting task with characteristic cheerfulness and resolve, and your General Secretary looks forward to working with them to present another memorable meeting. A detailed timetable of events leading up to the General Assembly will soon be drawn up. The timetable and much additional practical information on GA2000 will appear in future issues of the IB and on the IAU Web page.

### **8.2. The XVth General Assembly**

At the second session of the XXIIIrd General Assembly, an invitation to hold the XXVth General Assembly in Sydney, Australia, in August 2003, was also presented by J. Mould, on behalf of the Australian National Committee for Astronomy. The General Assembly voted unanimously to also accept this invitation, which thus fixed the venue of the XXVth General Assembly. Details on this event will follow in due course.

## **9. EDUCATIONAL ACTIVITIES**

The primary IAU activities in the educational sphere are the exchange programme operated by Commission 38 (see below) and the International Schools for Young Astronomers (IASYA) and

Teaching for Astronomy Development (TAD) programmes organised by Commission 46 (see Sect. 9.2). In addition, the IAU has coordinated its efforts with the ESA/UN Workshops on Basic Space Science.

In the future, these activities are expected to continue. Ways are being explored to coordinate them more deliberately with analogous plans at COSPAR, with the activities planned under the ambitious new ICSU programme on Capacity Building in Science, and with future plans at the UN. The goal would be to make the overall effort more effective both in the short and long term, and also to reflect changing patterns in the ways in which such activities can be funded. The UNISPACE III conference in July 1999 should be a good opportunity to refine and implement these ideas.

## **9.1. Commission 38: Exchange of astronomers**

### IAU TRAVEL GRANTS: GUIDELINES

Within the limitations imposed by the budget of the Commission as approved by the Executive Committee of the International Astronomical Union, funds are available to Commission 38 toward grants to qualified individuals to enable them to visit institutions abroad. It is intended, in particular, that the visitors should have ample time and opportunity to interact with the intellectual life of the host institution so that maximum benefit is derived by both sides. It is a specific objective of the programme that astronomy in the home country be enriched after the applicant returns.

1. Candidates may be faculty/staff members, post-doctoral fellows, or graduate students at any recognised educational/research institution or observatory. All candidates must have an excellent record of research and must have made permanent and professional commitments to astronomy. The programme is designed to support both the work of young astronomers and established astronomers whose visits may benefit the country or institution visited. It is emphasised that all recipients should return to their home institutions or home countries upon the completion of their visits.
2. All visits must normally consist of a stay of at least 3 months at a single host institution. In special cases, shorter visits can be considered; stopover at other institutions en route may be permitted.
3. All visits must be formally agreed to by the Directors of the home and host institutions involved. Such endorsements must confirm that the proposed plan of study is a reasonable one and will be of benefit to astronomy.
4. All applicants must give details of funds currently available to her/him to finance her/his proposed visit including supporting documents. In particular, s/he must state what other applications s/he has submitted in efforts to obtain support from other sources and the status of such applications. In the event that an applicant receives funds, which may be used, in whole or in part, for the same proposed purpose from another source, s/he is required to revise her/his application or make a refund to the IAU. If dependants are to accompany the applicant, details must be given.



5. The amount of the grant will be governed by the cost of one return economy air fare and limited to the least expensive fare (such as PEX, APEX, etc.) between home and host institutions and normally is to be used by the applicant for such travel. With prior approval, the funds can instead be used wholly or in part for subsistence costs during the visit.

Some grants may be awarded on the basis of a one-way fare. An example is the case where highly qualified graduate students apply for funds to go abroad to begin graduate studies at an institution where they have been formally accepted.

6. Grants to attend symposia, summer schools, conferences, society meetings, etc. are outside the scope of the programme.

Grants will not normally be made for the sole purpose of obtaining observational data.

An individual should normally not expect to receive an IAU award for a second visit.

7. Each recipient is required to submit a brief report to the President of Commission 38 after her/his return from the visit. Acknowledgement of support from the Exchange of Astronomers Programme of the IAU should be made in any published paper resulting from the visit.

## **Application Procedure**

1. An individual who wishes to apply for a grant under the IAU Exchange of Astronomers Programme should read the rules carefully to ensure that the circumstances of her/his case conform to the conditions under which IAU grants can be made. S/he should then proceed by formally submitting her/his request for a grant in the form of a letter to the President of Commission 38 (see § 4, below). Each candidate must submit a curriculum vitae showing that s/he is professionally qualified, and must submit a viable plan of scholarly activity to be carried out during the visit.

The information supplied in those documents should be complete and detailed as it will be used to judge whether the proposal is in conformity with the aims of the programme, whether the minimum initial requirements are being met, and whether the guidelines will permit a favourable decision. Any special circumstances must be carefully set forth.

2. It is the applicant's responsibility to arrange for the two confidential letters of endorsement from senior officials of the home and host institutions. These are to be sent without delay directly to the President of Commission 38. The letters from both institutions should confirm that the applicant's proposed visit has the knowledge and support of the directors or senior academic/research officers of the institutions involved. Further they should state whether the applicant will be returning to a position at the home institution at the conclusion of the visit. Finally, they should confirm to the President of Commission 38 that the senior officials themselves have made every effort to obtain the necessary travel funds from their own institutions and from other resources within the respective countries.

The applicant must state who is responsible for her/his subsistence during the prolonged visit at the host institute, i.e. subsistence paid by the home or by the host institute, by a grant or fellowship or by any other means. Copies of the relevant documents should be submitted with application. In addition the applicant should provide information on the lowest

available travel fare required.

