

IUGG Annual Report 2000

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INTRODUCTION

The International Union of Geodesy and Geophysics (IUGG) is a non-governmental, non-profit organization dedicated to advancing scientific knowledge of Earth including its physical components, dynamic behaviors, and environment in space, and to applying the knowledge gained by such studies to the needs of society, such as mineral resources, reduction of the effects of natural hazards and environmental preservation. Established in 1919, IUGG brings together seven semi-autonomous International Associations that address different disciplines of earth science. Through these Associations, IUGG promotes and enables research in the physical, chemical and mathematical studies of the Earth by providing a framework for collaborative research and information exchange. The Union gives particular emphasis to the scientific needs of developing countries, and strives to improve the capacity of all nations of the world to observe and understand the natural physical processes that bear upon their safety and economies.

Studies encompassed by IUGG include the shape of the Earth, its gravitational and magnetic fields, the dynamics of the Earth as a whole and of its component parts, the Earth's internal structure, composition and tectonics, the generation of magmas, volcanism and rock formation, the hydrological cycle including snow and ice, all physical aspects of the oceans, the atmosphere, ionosphere, magnetosphere and solar-terrestrial relations, and analogous problems associated with the Moon and other planets. Union activities embrace studies of the Earth by artificial satellites and other techniques for deploying instruments at high altitude.

The IUGG has initiated and vigorously supported collaborative efforts that have led to highly productive world-wide interdisciplinary research programs, such as the International Geophysical Year (1957-58), the Upper Mantle Project (1964-70), the Geodynamics Project (1972-79), the Global Atmospheric Research Programme (1970-80) and the International Lithosphere Programme (1981-). The Union is a partner with other Unions of ICSU in Inter-Union Commissions and co-

operates with international agencies such as the World Meteorological Organization and UNESCO to achieve common goals.

The official languages of the Union are English and French; the internet site is www.iugg.org.

MEMBERSHIP

By their very nature, geodetic and geophysical studies require a high degree of international co-operation as well as effective central co-ordination. During 2000, the Union had 70 Member Countries. However, several countries are in serious arrears of payment and are in observer status. During the 1999 IUGG General Assembly, a new category of membership, Associate Membership, was approved. Associate Member countries must establish a National Committee for IUGG but temporarily do not pay dues. Associate Members may attend all IUGG scientific and social activities, but may not participate in Council meetings. Two countries were accepted into Associate status in 2000. New Member Country applications are being actively encouraged.

VITAL STATISTICS

Structure

The Union comprises seven semi-autonomous Associations, each responsible for a specific range of topics or themes within the overall scope of the Union's activities and each with a sub-structure. The Associations convene their own general assemblies and sponsor particular symposia, often in partnership with one another, and, like the Union, are managed by a Bureau and Executive Committee whose members are elected during their General Assemblies. Within its own discipline each Association is responsible for determining its own program of investigations and for supporting the activities of its own component parts. All geo-scientists, worldwide, are eligible to participate in IUGG and Association assemblies, workshops, and symposia.

The Union and the Associations publish information bulletins of meetings of the Associations and of symposia sponsored by the Associations. The seven International Associations are listed below. Additional information about each Association and its components is given on their web sites, which can be accessed from the IUGG web site [www.iugg.org/].

International Association of Geodesy (IAG/AIG)

International Association of Geomagnetism and Aeronomy (IAGA/AIGA)

International Association of Hydrological Sciences (IAHS/AIHS)

International Association of Meteorology and Atmospheric Sciences (IAMAS/AIMSA)

International Association for the Physical Sciences of the Ocean (IAPSO/AISPO)

International Association of Seismology and Physics of the Earth's Interior (IASPEI/AISPIT)

International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI/AIVCIT)

Inter-Association Commissions and Committees

Owing to the interactive nature of the subject fields managed by the Union's Associations, a number of Inter-Association Commissions have been established which serve the Union and the international geophysical community by promoting the study of particular interdisciplinary problems. In the year 2000 a new interdisciplinary Commission, the Geo-Risk Commission, was formed. The Inter-Association Commissions are as follows:

Committee on Mathematical Geophysics (CMG; all-Associations)

Study of the Earth's Deep Interior (SEDI; IAGA, IASPEI, IAVCEI)

Geophysical Risk and Sustainability (Geo-Risk; all-Associations)

Tsunami Commission (IASPEI, IAVCEI, IAPSO)

International Heat Flow Commission (IHFC; IASPEI, IAVCEI, IAPSO)

In addition, IUGG and the International Union of Geological Sciences (IUGS) foster the Scientific

Committee on the Lithosphere (SCL), also known as the International Lithosphere Programme (ILP), within ICSU.

General Assemblies of the Union

General Assemblies have been held since 1922 and, since 1963, at 4 year intervals. The most recent General Assembly, our 22nd, was held 19-30 July, 1999, on the campus of the University of Birmingham, Birmingham, United Kingdom. 4052 scientists from 90 countries attended the 1999 IUGG General Assembly. The next General Assembly will be held in Sapporo, Japan in July, 2003.

