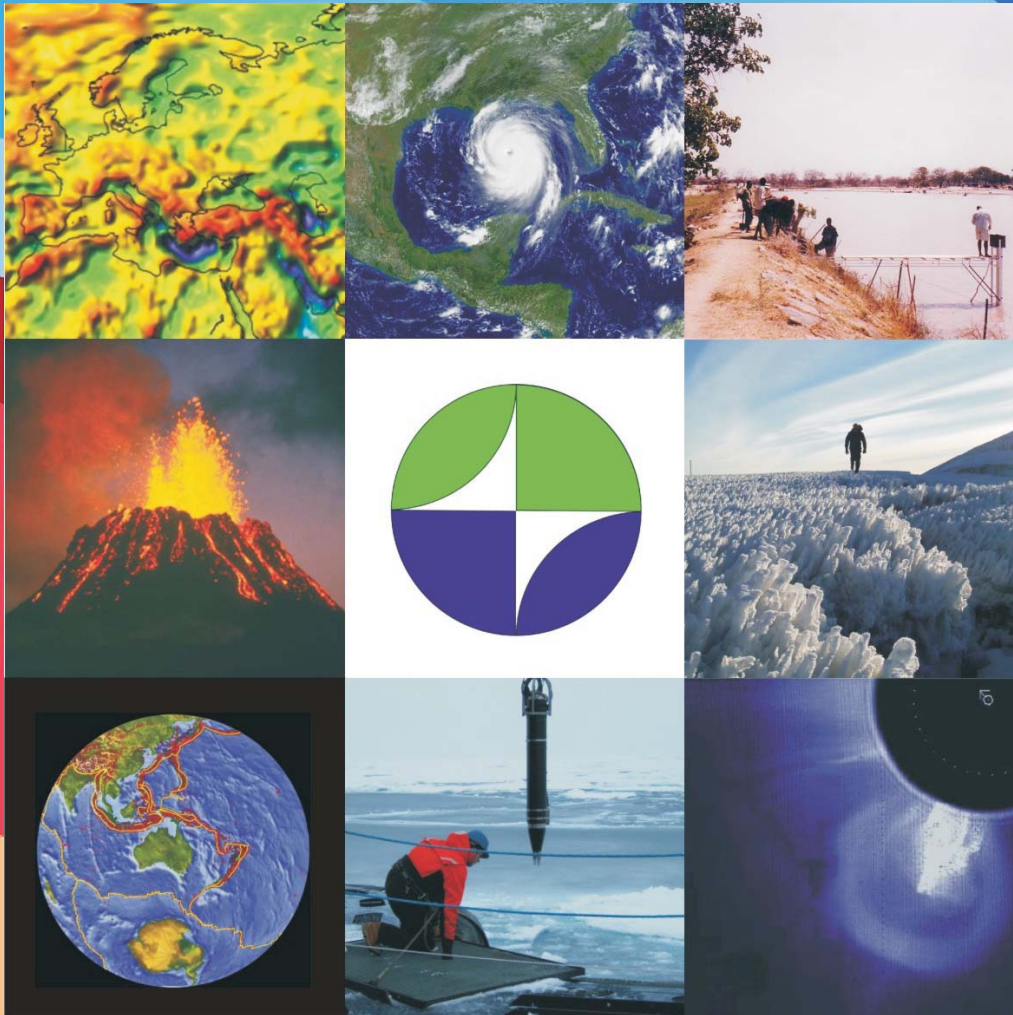
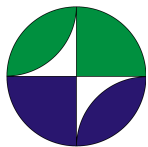




International Union of Geodesy and Geophysics (IUGG)  
*Union Géodésique et Géophysique Internationale (UGGI)*

# ANNUAL REPORT 2011





**INTERNATIONAL UNION OF GEODESY AND GEOPHYSICS  
UNION GEODESIQUE ET GEOPHYSIQUE INTERNATIONALE**

# **IUGG Annual Report 2011**

**Published by Secretary General  
Alik Ismail-Zadeh**

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# IUGG Annual Report 2011

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## INTRODUCTION

Established in 1919, the International Union of Geodesy and Geophysics (IUGG) is the international, non-governmental, non-profit organization dedicated to advancing, promoting, and communicating knowledge of the Earth system, its space environment, and the dynamical processes causing change. Through its constituent associations, commissions, and services, IUGG convenes international assemblies and workshops, undertakes research, assembles observations, gains insights, coordinates activities, liaises with other scientific bodies, plays an advocacy role, contributes to education, and works to expand capabilities and participation worldwide. Data, information, and knowledge gained are made openly available for the benefit of society – to provide the information necessary for the discovery and responsible use of natural resources, sustainable management of the environment, reducing the impact of natural hazards, and to satisfy our need to understand the Earth's natural environment and the consequences of human activities. IUGG Associations and Union Commissions encourage scientific investigation of Earth science and especially interdisciplinary aspects. Each Association establishes working groups and commissions that can be accessed by using the links on our website.

IUGG is one of 31 scientific unions adhering to the International Council for Science (ICSU). ICSU provides a global forum for scientists to exchange ideas and information and to develop standard methods and procedures for all fields of research. IUGG brings expertise on Earth studies from researchers in its International and Inter-Association Commissions. As a member of ICSU, IUGG strongly supports its policy of non-discrimination by affirming the rights and freedom of scientists throughout the world to engage in international scientific activity without limitation by such factors as citizenship, religion, creed, political stance, ethnic origin, race, color, language, age or gender.

IUGG has initiated and/or 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 International Hydrological Decade (1965-74), the Geodynamics Project (1972-79), the Global Atmospheric Research Programme (1967-80), the International Lithosphere Programme, the World Climate Research Programme, the International Decade for Natural Disaster Reduction, Integrated Research on Risk Disasters, the International Heliophysical Year (2007-2009), the Electronic Geophysical Year (2007-2008), the International Year of Planet Earth (2007-2009), and the International Polar Year (2007-2008). These programs have set a model for international, interdisciplinary cooperation. Representing all geophysical disciplines, IUGG is involved in the projects and programs related to climate change, global warming, and related environmental impacts.

IUGG supported and supports initiatives by ICSU, especially those in which Earth sciences have a role to play. IUGG cooperates with the United Nations Educational, Scientific and Cultural Organization (UNESCO) in the study of hydrological (via IAHS) and oceanographic (via IAPSO) research; with the World Meteorological Organization (WMO) to promote studies in atmospheric sciences and meteorology (via IAMAS) as well as in hydrology (via IAHS). Together with the International Civil Aviation Organization (ICAO) and WMO, IUGG promotes the studies, the monitoring and the modelling of volcanic ashes (via IAMAS and IAVCEI). IUGG also cooperates with the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO) in the studies related to seismology (via IASPEI), hydroacoustics, atmospheric transport modelling, and meteorology. In addition, IUGG places particular emphasis on the scientific problems of economically less-developed countries by sponsoring activities relevant to their scientific needs, e.g. Geosciences in Africa, eGY in Africa, Water Resources, Health and Well-Being etc.

The web site, available in English and French, can be found at <http://www.IUGG.org>.

## GENERAL INFORMATION

### MEMBERSHIP

By their very nature, geodetic and geophysical studies require a high degree of international co-operation. IUGG is critically dependent on the scientific and financial support of its member Adhering Bodies. The list of present and past IUGG Adhering Bodies is published in the IUGG Yearbook and posted on the web site. Each Adhering Body establishes a National Committee for IUGG, and names Correspondents to each Association (as appropriate). During 2011, the Union had 69 Member Adhering Bodies. Several members were in observer status because they were in arrears of dues payment. Five Adhering Bodies were in Associate Member status. New member country applications are being actively encouraged.

### STRUCTURE

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. The Council is convened at each quadrennial General Assembly. A Bureau, an Executive Committee and a Finance Committee administer IUGG affairs between Council meetings. The Executive Committee has the particular responsibility of overseeing the scientific programs of the Union. There is no permanent Secretariat; the National Committee of the country where the IUGG Secretariat is located is expected to provide administrative support for Union affairs.

### Associations

The Union brings together eight 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 assemblies and sponsor scientific symposia, often in partnership with one another. 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 Earth scientists, worldwide, are eligible to participate in IUGG and Association assemblies, workshops, and symposia, although only scientists from member countries with dues paid may serve as officers.

The eight International Associations are listed below, and short reports on their 2011 activities are included here. Additional information about each Association is given on their web sites, which can be accessed from the IUGG web site.

- International Association of Cryospheric Sciences (IACS)
- International Association of Geodesy (IAG)
- International Association of Geomagnetism and Aeronomy (IAGA)
- International Association of Hydrological Sciences (IAHS)
- International Association of Meteorology and Atmospheric Sciences (IAMAS)
- International Association for the Physical Sciences of the Oceans (IAPSO)
- International Association of Seismology and Physics of the Earth's Interior (IASPEI)
- International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI)

### Union Commissions

Owing to the interactive nature of the subject fields addressed by the Union's Associations, a number of Union Commissions have been established that promote the study of particular interdisciplinary problems. In 2011, the following bodies were active:

- Commission for Data and Information (UCDI)
- Commission on Geophysical Risk and Sustainability (GRC)
- Commission on Mathematical Geophysics (CMG)
- Commission on the Study of the Earth's Deep Interior (SEDI)

## **Inter-Unions Commission**

The International Lithosphere Program, guided by the Scientific Committee on the Lithosphere (SCL), was established in 1980 as the Inter-Unions Commission on the Lithosphere (ICL) by the International Council for Science (ICSU), at the request of IUGG and the International Union of Geological Sciences (IUGS). The name was formally changed to the Scientific Committee on the Lithosphere in 1999. According to Decision 8.4 from the 2005 ICSU General Assembly, ICSU decided "to withdraw ICSU sponsorship from SCL/ILP and to recommend that responsibility would then shift to IUGG and IUGS." Since that time, IUGG and IUGS have reaffirmed the ILP mission and have collaborated to re-define ILP as an Inter-Unions body.

## **GENERAL ASSEMBLIES OF THE UNION**

General Assemblies have been held since 1922 and, since 1963, at 4-year intervals. These assemblies provide an extraordinary opportunity for Earth scientists from around the world to gather and share expertise, research data, and results. Past IUGG General Assemblies are listed in the IUGG Yearbook and on the web site. The most recent General Assembly was held in Melbourne, Australia, 27 June – 8 July 2011. The next IUGG General Assembly will take place in Prague, Czech Republic, 22 June – 2 July 2015.

## **OTHER SCIENTIFIC MEETINGS**

Each Association organizes its own scientific assembly in the 4-year interval between Union General Assemblies in order to report scientific progress and conduct Association business. Associations sometimes meet jointly with the purpose of promoting interdisciplinary science. Topical and regional symposia and workshops are organized on other occasions by the Associations to provide opportunity for geodesists and geophysicists worldwide to discuss their respective methodologies, results and hypotheses and to plan collaborative research projects. The symposia, often held in less-visited, geophysically interesting locales, are intended to be attractive to the younger scientists from the developing countries of the world.

## **PUBLICATIONS**

The IUGG publishes an annual Yearbook that lists the organizational structure and officers of each body within the Union. The Yearbook is posted on the IUGG web site: <http://www.iugg.org/publications/yearbooks/>. The Union also distributes an electronic newsletter (the IUGG E-Journal) monthly to Adhering Bodies and National Committees. Each Association manages its own publications.

