CHAPTER V

REPORT OF THE EXECUTIVE COMMITTEE 1997-2000

1. Executive Committee 1997-2000

1.1. Composition of the Executive Committee

During the triennium 1997-2000, the Executive Committee was composed as follows:

President: Robert P. Kraft
President-Elect: Franco Pacini
General Secretary: Johannes Andersen
Assistant General Secretary: Hans Rickman
Vice-Presidents: Claudio Anguita, Catherine Cesarsky, Bambang Hidayat, Norio Kaifu, Nikolay Kardashev, Virginia Trimble
Advisors: Lodewijk Woltjer, Immo Appenzeller

(deceased March 3, 2000)
(Past President)
(Past General Secretary)

1.2. Meetings of the Executive Committee

The Executive Committee met as follows during the reporting period:

70th Meeting, August 27, 1997 at the XXIIIrd General Assembly in Kyoto, Japan
71st Meeting, July 2-3, 1998 at Observatoire de Paris, France
72nd Meeting, June 18-20, 1999 at the European Southern Observatory, Santiago, Chile
73rd Meeting, August 7-9 & 15, 2000 at the University of Manchester, UK

The business conducted by the Executive Committee is recorded in the Minutes of these meetings. Summaries of these Minutes have appeared in the IAU Information Bulletin (EC69 & 70: IB81, pp. 24-25; EC71: IB83, pp. 8-9; EC72: IB86, p. 11). Any urgent business between meetings, conducted by correspondence, is recorded in the Minutes of the following EC meetings.

1.3. Officers’ Meetings

Between the meetings of the EC, the Officers (President, President-Elect, General Secretary, and Assistant General Secretary) met at the IAU Secretariat in Paris on February 19-20, 1998, February 11-12, 1999, and March 2-3, 2000.
2. Membership of the Union

2.1. National Membership

In conformity with ICSU policy and upon applications by the Academies of Science of these countries, the Former Yugoslavian Republic of Macedonia became a Full Member of the IAU as of January 1, 1998, and Uzbekistan became an Associate Member effective January 1, 1999.

Due to five years of non-payment of dues, the membership of Azerbaijan terminated December 31, 1997 (IAU Statutes §7).

The Executive Committee approved a change in the Category of Canada from VI to V, effective January 1, 1998 and of the United States from VIII$\frac{1}{2}$ to IX, effective January 1, 2000.

<table>
<thead>
<tr>
<th>Number of Adhering Organizations as of April 15, 2000</th>
<th>62</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Members</td>
<td>55</td>
</tr>
<tr>
<td>Associate Members</td>
<td>7</td>
</tr>
</tbody>
</table>

In addition, applications for Associate Membership were received during the triennium from Cuba, Jordan, Morocco, and The Philippines and were forwarded to the XXIVth General Assembly for decision.

2.2. Individual Membership

Number of individual members admitted at the XXIIIrd General Assembly 741
Number of individual members as of April 15, 2000 8185
Number of Consultants 190

The Executive Committee is saddened to report the death of the following 181 members of the Union, which have been reported to the Secretariat since the XXIIIrd General Assembly:

Alberto Abrami                  J. J. Burger      Heino Eelsalu  
Claudio Anguita                 Mikle F. Bykov    Heinrich K. Eichhorn  
Ivan Atanasijevic              Patrick B. Byrne  Oystein Elgarøy  
Kamuran Avcioglu                Georgeanne R. Caughlan  Rebecca Anne Wood  
Bronislaw K. Bagildinsky        Wai Y. Chau  Elson  
M. C. Ballario                 Chung-chieh Cheng  Gerhard Elwert  
Edibe Balli                    Woyk E. Chvojko   David Emerson  
Jeno Barnothy                  Petar-Kasimir Colic  Christian Engelbrecht  
David B. Beard                 Salvatore Cristaldi  Nicolaj Erpylev  
Wilhelm Becker                 Imre K. Csada  John W. Evans  
Ravilsh Bibarsov               Bhaskar Datta  Paolo Farinella  
William Blitzstein          A. Dinescu  Boris Garfinkel  
Valentin Boriakoff             F. Dossin  John E. Geake  
Pierre Bouvier                  C. Dramba  Hubert Gent  
Izabella I. Brejdo              N. Durgaprasad  Samuel J. Goldstein  
Hermann A. Brück               Edward R. Dyer,  Louis C. Green  
Günter E. Brückner            Bengt Edlén  Virginia Grigorieva  
Paul Bruston                   Terry W. Edwards  Stefania Grudzińska
3. Divisions, Commissions & Working Groups

3.1. Divisions

DIVISION I

Commissions 8 & 24 prepared to merge into one new Commission 8, Astrometry at the XXIVth General Assembly.