The seven Associations of IUGG meet at these General Assemblies and organize separate or inter-Association symposia. The Union itself arranges lectures of high general interest, and interdisciplinary Symposia.

Each IUGG National Committee, which functions as a non-governmental entity in its relations with IUGG, is represented at the General Assemblies of the Union by delegates appointed by its adhering body. During these assemblies, policies governing the Union are agreed on, research programs requiring international participation are formulated and coordinated and plans are drawn for their execution. The scientific results of programs in progress are discussed at the numerous symposia, Commission and Working Group meetings and other gatherings of scientists that are held during these assemblies.

Other Scientific Meetings

Each Association organizes its own scientific assembly in between general assemblies of the Union. These are very important venues where scientific progress is reported and Association business is conducted. Associations may sometimes meet jointly with the purpose of promoting interdisciplinary science. During the 1995-1999 quadrennium, approximately 4790 scientists attended the Association Assemblies held in Australia, Brazil, Greece, Mexico, Morocco and Sweden.

The numerous topical and regional symposia and workshops organized on other occasions by the Associations, together with the general assemblies, provide opportunity for geodesists and geophysicists from the majority of the countries of the world to discuss their respective methodologies, results and hypotheses and to plan collaborative research projects. The symposia, often held in non-urban locales, are intended to be particularly helpful to the younger scientists from the developing countries of the world.

Publications

The IUGG publishes an annual Yearbook, in which the organizational structure and officers of each body within the Union are listed. The Yearbook is printed and mailed to all Members Countries and relevant persons and organizations, and is readable in electronic format on the IUGG web site. The Union distributes a short newsletter (the IUGG E-Journal) to Member Countries monthly. In 2000, a new IUGG Brochure was designed and printed that summarizes the purpose and work of IUGG and its Associations. Each Association manages their own publications.

ORGANIZATIONAL MATTERS

Responsibility for directing the Union's affairs is vested in the IUGG Council by the Statutes and Bylaws. The IUGG Council consists of the Council Delegates, who are designated by the adhering body of their respective countries as their representatives for each Council meeting. A Bureau, an Executive Committee and a Finance Committee administer the IUGG between Council meetings. The Executive Committee has the particular responsibility of overseeing the scientific programmes of the Union. There is no permanent Secretariat; the National Committee of the Secretary General is expected to provide administrative support for Union affairs.

The Bureau of the Union is composed of the following officers, elected July, 1999, until 2003:

President M. Kono (Japan)
Vice-President U. Shamir (Israel)
Secretary General J.A. Joselyn (U.S.A.)
Treasurer A.W. Hansen (Denmark)
Members J. Chen
H. Gupta
V. Shannon (China)
(India)
(South Africa)

The Executive Committee consists of the Bureau, the past President of the Union (P. Wyllie, U.S.A.) and the Presidents of the seven Associations, namely:

IAG F. Sanso' (Italy)
IASPEI B. Kennett (Australia)
IAVCEI S. Sparks (U.K.)
IAGA D. Kerridge (U.K.)
IAMAS H.C. Davies (Switzerland)
IAHS J.C. Rodda (U.K.)
IAPSO P. Rizzoli (U.S.A.)

The Finance Committee is composed of:

President A.F. Spilhaus (U.S.A.)
Secretary P. Pinet (France)
Members V.K. Gaur
E. Groten
M.J. Hamlin (India)
(Germany)
(U.K.)

ACTIVITIES IN 2000

Administration

The IUGG Bureau met in Boulder, Colorado, August 7-8, 2000. The Bureau was joined by members of the Associations for further meetings on August 9-10. Discussions included Membership issues (countries that are unfortunately in observer status and those that should be approached to apply for membership), financial issues to be communicated to the Finance Committee, approval of the Geo-Risk Commission proposed at the 1999 meeting of the Executive Committee, procedures to distribute a new budget item for Inter-Association initiatives that would benefit developing countries, ICSU Grants procedures, and most especially, the process whereby IUGG might re-examine its purpose, structure, and goals in order to meet the needs of science in the new millennium. There was discussion regarding the format and possible theme of the next IUGG General Assembly, to be held 30 June- 11 July, 2003, in Sapporo, Japan.

The administrative records of the IUGG have been accumulating since 1919, the year IUGG began. They have been passed to successive Secretary-Generals in turn, but the volume of paper has become difficult to handle. A permanent repository has been found for these records at the Center for the History of Physics Niels Bohr Library of the American Institute of Physics in College Park, Maryland, USA, so that they can be preserved and will be accessible for scholars of the history of geoscience.

ICSU Grants

In 2000, IUGG received two Category II awards, totaling \$11,000. These awards were used to

increase our effectiveness to promote the scientific study of the Earth and to apply the knowledge gained to the needs of society.