## IUGG OFFICERS FOR 2011-2015

### IUGG Bureau

President:	Harsh Gupta	INDIA
Vice-President:	Michael Sideris	CANADA
Secretary General:	Alik Ismail-Zadeh	GERMANY/RUSSIA
Treasurer:	Aksel Hansen	DENMARK
Members:	Isabelle Ansoerge	SOUTH AFRICA
	Pierre Hubert	FRANCE
	Kenji Satake	JAPAN

### IUGG Executive Committee

#### IUGG Bureau members

Immediate Past President:	Tom Beer	AUSTRALIA
IACS President:	Ian Allison	AUSTRALIA
IAG President:	Chris Rizos	AUSTRALIA
IAGA President:	Kathy Whaler	UK
IAHS President:	Gordon Young	CANADA
IAMAS President:	Athéna Coustenis	FRANCE
IAPSO President:	Eugene Morozov	RUSSIA
IASPEI President:	Domenico Giardini	SWITZERLAND
IAVCEI President:	Ray Cas	AUSTRALIA

### IUGG Finance Committee

Chair:	David Collins	UK
Members:	Zoltan Hajnal	CANADA
	Jan Krynski	POLAND
	David Rhoades	NEW ZEALAND

### Association Presidents and Secretaries General

#### International Association of Cryospheric Sciences

President:	Ian Allison	AUSTRALIA
Secretary General:	Andrew Mackintosh	NEW ZEALAND

#### International Association of Geodesy

President:	Chris Rizos	AUSTRALIA
Secretary General:	Hermann Drewes	GERMANY

#### International Association of Geomagnetism and Aeronomy

President:	Kathy Whaler	UK
Secretary General:	Mioara Manda	FRANCE

#### International Association of Hydrological Sciences

President:	Gordon Young	CANADA
Secretary General:	Christophe Cudennec	FRANCE

#### International Association of Meteorology and Atmospheric Sciences

President:	Athéna Coustenis	FRANCE
Secretary General:	Hans Volkert	GERMANY

International Association for the Physical Sciences of the Oceans

President: Eugene Morozov RUSSIA  
Secretary General: Johan Rodhe SWEDEN

International Association of Seismology and Physics of the Earth's Interior

President: Domenico Giardini SWITZERLAND  
Secretary General: Peter Suhadolc ITALY

International Association of Volcanology and Chemistry of the Earth's Interior

President: Ray Cas AUSTRALIA  
Secretary General: Joan Martí SPAIN

**Union Commission Officers**

Union Commission for Data and Information (UCDI)

President: Peter Fox USA  
Secretary: Adelina Geyer SPAIN

Union Commission on Geophysical Risk and Sustainability (GRC)

President: Kuniyoshi Takeuchi JAPAN  
Secretary: Diana Greenslade AUSTRALIA

Union Commission on Mathematical Geophysics (CMG)

President: Yehuda Ben-Zion USA  
Secretary General: Claudia Pasquero ITALY

Union Commission on Studies of Earth's Deep Interior (SEDI)

President: Satoru Tanaka JAPAN  
Secretary General: Michael Bergman USA

**Inter-Unions Commission: International Lithosphere Program (ILP)**

President: Sierd Cloetingh THE NETHERLANDS  
Secretary: Roland Oberhänsli GERMANY

**IUGG BUREAU AND EXECUTIVE COMMITTEE MEETINGS**

IUGG Bureau and Executive Committee meetings were held during the XXV IUGG General Assembly in Melbourne, Australia. The IUGG Bureau and Executive Committee for the term 2007-2011 met on 26 June, 1 July and 5 July. Meetings of the Bureau and the Executive Committee for the term 2011-2015 took place on 8 July. The next IUGG Bureau meeting will take place in Freudenstadt, Germany, from 29 September to 1 October 2012.



## MESSAGE FROM THE PRESIDENT



2011 has been an eventful year for IUGG. The Tohoku-oki earthquake of Mw 9.0 on 11 March 2011 was a surprise to earthquake seismologists in Japan and globally. This earthquake and the resultant tsunami claimed about 20,000 human lives and caused wide spread damage to structures. The tsunami also caused a number of nuclear accidents. This earthquake has given rise to a global debate on the anticipated maximum size of earthquakes and the safety of nuclear power plants. In the first 11 years of the 21<sup>st</sup> Century, the loss of human lives due to earthquakes and the resultant tsunamis has matched the total of similar losses in the entire 20<sup>th</sup> Century! IUGG is conscious of the challenges to contribute scientifically to make society more resilient to better handle disasters of such magnitude in the future.

The XXV IUGG General Assembly held from 27 June to 8 July 2011 in Melbourne, Australia, was a grand success. Some 3400 scientists from 81 countries participated in this Assembly. The quality of science was high and an increase in the participation of younger scientists was visible. The Symposia and Workshops were well attended. More people attended the closing ceremony than expected. The IUGG Council elected a new Bureau and Finance Committee and appointed Liaison Officers to several Scientific International and Inter-governmental bodies. Prague, Czech Republic, was selected by the IUGG Council for the XXVI IUGG General Assembly to be held in 2015. An effort is being made to set up a permanent secretariat for IUGG.

The 30<sup>th</sup> General Assembly of the International Council for Science (ICSU) started in Rome, Italy, on 27 September 2011. Prof Gordon McBean was elected as President-Elect of ICSU and will assume his position in 2014. He has been very closely associated with IUGG and has also served on the IUGG Bureau. The ICSU General Assembly endorsed plans for a new global initiative “*Health and Wellbeing in the Changing Urban Environment: A Systems Analysis Approach*” and established a new ten-year program “*Earth System Sustainability Initiative*”, which aims to effectively deliver solution-oriented research on global environmental change for sustainability. Nobel Laureate Professor Yuan Tseh Lee assumed the Presidency of ICSU at the conclusion of the General Assembly in Rome.

The issues that IUGG is going to emphasize in the next few years include engaging globally the young generation of geoscientists in the activities of the IUGG Associations; the interaction with decision makers and politicians, in appropriate forums, to share with them the knowledge base for a better tomorrow; interacting with public authorities for developing sound public policies and promote geosciences literacy globally.

I am grateful to the IUGG Bureau, the Executive Committee and the Secretariat and a number of individuals for their hard work and support for IUGG related activities in 2011.

Harsh Gupta

## MESSAGE FROM THE SECRETARY GENERAL



The Year 2011 was remarkable in the history of the Union: The 25th IUGG General Assembly was held in Melbourne, Australia (27 June – 8 July). Delegates from 49 IUGG Adhering Bodies attended the Union Council Meeting. The IUGG Council ratified the membership of Azerbaijan, Costa Rica, Georgia, and the F.Y.R. Macedonia. A number of changes to the Statutes and By-Laws were approved, among them an Affiliate membership to provide a mechanism to formalize linkages with various international and regional organizations dealing with Earth and space sciences, and an IUGG Fellowship to honor individuals for their exceptional contribution to international cooperation in geodesy or geophysics and attained eminence in the field of Earth and space sciences. The IUGG Council elected new IUGG officers and appointed liaison officers to several scientific international and intergovernmental organizations, where it is advantageous to both organizations. The Council selected Prague, Czech Republic, as the venue for the 26th General Assembly in 2015. The IUGG budget for 2012-2015 was approved, and five Resolutions were passed.

The Union was involved in various other activities during the last year and showed its strength in international cooperation and science promotion. A few major activities and events in the life of the Union for this year are highlighted below (they will be presented in the Annual Report in some detail).

- IUGG continued to strengthen cooperation with the Scientific Unions and multi-disciplinary bodies of the International Council for Science (ICSU) as well as with the World Meteorological Organization (WMO), the United Nations Education, Science and Culture Organization (UNESCO), the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), the American Geophysical Union (AGU), the Asia-Oceanic Geosciences Society (AOGS), the European Geosciences Union (EGU), and some other international and intergovernmental organizations.
- IUGG initiated and supported two ICSU-sponsored projects: “Better Internet Connectivity for Research and Education Institutions in Africa – eGYAfrica” (led by IUGG and supported by International Union of Geological Sciences - IUGS, the ICSU Committee on Data for Science and Technology - CODATA, and the ICSU Regional Office for Africa - ROA) and “Trans-Disciplinary Intercultural Ecological Research for Sustainability” (led by the International Geographical Union - IGU).
- IUGG was actively involved in the trans-disciplinary international project “Extreme Natural Hazards and Societal Implications – ENHANS” (<http://www.enhans.org>) co-organizing several scientific events around the world: (i) workshop in Pretoria (South Africa) focused on Africa, (ii) special session in Antalya (Turkey) focused on the Middle East, (iii) Union symposium and Open Forum in Melbourne (Australia) focused on Asia and the Pacific, (iv) advanced school in Trieste (Italy) to train early career scientists in the developing countries, and (v) sessions in San Francisco (USA) related to the predictability of extreme events.
- IUGG was involved in the new ICSU programs related to the Integrated Research on Disaster Risk (IRDR) and the World Data System (WDS).
- IUGG strengthened cooperation with WMO organizing a joint IAVCEI-WMO workshop on Ash Dispersal Forecast and Civil Aviation, and with CTBTO participating in the CTBTO Science Conference in Vienna and organizing a joint Union symposium in Melbourne.
- IUGG co-sponsored several international scientific meetings worldwide in 2011.
- IUGG and the Abdus Salam International Centre for Theoretical Physics (ICTP) in Trieste, Italy, signed an agreement to enhance geophysical and geodetic education and science collaboration for 2012-2015.
- As a response to the great earthquake and tsunami disaster in Japan, IUGG adopted the statement on Great East Japan Earthquake and Tsunami (18 April).

- The past and new IUGG Bureau and Executive Committee met in Melbourne in June and July to discuss the Union business.
- President Gupta and Secretary General Ismail-Zadeh attended the 30th General Assembly of the International Council for Science (ICSU), held in Rome, Italy, 27–30 September, and the business meeting of the ICSU Scientific GeoUnions on 25 September. Major outcomes of the assembly were the approval of two new international programmes: the Earth System Sustainability Initiative, and Health & Well-being in the Changing Urban Environment. Gordon McBean (Member of IUGG Bureau, 1987-1995) and Guoxiong Wu (President of IAMAS, 2007-2011) were elected ICSU President-Elect and ICSU Executive Board Member, respectively.

The IUGG Bureau and Secretariat thank the Adhering Bodies and National Committees, Union Associations and Commissions as well as all individuals who helped making the year 2011 exciting and productive in strengthening international Earth and space sciences for the benefit of society.

The IUGG Secretariat was located on the campus of the Karlsruhe Institute of Technology, Germany. As a response to the request of the German National Committee for Geodesy and Geophysics (NKGG), the German Research Foundation (DFG) awarded the IUGG Secretariat a grant to hire an Assistant Secretary General and to assist with business travels of the Secretary General for the years 2011-2012. The IUGG is very grateful to the NKGG for the support and to the DFG for the sponsorship of the IUGG Secretariat.

The report below highlights the activities of the Union, the Union Associations and Commissions, and the Inter-Union Commission for 2011.

Alik Ismail-Zadeh

# IUGG ACTIVITIES

## IUGG SECRETARIAT

### IUGG Yearbook for 2011

The 2011 Yearbook was available at the IUGG web site electronically in PDF format in January 2011 (<http://www.iugg.org/publications/yearbooks/yearbook2011.pdf>). The IUGG web site maintains the directory of Union and Association officials and the archive of IUGG memberships and General Assemblies.

### IUGG Annual Report for 2010

The IUGG Annual Report summarizes the activities of the Union, IUGG Associations and Union and Inter-Unions Commissions for 2010. The 2010 IUGG Annual Report is posted on the web page: <http://www.iugg.org/publications/reports/report2010.pdf>. The report was printed together with the 2011 IUGG Yearbook and was mailed to the Adhering Organizations, National Committees, International partners, and major libraries in May 2011.

### IUGG web-page

The IUGG web site <http://www.iugg.org>, in English and French, was maintained and updated in 2011. The Bureau decided to re-design the IUGG web-site, and the work started at the beginning of 2012.

### IUGG Electronic Journal

The E-Journal, an informal newsletter, was published monthly and distributed on the first day of each month keeping IUGG Member National Committees informed about the activities of IUGG, its Associations and Commissions, and the actions of the IUGG Secretariat. Also the journal publishes news from ICSU, the GeoUnions, IUGG scientific programs and co-sponsored scientific meetings, about awards and honours bestowed on IUGG scientists as well as obituaries, and a meeting calendar (<http://www.iugg.org/publications/ejournals/>).

### German Research Foundation's sponsorship of the IUGG Secretariat

The German National Committee for Geodesy and Geophysics (NKGG) applied for a grant from the German Research Foundation (DFG) to support the position of the Assistant Secretary General and to assist with business trips of the Secretary General for the years 2012-2013. The DFG awarded the travel grant to the Secretary General. The outcome of the support to the Assistant Secretary General will be known by mid 2012.