3. As noted above, care should be taken to make the application as complete as possible and to include detailed statements rather than generalities. Material should be typed and single spaced. The application will be considered as quickly as possible, but it should be recognised that information and opinions must be exchanged among the President, Vice-Presidents, and/or other Members of the Organising Committee of Commission 38.

4. In summary, the application should include:

- i. plan of scientific activity,
- ii. curriculum vitae,
- iii. letters of support from home and host institutions,
- iv. information on responsibility for subsistence at the host institution,
- v. information on lowest available travel fare.

and should be submitted in time for the Officers of the Commission to consult by post.

5. All correspondence, including the endorsements referred to above, should be directed to the President of Commission 38, International Astronomical Union, with copy to the Vice-President. For the period August 1994-July 1997, the addresses are:

<b>President</b>	<b>Vice-President</b>
Dr. Morton S. Roberts	Dr Richard M. West
NRAO	ESO
Edgemont Road	Karl Schwarzschildstr 2
Charlottesville VA 22903	D 85748 Garching Muenchen
USA	German
Phone: 1 804 296 0233	Phone: 49 89 320 06 276
Fax: 1 804 296 0278	Fax: 49 89 320 2362
E-mail: <a href="mailto:mroberts@nrao.edu">mroberts@nrao.edu</a>	E-mail: <a href="mailto:rwest@eso.org">rwest@eso.org</a>

## **9.2. Commission 46: Teaching of Astronomy**

### **9.2.1. 23rd IAU International School for Young Astronomers (ISYA)**

The 23rd International School for Young Astronomers (ISYA).

July 4 - 23, 1997, Zanjan, Iran

The 23rd ISYA met in the mile-high city of Zanjan, Iran, on the attractive campus of the Institute for Advanced Studies in Basic Sciences (IASBS), at the invitation of its Director, Dr. Y. Sobouti. The IAU provided travel grants to 14 foreign participants from Nigeria, Indonesia, Turkey, Lebanon, Poland, Ukraine, and Russia. Among 24 Iranian participants from 11 universities and IASBS, almost half were women (selected on criteria independent of gender). IASBS and its

efficient staff provided housing and meals, attended to the cultural events, excursions, and the many individual needs of participants. Much help was provided by the governor of the Province of Zanjan.

A major goal of ISYA is to demonstrate, to scientifically isolated students, the frontier nature of astronomy and the importance of questions, discussions, judgment on evidence, etc. Particularly important for a quick start of discussions was the opportunity, already on the first day, for small group daytime and nighttime sky observations and, soon thereafter, for practical work on computer-based data analysis. After some days, discussion groups formed quite independently of nationality or gender. Nearly half the participants presented a short outline of their research. Several participants eagerly sought out foreign faculty for detailed presentation of their work. For the first time at an ISYA, nearly all participants spoke English adequately for conversation even at the start of the ISYA.

The lecture courses started at a basic level, since most Iranian students were physics students with only introductory astronomy. But nearly all courses led to some current research topic and demonstrated the flavor of frontier science. Several topics treated in two courses with different points of view demonstrated the breadth of astronomy. The foreign faculty members were: Ed Guinan (USA, binary stars and their many astrophysical applications, use of small telescopes), Rajaram Nityananda (India, gravitational lenses), Michèle Gerbaldi (France, stellar atmospheres, data analysis with MIDAS), Jihad Touma (USA/Lebanon, chaos in the solar system), and Don Wentzel (USA, MHD and related solar physics). Mr. Arvind Paranjpye (from IUCAA, India) put the local telescope into working condition, provided his low-cost photometer for measurement of solar limb darkening and, with Michèle Gerbaldi, supervised night-time observing, including several nights using a CCD. Michèle Gerbaldi became a role model for the Iranian women and put them at ease talking with foreigners. Iranian lecturers from IASBS and four universities gave relatively short courses.

Michèle Gerbaldi brought two hard disks and software from Haute Provence Observatory, and ESO gave CD Roms with MIDAS software, so that MIDAS could be installed on the local computer system and participants could analyze spectroscopic data. After much efficient advice by telephone and fax to France, the installation was finally successful on one PC. Locally there was, however, no one sufficiently familiar with the computer system to accommodate the new programs to it. This experience demonstrates the difficulties that will be faced in the future when participants from any computer-intensive workshops will try to carry the programs home to their own relatively isolated institutions.

Donat G. Wentzel, secretary for ISYA

### **9.2.2. Teaching for Astronomy Development (TAD)**

Report on IAU/TAD-sponsored "Summer School on Astrophysics"

August 31 - September 12, 1997, Vinh University, Vietnam

This conference is central to the TAD program to re-introduce astronomy to Vietnam. It was organized by Prof. Nguyen Dinh Huan, vice-rector of Vinh University. The IAU supported all travel costs, rooms, and meals for 32 Vietnamese participants (and for some senior Vietnamese

astronomers who attended for a few days) and for the two foreign faculty, plus the costs of the conference in a government (air-conditioned) hotel. The total cost was about \$15,200. The previously internationally donated equipment, books, and journals were used actively.

Prof. Nguyen Quang Rieu (Observatoire de Paris, coordinator for TAD Vietnam) and Wentzel divided lectures and discussions between them. Wentzel added some practical activities, and his lectures and discussions were translated. Summaries of the lectures, in Vietnamese, were provided to all participants well before the conference, but they were probably rather too new and overwhelming for the participants.

Rieu's lectures centered on radio astronomy, its techniques and limitations, the physical origin of radio waves, and astrophysical applications, primarily to the interstellar medium but also in a broad sweep from the solar system to SETI and cosmology. Wentzel outlined the exploration of the solar system, then continued with solar science and stellar evolution. The topics overlapped sufficiently that some discussions were carried on in front of the participants, showing them how one may have different viewpoints in a frontier science like astronomy.