INTERMAGNET:

This award of \$5500 from the US National Academy of Sciences was for a proposal from the International Association of Geomagnetism and Aeronomy (IAGA). The funds assisted persons from Colombia, the Ukraine, Belgium, Hungary, and the Slovak Academy of Sciences to promote collection and dissemination of real-time magnetic data particularly from observatories in areas that are under-represented in the global INTERMAGNET network.

3rd Meeting of the Asian Seismological Commission:

This award of \$5500 from UNESCO was for a proposal from the International Association of Seismology and Physics of the Earth's Interior (IASPEI). The grant supported attendance at a symposium held at Tehran, Iran, on October 10-12, 2000. The grant was supplemented by other funds and ultimately supported 75 scientists including persons from Armenia, Azerbaijan, Bangladesh, India, Kyrgyzstan, Morocco, Nepal, and Slovenia.

Activities of the Associations

The following reports, prepared by the Secretaries General of the Associations (shown below), have been edited for the sake of brevity. These reports illustrate the impressive range of activities within each Association as well as their dedication to supporting science within developing countries. Each Association has an internet site where much more information can be found.

International Association of Geodesy (IAG)

www.gfy.ku.dk/~iag

Central Bureau activities:

The Bureau maintains the IAG home-page, updates a database of addresses, and publishes a bi-monthly newsletter printed in the Journal of Geodesy. The newsletter includes a listing of all geodetic publications (provided by the IAG Bibliographic Service). It also includes updates to the Geodesists Handbook and meeting reports.

The Executive Committee (EC):

The EC had one meeting April 28-29 April in Nice, France. The main items were the preparation of the IAG Scientific Assembly 2001 and the re-structuring of IAG. The present 3-level organisational structure (EC, sections, commissions/special commissions/special study groups/services) will be reduced to 2 levels (EC and Commissions with working groups and services). New statutes and by-laws are being prepared in order to be adopted at a council meeting to be held during the IAG Scientific Assembly in Budapest, September, 2001.

Scientific Symposia and Meetings:

International Workshop on Perspectives of Geodesy in South-East Europe, Dubrovnic, Croatia, 2-6 May

South American Geoid 2000 workshop, Sao Paulo, 17-19 May

EUREF Symposium, Tromsø, Norway, 22-24 June

Int. Symposium. on Gravity, Geoid and Geodynamics 2000, Banff, Canada, 31 Jul - 4 Aug

14th International Symposium on Earth Tides Mizusawa, Japan, 28 Aug - 1 Sep.

10th General Assembly of the Wegener Project, San Fernando, Spain, 18 - 22 Sep.

Dynamic evolution of Active Faulting in the Mediterranean Region, Algiers, 9-11 Oct

Educational Activities:

XIII International Course on Engineering Surveying, Munchen, Germany, 13 - 17 Mar.

The 4.rd Geoid School, Malaysia, 21-25 Feb.

Services:

An investigation has started whether the gravity field related services (Bureau Gravimetrique, International Geoid Service, International Center for Earth Tides) could be merged into one service.

Coordination with organisations within surveying, cartography and remote sensing:

IAG was represented at a meeting of the so-called "sister societies" (FIG, ISPRS, ICA, IHO etc.) in July in Amsterdam.

Developing Countries:

The possibilities for establishing a geodetic reference system for Africa is being investigated on the initiative of IAG Commission X. A preparatory meeting was held in Nice, April 27. The 4.rd Geoid School was intentionally placed in Malaysia in order to attract scientists from developing countries. IAG has, using the so-called IAG Fund, sponsored the participation of a number of scientists from developing countries in IAG sponsored meetings. [C.C. Tscherning (Denmark), IAG Secretary General]

International Association of Hydrological Sciences (IAHS)

www.cig.ensmp.fr/~iahs

Administration:

The IAHS Bureau met in Paris on June 4. Gordon Young, elected Secretary General at Birmingham, resigned from his position to take up duties in UNESCO within the World Water Development Report. President John Rodda (U.K.) appointed Dr. Pierre Hubert (France) to take the position until the Sapporo General Assembly. The President-elect, Professor K. Takeuchi (Japan) will assume office at the IAHS Scientific Assembly in July, 2001, and will serve until 2005.

Two important international hydrological bodies met in 2000. The Intergovernmental Council of the UNESCO International Hydrological Program (Paris-France, 5-9 June 2000) and the WMO Commission for Hydrology (Abuja-Nigeria, 6-18 November 2000). IAHS participated to both of them as observers.