### Permanent Secretariat of IUGG

Tom Beer, IUGG President, received a letter from Reinhard Hüttl, President of the Deutsches GeoForschungsZentrum (GFZ-Potsdam), indicating that the GFZ-Potsdam is willing to establish a permanent IUGG Secretariat and to provide a full post-doc position for an Executive Secretary to support the Secretariat. Alik Ismail-Zadeh, IUGG Secretary General, participated in the negotiations with Reinhard Hüttl and other GFZ-Potsdam representatives regarding the offer. They agreed that the GFZ-Potsdam advertises the position, and the Executive Secretary will be hired in the middle of 2012.

## XXV IUGG GENERAL ASSEMBLY AND COUNCIL MEETING



The XXV General Assembly of the International Union of Geodesy and Geophysics held from 27 June to 8 July 2011 in Melbourne, Australia, was a great success. The IUGG Executive Committee thanks the Australian Academy of Sciences and the Royal Society of New Zealand for hosting the event and the Melbourne Local Organizing Committee for the excellent management and hospitality provided to about 3400 participants of the assembly from 81 countries.

The Scientific Program of the XXV IUGG General Assembly ran from 28 June through to 7 July 2011. Over the 10 days of the Assembly delegates participated in 198 Symposia and Workshops comprised 2831 oral and 1927 poster presentations. The Program consisted of 12 Union Symposia, 52 Inter-Association Symposia, and 128 Symposia sponsored by the individual Associations, and several specialty workshops. Nine eminent Earth and space scientists were invited by the IUGG President to deliver prestigious Union Plenary Lectures. More information on the General Assembly can be found on the IUGG2011 website: <http://www.iugg2011.com/>.

Delegates from 49 IUGG Adhering Bodies attended one or more sessions of the **Council Meeting**. The IUGG Council ratified the membership of the Republic of Azerbaijan and the Former Yugoslav Republic of Macedonia as Regular Members of the Union, Costa Rica and the Republic of Georgia as Associate Members. A number of changes to the Statutes and By-Laws were suggested and approved, among them an Affiliate membership to provide a mechanism to formalize linkages with various international and regional organizations dealing with Earth and space sciences, and an IUGG Fellowship to honor individuals for their exceptional contribution to international cooperation in geodesy or geophysics and attained eminence in the field of Earth and space sciences.

The IUGG Council (i) elected new IUGG Bureau and Finance Committee Members and appointed Liaisons Officers to several scientific international and intergovernmental bodies, where it is advantageous to both organizations (a list of the Liaisons is published below). Prague, Czech Republic, was selected by the IUGG Council as the venue for the XXVI IUGG General Assembly in 2015. The IUGG budget for 2012-2015 was approved, and 5 Resolutions were passed:

- Standardized Schemes for the Terminology for Glacier Mass Balance Measurements and for Classification of Snow on the Ground
- Gravity and Magnetic Field Satellite Missions
- Second Realization of the International Celestial Reference Frame
- Adoption of the International Thermodynamic Equation of Seawater – 2010 (TEOS-10)
- A Resolution of Thanks

The **Comptes Rendus** of the General Assembly is available at the IUGG web site (<http://www.iugg.org/assemblies/2011melbourne>). The Comptes Rendus will be published in March 2012 and sent to the Council Delegates, National Committee officers, representatives of Adhering Bodies, and to major libraries.

### IUGG BUREAU MEETINGS

The IUGG Bureau met in Melbourne and held 3 sessions on 26 June, 1 July and 5 July. The Bureau considered the reports by the President, the Vice-President, the Secretary General, and the Treasurer as

well as the following topics: the membership of the Union, proposed changes of the IUGG Statutes and By-Laws, the relationship with ICSU and the GeoUnions, the report of the International Lithosphere Program, the reports of the IUGG Liaisons, the report of the Chair of the IUGG Finance Committee, issues related to the IUGG Budget for 2012-2015, the permanent Secretariat of IUGG, the procedure for business trips of the IUGG officers, and some other topics.

The new IUGG Bureau met on 8 July in Melbourne. The agenda of the meeting contained the following topics: reports of the President, the Secretary General and the Treasurer on the XXV General Assembly of IUGG, the responsibilities of the Vice-President and the Bureau Members of IUGG, the proposed revision of the Guidelines on IUGG Administration, the visibility of IUGG and its Associations, the guidelines for IUGG Liaison Officers, the ICSU General Assembly in Rome, the GeoUnions Meeting, the IUGG Special Publication series, and some other business.

## **IUGG EXECUTIVE COMMITTEE MEETINGS**

The IUGG Executive Committee met in Melbourne and held 3 sessions on 26 June, 1 July and 5 July. The Executive Committee (EC) approved the reports by the President, the Vice-President, the Secretary General, and the Treasurer. The agenda of the EC meeting included: reports on the activities of the IUGG Associations, the Union Commissions and the International Lithosphere Program (ILP), matters of membership, proposed changes of the IUGG Statutes and By-Laws, the relationship with ICSU and the GeoUnions, recommendations for appointments of the IUGG Liaisons for the term of 2011-2015, the report of the Chair of the IUGG Finance Committee, issues related to the IUGG Budget for 2012-2015, the report of the Local Organizing Committee of the XXV General Assembly of IUGG, a discussion on the resolutions of the Assembly, the permanent Secretariat of IUGG, and some other topics.

The new IUGG Executive Committee met on 8 July in Melbourne. The agenda of the meeting contained the following topics: reports of the President, the Secretary General and the Treasurer on the XXV General Assembly of IUGG, the responsibilities of the Vice-President and the Bureau Members of IUGG, the proposed revision of the Guidelines on IUGG Administration, the visibility of IUGG and its Associations, the guidelines for IUGG Liaison Officers, the ICSU General Assembly in Rome, the GeoUnions Meeting, the IUGG Special Publication series, and some other business.

## **IUGG STATEMENT**

### **Great Earthquake and Tsunami Disaster in Japan**

On 11 March 2011 Japan was struck by a magnitude 9.0 earthquake, one of the most powerful earthquakes ever recorded by Japanese seismologists or elsewhere, followed by a devastating tsunami. The TV images and videos of the destructions caused by the earthquake and the subsequent tsunami are shocking. This is a time of great trial for the Japanese nation. Our hearts go out to those in Japan who have suffered losses of loved ones and personal property in the geophysical disasters of the past few weeks. IUGG President Tom Beer and Secretary General Alik Ismail-Zadeh sent a letter to the Japanese National Committee for Geodesy and Geophysics expressing their condolences for those caught in this tragedy.

Japan is a well-known earthquake-prone region and is seismologically among the most well-studied areas of the Earth. As geoscientists we can ask: Was an event of such a magnitude expected to occur near Honshu? The answer is negative. Neither the world's densest network of seismic stations nor the densest network of GPS stations in the country alerted to this great earthquake. No earthquake forecasts were issued in this case. Based on long-term observations, almost all seismologists were thinking that the largest earthquake in this region could be of magnitude 8.

Compared to the 2010 Haiti earthquake disaster, the disaster in Japan is of different nature. The Haiti earthquake would not be listed as a disaster if preventive measures had been implemented in advance of the event. Because of the preventive management of natural disasters by the Japanese government and proper science education of the population by Japanese scientists, the country met the great release of the Earth's stress rather well prepared, even though the event of 11<sup>th</sup> March was not expected to have such a huge magnitude. The Japan Meteorological Agency issued a tsunami alert in 3 minutes

after the start of the earthquake rupture. All important control systems (including nuclear reactors) were properly shut down. Today it is rather clear that the unexpectedly high amplitude of the tsunami waves resulted in the death and the loss of many thousands of people and in damages of nuclear power plants.

Humans will never be able to prevent the occurrences of natural phenomena entirely. The case of the recent disaster in Japan has shown us again that the mitigation of disasters is an important and vital measure, which should be taken by every nation living with risks of natural hazards.

### **IUGG Statement on the Great East Japan Earthquake and Tsunami**

*(Proposed by the IUGG Commission on Geophysical Risk and Sustainability and adopted by the IUGG Bureau on 18 April 2011)*

At 14:46 on 11 March 2011 a magnitude 9.0 earthquake occurred off the Pacific Coast of Tohoku, Japan. It induced the catastrophic tsunami that hit the coasts of Tohoku and Kanto killing a huge number of people and destroying countless houses and infrastructure. The toll of dead and missing people is 27,621 (as at 7:00 pm 10 April). The tsunami also hit some of the Japanese nuclear power plants and damaged some reactors, which are still out of full control thus threatening people in a wide area around the site. The International Union of Geodesy and Geophysics expresses deep heartfelt condolence and sympathy for the victims and sufferers of the Great East Japan Earthquake and Tsunami.

Because of the concatenation of risks – from earthquake to tsunami and nuclear power station failure – the disaster was unexpected and more severe than one event on its own. The disaster impact is not only nation-wide but also international-wide affecting industry, market economy, the nations' energy policy, and disaster management policy. It thus poses the basic question of how to live with nature and manage societal sustainability. It is a disaster that occurred in the country with the world's densest network of geophysical observations, a state-of-the-art earthquake early-warning system and the biggest tsunami barriers where people are most experienced and trained, sciences are highly advanced and knowledge based disaster management is well implemented. Yet we face tragic consequences that were unexpected and turned out to be unprecedentedly serious.

IUGG takes this difficulty as a new challenge. A challenge for us to contribute scientifically for society to become more resilient, prepared and less damage-prone so as to result in less suffering should another hazard of this magnitude hit anywhere in the world in the future. The challenge is for us to measure our achievement by the reduction in disaster risk and actual damages rather than the amount of knowledge accumulated. Our challenge is to make geosciences truly integrated with the end users in the societal system. To this end IUGG fully supports “Integrated Research on Disaster Risk (IRDR)” - the major research program of the International Council for Science (ICSU) co-sponsored by the International Social Sciences Council (ISSC) and U.N. International Strategy on Disaster Reduction (UNISDR).

Geoscience information is a key to preparation for, and management of, disasters. More advanced knowledge needs to be acquired and used in a way that is integrated with all other disciplines and players especially with social sciences and public administration. In addition, geoscientists should revise their existing knowledge so as to avoid “false comfort” in dealing with infrequent extremes that, though hardly possible, keep occurring regularly.

On this direction IUGG resolves to:

1. contribute scientifically for society to become more resilient, prepared and less damage-prone so as to better manage concatenated risks.
2. strengthen its collaboration with the ICSU, ISSC, UNISDR and any other relevant national/regional/international/intergovernmental organizations on the program of Integrated Research on Disaster Risk (IRDR).
3. measure the achievement of science by the reduction in disaster risk and actual damages rather than just the amount of knowledge accumulated.
4. promote more actively geoscience knowledge use among policy makers and end-users in operational disaster management bodies to ensure effective risk and vulnerability reduction.

5. revise existing knowledge to avoid “false comfort” in dealing with infrequent extremes.
6. develop an international and trans-disciplinary project on modern global time-dependent earthquake and tsunami hazard/risk assessment that would take into account a variety of multidisciplinary data and methods related to long-term risk mapping.

## IUGG PROJECTS



The Project “Extreme Natural Hazards and Societal Implications – ENHANS” was an initiative of the International Union of Geodesy and Geophysics (IUGG) and received a grant of the International Council for Science (ICSU) in 2010. The ENHANS project was co-sponsored by the following project Partners: the American Geophysical Union (AGU), the International Geographical Union (IGU), the International Society for Photogrammetry and Remote Sensing (ISPRS), the International Union of Geological Sciences (IUGS), the International Union of Theoretical and Applied Mechanics (IUTAM), the Scientific Committee of the Program “Integrated Research on Disaster Risk” (IRDR), and the Global Ocean Observing System (GOOS) of IOC-UNESCO. The ICSU Regional Offices for Africa (ROA), Asia & the Pacific (ROAP), and Latin America and the Caribbean (ROLAC) have been involved in the relevant parts of the project providing links to the regions.