DIVISION III

During the triennium, the name of Division III was adjusted to Planetary Systems Sciences to reflect that also extrasolar planets are included in the activities of the Division. Moreover, the organisational basis for the IAU bodies dealing with planetary system nomenclature has been revised and updated (see below).

DIVISION IX

The name of Division IX was updated to Optical and Infrared Techniques to better reflect its current activities.

3.2. Commissions of the Executive Committee

Commissions 38 and 46 prepared to merge into one new Commission 46, Astronomy Education and Development, to include also the activities of the Working Group on the World-Wide Development of Astronomy of the Executive Committee.

3.3. Working Groups of the Executive Committee

Responsibility for the Working Group on Planetary System Nomenclature was transferred from the Executive Committee to Division III effective February 2000. Preparations were also made for transferring the activities of the EC Working Group on the World-Wide Development of Astronomy to the reorganised Commission 46, Astronomy Education and Development after the XXIVth General Assembly. Finally, the EC Working Group on Astronomy from the Antarctic proposes that it be discontinued at the same time.

3.4. Working Groups of Divisions and Commissions

DIVISION II

With the approval of the Executive Committee, responsibility for the Working Group on Planetary System Nomenclature and the Committee on Small Body Nomenclature is assigned to Division III, effective February 2000. Formal Terms of Reference for these bodies have also been approved by the Executive Committee and are reproduced in the report of Division III in this volume.

DIVISION IV

Division IV created a Working Group on Hot Massive Stars.

DIVISION VI

Division VI created a Working Group on Star Formation.
4. **Scientific Activities**

4.1. **Environmental Challenges to Astronomy**

Follow-up actions to Resolution A1 from the Kyoto General Assembly (Trans. IAU Vol. XXIII B, p. 31) have been a major activity during the triennium. A *Policy Statement on the Environment* was approved at the 71st meeting of the Executive Committee and is reproduced in Appendix I to this report.

As a further high-profile initiative, the *IAU-COSPAR-UN Special Environmental Symposium*, No. 196, on "Preserving the Astronomical Sky", was held in conjunction with the UNISPACE III conference of the *UN Committee on the Peaceful Uses of Outer Space (COPUOS)* in Vienna, Austria, in July 1999. The recommendations of the Symposium were presented to the main UN Conference and were largely included in its recommendations for the future. With the subsequent endorsement of these recommendations by the UN General Assembly in late 1999, these now form part of the official UN policy for the development of space activities in the first decades of the new millennium. The IAU is presently working with interested Member States, space agencies, and other relevant international and national Unions, scientific committees, and research organisations to develop specific proposals for international environmental standards for future space experiments, to be eventually submitted to UN-COPUOS.

Finally, as yet another step in raising public awareness of the increasing environmental challenges to astronomy, a *Policy Forum* was published in the journal *Science* (vol. **288**, p. 443, April 21, 2000).

4.2. **Research on Near-Earth Objects**

Research on *Near-Earth Objects (NEOs)* - minor planets and comets the orbits of which may eventually take them near the Earth - emerged during the triennium as a subject of dramatically increasing scientific activity as well as public and political attention. The IAU occupies a central role in this scientific field through Division III, Commission 20, and associated Working Groups, and especially through its scientific sponsorship of the *IAU Minor Planet Center* at the Smithsonian Astrophysical Observatory, USA.

After a long history as a quiet, essentially self-regulating backwater in the IAU structure, NEO research reached a point when a number of issues required attention and action at the level of the Executive Committee. A *Policy Statement* by the Executive Committee (see Appendix II to this report) defined these areas and set down high-level IAU policies for addressing them. The essential concerns are:

(i) The continued coordinated international development of search, follow-up, and orbital computation and prediction techniques for NEOs. This is being addressed by the appropriate bodies under IAU Division III and by an initiative to establish properly defined Terms of Reference and a proper contractual basis for the operation of the Minor Planet Center. A thorough discussion of these issues was also held during the *IMPACT Workshop* in Torino, Italy, in June 1999, which was co-sponsored by the IAU and whose Scientific Organizing Committee was co-chaired by the Presidents of IAU Commissions 15 and 20.