Scientific meetings:

In 2000, about 30 scientific meetings were sponsored by IAHS. A few of them, organized by our Commissions, follow:

Remote Sensing and Hydrology 2000, Santa Fe- USA, 2-7 April

Tram'2000: International Conference on Tracers and Modelling in Hydrogeology, Liège-Belgium, 23-26 May

The Kovacs Symposium, organized together with UNESCO and devoted this year to the HELP Program, Paris-France, 2-3 June

International Symposium on the Role of Erosion and Sediment Transport in Nutrient and Contaminant Transfer, Waterloo, Canada, 10-14 July

The Extremes of the Extremes, International Symposium on Extraordinary Floods, Reykjavik-Iceland, 17-19 July

International Workshop on Debris-Covered Glaciers, Seattle-USA, 13-15 September

International Workshop on Runoff Generation and Implications for River Basin Modelling, Freiburg-Germany, 9-12 October

International Symposium "Can Science and Society Avoid the Water Crisis in the 21st Century" Tokyo, Japan, 24 October

IAHS Publications in 2000:

IAHS Press published six issues of the Hydrological Science Journal, which is ranked as the best in

this domain. Four issues of the IAHS Newsletter were published and widely disseminated free of charge, both as hardcopies and on the Web.

IAHS also published six "Red Books" in 2000:

Interdisciplinary Perspectives On Drinking Water Risk Assessment And Management, Edited by Eric G. Reichard, Fred S. Hauchmann & Ana Maria Sancha., IAHS Publ. no. 260

The Hydrology-Geomorphology Interface: Rainfall, Floods, Sedimentation, Land Use, Edited by Marwan A. Hassan, Olav Slaymaker & Simon M. Berkowicz, IAHS Publ. no. 261

Tracers And Modelling In Hydrogeology, Edited by A. Dassargues, IAHS Publ. no. 262

The Role Of Erosion And Sediment Transport In Nutrient And Contaminant Transfer, Edited by M. Stone, IAHS Publ. no. 263

Debris-Covered Glaciers, Edited by M. Nakawo, C. F. Raymond & A. Fountain, IAHS Publ. no. 264

Calibration And Reliability In Groundwater Modelling: Coping With Uncertainty, Edited by F. Stauffer, W. Kinzelbach, K. Kovar & E. Hoehn, IAHS Publ. no. 265

Capacity Building:

The IAHS TFDC (Task Force for Developing Countries) continued its action and distributed all IAHS publications (Hydrological Science Journal and the Red Books) free of charge to more than 60 selected Universities and Research Institutions of Africa, Asia, South-America and Eastern Europe.

Hydrology Prize and Tison Award 2000:

The recipient of the 2000 International Hydrology Prize, in recognition of an outstanding contribution to science and awarded jointly with UNESCO and the WMO, was Uri Shamir, (Israel), former IAHS President and presently IUGG Vice President.

The 2000 Tison Award (made to a young scientist in recognition of an outstanding contribution to hydrology) was made to Dr. S. Ulhenbrok (Germany). [P. Hubert (France), IAHS Secretary General]

International Association of Meteorology and Atmospheric Sciences (IAMAS)

<http://IAMAS.org>]

Administration:

A major project in 2000 was the upgrading of the IAMAS Webpage. This was facilitated by a substantial grant for a "Web master," Dr. Bettina Bauer, through the auspices of ETHZ. IAMAS is investigating the type of Website which would be most beneficial for interacting with the scientists/meteorologists of the world in specific fields. The first field to be developed, in close collaboration with WMO, will be "Cloud Physics and Weather Modification."

The program for the IAMAS Assembly in Innsbruck, 10 - 18 July, 2001, was developed with the great help of the IAMAS Executive and the Secretaries of the 10 IAMAS Commissions. This Program was put on two Webpages, the one by the organizers [Leader Professor Michael Kuhn] "<http://meteo.uibk.ac.at/IAMAS2001>" the other as part of the IAMAS Webpage. The highlight will be a Symposium by the WG 1 of IPCC. In addition to joint symposia with IAHS there will be 32 Symposia and Workshops by IAMAS Commissions. The Innsbruck Conference Centre, with the University, has the capacity for up to 11 parallel sessions. Four President's Lecturers have been recruited and five younger, upcoming scientists will be given an opportunity to give major bring-your-own-lunch plenary session lectures. Specific procedures to obtain IAMAS grants were established, with firm eligibility criteria. This was needed after ~500 IAMAS scientists of a total of 780 applied for financial support for IUGG99. [The explicit new rules seem to be working very well.] The plan for 2001 is to provide grants to the amount of \$25000+ for scientists from the

developing world and the former USSR, and some additional support of young scientists, independent of origin.