The principal goals of the ENHANS project have been

- (i) to improve understanding of critical phenomena associated with extreme natural events and to analyze impacts of the natural hazards on sustainable development of society;
- (ii) to promote studies on the prediction of extreme events reducing predictive uncertainty and on natural hazards mitigation; to bring the issues into political and economical policies;
- (iii) to disseminate knowledge and data on natural hazards for the advancement of research and education in general and especially in developing countries; and
- (iv) to establish links and networks with the international organizations involved in research on extreme natural hazards and their societal implications setting up a consortium of experts of ICSU Unions and several major intergovernmental and multi-national organizations involved in the project.

The goals of the ENHANS project have been achieved via scientific meetings and open forums bringing together research experts, decision makers, and disaster management, insurance agency and mass media practitioners. The project placed a special emphasis on the importance of research on extreme natural hazards and disaster risk mitigation in the most vulnerable regions of the world, particularly in Latin America and the Caribbean, in Africa, in the Middle East, in Asia, and the Pacific region.

The project contributed to and promoted the activities of the Partner organizations in natural hazard and disaster risk research, particularly it contributed to the implementation of the IRDR Programme. The project revealed the existing knowledge, potentials, and scientific expertise in the relevant topics of extreme natural hazards and disaster risk research in many regions of the world. The project events were held around the world focusing on extreme natural hazards and disaster risks in a particular region:

- Latin America and the Caribbean (Iguassu, Brazil, August 2010),
- North Africa (Cairo, Egypt, November 2010),
- North America and Europe (San Francisco, USA, December 2010);
- sub-Saharan Africa (Pretoria, South Africa, January 2011);
- the Middle East (Antalya, Turkey, May 2011), and



- Asia and the Pacific region (Melbourne, Australia, July 2011).

Moreover, the school (Trieste, Italy, October 2011) and scientific session (San Francisco, USA, December 2011) on predictability of extreme events have been the parts of the ENHANS project.

The ENHANS project concludes that a reduction of disaster risk can be reached through in-depth scientific research on disaster risks and through risk assessments. The ENHANS project calls for the following important actions:

1. to promote comprehensive holistic inter- and trans-disciplinary approaches to natural hazard and disaster risk research, which have to integrate knowledge from natural and social sciences, mathematics, engineering, disaster management, insurance sectors and other stakeholders dealing with disaster risk;
2. to help in networking existing regional scientific and educational centers with the aim to establish a regional center of excellence in disaster risk research (e.g., in sub-Saharan Africa);
3. to negotiate on setting up a process of assessing and synthesizing the policy-relevant results of peer-reviewed published research on the understanding of the natural phenomena and the social vulnerability associated with disasters; on the capability of predictive systems to disseminate timely and accurate information needed for policy and decision making; on methodologies and approaches for reducing vulnerability and increasing resilience of societies; and on the overall ability of societies to reduce risk (prevent, mitigate and prepare for the increasing impact of natural events). The assessment would contribute to enhance the knowledge of disaster risk at global, regional, and local levels and the awareness of the people living with risk.



The major scientific results of the ENHANS project have been broadcast via the project homepage (<http://www.ENHANS.org>), newsletters of the U.N., international and national organizations, and the Internet (as video presentations or as report presentations). The ENHANS project results will be summarized in the book to be published by the Cambridge University Press in 2013.

### **Monitoring Taal volcano unrest in the Philippines**

The Philippines archipelago suffers frequent and large catastrophic natural hazards (volcanic eruptions, earthquakes, cyclones, and tsunamis). These events induce great loss of human life, economic hardship and destruction of the social fabric. The Philippines Institute of Volcanology and Seismology (PHIVOLCS, <http://www.phivolcs.dost.gov.ph/>) is in charge of monitoring most of these hazards and provides direct response to Civil Authorities on the likely consequences and risks. In 2003, during an international workshop held in Manila for 'Initiating seismic and volcanic

electromagnetic (EM) monitoring in Asian countries', PHIVOLCS and the IUGG Inter-Association on 'Electromagnetic Studies of Earthquakes and Volcanoes' (EMSEV, <http://www.emsev-iugg.org/emsev/>) proposed a tight cooperation on the Taal volcano. The Taal volcano is responsible for serious hazards in the region such as pyroclastic flows, base surges, and violent phreatic explosions, as experienced during the previous 33 historical eruptions. Since the last long eruptive episode in 1965-1977, the Taal volcano has continuously exhibited sporadic and intense seismic activity, ground deformation, and surface activity. In 2004, PHIVOLCS and EMSEV signed a Memorandum of Agreement with the objectives to: (1) understand the interactions between the magma feeding system and the hydrothermal system buffered by both the hot acidic inner Crater Lake and the cold outer Taal Lake, the geological discontinuities along which heat and soil degassing prevail, (2) evaluate scenarios of activities, (3) monitor the volcanic activity, and (4) build an electromagnetic scientific community at PHIVOLCS.

Late in 2004, a newly formed PHIVOLCS EM team and a Japanese-French EMSEV team started to image the hydrothermal system, the geological and tectonic discontinuities with combined magnetic, electric, ground temperature and soil degassing surveys. Progressively, the international EMSEV community enlarged with researchers from Greece, Italy, USA, and Belgium. New research methods, also applicable by the PHIVOLCS EM team, were carried out, such as audiomagnetotellurics and resistivity soundings, magnetic and bathymetric mappings of the inner acidic lake, and bottom lake temperature. From these bi-annual field campaigns, new important results were obtained. These are now used in information planning by both the local inhabitants and the Civil Authorities. One outcome is that the northern part of the volcano is apparently undergoing strong thermal transfers, degassing, and mineralization. The activity takes place along active E-W fissures possibly linked to the root of the northern border of the Crater at a depth of some hundreds of metres, and connected to the hydrothermal/volcanic source of the volcano. This thermal source could be the primary focus of the next eruptive activity. In such a case, strong activity could induce a collapse of a part of the northern crater rim into the Crater Lake, due to mechanical weakening by the active 1992-1994 fissures.

Simultaneously with repeated surveys, EMSEV and PHIVOLCS have built a real-time monitoring network based on electromagnetic and other geophysical parameters as magnetic and electric fields, ground temperature and gradients, seismicity, and tilt. Data are automatically transferred to Taal volcano observatory, PHIVOLCS headquarter and EMSEV servers. Thanks to the real-time multi-parametric network, EMSEV was able to regularly process data and to inform PHIVOLCS about anomalous signals observed before and during the April to June 2010 strong seismic crisis. During this crisis, PHIVOLCS raised the alert level from 1 to 2 requiring a partial evacuation of the volcanic Island. Two new real time EM stations will be added to the 2 existing multi-parametric stations in 2011. In addition to these land observations, satellite Aster thermal imagery, MOPITT observations, and Robust Satellite Techniques will now be jointly performed.

PHIVOLCS is now a major contributor to the development of EM studies on the Taal volcano and to the analysis of its ongoing activity as it was stated during the February 2010 EMSEV-PHIVOLCS international workshop on 'Monitoring active volcanoes by electromagnetic and other geophysical methods; Application to Asian volcanoes'. The new Memorandum of Agreement for the coming 5-years is the confirmation of long term and successful cooperation between PHIVOLCS and the Inter-Association working group EMSEV. Further information can be found on EMSEV and PHIVOLCS web-sites (<http://www.emsev-iugg.org/emsev/> and <http://www.phivolcs.dost.gov.ph>). This cooperation was supported by an IUGG grant. (Received from Jacques Zlotnicki, EMSEV Chair)

### **Artificial Intelligence in the Earth's Magnetic Field Study**

The Earth's magnetic field is the most important source of information about the inner structure of the Earth and its evolutionary processes. The most accurate and rapid data on the geomagnetic field are provided by INTERMAGNET (International Real-time Magnetic Observatory Network), which has been operating now for more than 20 years (<http://www.intermagnet.org>). The main objectives of the network, which consists of more than 110 observatories all over the world, are observations, acquisition, accumulation, storage, dissemination, analysis and correction of magnetograms with minimum time delay. Huge volumes of recorded geomagnetic data lead to the necessity of fundamentally new methods of processing them. Such methods include pattern recognition and

geoinformatics.

The International Workshop “Artificial Intelligence in the Earth’s Magnetic Field Study. INTERMAGNET Russian Segment” was organized on 26-28 January 2011 in Uglich, Yaroslavl region, Russia, and co-sponsored by IUGG. The main goal of the Workshop was to exchange knowledge and experience in the application of modern geomagnetic instruments, the deployment of magnetic observatories as well as the technical/scientific processing of magnetograms. The specific objective was to discuss plans for a further INTERMAGNET development in Russia. The Workshop brought together leading scientists and specialists in geomagnetism and magnetic observations from Canada, France, Germany, Hungary, Russia, USA and Ukraine. Manufacturers and suppliers of geomagnetic and modern computer equipment took part in the exhibition organized within the framework of the Workshop.



*Left: At the workshop. Right: Alexei Gvishiani (President of the National Geophysical Committee of the Russian Federation, and Mioara Manda, IAGA Secretary General)*

The installation of new INTERMAGNET observatories was planned. As a result of this meeting, several important steps in cooperation to develop the INTERMAGNET Russian Segment were undertaken including (i) a decision to establish a working group within the National Geophysical Committee of the Russian Federation (which is the National Committee for IUGG) to set up the INTERMAGNET Russian Segment; (ii) an agreement to establish a national geomagnetic node for collecting and processing geomagnetic data. Leading geomagnetism scientists formulated specific recommendations on the deployment of new INTERMAGNET observatories in Russia. Detailed information on the Workshop is available on the website [http://uglich2011.gcras.ru/index\\_e.html](http://uglich2011.gcras.ru/index_e.html). (Received from R. Krasnoperov, Secretary General, Russian National Geophysical Committee.)

### **Electronic Geophysical Year in Africa (eGYAfrica)**

eGYAfrica evolved from the Electronic Geophysical Year in response to the need for better Internet connectivity for research and education in Africa – i.e., to help reduce the digital divide. The objective is to strengthen research and education in Africa to serve national interests and to increase African participation in international science. The two-day eGYAfrica Workshop and planning meeting, held in Accra, Ghana in November 2010, was supported through a grant from IUGG, together with additional support from IAGA. Seven African countries were represented.

The first day focused on Internet issues in Africa, particularly the digital divide, the rapid expansion of fibre-optic cabling around and within Africa, and the development of National Research and Education Networks (NRENs). The PingER Project (<http://www-iepm.slac.stanford.edu/pinger/>) that measure end-to-end Internet performance shows, despite this impressive progress, that a digital divide persists in Africa that hampers progress. Limitations at the institutional level are often an important factor. The second day was devoted to eGYAfrica review and planning. A solid working relationship was established with the Association of African Universities and with the ICSU Regional Office for Africa. Workshop participants were pleased with the progress of eGYAfrica and were enthusiastic about its future; officers were elected for the eGYAfrica Committee for the next 2 years; and a monograph based on the themes of eGYAfrica and the developments of NRENs in Africa is planned.

A key activity of eGYAfrica is to establish national groups who will seek to influence decision-makers. This is currently being pursued in Cote d'Ivoire, Ethiopia, Ghana, Kenya, Nigeria, Rwanda, Senegal, and South Africa. The importance of working through existing groups when possible was emphasized. A full report on the Workshop can be downloaded from the following site: <http://dl.dropbox.com/u/31851729/eGYAfrica%20Workshop2010.doc>. (Received from Victor Chukwuma (Nigeria), eGYAfrica Chair, Alem Mebrahtu (Ethiopia), eGYAfrica Secretary, and Charles Barton (Australia), International Liaison)

### Networking World Seismologists

The objective of this project is to update and maintain up-to-date information on the network of scientific institutions, seismologists and geophysicists in each country willing to serve as scientific points of contact to: (i) seismologists and geophysicists in other countries; (ii) governments; (iii) charitable, response and relief organizations; and (iv) media. Particular care is devoted to establishing and maintaining contacts in developing countries. In addition to the IUGG funding, the project benefits from additional support in terms of staff time from the Institute of Geophysics and the China Earthquake Networks Center of China Earthquake Administration.

The IUGG grant enables IASPEI and ISC to develop and maintain a worldwide registry of seismologists & geophysicists willing to serve as a point of contact in countries with and without affiliation to IUGG, with a particular focus on developing countries. The registry in its current form is readily available for scientific & research institutions, governmental bodies, charitable and relief organizations and media at: [www.isc.ac.uk/projects/seismocontacts](http://www.isc.ac.uk/projects/seismocontacts).