Response of the astronomy teachers. About half the participants teach the introductory course in astronomy that is required of physics students in Vietnamese universities and pedagogical institutes. This course emphasizes fundamental astronomy and currently includes astronomical development only until about 1968. The teachers, typically physics-trained and in their mid-30's, reacted eagerly to the modern astronomy and took home enough materials so as to incorporate some (at first probably small) part of modern astronomy into their courses. During the second week, it was tried to have the teachers discuss among themselves how to do this, given their physical limitations (e.g. almost none have any projector in their home institution). However, the process of such a discussion was so new to them and the guidance in English too uncertain for any definite results during the conference.

The teachers were particularly fascinated with the informal style of teaching, i.e. encouraging questions from and discussions among the participants. Follow-up astronomy teaching conferences, probably regional, are expected within a year.

Response of the physics students. About half the participants were selected from the most able physics students nationwide. However, these students are used to passive transcription of notes from lecturer via board to their notebooks. They are not used to thinking about what might be measured, or about the accuracy of a set of measurements, nor about interpretations of measurements. They needed an explicit introduction to the inquiry nature of basic science. Thus Rieu spent much time on observational aspects of radio astronomy. Wentzel's interpretation of pictures from space probes at first left the students somewhat puzzled. However, by the third practical exercise on astronomical photographs, students began to learn how one might discuss such pictures with fellow students and reach conclusion without the Professor's dictation.

During the second week, a few lecture topics were replaced by the solution of specific physics problems, such as Kepler's third law used to obtain masses of newly detected planets or of black holes, contraction times of the early Sun, sunspots regarded as a solenoid, gravity on neutron stars. The role of order-of-magnitude estimates was emphasized, how one can set up simple problems that preserve the essential physics and how one can keep the mathematics in a form that can be readily interpreted in terms of physics. Students and teachers responded immediately to this format of presenting astrophysics.

Donat G. Wentzel, secretary for TAD

## 10. RELATIONS TO OTHER ORGANIZATIONS

### IAU REPRESENTATIVES TO INTERNATIONAL ORGANIZATIONS

Acronym	Organisation	Representative(s)	
ICSU	International Council of Scientific Unions	<i>J. Andersen</i>	
	General Committee		
BIPM	Bureau International des Poids et Mesures	<i>J. Kovalevsky</i>	
CCDS	International Consultative Committee for the Definition of the Second	--	
CIE	Compagnie Internationale de l'Eclairage	<i>S. Isobe</i>	
CODATA	Committee on Data for Science & Technology	<i>E. Raimond</i>	
COPUOS	Committee on the Peaceful Uses of Outer Space Scientific and Technical Subcommittee	<i>J. Andersen</i>	
COSPAR	Committee on Space Research	<i>J. Andersen</i>	
	COSPAR SC B	<i>C. de Bergh</i>	
	COSPAR SC D	<i>F. Verheest</i>	
	COSPAR SC E	<i>W. Wamsteker</i>	
	COSPAR Sub. Committee E1	<i>R. Sunyaev</i>	
	COSPAR Sub. Committee E2	<i>O. Engvold</i>	
	COSTED	Committee on Science & Technology in Developing Countries	<i>J. Andersen</i>

<b>FAGS</b>	Federation of Astronomical & Geophysical Services	<i>P. Pâquet/ E. Tandberg-Hanssen</i>
<b>IAF</b>	International Astronautical Federation	<i>Y. Kondo</i>
<b>IERS</b>	International Earth Rotation Service	<i>B. Kolaczek</i>
<b>IGBP</b>	International Geosphere-Ionosphere Programme	<i>J. Eddy</i>
<b>IUCAF</b>	Inter-Union Commission on Frequency Allocation for Radio Astronomy & Space Science	<i>B.A. Doubinsky I Kawaguchi S. Ananthkrishnan A.R. Thompson</i>
<b>IUPAP</b>	International Union of Pure & Applied Physics	<i>J. Andersen</i>
	<b>IUPAP C4</b> Commission on Cosmic Rays	<i>C. Cesarsky</i>
<b>IUT</b>	International Telecommunication Union	
	<b>IUT-BR</b> Radiotelecommunication Bureau	<i>W. Klepczynski</i>
	<b>IUT-R</b> Radiocommunication Bureau	<i>J. Whiteoak/ A.R. Thompson</i>
<b>IUWDS</b>	International Ursigram & World Day Service	<i>H. Coffey</i>
<b>QBSA</b>	Quarterly Bulletin on Solar Activity	<i>P. Lantos</i>
<b>SCOPE</b>	Scientific Committee on Problems of Environment	<i>D. McNally</i>
<b>SCOSTEP</b>	Scientific Committee on Solar-Terrestrial Physics	<i>B. Schmieder</i>
<b>URSI</b>	Union Radio-Scientifique Internationale	<i>J. Moran</i>

WMO

World Meteorological Union

*L. Woltjer*

## 11. PUBLICATIONS

The Proceedings of IAU General Assemblies and Symposia are published as a series by the IAU Publisher, i.e. by Kluwer Academic Publishers for all meetings through 1997, and the Astronomical Society of the Pacific for all meetings after January 1, 1998. The Secretariat automatically receives a number of copies of these books. The choice of publisher for IAU Colloquia, Regional Meetings, and Co-Sponsored Meetings is left to the discretion of the Scientific Organising Committee of each; one copy is to be sent to the IAU Secretariat. It is intended to provide an up-to-date list of all previous meetings and their proceedings through the IAU Web page (under *Scientific Meetings* and *IAU Publications*, respectively), with the Symposium series already in place, the Colloquia almost ready, and other meetings to follow as time allows. Please communicate any errors or incompletenesses to the Secretariat.