Scientific Meetings:

The Commission for Atmospheric Chemistry and Global Pollution, CACGP, held a Workshop on Priorities in International Chemistry Research and the Future of IGAC, Aspen, CO, USA, 27 April to 2 May

International Conference on Clouds and Precipitation (ICCP), Reno, Nevada, USA August 14-18

15th International Conference on Nucleation and Atmospheric Aerosols, Rolla, Missouri USA (University of Missouri-Rolla), August 6-11

Quadrennial Ozone Symposium, Sapporo, Japan, 3-8 July

Radiation Commission (IRC): International Radiation Symposium 2000: Current Problems in Atmospheric Radiation, 24-29 July 2000, St. Petersburg, Russia

The LASG, of the Chinese Academy of Sciences and the Commission for Dynamic Meteorology (ICDM) and IAMAS co-sponsored the International Conference on Climate and Environment Variability and Predictability (CEVP), Shanghai, China; August 7-11

Capacity Building:

The bulk of the expenditures was travel grants to the IAMAS Commissions [\$15500] for use for scientists from needy countries attending conferences or symposia. In effect the annual IUGG contribution to IAMAS, intended to provide office and meeting expenses, is basically used to support scientists from developing countries. The cost for this support is carried by direct and indirect contributions of the universities, countries and granting agencies of the IAMAS President and IAMAS SG.

IAMAS is considering a Joint Assembly with IAHS and IAPSO in the developing world in 2005. This is not an easy undertaking, requiring facilities for 2000 scientists and ~20 parallel sessions but with minimal or no registration fees. The IAMAS Executive meeting in Innsbruck in 2001 will decide what venue to choose. [R. List (Canada), Secretary General]

International Association for the Physical Sciences of the Ocean (IAPSO)

www.olympus.net/IAPSO/

Administration:

During the year 2000, action was initiated to form an IAPSO/IAHS Joint Commission on Groundwater-Seawater Interactions. Funding was obtained to hold an initial meeting at the IAHS Assembly in 2001. Activities of the Permanent Service on Mean Sea Level (sponsored by IAPSO), and IAPSO's Standard Sea Water Service (operated by Ocean Scientific International) continued in 2000.

The IAPSO President initiated contacts with the Palace in Monaco regarding the proposed creation of a medal to be awarded for distinguished accomplishments in the physical sciences of the oceans. Prince Rainier of Monaco has agreed to establish the Prince Albert I medal to be awarded biannually by IAPSO for that purpose. An invitation was extended to have a member of the Prince's family present the first medal at the Joint Assembly in 2001.

Maintenance and updating of the IAPSO Web page continued. A page of information for younger students was added as an outreach effort. A mirror Web page was created as a direct portion of the IUGG Web page. Additional links were added to university laboratory and institute Web pages. Accesses to the IAPSO Web page reached a level of 5,000 hits per month by late summer, with a substantial percentage accessing the 1999 symposia abstracts and a significant number accessing 1997 abstracts.

Scientific Meetings:

Plans continued for a Joint IAPSO/IABO Assembly in Mar del Plata Argentina in October 2001. The final technical program for that Assembly was prepared, symposia convenors and co-convenors were established, registration information was added to the Joint Assembly Web page, and efforts were initiated to obtain funds from various sources for travel grants. Substantial advertising has been carried out for the Joint Assembly including e-mail distribution of notices, and distribution of hard copies of the Call for Papers. IAPSO joined with other Associations in providing information at an IUGG booth at the AGU Fall meeting. IAPSO joined with IAG to hold a week-long workshop in Brazil in 2000, with a follow-up symposium scheduled in conjunction with the 2001 Assembly in Argentina.

Discussions were also initiated in regard to the site for an Assembly in 2005. Discussions have been carried out with a representative in India, as India expressed an interest in 1999. Discussions/coordination have continued with IAMAS and IAHS with regard to the possibility of a Joint Assembly. Partial funding was obtained to allow representatives of the three Associations to travel to India in 2001 to view a potential site and discuss possibilities with representatives of the three Associations in India. [F.E. Camfield (USA), Secretary General]

International Association of Seismology and Physics of the Earth's Interior (IASPEI)

www.iaspei.org

Scientific Meetings:

The 3rd Meeting of the Asian Seismological Commission (ASC) was organized by the Institute of Geophysics, University of Teheran was held at Tehran, Iran, 10-12 October 2000. It was co-sponsored by IASPEI, IUGG, ICSU, UNESCO, the Ministry of Culture and Higher Education of Iran, the National Committee for Reduction of Natural Disasters in Iran, and the Scientific Research Council of Iran. The symposium was an opportunity for the representatives from most of the Asian countries as well as from Africa, Europe, America and Australia to offer the results of their scientific achievements in the field of Seismology, Earthquake Hazard Assessment and Earth's Interior Related Topics. The technical sessions included the following topics: earthquake processes, precursors and forecasts; recent devastating earthquakes, strong ground motion, and seismic hazard; seismotectonics with special reference to western Asia; induced and triggered seismicity; heat flow, volcanology, lithosphere and structure of the Earth's interior; and recent trends in seismic instrumentation, data processing, GPS, public awareness and related topics. The symposium was followed by two technical workshops, Educating the Public about Earthquake Hazard and Risk, and Seismic Networks and Site Selection, which were held at the Institute of Geophysics, University of Teheran on 13-14 October 2000.