This webpage lists all countries worldwide in three distinct categories:

- in **RED** are countries in which institutes and individual members of staff are willing to share information and serve as a local point of contact;
- in **BLUE** are countries for which we have limited information about operating geophysical organisation(s); and
- in **BLACK** are countries for which we do not currently hold any information.

During the first phase of the project the efforts were concentrated on Central and East Asia and Sub-Saharan Africa – the most important areas as far as the goal of the project is concerned.

*Central and East Asia.* Work in this area has been done with the help from the staff of the China Earthquake Networks Center (CENC) of China Earthquake Administration (CEA). An official appeal letter was compiled on behalf of the IASPEI, ISC and CEA and used in communications with colleagues from almost 40 countries. At the project's start, information on 12 countries in "red" and 12 countries in "blue" categories was available. This information though was likely to be outdated and therefore required an update. At present, contact information in as many as fifteen Asian countries has been updated and/or re-confirmed. The number of Asian countries with both organizational and staff contact information (red category) has increased from twelve to eighteen, where four of them moved from black to red category. To this date the search was concentrated in the area of South East Asia and Sub Saharan Africa. In the second part of the project we plan to shift the accent towards contacts in Central and South America.

*Sub Saharan Africa.* At the beginning of the project information on specific members of staff was available in just four countries (red) and information on operating institutions was additionally available in further six countries (blue). As a result of a similar campaign based on the efforts of an ISC staff member (originally from Africa), the situation improved and as many as fifteen countries now fall in the "red" category and further four countries belong to the "blue" category. (Received from Peter Suhadolc, IASPEI Secretary General, and Dmitry A. Storchak, Director of the International

Seismological Centre.)

### **INTERNATIONAL LITHOSPHERE PROGRAM: IUGG AND IUGS JOINT REVIEW**

The International Union of Geological Sciences (IUGS) and IUGG co-sponsor the joint International Lithosphere Program (ILP). Both organizations agreed to conduct a joint review of the ILP activities for the last quadrennium in 2011. The IUGS review was made through an interview with the ILP President Sierd Cloetingh and the ILP Secretary General Roland Oberhänsli. The IUGS review panel was comprised of the following experts: Jacques Charvet (France), William Cavazza (Italy); Laurent Jolivet (France); Jaume Vergés (Spain). To conduct an IUGG review of the ILP scientific/administrative/financial activities, IUGG President Harsh Gupta appointed the following experts to serve on the ad-hoc review committee: Chen Yun-tai (China), Alik Ismail-Zadeh (Germany/Russia), and Kalachand Sain (India). Bob Engdahl (USA) and Søren Gregersen (Denmark) were asked to comment on a draft report. The IUGG review was based on the ILP reports (2007-2010) submitted by the ILP Secretary General to IUGG, and on the ILP Terms of Reference.

For the past four years the International Lithosphere Program (ILP) has been very active and successful in accomplishing its tasks following the guideline assigned by IUGG and IUGS. ILP has contributed immensely to unravel the scientific curiosity of what happened in the past and what is expected in future. The program has provided important information on the lithosphere from its shallow parts to the deep interior through multidisciplinary research projects. Although ILP has been keeping a fine balance between “addressing societal needs” and “satisfying scientific curiosity”, the review had several recommendations as to how the program could widen its impact and strengthen its activities, and also improve its administration. The joint review report can be downloaded from the IUGG web-page: <http://www.iugg.org/programmes/ILP%20IUGS-IUGG%20ARC%20Review.pdf>.

### **SCIENTIFIC MEETINGS CO-SPONSORED BY IUGG**

IUGG co-sponsors symposia and workshops appropriate to our disciplines of study and supports the participation of young scientists and scientists from developing countries.

For 2011, IUGG supported the following meetings (the name of the IUGG Associations that endorsed the meetings are indicated in brackets):

- Colloquium of African Geology, Johannesburg, South Africa, 8-14 January (IUGG)
- Symposium “The 2001 Bhuj Earthquake and Advances in Earthquake Science”, Gandhinagar, Gujarat, India, 22-27 January (IASPEI)
- Vertical Coupling in the Atmosphere-Ionosphere System, Prague, Czech Republic, 14-18 February (IAGA)
- 3rd IAGA Symposium “Heliospheric physics during and after a deep solar minimum”, Luxor, Egypt, 19-23 March (IAGA)
- Towards an Observing System for the Greater Agulhas System: Building links and capacity for East African participation, Port Louis, Mauritius, 21-25 March (IAPSO)

For 2012, IUGG will support the following meetings:

- International summer school/workshop in glaciology, McCarthy, USA, 10-20 June (IACS)
- Workshop on measurement and uncertainty assessment of glacier mass balance, Tarfala, Sweden, 9-11 July (IACS)
- Workshop on Vertical Datum Unification, Bogotá, Colombia, 10-14 December (IAG)
- 21st Electromagnetic Induction Workshop, Darwin, Australia, 25-31 July (IAGA)
- 2012 International EMSEV meeting, Shizuoka, Japan, 30 September-4 October (IAGA)
- 3rd STAHY International Workshop, Tunis, Tunisia, 1-2 October (IAHS)
- Symposium “Completion of the IAHS decade on Prediction in Ungauged Basins”, Delft, The Netherlands, 23-25 October (IAHS)
- International Conference on Clouds and Precipitation, Leipzig, Germany, 28 July-3 August (IAMAS)
- International Radiation Symposium (IRS) 2012, Berlin, Germany, 6-10 August (IAMAS)

- ICDM Workshop 2012 “Dynamics and Predictability of High-impact weather and Climate Events”, Kunming, China, 6-9 August (IAMAS)
- Comparative Climatology of Terrestrial Planets, Boulder, CO, USA, 25-28 June (IAMAS)
- 33rd General Assembly of the European Seismological Commission and Young Seismologists Training Course, Moscow, Russia, 19-24 August (IASPEI)
- 9th General Assembly of the Asian Seismological Commission 2012, Ulaanbaatar, Mongolia, 17-20 September (IASPEI)
- IUGG GRC Conference “Extreme Natural Hazards and Their Impacts”, Orange, CA, USA, 11-14 December (IUGG Commission on Geophysical Risk and Sustainability)
- 39th COSPAR Scientific Assembly, Mysore, India, 14-22 July (IAGA, IAMAS)

## **Scientific Meeting Reports**

### ***IAVCEI-WMO Workshop on Ash Dispersal Forecast and Civil Aviation***

The regulatory response to the 14 April 2010 Eyjafjallajökull eruption (Iceland) resulted in severe disruption to air traffic. By 21 April, the UK Civil Aviation Authority (CAA) and Eurocontrol had pioneered a new way to manage the crisis based on ash concentration thresholds defined by engine manufacturers. Both the initial zero ash tolerance approach by ICAO and the new ash concentration thresholds, used by the UK MetOffice and currently under discussion within ICAO, require robust ash dispersal forecasting based on the combination of Numerical Weather Prediction (NWP), Volcanic Ash Transport and Dispersal Models (VATDM) and ash cloud data acquisition. The new ash concentration thresholds require more accurate information on the ash mass in the eruption since downwind concentrations depend on the source.

At the occasion of the 5th International Scientific Workshop on Volcanic Ash (Santiago de Chile, March 2010), the joint WMO-IUGG Volcanic Ash Scientific Advisory Group (VASAG) was proposed to be set up. Both the IUGG Executive Committee and WMO Executive Committee-LXII endorsed the initiative. IAVCEI, as an IUGG Association dealing with volcanology, hence became a natural player in the WMO-IUGG long-standing cooperation.

The first IAVCEI-WMO Ash Dispersal Forecast and Civil Aviation Workshop aimed to produce a consensual document describing the characteristics and range of application of different VATDMs, identifying the needs of the modelling community, investigating new data-acquisition strategies and discussing how to improve communication between different disciplines, researchers and operational institutions to improve volcanic ash transport and dispersion model forecasts. The Workshop was held from 18 – 20 October 2010 at the WMO Geneva Headquarters under the sponsorship of the Faculty of Sciences of the University of Geneva, the International Association of Volcanology and Chemistry of the Earth's Interior - IAVCEI (a Scientific Association of IUGG), and Canton of Geneva, and organized by scientists from the University of Geneva (Switzerland), the Barcelona Supercomputing Center (Spain), the Aeronautical Meteorology Division of the World Meteorological Organization (WMO), and the British Geological Survey (UK). Fifty-two volcanologists, meteorologists, atmospheric dispersion modellers, and space and ground-based monitoring specialists from 12 different countries were gathered (attendance by invitation only), including representatives from 6 Volcanic Ash Advisory Centers (VAACs) and related institutions. As a main conclusion of the Workshop, model developers, meteorologists, volcanologists and stakeholders need to work closely together to develop new and improved strategies for ash dispersal forecasting and, in particular, to improve the definition of the source term; to design models and forecasting strategies that can better characterize uncertainties; to explore and identify the best ensemble strategies that can be adapted to ash dispersal forecasting; to identify optimised strategies for the combination of models and observations; and to implement new critical operational strategies. More information is available at the website: [www.unige.ch/hazards/Workshop.html](http://www.unige.ch/hazards/Workshop.html). (Received from C. Bonadonna, A. Folch, S. Loughlin, and H. Puempel, co-organisers of the Workshop.)

### ***Colloquium of African Geology***

The Colloquium of African Geology is a major international biennial conference first launched in 1964 and organized every second year, under the auspices of the Geological Society of Africa (GSAf).

About 500 geoscientists representing 58 countries worldwide were gathered at the University of Johannesburg from 8 – 14 January 2011 under the theme: “*Together in Africa for a Leading Role in Geoscience*”. The event was organized in collaboration with the University of Witwatersrand, the Nuclear Energy Corporation of South Africa (NECSA), the Geological Society of South Africa (GSSA) and the Mineralogical Society of South Africa (MINSA). CAG23 was a unique opportunity to present and discuss on-going research work on all aspects of African geosciences. It offered a rich scientific program comprising 14 scientific symposia, of which some were dedicated to outstanding geoscientists for their remarkable work and contribution to African geology as well as the Young Earth Scientists (YES) and Women in Geosciences. World-class scientists presented six plenary lectures on the most salient topics, which have implications on African geosciences and society. The program included 25 keynote and invited talks, 6 workshops, 6 excursions, 4 business meetings and 2 short courses. 17 national and international exhibitors were present. The opening ceremony of the event took place at the Soweto Campus of the University of Johannesburg, where the Minister of Science and Technology, Mrs Naledi Pandor, delivered the opening address in which she highlighted the importance of geosciences. This was the first time an international conference was opened in Soweto. Delegates were also offered a very special social program through tours around the city and 5 evening functions. During three of these functions delegates were entertained by a group of students from the UJ Choir. The event was indeed a great opportunity for African geoscientists in general and South African ones in particular to build links and strengthen the networking and research collaboration in the field of geosciences. IUGG co-sponsored the event. (Received from Hassina Mouri, Chair of the Organizing Committee, Secretary General of the Geological Society of Africa).

#### ***International Symposium “Advances in Earthquake Science-2011”***

The International Symposium “Advances in Earthquake Science-2011” was held at the Institute of Seismological Research, Raisan, India, on 21-24 January 2011. It was dedicated to the 10th anniversary of the Bhuj Earthquake. A number of technical sessions attracted about hundred geoscientists, namely, the sessions on the Bhuj Earthquake and Aftershock Studies; Intraplate Seismicity; Seismicity and Earthquake Source Processes; Paleoseismology and Historical Seismology; Earthquake Precursors and Prediction Studies; Seismic Wave Propagation; Real Time Seismology, Loss Reduction and Early Warning; Earthquake Ground Motion and Damaging Earthquakes; Seismic Hazard Assessment / Microzonation; Tectonics and Crustal Movements; Earth’s Interior, Structure & Dynamics; Remote Sensing, GPS & InSAR; Exploration for Oil and Crustal Structure; Ground Response Studies for Nuclear Power Plants; Tsunami Modeling; and an IGCP Session on Archeoseismology. Scientists from Bangladesh, China, France, Germany, Hungary, India, Italy, Japan, Korea, Russia, and USA attended the symposium, which was co-sponsored by IUGG. (Received from B. K. Rastogi, Chair of the Symposium’s Local Organizing Committee.)