Especially for older meetings and Proceedings in the Colloquium series, our records and collection of volumes has large gaps, which we hope to fill with time. We hope Members will help to fill in the missing details, and will later issue a call for missing volumes of Colloquia and Regional Meetings to complete our collections

### Transactions Series

#### Reports on Astronomy XXIIIA

Ed. I. Appenzeller

Kluwer Academic Publishers, ISBN 0-7923-4651-3, 1997

### Symposium Series

#### 170 CO: Twenty –Five Years of Millimeter-Wave Spectroscopy

Tucson, AZ, USA, May 29 - June 2, 1995

Eds. W.B. Latter, S.J.E. Radford, P.R. Jewell, J.G. Mangum & J. Bally

Kluwer Academic Publishers, ISBN 0-7923-4283-6, 1997

**182 Herbig-Haro Flows and the Birth of Low Mass Stars**

Chamonix, France, January 20-26, 1997

Eds. B. Reipurth & C. Bertout

Kluwer Academic Publishers, ISBN 0-7923-4660-2, 1997

**189 Fundamental Stellar Properties: The Interaction between Observation and Theory**

Sydney, Australia, January 13-17, 1997

Eds. T.R. Bedding, A.J. Booth & J. Davies

Kluwer Academic Publishers, ISBN 0-7923-4651-3, 1997

**Colloquium Series****154 Solar and Interplanetary Transients**

**Pune, India, January 23-27, 1995.**

**Eds: S. Ananthakrishnan & A. Pramesh Rao**

**Astroph. & Sp. Sci. Vol. 243, Kluwer Acad. Publ., ISSN 0004-640X, 1996**

**157 Barred Galaxies**

**Tuscaloosa, AL, USA, May 30 - June 3, 1995**

**Eds: R. Buta, D.A. Crocker & B.G. Elmegreen**

**ASP Conf. Ser. Vol. 91, ISBN 1-886733-12-0, 1996**

**159 Emission Lines in Active Galaxies: New Methods and Techniques**

**Shanghai, China, June 17 - 20, 1996**

**Eds: B.M. Peterson, F.-Z. Cheng & A.S. Wilson**

**ASP Conf. Ser. Vol. 113, ISBN 1-886733-33-3, 1997**

**160 Pulsars: Problems and Progress**

**Sydney, Australia, January 8 - 12, 1996**



**Eds: M. Bailes, S. Johnston & M.A. Walker**

**ASP Conf. Ser. Vol. 105, ISBN 1-886733-25-2, 1996**

**161 5<sup>th</sup> International Colloquium on Bioastronomy: Astronomical and Biochemical Origins and the Search for Life in the Universe**

**Capri, Italy, July 1-5, 1996**

**Eds: C. Cosmovici, S. Bowyer & D. Werthimer**

**Editrice Compositori, Bologna, ISBN 88-7794-092-1, 1997**

**163 Accretion Phenomena and Related Outflows**

**Port Douglas, Australia, July 15-19, 1996**

**Eds: D.T. Wickramasinghe, G. Bicknell & L. Ferrario**

**ASP Conf. Ser. Vol. 121, ISBN 1-886733-41-4, 1997**

**165 Dynamics and Astrometry of Natural and Artificial Celestial Bodies**

**Poznan, Poland, July 1-5, 1996**

**Eds: I. Wytrzyszczak, J.H. Lieske & R.A. Feldman**

**Kluwer Acad. Publ., ISBN 0-7923-4574-6, 1997**

**Regional Meetings**

**8<sup>th</sup> Latin American Regional Meeting of Astronomy**

**November 27 – December 1, 1995, Montevideo, Uruguay**

**Eds. E. Falco, J.A. Fernández & R.F. Ferrero**

**Rev. Mex. Astron. Astrofís., Conf. Ser. Vol. 4, ISSB 1405-2059, 1996**

**7<sup>th</sup> Asian-Pacific Regional Astronomy Meeting of the IAU**

**August 19 – 23, 1996, Pusan, Korea**

**Eds. H.M. Lee, S.S. Kim & K.-S. Kim**

**Journ. Korean Astron. Soc. (Supplement), Vol. 29, ISSN 0253-3065**

## 12. MEMBERSHIP

At the XXIIIrd General Assembly, the Union welcomed as new Associate Members Bolivia and the Central American Assembly of Astronomers, as representing jointly the astronomers in Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama. An application for Associate Membership by the Macedonian Astronomical Society was found not to be in order, but the General Assembly authorised the Executive Committee to accept an application by the appropriate body when such an application would be received.

Regrettably, the membership of Morocco in the IAU terminated on 31 December 1996 by virtue of Article 7 in the Statutes. An invitation to Associate Membership has been extended to Morocco.

At its 69th meeting on Monday, August 25, 1997, the Executive Committee, upon the advice of the Nominating Committee, admitted 774 new individual Members to the Union. At the second session of the General Assembly, on August 27, 1997, a moment of silence was observed in remembrance of the 104 Members deceased since the XXIIInd General Assembly, while their names were read by the General Secretary. Thus, like in other families, the sadness of missing old friends was counteracted by the pleasure of welcoming so many new faces in our ranks. In all, the IAU had a total of 8,562 individual members as of that date.