Education/Training Activities:

The European Seismological Commission (ESC), with the financial support of IASPEI, has sponsored three training courses for Young Seismologists in order to expose them to data acquisition, processing techniques and empirical evaluation of site effects under the tutorship of many established seismologists throughout Europe and the world. The recent training course in Lisbon, following the now established format, took place in the two days (8-9 September 2000) before the General Assembly and focused on earthquake locations and their uncertainties. Eleven students from four countries attended the course. Lecture notes were distributed to the students together with CD's containing the test data used in the course for students to use on their return.

As an implement of IASPEI's training and education program, the local organizing committee of the Asian Seismological Commission (ASC) organized the International Regional Training Course on Seismology and Mitigation of Seismic Disasters prior to the third ASC Assembly. The Training Course was co-sponsored by the Institute of Geophysics, Teheran University. New understanding of

seismotectonic features, prediction studies, physics of the source, inversion methods, ground strong motion and the use of internet facilities were among the topics that were included in the course.

Publications:

IASPEI Bulk E-Mail System - IASPEI uses this system to broadcast announcements about forthcoming meetings and other information of interest to IASPEI members.

IASPEI Home Page - IASPEI continues development of its Home Page on the WorldWideWeb which contains organizational information, a publications list, meeting announcements and Internet connections and other information of interest to IASPEI scientists.

IASPEI Brochure - The IASPEI Secretariat with the assistance of Carl Kisslinger (Editor) has published a 26 page Brochure entitled "The International Association of Seismology and Physics of the Earth's Interior: Cooperation for Better Understanding of the Earth". Copies can be obtained from the IASPEI Secretariat.

Oni, E. A. (Editor). *Advances in Geodesy and Geophysics Research in Africa*, International Commission for Earth Sciences in Africa, Dept. of Physics, University of Ibadan, Ibadan, Nigeria, 498 p., 2000.

Igel, H., Geller, R.J. (Editors). Special Issue. *Numerical Modeling of Global Seismic Wave Propagation: Algorithms-Accuracy-Verification*, Proceedings of the IASPEI Symposium held during the 29th General Assembly in Thessaloniki, Greece, *Physics of the Earth and Planetary Interiors*, v. 119, 2000.

Zhao, D., Hasegawa, A. (Editors). Special Issue. *Seismic Structure and Stress Regime of Subduction Zones*, Proceedings of the IASPEI Symposium held during the 29th General Assembly in Thessaloniki, Greece, *Tectonophysics*, v. 319, 2000.

Wu, Ru-Shan (Editor). Special Issue. *Waves in Complex Media*, Proceedings of the IASPEI Symposium held during the 29th General Assembly in Thessaloniki, Greece, *Physics of the Earth and Planetary Interiors*, v. 120, 2000.

International Handbook of Earthquake and Seismology:

Modern scientific investigations of earthquakes began in the 1880's. With rapid advances in the 20th century, many branches of seismology developed and there is not an authoritative reference that summarizes our present knowledge about earthquake and engineering seismology. This Handbook will help to bridge the gap between seismologists and earthquake engineers and will be truly international in scope. It will consist of about 84 chapters grouped into 10 parts, with 4 CD-ROMs containing materials to augment the printed chapters, and including a compilation of seismic data from around the world and a global earthquake database with software for displaying seismicity maps. It will be published in 2001 on the occasion of the 100th anniversary of IAS (the predecessor of IASPEI). Publication of this Handbook is under the auspices of the IASPEI Committee on Education.

New Manual of Seismological Observatory Practice:

While there exist good text books and many university curricula on more general or theoretical, research- oriented aspects of seismology there is a lack of job-related education, training and instruction material in the field of observational seismology. Although the last (1979) edition of the *Manual of Seismological Observatory Practice (MSOP)* is now available on the web (www.seismo.com), it covers analogue techniques only. Computer and communication technologies, as well as the availability of modern broadband sensors, have revolutionized seismological practice during the last two decades of the 20th century. This necessitates the

elaboration of a new MSOP (NMSOP), currently under development as a web site. The web-based NMSOP is maintained as continuously up-graded, up-dated and complemented reference source with integrated training modules. First contributions are already available via www.seism.com/msop/nmsop/nmsop.php. A hard copy version of the NMSOP is planned, complemented by an easy to update loose-leaf collection of job-related worksheets. Instructions, relevant formulae, programs, references data and sources needed for proper execution of the most important observatory tasks such as site selection, instrument installation and calibration, seismogram analysis, earthquake location, parameter determination, etc. will be provided. Manual chapters and worksheets may be used as training modules for observatory practice.