#### ***Workshop “Vertical Coupling in the Atmosphere/Ionosphere System”***

The 4th IAGA/ICMA/CAWSES-II TG4 Workshop “Vertical Coupling in the Atmosphere / Ionosphere System” was held in Prague, Czech Republic, 14–18 February 2011. 75 scientists from 16 countries attended the meeting presenting 79 papers, from which 16 were solicited presentations. Before the official opening of the workshop there were two public/educational lectures attended mainly by students from Prague schools and universities. The meeting brought together research experts from both the middle and upper neutral atmospheric and ionospheric communities in order to present their work and assess/debate ongoing issues relating to the theoretical, modeling and observational aspects of all kind of processes that transfer energy and momentum from the lower atmosphere to the upper atmosphere and ionosphere and vice versa. The aim of this workshop was not only to address the physics behind the forcing mechanisms that originate in the lower atmosphere and play an important role on the upper atmosphere and ionosphere, but also to show the solutions of some of the problems, which were identified during the 3rd IAGA/ICMA Workshop held five years ago in Varna, Bulgaria. The program focused on various aspects and topics of neutral dynamics as well as ionospheric electrodynamics and plasma physics including coupling processes in the middle atmosphere and in the atmosphere/ionosphere system. The meeting provided an excellent opportunity for the research communities to interact to review and debate the progress to date in the field of upper atmosphere-ionosphere research and come up with suggestions and ideas for further research on the

vertical coupling of the atmosphere-ionosphere system as the workshop brought together scientists working in the independent research areas of the mesosphere and lower thermosphere and the ionosphere, that is, on two collocated “spheres” of the near-earth environment which remain closely coupled and continuously interact. Co-sponsors of the workshop were the International Association of Geomagnetism and Aeronomy (IAGA), the International Commission on the Middle Atmosphere (ICMA), the International Union of Geodesy and Geophysics (IUGG), the International Union of Radio Science (URSI), and the Scientific Committee on Solar-Terrestrial Physics (SCOSTEP). (Received from Petra Koucká Knížová, Chair of the Workshops Organizing Committee.)

### **SCOR/IAPSO Workshop**

The SCOR/IAPSO workshop “Towards an Observing System for the Greater Agulhas System: Building Links and Capacity for East African participation” was held in Mauritius, 21-25 March 2011.



*Meeting participants (photo from <http://www.jcomm.info/wio-dbc2>)*

The SCOR/IAPSO Working Group 136 on the Climatic Importance of the Greater Agulhas System conducted their second meeting joining with a meeting and capacity building workshop in Mauritius with the WMO/IOC Data Buoy Cooperation Panel (DBCP). There were fifty attendees; about half of the participants came from East Africa. The agenda was formulated around the WG136 Terms of Reference: (1) to facilitate collaborations between existing and planned studies of the region; (2) to write a review paper on the climatic importance of the greater Agulhas; (3) to identify key components of the region that deserve further study and/or sustained observations; and (4) to organize a Chapman Conference with the participation of the African science community. A further goal of the WG is to contribute to capacity building in East African countries, which border the Great Agulhas System.

One of the primary goals for WG136 at this meeting was to network with East African scientists and to contribute to capacity building for the region. Four workshops were created and run by WG members. In addition, IUGG/IAPSO sponsored the attendance of trainer Pierrick Penven (Associate member), who led a hands-on capacity building workshop on ocean modeling, demonstrating some basic geophysical fluid dynamics through a hierarchy of models built using ROMS.

Discussions during the meeting on Resource and Science Planning for the region and on the Chapman Conference have led to a short document on the elements for a sustained observing system in the Greater Agulhas region, to be presented at the 8th International CLIVAR Indian Ocean Panel meeting, and to a Chapman proposal for a conference in Grahamstown, South Africa, in 2012. (Received from Johan Rodhe, IAPSO Secretary General.)



### ***IAGA-III Heliospheric Physics Symposium***

The IAGA-III Symposium “Heliospheric physics during and after a deep solar minimum” was held in Luxor, Egypt, 13-17 November 2011, where the IAGA community could share their latest research results, establish a new cooperation in solar and space research, and discuss the consequences and effects of a deep solar minimum. The Symposium focused on the fundamental problems of solar physics and solar cycle and their related physical effects on the space environment including the outer atmosphere and the interplanetary space.



*Participants of the IAGA-III Symposium*

The presentations and discussions were also focused on identifying (i) the highest priorities needed for operational services that can guide future researches and (ii) the new high-value capabilities that can be translated into operations. The scientific topics presented at the Symposium covered solar cycle prediction techniques; source regions of the solar wind at solar activity minimum and associated modeling; the impact of prolonged solar minima on global climate change; solar wind at the time of solar minimum and of the rising phase of cycle 24; physics, dynamics, and behavior of the Sun-Earth system over the 11-years solar cycle; particle acceleration near the Sun and in the heliosphere under quiet and active solar conditions; the heliosphere in the local interstellar medium; solar variability; space weather and geo-hazards. About fifty participants from 21 countries attended the IAGA-III Symposium. The cultural program of the Symposium included excursions to the Luxor & Karnak temples and to the Valley of Kings and queens in Luxor. IUGG co-sponsored the IAGA-III Symposium. (Received from Ahmed Hady, the Symposium co-organizer.)

### **NATIONAL COMMITTEES FOR GEODESY AND GEOPHYSICS: REPORTS**

#### **Meeting of the German National Committee for Geodesy and Geophysics**

The business meeting of the German National Committee for Geodesy and Geophysics (NKG) was held on 12 November 2010 at the Alfred Wegener Institute for Polar and Marine Research (AWI) in Bremerhaven. The meeting was chaired by the NKG President Rainer Kind. Heinrich Miller, head of the Glaciology Department of the Alfred Wegener Institute and host of the meeting, presented the Institute and spoke about the AWI history, the structure, and the scientific activities. Members of the Committee reported on their activities in the IUGG Associations, commissions, and working groups. IUGG Secretary General Alik Ismail-Zadeh attended the business meeting and informed the NKG members about the current and planned IUGG activities, particularly about the preparations for the XXV IUGG General Assembly in Melbourne. The Committee discussed closer cooperation with the German National Committee for IUGS. A special lecture on the tsunami warning system in the Mediterranean was delivered by Peter Koltermann, former head of Section, UNESCO Tsunami unit. More information on the Committee can be found on the web page [www.bgr.de/nkgg/](http://www.bgr.de/nkgg/) (in German). (Received from Thomas Plenefisch, NKG Secretary).

### Meeting of the Austrian National Committee for Geodesy and Geophysics

The members of the Austrian National Committee for IUGG (ÖNK) gathered on 14-15 April 2011 at the Conrad Observatory (COBS) of the Central Institute for Meteorology and Geodynamics (ZAMG) for their annual meeting at the invitation of Wolfgang Lenhardt (Austrian national representative to IASPEI). Roman Leonhardt, head of COBS, welcomed the members of ÖNK and gave an outline of the COBS history and the Observatory's aims and presented the geophysical and geodetic instruments that have been set up so far at COBS. The guided tour included a visit to the heart of COBS, a tunnel of 150 meters equipped with a whole variety of instruments: several seismometers, borehole seismometers, superconducting gravimeter GWR C025, absolute gravimeter FG5 and some others. A GNSS-Permanent Station of the European Permanent Network (EPN) of EUREF operated by the Federal Office of Metrology and Surveying (BEV) in Vienna is situated near COBS. Apart from the seismic observatory, several geomagnetic sensors are being installed at the Conrad Observatory. The new part of the Observatory is currently at the final stage of its construction and will boast a tunnel that will finally have a length of 400 meters.



*From left to right: W. Lenhardt (IASPEI), G. Kaser (IACS), N. Höggerl (IAG, ÖNK Secretary General), A. Ismail-Zadeh, B. Leichter (IAGA), H. Schuh (IAG, ÖNK President), G. Duma (IAGA), R. Leonhardt (the meeting host)*

During the ÖNK meeting the following topics were addressed: Preparation of the IUGG General Assembly 2011 in Melbourne; ÖNK membership; information exchange. The Austrian National Committee was very pleased to welcome Alik Ismail-Zadeh, IUGG Secretary General, to this meeting, which was a perfect platform for the exchange of valuable information between the members of the different associations of IUGG in a very relaxed atmosphere. Recent natural disasters have clearly shown that the regular exchange of information and results achieved in various fields of geosciences are indispensable for research on climate change and natural hazard mitigation and prevention. More information about the Conrad Observatory and the ÖNK meeting can be found at the following web-sites: <http://www.oegk-geodesy.at/austria/iugg/index.html>. (Received from Norbert Höggerl, ÖNK Secretary General)

### Meeting of the Chinese National Committee for Geodesy and Geophysics

The Chinese National Committee for Geodesy and Geophysics (CNC-IUGG) was pleased to welcome Alik Ismail-Zadeh, IUGG Secretary General, to visit the Institute of Atmospheric Physics (IAP), Chinese Academy of Sciences (CAS), where CNC-IUGG is located. Ismail-Zadeh visited IAP together with the ICSU President-elect Gordon McBean (a distinguished Canadian meteorologist and a former Member of IUGG Bureau) on 4 November 2011 after their attendance at Integrated Research on Disaster Risk (IRDR) Conference held in Beijing (31 October - 2 November 2011). McBean and Ismail-Zadeh gave talks at an IAP seminar before the meeting. McBean spoke on the environmental hazards, climate change and importance of early warning system, and Ismail-Zadeh discussed data assimilation techniques used in geodynamic models.



During the meeting. Left panel (from left): J. Zhu, J. Qin, Y. Liang, G. Wu and Z. Xie.  
Right panel (from left): J. Li, A. Ismail-Zadeh, G. McBean, and Y. Lin.

The meeting was chaired by Guoxiong Wu, Vice-President of CNC-IUGG, IAMAS Immediate Past President, and an Ordinary Member of the ICSU Executive Board. Yingnan Liang, Deputy Director-General, Department of International Affairs, China Association for Science and Technology (CAST), also attended the meeting. Every four years, IAP sends a big delegation of atmospheric scientists and graduate students to attend an IUGG General Assembly. CAST is also active in searching funding to support Chinese scientists' involvement in IUGG. Both CAST and IAP would continue to work with IUGG to promote earth sciences in China and the international community. CNC-IUGG Secretary General, Jianping Li, presented Ismail-Zadeh the Newsletters of CNC-IUGG and Chinese Version of IUGG E-Journals (2009-2011). It is an impressive collection of data on IUGG and Union Associations translated into Chinese. Ismail-Zadeh highly recognized CNC-IUGG's efforts in promoting IUGG's profile in China. He also expressed thanks to CAST and the host institute IAP for their invaluable support to CNC-IUGG. Ismail-Zadeh stressed IUGG's support to integrated science education, and he encouraged IAP and CNC-IUGG to initiate science education activities related to integrated research. Particularly he mentioned that China can play an active role in advanced summer schools in the southeastern Asian region on topics of a common interest not only to atmospheric scientists, but also to hydrologists, oceanographers and even solid earth physicists (e.g. data assimilation, climate and natural hazards research), so that young scientists and students can be more broadly educated and can improve their global understanding of complex natural processes.

### National Committee Reports

National Reports of activities in geodesy and geophysics are requested from each IUGG Adhering Body before each quadrennial General Assembly. These reports are useful to reference the expertise resident in each country and the unique opportunities for research and collaboration that may be available. National Reports were received from Argentina, Bulgaria, China, Hungary, India, Japan, Romania, Russia, the Slovak Republic, Thailand, and Turkey. The National Report from Hungary is a special issue (Vol. 46, No. 2, 2011) of *Acta Geodaetica et Geophysica Hungarica*; the National Report from the Slovak Republic is a special issue (Vol. 41) of *Contributions to Geophysics & Geodesy* published by the Geophysical Institute of the Slovak Academy of Sciences. The reports that were provided in electronic form are posted on the IUGG website.