(ii) The establishment of an open, international refereeing service for any claims of a future potential hazardous passage of a NEO. This has been established by the Working Group on NEOs of Divisions I and III.
(iii) The definition of suitable procedures for communications concerning harmless as well as potentially hazardous events to responsible authorities as well as to the public. These were also debated in depth at the IMPACT Workshop.

There is little doubt that NEO research and public attention to it will continue to grow in the foreseeable future. The scientific issues and potential threat – of such magnitude as it might be – which are posed by NEOs are global, and scientific strategies, collaborations, and coordination should be designed accordingly. The IAU should continue to play a pivotal role in this development, but for this to succeed will require careful attention to the subject, internally in the IAU as well as externally.

4.3. IAU Scientific Meetings

The IAU programme of scientific meetings is probably the highest-profile aspect of the scientific activities of the IAU. As a guide for prospective organisers of such scientific meetings, the Rules for IAU Sponsored Scientific Meetings, with associated application and report forms, are maintained on-line at the IAU web site. For reference, they are also reproduced in this volume.

IAU Scientific Meetings Held Since the XXIIrd General Assembly and Up to the XXIVth General Assembly Included

**XXIIIrd IAU General Assembly**
Kyoto, Japan, August 17-30, 1997

**IAU Symposia**

190 *New Views of the Magellanic Clouds*
Victoria, Canada, July 13-19, 1998

191 *Asymptotic Giant Branch Stars*
Montpellier, France, August 28-September 1, 1998

192 *The Stellar Content of Local Group Galaxies*
Cape Town, South Africa, September 7-12, 1998

193 *Wolf-Rayet Phenomena in Massive Stars and Starburst Galaxies*
Puerto Vallarta, Mexico, November 3-7, 1998

194 *Activity in Galaxies and Related Phenomena*
Yerevan, Armenia, August 17-21, 1998

195 *Highly Energetic Physical Processes and Mechanisms for Emission from Astrophysical Plasmas*
Bozeman, MT, USA, July 6-10, 1999

196 *Preserving the Astronomical Sky: An IAU/COSPAR/UN Special Environmental Symposium*
Vienna, Austria, July 12-16, 1999

197 *Astrochemistry: from Molecular Clouds to Planetary Systems*
Sogwipo, Rep. of Korea, August 23-27, 1999

198 *The Light Elements and their Evolution*
Natal, Brazil, November 22-26, 1999
<table>
<thead>
<tr>
<th>No.</th>
<th>Event Title</th>
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<tr>
<td>199</td>
<td><em>The Universe at Low Radio Frequencies</em></td>
<td>Pune, India, November 30-December 4, 1999</td>
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<td>200</td>
<td><em>The Formation of Binary Stars</em></td>
<td>Potsdam, Germany, April 10-15, 2000</td>
</tr>
<tr>
<td>201</td>
<td><em>New Cosmological Data and the Values of the Fundamental Parameters</em></td>
<td>Manchester, UK, August 7-10, 2000</td>
</tr>
<tr>
<td>203</td>
<td><em>Recent Insights into the Physics of the Sun and Heliosphere</em></td>
<td>Manchester, UK, August 7-10, 2000</td>
</tr>
<tr>
<td>204</td>
<td><em>The Extragalactic Infrared Background and its Cosmological Implications</em></td>
<td>Manchester, UK, August 15-18, 2000</td>
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<td>205</td>
<td><em>Galaxies and their Constituents at the Highest Angular Resolutions</em></td>
<td>Manchester, UK, August 15-18, 2000</td>
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<td><strong>IAU Colloquia</strong></td>
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<tr>
<td>168</td>
<td><em>Cometary Nuclei in Space and Time</em></td>
<td>Nanjing, China, May 18-22, 1998</td>
</tr>
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<td>170</td>
<td><em>Precise Stellar Radial Velocities</em></td>
<td>Victoria, Canada, June 21-26, 1998</td>
</tr>
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<td>171</td>
<td><em>The Low Surface Brightness Universe</em></td>
<td>Cardiff, UK, July 6-10, 1998</td>
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<td>172</td>
<td><em>The Impact of Modern Dynamics in Astronomy</em></td>
<td>Namur, Belgium, July 6-11, 1998</td>
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<td>174</td>
<td><em>Small Galaxy Groups</em></td>
<td>Turku, Finland, June 13-18, 1999</td>
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<td>175</td>
<td><em>The Be Phenomenon in Early-Type Stars</em></td>
<td>Alicante, Spain, June 28-July 2, 1999</td>
</tr>
<tr>
<td>176</td>
<td><em>The Impact of Large-Scale Surveys on Pulsating Star Research</em></td>
<td>Budapest, Hungary, August 8-12, 1999</td>
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<td>177</td>
<td><em>Pulsar Astronomy - 2000 and Beyond</em></td>
<td>Bonn, Germany, August 30-September 3, 1999</td>
</tr>
<tr>
<td>178</td>
<td><em>Polar Motion: Historical and Scientific Problems</em></td>
<td>Cagliari, Italy, September 27-30, 1999</td>
</tr>
</tbody>
</table>
5. Publications