Activities Involving Developing Countries

Africa:

The International Commission for Earth Sciences in Africa (ICESA) was formed jointly with IASPEI as a Coordinating Committee of the International Lithosphere Program (ILP). Its overall objectives include promoting and coordinating geo-scientific work in Africa by facilitating the exchange of scientific personnel, information and collaboration among African countries and similar organizations working in the field of earth sciences. ICESA is also devoted to the initiation of training programs for African scientists and technicians as well as to the organization of meetings/seminars for the exchange of ideas among earth scientists. The new council of ICESA decided on activities over the next six years that will result in the publication of a book on African geology and the stimulation of publications by African scientists in international journals. At this stage of the project eight Special Issues of the Journal of African Earth Sciences (JAES) are being planned as a joint venture between ICESA and JAES. Provisional titles for the Special Issues and a list of Guest Editors have been compiled. The Guest Editors, in consultation with ICESA Council, will produce the final list of review papers for each Special Issue.

Committee on Developing Countries (CDC) Newsletter:

Distributed twice a year from Hyderabad, India, the Newsletter provides a forum for various scientific activities of IASPEI and other scientific bodies. It disseminates information about symposia, meetings, travel grant opportunities, training courses, network development, reports of important geological events, software and instrumental development, etc.. Realising the fact that many research/educational institutes in developing countries suffer from inadequate scientific literature, very often a good number of popular scientific articles on earth and natural sciences from various international journals are reproduced. The Newsletter is circulated globally, primarily to the scientists in developing countries, but also to some scientists in developed countries who are especially interested in the development of seismology in third world countries. The present circulation figure is more than 300.

As part of IASPEI's outreach effort, the Publications Transfer Program of the Committee for Developing Countries (CDC) makes available basic texts and publications on seismology and related earth sciences to institutions in need. The IASPEI Secretariat currently serves as a clearing house for all publications requests and offers. There have been many requests for the materials available through the publications transfer project. In the year 2000 the project has provided publications to the following institutions:

Instituto Geofisico del Peru (Lima, Peru) - on May 22nd the library was totally destroyed. Hence, in addition to sending them the journals on their list, we also sent them 4 boxes of assorted texts.

Centre for Earth Science Studies (Akkulam, India) - This institution does not have any of the publication transfer journals dated after 1987.

Guru Jambheshwar University (Hisar, India) - Their applied mathematics department has requested access to geophysical journals on behalf of 3 members of their staff conducting research in

theoretical seismology.

Gadjah Madah University (Yogyakarta, Indonesia) - Journals were requested on behalf of the departmental library of the Department of Geodetic Engineering. They will primarily be used by students.

Univ. Nac La Plata (Argentina) - They are trying to fill gaps in their BSSA collection.

Special Projects:

IASPEI Seismological Software Library (SSL) - Each software volume of the IASPEI Software Library includes the executable code, examples on floppy diskettes, and printed documentation.

IASPEI PC Shareware Library - Under the auspices of the Working Group on Personal Computers, a PC shareware library is being published on diskette, including files with short-form manuals of the programs. The Library provides for fast and wide distribution of geophysical programs and utilities, reduced or demonstration versions of geophysical software, and beta-versions of new programs to be included in future volumes of the SSL. [E.R. Engdahl (USA) Secretary General]

International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI)
www.iavcei.org/

Administration:

IAVCEI ended the year with 609 paid individual members, the most ever. The web page was redesigned and updated. The volcano listserv administered by Arizona State University is now the official IAVCEI listserv. It has 2200 people listed, which far exceeds the IAVCEI membership. Thus we hope to further boost the membership in IAVCEI.

Scientific Meetings:

The highlight of the last year was the highly successful IAVCEI General Assembly. Approximately 500 volcanologists attended the meeting from July 18-22, 2000 in Bali, Indonesia. The five-day meeting brought together volcanologists from around the globe to discuss all aspects of volcanology as well as to visit some of the world's most famous and destructive volcanoes. The meeting was well organized by the Volcanological Society of Indonesia (VSI), assisted by the Directorate General Geology & Mineral Resources (DGGMR), the Indonesian Geologists's Association (IGA), the Institute of Technology of Bandung (ITB), and the Department of Mining and Energy (DME). Midway through the five-day meeting, the participants traveled to Batur caldera and one of VSI's volcano observatories. There were also two workshops and six field trips held in association with the meeting.

The next General Assembly is tentatively scheduled for November-December 2004 in Chile. Over the next few years, IAVCEI will focus its efforts on several smaller meetings, including Cities on Volcanoes 2 (Feb. 2001, New Zealand), a Penrose conference (June 2001, California), and the IAVCEI 1902 Centennial Workshop (May 2002, Martinique). We expect a strong showing for volcanology at the July 2003 IUGG meeting in Sapporo, Japan, as well as excellent field trips.

The full IAVCEI Executive Committee met in Bali and conducted two meetings covering all aspects of IAVCEI business.