All membership lists will appear in the Proceedings of the General Assembly (*IAU Trans. Vol. XXIIIB*) and the full current membership directory as a separate publication. In addition, after entry and verification of the data for our many new members (nearly complete at the time of this writing), the membership directory will continue to be available on-line from our Web page, from which corrections to the data can be transmitted to the Secretariat.

Finally, the General Secretary regrets to report the names of IAU members whose death has been communicated to the Secretariat since the XXIIIrd General Assembly:

Andrew Michalitsianos, USA, 29/10/97

Prof. Victor G Szebehely, USA, 24/10/97

## 13. OTHER SCIENTIFIC MEETINGS OF INTEREST TO MEMBERS

First International Conference on Comet Hale-Bopp

February 2 - 5, 1998, Puerto de la Cruz, Tenerife, Spain

*Contact address:* Richard West, ESO, Karl-Schwarzschild-Str. 2, D 85748 Garching bei München, Germany.

**Tel: 49 89 32006 276 E-mail: [rwest@eso.org](mailto:rwest@eso.org)**

**Fax: 49 89 320 236**

**WWW: <http://www.eso.org/outreach/info-events/hale-bopp/hbitp98.html>**

### **Primordial Black Hole Workshop**

**February 17, 1998, Los Angeles area, CA, USA**

***Contact address:* Joan George, Dpt. of Physics & Astronomy, UCLA, Box 951547, Los Angeles, CA 90095, USA.**

**Tel: 1 310 825 4649 E-mail: [dm98@physics.ucla.edu](mailto:dm98@physics.ucla.edu)**

**Fax: 1 310 206 1069 WWW: <http://www.physics.ucla.edu/dm98>**

### **Sources and Detection of Dark Matter**

**February 18 - 20, 1998, Los Angeles area, CA, USA**

***Contact address:* Joan George, Dpt of Physics & Astronomy, UCLA, Box 951547, Los Angeles, CA 90095, USA.**

**Tel: 1 310 825 4649 E-mail: [dm98@physics.ucla.edu](mailto:dm98@physics.ucla.edu)**

**Fax: 1 310 206 1069 WWW: <http://www.physics.ucla.edu/dm98>**

### **Numerical Astrophysics 1998**

**March 10 - 14, 1998, Tokyo, Japan**

***Contact address:* Kazunari Shibata, National Astronomical Observatory, 2-21-1 Osawa, Mitaka-shi, Tokyo 181, Japan.**

**Tel: 81 422 34 3712 E-mail: [nap98@yso.mtk.nao.ac.jp](mailto:nap98@yso.mtk.nao.ac.jp)**

**Fax: 81 422 34 4700 WWW: <http://diamond.mtk.nao.ac.jp/nap98>**

### **Dwarf Galaxies and Cosmology**

**March 14 - 21, 1998, Les Arcs, Savoie, France**

***Contact address:* Sabine Kimmel, Observatoire de Meudon - D.A.E.C., 5 Place Jules Janssen, F 92195 Meudon Cedex, France.**

**Tel: 33 1 45 07 74 14 E-mail: [kimmel@obspm.fr](mailto:kimmel@obspm.fr)**

**Fax: 33 1 45 07 74 14 WWW: <http://www.obspm.fr/moriond>**

### **29th Lunar and Planetary Science Conference**

**March 16 - 20, 1998, NASA JSC, Houston, TX, USA**

***Contact address:* 29th LPSC, Publications and Program Services Dpt, Lunar and Planetary Institute, 3600 Bay Area Bd., Houston, TX 77058-1113, USA.**

**Tel: 1 281 486 2158 E-mail: [simmons@lpi.jsc.nasa.gov](mailto:simmons@lpi.jsc.nasa.gov)**

**Fax: 1 281 486 2125 WWW: <http://cass.jsc.nasa.gov/meetings/LPSC98/>**

### **Astronomical Telescopes and Instrumentation**

**March 20 - 28, 1998, Kona, Hawaii, USA**

***Contact address:* SPIE, P.O. Box 10, Bellingham, WA 98227-0010, USA.**

**Tel: 1 360 676 3290 E-mail: [cscore@spie.org](mailto:cscore@spie.org)**

**Fax: 1 360 647 1445 WWW: <http://www.spie.org>**

### **Structure and Kinematics of Quasar Broad Line Regions**

**March 23 - 26, 1998, Lincoln, NE, USA**

***Contact address:* Martin Gaskell, Univ. Nebraska Dept. Physics & Astronomy, Lincoln, NE 68588-0111, USA.**

**Tel: 1 402 472 4788 E-mail: [gaskell@unlinfo.unl.edu](mailto:gaskell@unlinfo.unl.edu)**

**Fax: 1 402 472 2879 WWW: [http://www.unl.edu/physics/blr\\_conf.html](http://www.unl.edu/physics/blr_conf.html)**

### **Journées Scientifiques de la Société Française des Spécialistes en Astrophysique**

**March 24 - 27, 1998, Nice, France**

***Contact address:* Dr. Philippe Stee, Observatoire de la Côte d'Azur, B.P. 229, F 06304 Nice Cedex 4, France.**

**Tel: 33 4 93 40 54 93 E-mail: [stee@obs-nice.fr](mailto:stee@obs-nice.fr)**

**Fax: 33 4 93 40 44 31 WWW: <http://www.obs-nice.fr/stee/sfsa98.html>**

### **Irvine Workshop on the ICECUBE Neutrino Telescope**

**March 27 - 28, 1998, Irvine, CA, USA**

**Contact address: Steven Barwick, University of California - Irvine, Dpt of Physics and Astronomy, Irvine, CA 92697, USA.**