### IUGG LIAISON OFFICERS FOR 2011-2015

Organization	Liaison(s)
The Cartographic Section of the United Nations	Luiz P. S. Fortes (BRAZIL)
UNESCO International Hydrological Program (IHP)	Pierre Hubert (FRANCE)
UNESCO Intergovernmental Oceanographic Commission (IOC)	Stefania Sparnocchia (ITALY)

World Meteorological Organization (WMO)	Arthur Askew (SWITZERLAND) Arnau Folch (SPAIN) Hans Volkert (GERMANY)
International Civil Aviation Organisation (ICAO)	Marianne Guffanti (USA) William Rose (USA)
Pan American Institute of Geography and History (PAIGH)	Hermann Drewes (GERMANY)
Consultative Committee for Time and Frequency (CCTF)	Claude Boucher (FRANCE)
ICSU Committee on Data for Science and Technology (CODATA)	Alexei Gvishiani (RUSSIA) Mark Parsons (USA)
ICSU Committee on Space Research (COSPAR)	Eric Donovan (CANADA)
ICSU-ISSC-UNISDR Scientific Committee on Integrated Research on Disaster Risk (IRDR)	Kuniyoshi Takeuchi (JAPAN)
ICSU Regional Office for Africa (ROA)	Isabelle Ansorge (SOUTH AFRICA) Ali Tealeb (EGYPT)
ICSU Regional Office for Asia and the Pacific (ROAP)	Sukanta Roy (INDIA) Sri Widiyantoro (INDONESIA)
ICSU Regional Office for Latin American and the Caribbean (ROLAC)	Jaime U. Fucugauchi (MEXICO)
ICSU Scientific Committee on Antarctic Research (SCAR)	Ian Allison (AUSTRALIA)
ICSU Scientific Committee on Oceanic Research (SCOR)	Athena Coustenis (FRANCE) Eugene Morozov (RUSSIA)
ICSU Scientific Committee on Solar-Terrestrial Physics (SCOSTEP)	Vladimir Kuznetsov (RUSSIA)
World Climate Research Program (WCRP)	Tom Beer (AUSTRALIA)
ICSU World Data System (WDS)	Ruth Neilan (USA)

### **Report of the IUGG Liaison Officer to the Cartographic Section of the United Nations**

The First High Level Forum on Global Geospatial Information Management, co-organized by the Korean National Geographic Information Institute (NGII Korea) and the UN Department of Economic and Social Affairs (UN-DESA) and supported by the Permanent Committee on GIS Infrastructure for Asia and the Pacific (PCGIAP), the Permanent Committee for Geospatial Data Infrastructure of the Americas (PC-IDEA), and the Committee on Development Information, Science and Technology (CODIST) for Africa, was held from 24-26 October 2011 in Seoul, Republic of Korea. 350 participants from 90 countries, 22 United Nations representatives, and 37 representatives from international organizations and the private sector attended this meeting. The Forum acknowledged that common frameworks and methodologies are useful to increase the accessibility and sharing of data and welcomed the suggestions put forward on the global geodetic reference system (e.g. towards its adoption by countries in the world) and a global consultation mechanism on the adoption of technical standards. Also the Forum adopted the Seoul Declaration on Global Geospatial Information Management (GGIM), which particularly expresses a “support for the initiative of the United Nations to foster geospatial information management among UN Member States, international organizations, and the private sector”.

At the same occasion, the United Nations Committee of Experts on Global Geospatial Information Management (UNCE-GGIM), established by the United Nations Economic and Social Council

(ECOSOC) Resolution 2011/24 on 27 July 2011, as the official UN consultative mechanism on GGIM, convened its inaugural session on 26 October 2011. The inaugural meeting brought together experts from Member States and observers from international organizations to adopt the Terms of Reference of the Committee, review the Rules of Procedure of the Committee, and discuss its contribution to Rio+20 Conference as well as an inventory of critical issues to be addressed by the Committee. The second session of Committee will be held from 13-15 August 2012 at the United Nations Headquarters in New York. Additional information can be found at the web: <http://ggim.un.org> and <http://www.unggim2011.org>. (Received from Luiz Paulo Fortes.)

### **Report of the IUGG Liaison Officer to WCRP**

The Open Science Conference (OSC) of the World Climate Research Program (WCRP) was held in Denver, Colorado, 24-28 October 2011. WCRP is the major mechanism for the coordination and promotion of climate science and its applications. It is co/sponsored by the International Council for Science (ICSU), the Intergovernmental Oceanographic Commission of UNESCO, and the World Meteorological Organization (WMO). The WCRP establishes and coordinates major internationally coordinated research activities. Current major programs are the Climate and Cryosphere Program (CliC), the Climate Variability and Predictability Program (CLIVAR), the Global Energy and Water Experiment (GEWEX), and the Stratospheric Processes and their Role in Climate Program (SPARC). WCRP research is the major source of the assessments carried out by the Intergovernmental Panel on Climate Change (IPCC).

This major and unusual conference of all the programs of WCRP plus other research communities was aimed at identifying and establishing the major new directions of WCRP and how it will strengthen its collaborations with other related international efforts in biodiversity, human dimensions and economics. The meeting structure comprised a morning of keynotes in plenary, a large number of posters (around 1800 in total) and 3 parallel speaker sessions in the afternoons. The key outcome of the meeting was to identify the grand challenges facing the climate research community and help establish future priorities for climate research. As the meeting proceeded the concept of focusing research on the delivery of ‘climate services’ which would comprise ‘actionable science’ - forecasts that are sufficiently predictive, accepted and understandable to support decision-making, including capital investment decision-making. In his final remarks, Tony Busalacchi, WCRP President, mentioned some key themes that arose for future focus:

1. Predictions of the full Earth System including biological and human systems.
2. The persistent and critical uncertainties resulting from poorly constrained understanding of cloud-radiation feedback and clouds and aerosols, which are significantly hampering model development and evaluation, but also the potential for a strong ongoing observational program (of which, e.g., cloudsat and calypso are a start) to make substantial progress in this area.
3. Future climate on regional scales, via both high resolution global models and regional models used responsibly.
4. Estimating the “true uncertainty” - going beyond the “commonly used but poor proxy for uncertainty of model ensemble spread. In particular, development and use of stochastic physics and perturbed physics methods.
5. Decadal predictability – some great and promising work has started (MIROC-Japan; ECMWF and Hadley centre-Europe). What ocean observations are needed?
6. Polar predictability – we need to understand ocean/ice-sheet dynamics; ocean sea-ice dynamics.
7. Gain an understanding of regional sea level rise.
8. Capacity development, not only regionally, for effective applications, but also globally in terms of the next generation of scientists.

A selection of some other key issues are:

- USA/European budget impacts on key satellite missions – ocean vector winds may face major gaps and degradation; satellite gravity measurements that have revealed the acceleration of the mass loss from the ice sheets (Greenland and Antarctica) and track water budgets over land (such as groundwater changes), face a 5-7 year gap as the GRACE-follow-on will likely only

be launched in 2017 and GRACE will likely stop working in 2015, but could stop earlier; altimetry is relying on the JASON 2 satellite lasting well beyond its design life.

- The community as a whole struggles with the balance between service provision and spending resources on improving the core process understanding and models. Regarding the latter, the model/observationalist ‘Climate Process Teams’ created under US CLIVAR seems like an excellent model to follow, targeting process science and driving a fast pathway into improving the model physics.
- Susan Solomon’s talk on Climate Change commitment and irreversibility clearly communicates the long time scales for ‘recovery’ constrained by both the ocean slow thermal response time and the long residence of CO<sub>2</sub> in Earth’s atmosphere. The upshot is that the temperature reached even on total cessation of carbon emissions will not come down much over the next ~1000 years, essentially locking in this warming for many human generations. Sea levels will continue to rise during this time. She also demonstrated that emission reduction of the short lived GHGs (e.g. methane) cannot be traded for the long-lived CO<sub>2</sub> with regard to this long-term warm plateau, the intensity of which is dependent solely on the total time-integrated carbon emissions.

Meeting outcomes will be posted as a series of white papers edited to include community comments. All the talks and many of the posters presented at the meeting are available at <http://www.wcrp-climate.org/conference2011/>. (Received from Tom Beer.)

## **GEOSCIENCES, EARLY CAREER SCIENTISTS AND THE FUTURE OF PLANET EARTH**

IUGG continued its tradition to run a Union symposium dedicated specifically to the vision of early career scientists of the future of our planet. The Union symposium “Geosciences and the Future of Planet Earth” was held at the XXV IUGG General Assembly in Melbourne on 28 June 2011. Organized and convened by Harsh Gupta (Vice-President IUGG; currently IUGG President), the aim of this symposium was to invite early to mid-career scientists to make suggestions as to how IUGG and its Associations could enhance the role of earth and space sciences in the service of mankind. The very international array of speakers addressed the remit in a variety of ways. Kate Heal (UK, IAHS) and Adelina Geyer Traver (Spain, IAVCEI) focussed on communication between scientists, policymakers and the public.

In their talks, Kusumita Arora (India, IAGA), Abdul Azeez K. K. (India, IAGA), Endawoke Yisengaw (Ethiopia/USA, IAGA), Alexandra Yahn (USA, IAPSO), Rima Chatterjee (India, IASPEI), Gulam Babayev (Azerbaijan, IAG) and Claudia Emde (Germany, IAMAS) demonstrated the relevance of different areas of the geosciences to mankind, ranging from identifying alternative energy sources, mineral prospecting and hazard risk assessment to satellite-based communications and aviation. Claudia’s talk was extremely topical given the disruption to aviation caused by the ongoing eruption of the Chilean volcano, Puyuhue, and illustrated how basic science - in this case the development of new methods using polarised radiance fields for assessing mass concentration of ash – is of relevance to society. The presentations by James Wookey (UK, IASPEI) and Craig Rodger (New Zealand, IAGA) focussed more on the benefits of collaboration within the scientific community. James stressed the need to share and publish datasets requiring standards, which IUGG could play a role in endorsing and promoting. Craig emphasised that large international experimental collaborative networks are incredibly important to scientists in small countries and developing countries. He presented an example of such a network, the World Wide Lightning Location Network (wwlln.net), which operates on the principles of no exchange of funds and free exchange of data. The network is yielding many, and some unexpected applications, including early warning of volcanic eruptions and predicting tropical storm intensity. Scientific collaboration and networks were also the subject of the talk by Inga May (Germany, IACS). She introduced the highly successful APECS (Association of Polar Early Career Scientists, [www.apecs.org](http://www.apecs.org)) which facilitates research, career development and outreach activities for 2500 members in more than 45 countries and is run by enthusiastic, dedicated volunteers with only one full-time paid staff member. The symposium was very well attended and there was plenty of time between the talks for lively discussion. Many suggestions were made as to how to improve communication between scientists, the public and policy makers. They included an IUGG blog-space and using IUGG Assemblies to offer lectures to schools and colleges and engage with the

media. Examples were given of how scientists in Australia have improved communications with policy makers through scientists meeting parliamentarians on a regular basis and also the production of a National Strategy for Geosciences. Some participants emphasised the need to use professional communicators, but also the role of scientists in defining the messages to be communicated. A further point stressed during the talks and discussion was that a strategic approach by scientific organisations and also incentives for early and mid-career scientists are both required to fully address the immense challenge of more effectively communicating our science. Overall the Symposium formed a stimulating and multi-disciplinary start to the Assembly and it is hoped that the discussion engendered will be of benefit to IUGG activities. (Received from Kate Heal, School of GeoSciences, The University of Edinburgh, UK.)

### **IUGG AND ICTP TO PROMOTE EDUCATION IN GEOPHYSICS AND GEODESY**

The International Union of Geodesy and Geophysics and the Abdus Salam International Centre for Theoretical Physics (ICTP) have taken steps to enhance geophysical and geodetic education and science collaboration.