The change of IAU Publisher from Kluwer Academic Publishers to the Astronomical Society of the Pacific took place during the triennium, effective for the proceedings of meetings held after January 1, 1998. Thus, the *IAU Transactions* Vol. XXIIIA & B and *Highlights of Astronomy* Vol. 11A & B were published by Kluwer, as are the *IAU Symposium* proceedings through Symposium No. 189. The IAU publications printed by the Astronomical Society of the Pacific thus begin with the *IAU Transactions* Vol. XXIVA (Reports on Astronomy 1996-1999) and the *IAU Symposia* from No. 190 onwards.

With the change of IAU Publisher, the opportunity was taken to redesign the cover of the Information Bulletin, which had remained basically unchanged since 1982.

The individual IAU publications which have appeared during the triennium are listed in the following; continually updated listings with all particulars are maintained at the IAU web site.

**IAU Information Bulletin**: Nos. 81-87 (January 1998 through June 2000)
Printed and distributed for the IAU by the Astronomical Society of the Pacific

**Highlights of Astronomy, Vol 11A and Vol.11 B**

**Transactions of the International Astronomical Union, Vol. XXIIIIB**
(Proceedings of the XXIIIrd General Assembly)
Alphabetical list of members/Liste alphabétique des membres

Transactions of the International Astronomical Union, Vol. XXIVA
(Reports on Astronomy 1996-1999)

IAU Symposium Proceedings

178 Molecules in Astrophysics: Probes and Processes
Leiden, Netherlands, July 1-5, 1996
Ed. E. F. van Dishoeck

179 New Horizons from Multi-Wavelength Sky Surveys
Baltimore, USA, August 26 - 30, 1996

180 Planetary Nebulae
Groningen, The Netherlands, August 26-30, 1996

181 Sounding Solar and Stellar Interiors
Nice, France, September 30 - October 3, 1996
Eds: J. Provost & F.-X. Schmieder

182 Herbig-Haro Flows and the Birth of Low-Mass Stars
Chamonix, France, January 20-26, 1997
Eds. B. Reipurth & C. Bertout

183 Cosmological Parameters and the Evolution of the Universe
Kyoto, Japan, August 18-22, 1997
Eds: K. Sato

184 The Central Regions of the Galaxy and Galaxies
Kyoto, Japan, August 18-22, 1997
Eds: Y. Sofue

185 New Eyes to See inside the Sun and the Stars: Pushing the Limits of Helio- and Astero-Seismology with new Observations from the Ground and from Space
Kyoto, Japan, August 18-22, 1997
Eds: D.W. Kurtz & J. Leibacher

186 Galaxy Interactions at High and Low Redshift
Kyoto, Japan, August 26-30, 1997
Eds: J. Barnes & D.B. Sanders
The Hot Universe
Kyoto, Japan, August 26-30, 1997
Eds. K. Koyama, S. Kitamoto & M. Itoh

Fundamental Stellar Properties: The Interaction between Observation and Theory
Sydney, Australia, January 13-17, 1997
Eds. T. Bedding, A.J. Booth & J. Davis

New Views of the Magellanic Clouds
Victoria, Canada, July 13-19, 1998
Eds. Y.-H. Chu, J. Hesser & N. Suntzeff

Asymptotic Giant Branch Stars
Montpellier, France, August 28 - September 1, 1998
Eds. A. Lebre, T. le Bertre & C. Waelkens

The Stellar Content of Local Group Galaxies
Cape Town, South Africa, September 7-12, 1998
Eds. P. Whitelock & R. Cannon

Wolf-Rayet Phenomena in Massive Stars and Starburst Galaxies
Puerto Vallarta, Mexico, November 3-7, 1998
Eds. K.A. van der Hucht, G. Koenigsberger & P.R.J. Eenens

Active Galactic Nuclei and Related Phenomena
Byurakan, Armenia, August 17-22, 1998
Eds. Y Terzian, D. Weedman & E. Khachikian