**Tel: 1 714 824 2626 E-mail: [barwick@master.ps.uci.edu](mailto:barwick@master.ps.uci.edu)**

**Fax: 1 714 824 7478 WWW: <http://www.ps.uci.edu/~icecube>**

### **AAS Division on Dynamical Astronomy**

**April 1 - 3, 1998, Charlottesville, VA, USA**

**Contact address: Philip Ianna, University Station, University of Virginia, Box 3818, Charlottesville VA 22903, USA.**

**Tel: 1 804 924 7494 E-mail: [pai@fermi.clas.virginia.edu](mailto:pai@fermi.clas.virginia.edu)**

**Fax: 1 804 924 3104**

### **Laboratory Space Science Workshop**

**April 1 - 3, 1998, Cambridge, MA, USA**

**Contact address: Peter L. Smith, Harvard-Smithsonian CfA, 60 Garden Street, Cambridge, MA 02138, USA.**

**Tel: 1 617 495 4984 E-mail: [plsmith@cfa.harvard.edu](mailto:plsmith@cfa.harvard.edu)**

**Fax: 1 617 495 7455 WWW: <http://cfa-www.harvard.edu/amp.law/>**

### **Galactic Sources with Relativistic Jets**

**April 15 - 16, 1998, Milton Keynes, UK ; listed in IB80**

**Note following change: Fax: 44 1908 654 192**

### **Chemistry and Physics of Molecules and Grains in Space**

**April 15 - 17, 1998, Nottingham, UK; listed in IB80**

**European Geophysical Society XXIII General Assembly**

**April 20 - 24, 1998, Nice, France**

*Contact address:* EGS Office, Max-Planck-Strasse 13, D-37191 Katlenburg-Lindau, Germany.

**Tel: 49 5556 1440 E-mail: [egs@copernicus.org](mailto:egs@copernicus.org)**

**Fax: 49 5556 4709 WWW: <http://www.copernicus.org/EGS/EGS.html>**

**Library and Information Services in Astronomy: LISA III**

**April 21 - 24, 1998, Puerto de la Cruz, Tenerife, Spain**

*Contact address:* Monica Murphy, Inst. de Astrofisica de Canarias, Library, Via Lactea S/N, E-38200 La Laguna (Tenerife), Spain.

**Tel: 34 22 605 248 E-mail: [lisa3@ll.iac.es](mailto:lisa3@ll.iac.es)**

**Fax: 34 22 605 210 WWW: <http://www.iac.es/biblio/lisa/>**

**Astrophysics and Algorithms: A DIMACS Workshop on Massive Astronomical Data Sets**

**May 6 - 8, 1998, Princeton, NJ, USA**

*Contact address:* M. Vogeley, Princeton Univ. Observatory, Princeton, NJ 08544-1001, USA.

**Tel: 1 609 258 3812 E-mail: [dimacs@astro.princeton.edu](mailto:dimacs@astro.princeton.edu)**

**Fax: 1 609 258 1020 WWW: <http://dimacs.rutgers.edu/Workshops/Astro/index.html>**

**The Jovian System after Galileo - The Saturnian System before Cassini-Huygens**

**May 11 - 15, 1998, Nantes, France; listed in IB80**

**Note following change: WWW: <http://www.sciences.univ-nantes.fr/JupSat/JUPSAT2.html>**

**The International Spring Meeting of the Astronomische Gesellschaft: Astrometry and History of Astronomy**

**May 11 - 15, 1998, Gotha, Germany; listed in IB80**

**XIV IAP Meeting: Wide Field Surveys in Cosmology**

**May 26 - 29, 1998, Paris, France**

*Contact address:* Yannick Mellier, Institut d'Astrophysique, 98bis Boulevard Arago, F 75014 Paris, France.

**Tel:** 33 1 44 32 8140 **E-mail:** [mellier@iap.fr](mailto:mellier@iap.fr)

**Fax:** 33 1 44 32 8001 **WWW:** <http://terapix.iap.fr/w98/iap98.html>

**SOHO 6/GONG 98 Workshop: Structure and Dynamics of the Interior of the Sun**

**June 1 - 4, 1998, Boston, MA, USA**

*Contact address:* Sylvain G. Korzennik, Harvard-Smithsonian CfA, 60 Garden Street, Cambridge, MA 02138, USA.

**Tel:** 1 617 496 7916 **E-mail:** [skorzennik@cfa.harvard.edu](mailto:skorzennik@cfa.harvard.edu)

**Fax:** 1 617 495 7049 **WWW:** <http://cfa-www.harvard.edu/SOHO6>

**The Next Generation Space Telescope: Science Drivers and Technological Challenges**

**June 15 - 18, 1998, Liège, Belgium**

*Contact address:* NGST Conference, c/o Britt Sjöberg, ST-ECF/ESO, Karl-Schwarzschild-Strasse 2, D 85748 Garching bei München, Germany.