Education/outreach:

In 2000, IAVCEI sold over 90 videos on 1) understanding volcanic hazards and 2) reducing volcanic risk. These videos were produced professionally under contract with IAVCEI. Also, a volcano calendar was produced by IAVCEI members and was printed and marketed by a professional calendar company. Over 7,300 calendars were sold and an additional 800 were distributed by IAVCEI to various scientific, educational, and governmental organizations. IAVCEI received a small royalty payment for the calendars. [S. McNutt (USA) Secretary General]

International Association of Geomagnetism and Aeronomy (IAGA)
www.ngdc.noaa.gov/IAGA

Administration:

The IAGA Executive Committee met in Edinburgh, Scotland on September 8-9, 2000. The committee approved the record of the previous meeting held in Birmingham and the planning budgets for 2001 and 2002. Applications for support for local symposia in Brazil, India and the Czech Republic in 2001 were approved. It was agreed that IAGA would lead in co-ordinating a response, together with IASPEI and IAVCEI, to a proposal to establish a committee on electromagnetic studies of earthquakes and volcanoes.

Much of the meeting was taken up with planning for the joint IAGA-IASPEI Scientific Assembly to be held in Hanoi, Vietnam on August 19-31, 2001. This will be the first time IAGA has held an Assembly in Southeast Asia. Local, national, and regional scientists will have the opportunity to participate in a wide range of symposia with topics ranging from the workings of the Earth's internal dynamo to the solar wind. At the Assembly, IAGA will sponsor 58 symposia and co-sponsor 11 symposia with IASPEI, SEDI and ILP. In addition to the symposia, Inter-Association lectures will be given.

To improve communication of IAGA activities a brochure, developed with support from ICSU, was produced and will be published in 2001. The IAGA homepage, hosted by the US National Geophysical Data Center (NOAA), was redesigned to be more efficient and to make it easier to find information on IAGA activities.

Scientific meetings:

In 2000, the following meetings were sponsored or cosponsored by IAGA.

Space Weather: Progress and Challenges in Research and Applications, March 20-24, 2000, Clearwater, Florida, USA

Fifth International Conference on Substorms, in May, 2000, St. Petersburg, Russia

IX IAGA Workshop on Geomagnetic Observatory Instrument, Data Acquisition and Processing, (In Honor of the 100th Anniversary of the Observatory), June 12-18, 2000, Hubanovo, Slovakia

The 7th Biennial Castle Meeting on New Trends in Geomagnetism, June 19-25, 2000, Castle Moravany, Slovakia

Space Storms and Space Weather Hazards, June 19-29, 2000, Heraklion, Crete, Greece

33rd COSPAR Assembly, July 16-23, 2000, Warsaw, Poland

Lower Atmosphere Effects on the Ionosphere and Upper Atmosphere, July 25-28, 2000, Prague, Czech Republic

15th Electromagnetic (EM) Workshop, August 19-26, 2000, Cabo Frio, Brazil

The First S-RAMP Conference, October 2-6, 2000, Sapporo, Japan

SPARC Second General Assembly, November 6-10, 2000, Mar del Plata, Argentina

Publications:

IAGA Bulletins 32w, Geomagnetic Data for 1993 and IAGA Bulletin 32y, Geomagnetic Data for 1994, were published.

The International Geomagnetic Reference Field (IGRF) is a global model of the geomagnetic field and its secular variation produced by a group of geomagnetic field modellers working under the auspices of IAGA. The year 2000 revision of the IGRF was agreed in November 1999 and the model coefficients were published in *Physics of the Earth and Planetary Interiors* (vol 120 , pp 39-42), and in *Geophysical Journal International* (vol 141, pp259-262) in 2000.

AGA Award:

Mr Emil Pisara was given an IAGA Long Service award in recognition of his many years of

dedicated service at Hurbanovo Observatory, Slovakia. The IAGA President presented Mr Pisara with his medal at the Opening Ceremony of the IX IAGA Workshop on Geomagnetic Observatory Instrument, Data Acquisition and Processing, held at Hurbanovo Observatory.

Other Activities:

IAGA was successful in an application for ICSU support for the INTERMAGNET programme. INTERMAGNET has succeeded in accelerating the modernisation of instrumentation, and practices for data collection and dissemination in the global magnetic observatory network. In 2000 participation in INTERMAGNET grew to 75 observatories from 32 countries. [Herbert Kroehl (USA) Secretary General]

CONCLUSION AND FUTURE PLANS

The IUGG Bureau and Executive Committee will meet 30- July - 2 August, 2001, in Sapporo, Japan. There will be a concurrent meeting of the 2003 General Assembly Scientific Programme Committee.

Dates and places of the Scientific Assemblies of the Associations

IASPEI/IAGA: August 18-30, 2001, Hanoi (Vietnam)

IAVCEI: July 18-22, 2000, Bali (Indonesia)

IAMAS: July 10-18, 2001, Innsbruck (Austria)

IAHS: July 18-27, 2001, Maastricht (Netherlands)

IAPSO: October 21-28, 2001, Mar del Plata (Argentina) - jointly with IABO

Date and place of the 23rd Union General Assembly

June 30 - July 11, 2003, Sapporo (Japan)