Highly Energetic Physical Processes and Mechanisms for Emission from Astrophysical Plasmas
Bozeman, MT, USA, July 6-10, 1999
Eds. H. Hudson & S. Tsuruta

Astrochemistry: from Molecular Clouds to Planetary Systems
Sogwipo, Rep. of Korea, August 23-27, 1999
Eds. Y.C. Minh & E.F. van Dishoeck

IAU Colloquium Proceedings

Astronomical and Biochemical Origins and the Search for Life in the Universe
Capri, Italy, July 1-5, 1996
Eds: C.S. Cosmovici, S. Bowyer & D. Werthimer
New Trends in Astronomy Teaching
London and Milton Keynes, UK, July 8-12, 1996

Accretion Phenomena and Related Outflows
Port Douglas, Australia, July 15-19, 1996
Eds: D.T. Wickramasinghe, G. Bicknell & L. Ferrario

Radio Emission from Galactic and Extragalactic Compact Sources
Socorro, New Mexico, USA, April 21-26, 1997

Dynamics and Astrometry of Natural and Artificial Celestial Bodies
Poznań, Poland, July 1-5, 1996

The Local Bubble and Beyond
Garching b. München, Germany, April 21-25, 1997
Eds: D. Breitschwerdt, M.J Freyberg & J. Trümper

New Perspectives on Solar Prominences
Aussois, France, April 28 - May 4, 1997
Eds: D. Webb, D. Rust, & B. Schmieder

Variable and Non-Spherical Stellar Winds in Luminous Hot Stars
Heidelberg, Germany, June 15-19, 1998
Eds: B. Wolf, O. Stahl & A.W. Fullerton

Precise Stellar Radial Velocities
Victoria, Canada, June 21-26, 1998
Eds. J.B. Hearnshaw & C.D. Scarfe

The Low Surface Brightness Universe
Cardiff, UK, July 6-10, 1998
Eds. J. Davies, C. Impey & S. Phillips

The Impact of Modern Dynamics In Astronomy
Namur, Belgium, July 6-11, 1998
Eds. J. Henrard & S. Ferraz-Mello

Evolution and Source Regions of Asteroids and Comets
Eds. J. Svoreň, E.M. Pittich & H. Rickman
Astronomical Institute of the Slovak Academy of Sciences, Tatranská Lomnica
ISBN 80-88780-32-2, 1999
6. Educational Activities

6.1. The IAU-UNESCO International Schools for Young Astronomers (ISYA’s)

The following ISYA’s took place during the triennium:
- 23rd ISYA Zanjan, Iran, July 4-23, 1997
- 24th ISYA Bucharest, Romania, July 26-August 14, 1999

6.2. The Teaching for Astronomy Development (TAD) Programme

The recently instituted Teaching for Astronomy Development (TAD) programme helps to build up astronomy education at the university level, including education of future teachers at the high school level, in countries where astronomy has not existed before or been dormant, and which have requested such help. Programs for specific countries extend over a few years and comprise periodical visits by lecturers, support for local or regional meetings, and grants for educational equipment.

The majority of activities under the TAD programme have been focused on Vietnam, Central America, and Morocco (see previous Information Bulletins for details). They have been supported in part by UNESCO.

6.3. Exchange of Astronomers

The aim of this programme is to provide support to astronomers from developing countries who spend periods over three months at a foreign host institution to pursue their training and formation in astronomy and their scientific collaboration with other astronomers. During the triennium 1997-1999, 37 grants totalling ~68,700 CHF were awarded to astronomers on this programme. A detailed list of grantees is published in this volume, Chapter VI, Commission 38.

6.4. United Nations

A joint *IAU-COSPAR-UN Special Educational Workshop* was held during the UNISPACE III Conference in Vienna in July 1999 and was well attended and well received. Its recommendations were presented to the main Conference and generally strongly supported in the *Report and Recommendations* of UNISPACE III, which has later been endorsed by the UN General Assembly. Synergistic initiatives between the IAU, COSPAR, and the *Regional Educational Centres for Space Science and Technology*, affiliated to the United Nations, were among these recommendations and are currently being actively explored.

The IAU was represented by the General Secretary and two other speakers at the Eighth *UN/ESA Workshop on Basic Space Science*, held in Jordan, March 13-17, 1999. The IAU was also represented by a speaker at the Ninth UN/ESA Workshop in Toulouse, France, June 27-30, 2000.