**Tel:** 49 89 3200 6291 **E-mail:** [ngstconf@eso.org](mailto:ngstconf@eso.org)

**Fax:** 49 89 3200 6480 **WWW:** <http://ecf.hq.eso.org/ngst/ngstconf/>

**Astrophysics with Infrared Surveys: A Prelude to SIRTf**

**June 22 - 24, 1998, Pasadena, CA, USA**

*Contact address:* Michael Bicay, JPL, 4800 Oak Grove Drive, Pasadena, CA 91109, USA

**Tel:** 1 818 354 6958 **E-mail:** [Michael.D.Bicay@jpl.nasa.gov](mailto:Michael.D.Bicay@jpl.nasa.gov)

**Fax:** 1 818 393 4426 **WWW:** <http://sirtf.jpl.nasa.gov/survey>

**The BL Lac Phenomenon****June 22 - 26, 1998, Turku, Finland; listed in IB80****Symposium on Teaching Astronomy to Non-Science Majors****June 29 - 30, 1998, Albuquerque, NM, USA****Contact address:** Laurie Keechler, Astronomical Society of the Pacific, 390 Ashton Ave, San Francisco, CA 94112, USA.**Tel:** 1 415 337 1100/1109 **E-mail:** lkeechler@aspsky.org**Fax:** 1 415 337 5205 **WWW:** <http://www.aspsky.org>**Observational Cosmology: The Development of Galaxy Systems****June 30 - July 3, 1998, Sesto Pusteria, Italy****Contact address:** G. Giuricin, SISSA, via Beirut 4, I 34013 Trieste, Italy.**Tel:** 39 40 378 71 **E-mail:** sesto@newton.sissa.it or giuricin@sissa.it**Fax:** 39 40 378 7528**Nuclei in the Cosmos V****July 6 - 11, 1998, Volos, Greece****Contact address:** N. Prantzos, Inst. d'Astrophysique, 98bis Bd Arago, F 75014 Paris, France.**Tel:** 33 1 44 32 8188 **E-mail:** prantzos@iap.fr**Fax:** 3 1 44 32 8001**Protostars and Planets IV****July 5 - 12, 1998, Santa Barbara, CA, USA; listed in IB80****32nd COSPAR Scientific Assembly**



**July 12 - 19, 1998, Nagoya, Japan**

*Contact address:* COSPAR Secretariat, 51 bd de Montmorency, F 75016 Paris, France.

Tel: 33 1 45 25 06 79 E-mail: [cospar@paris7.jussieu.fr](mailto:cospar@paris7.jussieu.fr)

Fax: 33 1 40 50 98 27 WWW: <http://cospar.itodys.jussieu.fr>

**Chapman Conference on Magnetic Helicity in Space and Laboratory Plasmas**

**July 28 - 31, 1998, Boulder, CO, USA**

*Contact address:* Meetings Dpt, AGU, 2000 Florida Ave. NW, Washington, DC 20009, USA.

Tel: 1 800 966 2481 E-mail: [meetinginfo@kosmos.agu.org](mailto:meetinginfo@kosmos.agu.org)

Fax: 1 202 328 0566 WWW: <http://www.agu.org/meetings/cc98bcall.html>

**Galaxy Dynamics**

**August 8 - 12, 1998, New Brunswick, NJ, USA**

*Contact address:* Dr Monica Valluri, Dpt of Physics & Astronomy, Rutgers University, 136 Frelinghuysen Rd, Piscataway, NJ 08854-8019, USA.

Tel: 1 732 445 2915 E-mail: [dynamics@physics.rutgers.edu](mailto:dynamics@physics.rutgers.edu)

Fax: 1 732 445 4343 WWW: <http://www.physics.rutgers.edu/~dynamics>

**High Velocity Clouds Workshop**

**August 14 - 15, 1998, Canberra, Australia**

*Contact address:* Brad K. Gibson, Mount Stromlo & Siding Springs Observatories, Weston Creek Post Office, Weston, ACT 2611, Australia.

Tel: 61 26 279 8037 E-mail: [gibson@mso.anu.edu.au](mailto:gibson@mso.anu.edu.au)

Fax: 61 26 249 0233 WWW: <http://msowww.anu.edu.au/~gibson/HVC.html>

**Meteoroids 1998**

**August 16 - 22, 1998, Tatranská Lomnica, Slovak Republic**

*Contact address:* Vladimir Porubcan, Astronomical Institute SAV, Dúbravská 9, 84228

**Bratislava, Slovakia.****Tel: 421 7 375157 E-mail: [astropor@savba.savba.sk](mailto:astropor@savba.savba.sk)****Fax: 421 7 375157 WWW: <http://www.ta3.sk/~ne/Meteoroids98>****The Galactic Halo: Bright Stars & Dark Matter****August 17 - 21, 1998, Canberra, Australia*****Contact address:* John E Norris, Mount Stromlo & Siding Spring Observatories, Private Bag, Weston Creek PO, Canberra, ACT 2600, Australia.****Tel : 61 6 249 0266 E-mail: [tss@mso.anu.edu.au](mailto:tss@mso.anu.edu.au)****Fax : 61 6 249 0233 WWW: <http://msowww.anu.edu.au/meetings/>****Joint European and National Astronomy Meeting****September 9 - 12, 1998, Prague, Czech Republic*****Contact address:* ICARIS Ltd. Conference Management, Nám. Dr. Holého 8,****CZ 180 00 Praha 8, Czech Republic.****Tel: 420 2 683 6100 E-mail: [icaris@bohem-net.cz](mailto:icaris@bohem-net.cz)****Fax: 420 2 684 0817 WWW: <http://sunkl.asn.cas.cz/jenam98>****Astronomy with Adaptive Optics - Present Results and Future Programs****September 11 - 17, 1998, Garching bei München, Germany*****Contact address:* Domenico Bonaccini, ESO, Karl-Schwarzschild-Str. 2, D 85748 Garching, Germany.****Tel: 49 89 32006 567 E-mail: [ezuffane@eso.org](mailto:ezuffane@eso.org)****Fax: 49 89 32006 358 WWW: <http://www.eso.org/aot>****Harmonizing Cosmic Distance Scales in a Post-Hipparcos Era****September 14 - 16, 1998, Strasbourg, France*****Contact address:* Daniel Egret & André Heck, Strasbourg Astronomical Observatory, 11 rue**