7. Relations to Other Organisations

7.1. ICSU

The IAU was represented by the General Secretary at the following meetings:
- Meetings of the Standing Committee on Membership, Structure and Statutes (SCMSS), Paris, October 1-3, 1997 & April 13, 1999
- 37th General Committee Meeting, Vienna, Austria, April 23-24, 1998
The IAU was represented by J. Fierro (President, Commission 46) at the Conference on the Programme for Capacity Building in Science, June 24-25, 1999, organised in conjunction with the ICSU/UNESCO World Conference on Science in Budapest, Hungary, in June, 1999.

7.2. COSPAR

The IAU was represented by the General Secretary at the following meetings:

- 59th Bureau, March 19, 1999, Paris
- 60th Bureau, March 31-April 1, 2000, Paris
- 32nd Scientific Assembly, Warsaw, Poland, July 15-23, 2000

The IAU was represented by A.A. Boyarchuk at the 32nd Council, Nagoya, Japan, July 12-19, 1998

7.3. UN-COPUOS

The IAU was represented by the General Secretary at the meetings of the UN Committee on the Peaceful Uses of Outer Space (COPUOS), held February 9-20, 1998, and February 20-24, 2000 (all Scientific and Technical Subcommittee of COPUOS) and July 18, 1999 (full Committee). Presentations were made at these meetings on the environmental challenges to astronomy (1998-1999) and on International Coordination of Research on Near-Earth Objects (2000).

The IAU was represented by the General Secretary at the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III) in Vienna, July 19-30, 1999. Two events under the Technical Forum accompanying the Conference were organised by the IAU jointly with COSPAR and the UN Office of Outer Space Affairs: Symposium 196 on Preserving the Astronomical Sky (July 12-16), and a Special Educational Workshop: Capacity Building in Astronomy and Basic Space Science (July 20-22).

7.4. Representatives to Other Organisations

A list of representatives 1997-2000 is in Trans. IAU XXIIIB, p. 57; the full list for 2000-2003 as approved at EC 74 is published in this volume.

8. Administrative Matters

8.1. Revision of Statutes, Bye-Laws and Working Rules

During the triennium, revisions of the Statutes and Bye-Laws were prepared for submission to the vote of the XXIVth General Assembly. These revisions were primarily to clarify the rules applying for Associate Membership of the Union, to update the rules for the Officers and Boards of Divisions in the light of experience gathered during the first six years of the Divisional structure, and to allow the Chairs of Working Groups of the Executive Committee to nominate new Individual Members of the Union on the same basis as the Presidents of Divisions. The Working Rules were updated by the Executive Committee to reflect practical procedures regarding these changes. The complete texts of all these documents as approved at the end of the XXIVth General Assembly are reproduced, Chapter VII of this volume.
8.2. Secretariat

The Secretariat in Paris was headed throughout the triennium by Ms. Monique Léger-Orine with the dedication and efficiency that has characterised her decade-long service for the IAU. Relations to Member States, accounts and financial matters, and preparation of the General Assembly are among her primary responsibilities.

Effective July 1, 1998, Ms. Julie Saucedo resigned after eight years of service in the Secretariat to seek new career challenges. The IAU was fortunate to find immediately an able successor in Ms. Jodi Greenberg of the United States, who integrated quickly and smoothly into the work of the Secretariat. She has been primarily in charge of the maintenance of the Membership Directory and the preparation of the Information Bulletins.

At the start of the triennium, the offices of the Secretariat were given a much-needed facelift. Walls were renovated and repainted; new and more rational furniture installed, new computers purchased and installed, and archival material moved to the storage room.

The IAU web site is an aspect of the service of the Secretariat which has been given much time and attention during the triennium. First, it was decided that a permanent URL was needed, independent of any other institutions. After a period with a temporary address (www.intastun.org) it became possible to secure the URL www.iau.org, which is intended to be permanent. During the triennium reported here, the files have been physically stored at the Astronomical Observatory, University of Copenhagen.

From a relatively modest beginning, the information available at the web site has expanded to include news and deadlines; contact information to the Secretariat, Officers, Executive Committee, Adhering Organisations and related Unions and other Organisations as well as all Divisions and Commissions; the current Statutes, Bye-Laws, and Working Rules; a searchable on-line Membership Directory; and information on the programme of IAU sponsored scientific meetings, including the Rules for Scientific Meetings, lists of past and future meetings, and all meeting proposal and reporting forms as well as forms for Travel Grant applications. Updated lists of IAU publications and on-line versions of recent IAU Information Bulletins are maintained on the web, and a section on Frequently Asked Questions gives information on questions known to be of particular interest to readers, whether constant or connected to temporary events (e.g. Solar eclipses). The web site has also been used extensively to provide up-to-date information to members in preparation for the XXIVth General Assembly. Further expansions are foreseen for the future.

8.3. Archives

As described in previous reports, former IAU President, Prof. Adriaan Blaauw had undertaken a complete review, sorting, packing, and inventory of all archival material in the possession of the Union for the years 1919-1970. This monumental task was completed in 1998 with the deposit of the entire material in the Archives of the Académie des Sciences in Paris, following an Agreement according to which the Académie will undertake the preservation of the IAU Archives to professional standards. Qualified astronomers and historians of science will have access to the IAU Archives upon the written permission of the IAU General Secretary. An Inventory of the Archives 1919-1970 has been prepared by Prof. Blaauw and published by the IAU; it is available for a nominal fee from the Secretariat and from the Kapteyn Institute, Groningen, The Netherlands.

As another aspect of the organisation of the archives of the Union, the IAU membership data base has been completed to comprise all members of the Union since its founding in 1919, giving the years of their admission to and retirement from the Union as well as any IAU functions held during their membership.

### TRIENNIAL 1997-1999

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### TRIENNium 1997-1999

#### STATEMENT OF EXPENDITURE (CHF) - Ctd

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Environmental Challenges to Astronomy

Policy Statement issued July 4, 1998, by the IAU Executive Committee

During the 20th century, astronomy has made great progress on the most fundamental questions concerning the origin and evolution of the Universe and our place in it. Within subjects ranging from the origin and evolution of the Solar system, the formation and evolution of stars and the origin of the chemical elements, the nature and evolution of galaxies, up to the structure, origin, and evolution of the Universe itself, sound physical theories have been developed and tested against a wealth of increasingly detailed observational facts.

Except in the Solar system, astronomers cannot conduct experiments on the subjects of their studies. Thus, our understanding of the Universe is primarily based on observations of the electromagnetic and other kinds of radiation emitted by stars and galaxies. The dramatic recent progress is due to a series of observational breakthroughs, made with ground and space based observatories and closely linked to the development of cutting-edge technologies. In order to probe the diverse range of astronomical objects, observations must cover all wavelengths from radio via infrared and optical to X- and gamma-rays, some of which are only accessible from space.

The phenomena thus discovered include the most violent events known in the Universe. Yet, these objects are so far away that the signals recorded by astronomical telescopes when capturing radiation from the early phases of the Universe are vastly fainter than those familiar from everyday life. This fact makes astronomy especially vulnerable to, but also a very sensitive indicator of, environmental degradation affecting the night sky at all wavelengths.

At the threshold of the third millennium, progress in the further exploration of the depths of the universe is threatened by human activities affecting the night sky. Briefly, these adverse effects are fourfold:

1. **Pollution by scattered light from ground based light sources.**
   To millions of people living in or near great cities or industrial centres, the sight of the dark night sky is unknown. Plainly visible from space, this light not only obliterates the faint signals reaching us from the Universe, it also represents the useless waste of much fossil or nuclear fuel. Thus, economic incentive and scientific interest go hand in hand in this matter. Simple measures exist to direct light where it is needed, and thus both conserve energy and keep the night sky pristine; they need to be implemented more widely. The IAU values and supports the numerous national and local initiatives taken to promote understanding and action on this issue.

2. **Interference from man-made radio noise.**
   Radio astronomy has contributed several of the most fundamental discoveries of the past century. Now, however, it is under relentless and increasing pressure, above all from the communications industry, to give up the protected wavebands containing the astrophysically most important frequencies. Considering that an ordinary portable telephone, if placed on the Moon, would be one of the very brightest sources in the radio sky at its wavelength, even sideband radiation from transmissions in a permitted waveband may be fatal to astronomy. Continued efforts by the IAU and URSI (Union de Radio Science Internationale), as represented by the Inter-Union Committee on the Allocation of Frequencies for Radio
Astronomy and Space Science (IUCAF) within the International Telecommunications Union (ITU), are vital for radio astronomy to survive in the face of this competition.

3. Space debris.
Space debris from spacecraft and launchers has two kinds of deleterious effects on astronomy: First, it leaves luminous trails on the sky which ruin astronomical observations. Second, direct hits by spacecraft debris are a threat to the survival of scientific satellite observatories, including the International Space Station, somewhat analogous to the effects of swarms of small natural meteorites. The former effect is mainly felt by astronomers; the latter problem affects all satellites regardless of their purpose. For this reason, international efforts are under way to control the growth of space debris, which will hopefully also benefit astronomy.