**de l'Université, F 67000 Strasbourg, France.**

**Tel: 33 3 88 15 07 10 E-mail: Daniel.Egret@astro.u-strasbourg.fr**

**Fax: 33 3 88 15 07 60 Andre.Heck@astro.u-strasbourg.fr**

**WWW: <http://astro.u-strasbourg.fr/candle98.html>**

### **The Extreme Universe**

**September 14 - 18, 1998, Taormina, Italy**

**Contact address: Christoph Winkler, Astrophysics Division, ESA-ESTEC, Keplerlaan 1, NL 2201 AZ Noordwijk, The Netherlands.**

**Tel: 31 71 565 3591 E-mail: tao98@ias.fra.cnr.it**

**Fax: 31 71 565 4690 WWW: <http://www.ias.fra.cnr.it/ias-home/imager/tao98.htm>**

### **Galaxy Evolution: Connecting the Distant Universe to the Local Fossil Record**

**September 21 - 25, 1998, Meudon, France**

**Contact address: Monique Spite, Observatoire de Paris-Meudon, 5 Place Janssen, F 92195 Meudon Cedex, France.**

**Tel: 33 1 4507 7878 E-mail: spitem@memaga.obspm.fr**

**Fax: 33 1 4507 7839 WWW: <http://www.obspm.fr/admin/seminaire/col.html>**

### **3rd Cologne-Zermatt Symposium: The Physics and Chemistry of the Interstellar Medium**

**September 22 - 25, 1998, Zermatt, Switzerland**

**Contact address: Volker Ossenkopf, 1. Physikalisches Institut der Universität zu Köln, Zilpicher Strasse 77, D 50937 Köln, Germany.**

**Tel: 49 221 470 3554 E-mail: zermatt@ph1.uni-koeln.de**

**Fax: 49 221 470 5162 WWW: <http://www.ph1.uni-koeln.de/zermatt1998/>**

### **1st X-Ray Multi-Mirror Mission Workshop**

**September 28 - October 2, 1998, Noordwijk, The Netherlands**

**Contact address:** Michael Dahlem, Astrophysics Division, ESTEC, PO 299, NL 2200 AG Noordwijk, The Netherlands.

**Tel:** 31 71 565 5908 **E-mail:** xmmws1@astro.estec.esa.nl

**Fax:** 31 71 565 4690 **WWW:** [http://astro.estec.esa.nl/XMM/news/ws1\\_top.html](http://astro.estec.esa.nl/XMM/news/ws1_top.html)

### **ESO Workshop on Minor Bodies of the Outer Solar System**

**November 9 - 12, 1998, Garching bei München, Germany**

**Contact address:** Richard West, ESO, Karl-Schwarzschild-Str. 2, D-85748 Garching bei München, Germany.

**Tel:** 49 89 32006 276 **E-mail:** rwest@eso.org

**Fax:** 49 89 320 2362 **WWW:** <http://www.eso.org/mboss98/>

### **Origin of the Earth and Moon**

**December 1 - 3, 1998, Monterey, California, USA**

**Contact address:** Origin of the Earth and Moon, Publications and Program Services Dpt, Lunar and Planetary Inst., 3600 Bay Area Bd, Houston TX 77058-1113, USA.

**Tel:** 1 281 486 2166 **E-mail:** simmons@lpi.jsc.nasa.gov

**Fax:** 1 281 486 2125 **WWW:** <http://cass.jsc.nasa.gov/meetings/origin98/>

### **19<sup>th</sup> Texas Symposium on Relativistic Astrophysics and Cosmology**

**December 14 - 18, 1998, Paris, France**

**Contact address:** Dr Thierry Montmerle, CEA-Saclay, Service d'Astrophysique, Bat 709, F 91191 Gif sur Yvette Cedex, France.

**Tel :** 33 1 69 08 4722 **E-mail:** texas@discovery.saclay.cea.fr

**Fax:** 33 1 69 08 9266 **WWW:** <http://www.iap.fr/coll/texas/index.html>

## **14. ANNOUNCEMENTS**

### **14.1. AAS Chrétien International Research Grants**

**The American Astronomical Society invites applications for its Chrétien International**

**Research Grants, named in honour of Prof. Henri Chrétien. Grants up to 20,000 USD will be available in 1998 to individuals or groups for the support of international observational astronomy with the emphasis on long-term international visits. The awards are open to astronomers throughout the world.**

**Details on eligible expenditures and application procedures are available in the 1998 AAS Membership Directory, or from the AAS office at the address given below, or at [aas@aas.org](mailto:aas@aas.org) or <http://www.aas.org/grants/grants.html>**

**Applications must be received before April 1, 1998 by:**

**Chrétien International Research Grant Committee American Astronomical Society**

**2000 Florida Avenue, NW, Suite 400**

**Washington, DC 20009-1231**

**USA**

#### **14.2. The International Geophysical Calendar 1998**

**The Secretariat has received the International Geophysical Calendar for 1998. This Calendar is issued under the auspices of the International Space Environment Service (ISES) of the International Council of Scientific Unions (ICSU). Observations for solar phenomena and the International Solar Cycle Studies 1998-2000 project are covered in this calendar.**

**The Calendar, with basic explanations, has in the past often been printed in the Information Bulletin. Given the large volume of the present post-General-Assembly issue, it is preferred to give instead the WWW addresses where the complete Calendar and all explanatory files can be found and downloaded:**

**<http://www.ngdc.noaa.gov/stp>, under the icon 'Solar and Upper Atmosphere'**

**or**

**<http://www.sec.noaa.gov/> under the icon ISES**

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