4. Technology experiments and artistic or commercial displays in space.
Experiments continue to be proposed which would place strongly luminous objects in space, whether for technology assessment (generation and transmission of illumination or power), or for artistic or commercial purposes. Responsibly executed and carefully controlled experiments should, of course be allowed, but malfunctions may occur. Moreover, at the moment, no international regulations exist to prevent uncontrolled private and other enterprises from launching objects into space that would ruin the night sky for people of all nations, potentially for many generations: Unlike ground-based art or advertising displays, space displays respect no national sovereignty or environmental regulations. An international treaty is needed to prevent unbridled proliferation of such displays to the irreparable detriment of scientific progress in astronomy.

The IAU, therefore, urgently appeals to the nations of the world to negotiate and implement an international treaty regulating space activities that would unnecessarily endanger what is perhaps the last natural resource available to all mankind: The night sky. Clearly, nations should be free to develop potentially beneficial space technology in a controlled and responsible manner as defined by internationally recognised guidelines. The IAU urges, however, that such guidelines be defined with due regard to the protection of peaceful scientific investigation, following the models set by, e.g. the Antarctic Treaty or the international agreements on radio frequency allocations.
IAU Policy Statement on Near Earth Object Research

Policy Statement issued July 4, 1998, by the IAU Executive Committee

The Solar system contains a large number of bodies ranging in size from the major planets to tiny meteorites. Research over the last several decades has revealed that all major bodies of the Solar system have suffered larger or smaller impacts of bodies ranging in size from millimetres to kilometres, the best-known example of which is the abundance of craters on the Moon. Geological features on Earth show that impacts of significant size have occurred also on our own planet. The realization that such impacts occur at long, but presently poorly-known intervals has recently caused growing concern in the public, and in the press.

Research on the minor constituents of the Solar system – the minor planets or asteroids – has formed part of astronomical research for the last two centuries. The International Astronomical Union (IAU) has acted as the international focal point for this research since the foundation of the Union in 1919, in particular through its Commission on the Positions and Motions of Minor Planets, Comets, and Satellites. As part of this function, the IAU has for over 50 years operated a Minor Planet Center (MPC), currently at the Smithsonian Astrophysical Observatory (SAO; Cambridge, Mass., USA), for the collection of data and the dissemination of information concerning minor planets and, lately, comets. When continued research showed that the orbits of several minor planets crossed that of the Earth, the IAU in 1991 appointed a Working Group on Near Earth Objects (NEO) to coordinate international studies of NEOs and develop suitable strategies for detection, follow-up, and orbit prediction. As one result of this work, the international Spaceguard Foundation was formed, and a number of observational programs for the detection of NEOs have been started. The WGNEO is also active in the development of proven algorithms for long-term NEO orbit prediction and thus for assessing the distance to which NEOs may approach Earth within the next few centuries.

Currently, the number, size distribution, and orbits of individual NEOs are incompletely known from observation. Thus, the most urgent task is the detection and observation of NEOs to determine their orbits. This is an international responsibility that requires the efforts of and support for astronomers around the world. As the international organization of professional astronomers, the IAU coordinates this activity through the NEO Working Group and offers the services of the MPC for the collection and collation of new observations and computation of predictions from which follow-up observations can be made to improve our knowledge of the orbits and sizes of these objects.

It is possible that, sometime in the future, these studies may lead to the prediction of an actual impact on Earth. In such a case, this information must be promptly conveyed to the governments of the world, who may be in a position to organise countermeasures (a subject outside the mandate of the IAU). On the other hand, public announcements of potential impacts without proper verification are clearly undesirable. The IAU has therefore charged the WGNEO, in consultation with astronomers worldwide, to draft a set of recommended procedures to be followed in case minor planets and comets are discovered that lead to predictions by the MPC of potential impacts. These procedures will conform to the following general principles:
1. All information will be openly shared with astronomers and the general public world-wide.

2. The content of public statements that might alarm the public will be subject to prior scientific peer review by the IAU.

3. The IAU Officers and appropriate authorities will be consulted before such information is released to the press.

The IAU reaffirms and increases its support of the Minor Planet Center, as the international clearing-house for this research, and acknowledges the support of SAO and NASA for its operation. The IAU encourages all countries of the world to contribute to the effort of charting the NEO population and will continue to ensure that this global issue is addressed in a properly international forum.