*ICTP Director F. Quevedo (right) and IUGG Secretary General A. Ismail-Zadeh*

On 6 October 2011, ICTP Director Fernando Quevedo and IUGG Secretary General Alik Ismail-Zadeh signed a Memorandum of Understanding to promote educational programs related to geodesy and geophysics for the next quadrennium (2012-2015). Among other points, the agreement encourages collaboration in the organization of advanced schools/workshops in geodesy and geophysics in ICTP or in economically less developed countries; in the development of diploma courses related to Earth and space sciences; and in the dissemination of information on educational and scientific meetings.

Founded in 1964 by the late Nobel Laureate Abdus Salam, ICTP seeks to accomplish its mandate by providing scientists from developing countries with continuing education and skills that they need to enjoy long and productive careers. ICTP has been a major force in stemming the scientific brain drain from the developing world. The impact of ICTP extends well beyond the Centre's facilities to virtually every corner of the Earth. The Earth System Physics (ESP) Section of ICTP studies a wide spectrum of the Earth system, from its fluid components (oceans and the atmosphere) to the planet's interior.

### **INTERNATIONAL COUNCIL FOR SCIENCE (ICSU) AND IUGG**

#### **ICSU Grant Awards**

The International Council for Science (ICSU) announced the 2011 awardees to be funded from the ICSU Grants Programme. The project proposal "eGYAfrica - better Internet connectivity for research and education institutions in Africa", submitted by IUGG, has been awarded EUR 20,000. The project is supported by the International Union of Geological Sciences (IUGS), the ICSU Committee on Data

for Science and Technology (CODATA), and the ICSU Regional Office for Africa. The ultimate goal of eGYAfrica is to help make African communities wealthier, safer, and more sustainable through full participation in the information revolution. The specific objective is to reduce the digital divide through better Internet access for scientists (and others) in Universities and similar research and education institutions in Africa. The tactical objective is to mobilise and empower the user community in African countries to influence decisions about Internet resource allocation at institutional, national, regional, and international levels. The end result sought is fuller participation by Africans scientists in main-stream research and education. The bulk of the proposed grant is for a 2012 eGYAfrica Workshop and planning meeting. The aim of the Workshop is to review and revise goals, work plans, and task allocations; heighten the common sense of purpose among eGYAfrica participants; strengthen and expand national eGYAfrica groups, and further collaboration with other organisations also concerned with reducing the digital divide in Africa. This Workshop and participation in other meetings/conferences will also raise awareness of the digital divide issue and what eGYAfrica and others are doing about it.

In 2011-2012 IUGG will be also involved in the TIERS project awarded by a 2011 ICSU grant and led by the International Geographical Union. The Trans-disciplinary Intercultural Ecological Research for Sustainability (TIERS) project will identify, collate, compare, and disseminate examples of integrative research on coupled social/natural systems and their applications to environmental policies from a broad array of cultures and traditions. A mix of young and seasoned scholars from different language and culture realms, from the natural, behavioural, and social sciences and from engineering and the humanities will meet for four days to present the latest relevant research in their respective specialties to environmental policy makers. The papers and conclusions from the conference will be reported in a special issue of a major environmental journal and will buttress ICSU-ISSC plans for a decade devoted to global sustainability research. Teaching modules based on the conference presentations will be prepared for use in schools.

### **30th ICSU General Assembly**

The 30th General Assembly of the International Council for Science (ICSU) kicked off in Rome on Tuesday, 27 September, to address key global challenges. The delegates of the general assembly represented 30 international scientific unions and more than hundred national academies and research councils from all parts of the world. The general assembly discussed how science could contribute to boosting sustainable development, understanding climate change, mitigating natural and human-induced disasters, and increasing well-being and health in the changing urban environment. Three distinguished scientists were invited to deliver key-note lectures during the General Assembly: Prof. Matthias Kleiner (President of the German Research Foundation – DFG, Germany), Prof. Johan Rockström (Executive Director, Stockholm Environmental Institute, Sweden), and Prof. Werner Arber (a winner of the 1978 Nobel Prize in Medicine, President of the Pontific Academy of Sciences, and former ICSU President).

The ICSU General Assembly endorsed plans for a new global initiative “*Health and Wellbeing in the Changing Urban Environment: A Systems Analysis Approach*”. Over half of the world’s population lives in urban areas and this proportion is increasing rapidly, generating new challenges for maintaining and improving human health and wellbeing. Simple models for population health often have limited applicability in complex urban settings, where decision-making and policies have to simultaneously take account of many different issues. The ICSU Science Plan lays out a new conceptual framework for considering the multi-factorial nature of both the determinants and the manifestations of health and wellbeing in urban populations. The application of systems analysis – quantitative modeling of relationships among interrelated systems – provides a mechanism for exploring this complexity and providing solutions to real-world problems. “The success of this initiative will depend on the extent to which scientists from different disciplines are able to work together to address urban problems in a way that is useful to decision-makers” says Landis MacKellar, an economist from the International Institute of Applied Systems Analysis (Laxenburg, Austria), who chaired the ICSU Planning Group. “It is an ambitious plan but the scale of urban health challenges is enormous and growing, so we have to be optimistic that the science and policy communities can come together around this to work out practical solutions.”



ICSU, within a global alliance of partners, established a major ten-year initiative, which aims to effectively deliver solution-oriented research on global environmental change for sustainability. This new international collaboration effort, the *Earth System Sustainability Initiative*, will provide global coordination for science to respond to the most pressing societal and environmental challenges. With its integrated approach based on the active involvement of a broad range of stakeholders, the initiative will provide support for actions towards sustainability. Its launch will be June 2012, at the United Nations “Rio+20” Conference on Sustainable Development, when policy- and decision-makers from across the world will explore new pathways to sustainable development. “For the first time on a global scale we can talk about effectively co-designed research on global environmental change, with researchers, donors and users working hand-in-hand to define goals and priorities upfront”, says Prof. Yuan Lee, winner of the 1986 Nobel Prize in Chemistry and ICSU President. Lee emphasizes that “this new broad partnership will ensure a step-change in international research coordination” and adds that “ICSU and its Members, representing the global scientific community, are fully committed and ready to promote this new effort that will further strengthen international science for the benefit of society.” (Source: ICSU Press Releases.)

### **IRDR and Assessment of Disaster Risk**

At the ICSU General Assembly in Maputo (Mozambique) a new interdisciplinary program on Integrated Research on Disaster Risk (IRDR) was established. The program is co-sponsored by the International Social Science Council (ISSC) and the United Nation International Strategy for Disaster Reduction (UNISDR). IRDR undertakes coordinated, international, multi-disciplinary research leading to more effective global societal responses to the risks associated with natural and human-induced environmental hazards. The program’s research goals are classified into three main research objectives: Characterization of hazards, vulnerability, and risk; understanding decision-making in complex and changing risk contexts; and reducing risk and curbing losses through knowledge-based actions. Jane Rovin, Executive Director of the IRDR International Program Office, presented the recent achievements of the Program.

One of the IRDR initiatives is to establish a project on assessment of integrated research on disaster risk (AIRDR), which will undertake the first systematic and critical global assessment of research on disaster risk. The goals of AIRDR are to provide a baseline of the current state of the science in integrated research on disaster risk to measure effectiveness of multiple programs, use it to identify and support longer-term science agenda for the research community and funding entities, and to provide scientific evidentiary basis in support of policy and practice.

During discussion of the IRDR activity, IUGG President Harsh Gupta thanked the IRDR Scientific Committee for the tremendous work they did during the short period of time. He highlighted a vital importance of assessment of disaster risks on global, regional and local levels by involving national governments. IRDR and other existing relevant institutions can and should start a negotiation on setting up a process of assessing and synthesizing the policy-relevant scientific results on disaster risks. The assessment would contribute to enhance the knowledge of disaster risk at global, regional, and local levels and the awareness of the people living with risk. The assessment should be undertaken by a high-level body of experts on disaster risk reduction to be established by governments.

“Today all governments recognize the importance of climate change and potential global warming of our planet. Thanks to the Intergovernmental Panel for Climate Change (IPCC). Unless the issue of disaster risk assessment is raised to a governmental level, society will be facing humanitarian catastrophes due to natural hazards and increasing vulnerability. We need an IPCC-type organization dealing with disaster risk assessment,” said IUGG Secretary General Alik Ismail-Zadeh. IUGG proposed a resolution on Science on Disaster Risk, which was supported by IRDR and several Scientific Union and National Members of ICSU. The proposed resolution was presented at the ICSU General Assembly. After discussion of the resolution, it was agreed that the resolution should be submitted to the new Executive Board of ICSU for a final approval before voting by ICSU members.



*During the Union Forum at the General Assembly of ICSU, FAO, Rome, Italy: IUGG President Harsh Gupta (right) and Secretary General Alik Ismail-Zadeh (left)*

### **Nobel Prize winning scientist is new President of ICSU**

Professor Yuan Tseh Lee, a Nobel Prize-winning chemist from China: Taipei became the new President of the International Council for Science (ICSU) at the conclusion of the 30th ICSU General Assembly. A world leader in the field of chemical dynamics, Lee had been elected by representatives from ICSU's 114 National Members and 29 International Scientific Unions at the previous General Assembly in Maputo, Mozambique in October 2008. He takes over from Prof. Catherine Bréchnignac, Permanent Secretary of the French Académie des Sciences. In his inaugural address to the delegates and guests of the ICSU General Assembly, Prof. Lee underscored the challenges facing society and science in the coming decades.



### **Canadian meteorologist elected as next President of ICSU**



Professor Gordon McBean, an internationally recognized meteorologist and climatologist, has been elected as the future President of the International Council for Science (ICSU). An established member of the ICSU community, McBean was elected by representatives from ICSU's 120 National Members and 30 International Scientific Unions gathered at the 30th ICSU General Assembly in Rome, Italy, from 27–30 September 2011. He is set to succeed the current ICSU President, Yuan Tseh Lee, in October 2014, and will be the first Canadian to take up this office. Gordon McBean was nominated by IUGG. McBean was an IUGG Bureau Member from 1987 to 1995. (Source: ICSU Press Releases).

## **IRDR Conference on Disaster Risk**

The Integrated Research on Disaster Risk (IRDR) is a new ICSU ten-year program enthusiastically supported by IUGG. The first IRDR Conference was organized in Beijing, China, and was conceived to respond to two fundamental questions: (i) why, despite advances in the natural and social science of hazards and disasters, do losses continue to increase; and (ii) to what extent is the world-wide growth in disaster losses a symptom and indicator of unsustainable development? In addition to these questions the Conference focused on the most important problems related to the reduction of disaster risk. This event was focused on the characterization of hazards, vulnerability, and risk; understanding decision-making in complex and changing risk contexts; and reducing risk and curbing losses through knowledge-based actions. It stressed the importance of developing resilient societies through disaster risk reduction, based on the guidance provided by the Hyogo Framework for Action (2005-2015): Building the Resilience of Nations and Communities to Disasters. The key outcome of the Conference was the 2011 Beijing Declaration for Integrated Research on Disaster Risk, which called for commitments to integration across disciplines; advanced research on natural, social, engineering, and technology aspects of disaster risk; collaboration; global standardization of open source information, disaster loss data etc; raising of awareness of decision makers and the public; a holistic approach in natural hazards and disaster risk education; and funding allocation to address the urgent need of applied integrated research on disaster risk.

The Integrated Research on Disaster Risk (IRDR) Conference kicked off in Beijing on 31 October with an opening ceremony featuring addresses from leading members of the scientific community. The speakers stressed the importance of disaster risk research, while recognizing the serious shortcomings in current approaches. “It should no longer be acceptable for people to lose their lives from disasters, because they live in places experts knew to be disaster-prone in the first place,” emphasized Yuan Tseh Lee, Nobel Prize Winner and ICSU President. Lee told delegates from some 40 countries that IRDR is “without question” one of the most important initiatives in ICSU’s upcoming strategic plan. Chair of the IRDR Scientific Committee Gordon McBean led the opening ceremony to commence the three-day conference, themed “Disaster Risk: Integrating Science and Practice”. McBean is ICSU President-elect, and he served on the Intergovernmental Panel on Climate Change and on the IUGG Bureau (1987-1995). The Opening Ceremony saw talks from Han Qide, Chair of the China Association for Science and Technology (CAST); Heide Hackmann, Executive Director of the International Social Science Council (ISSC); and Margareta Wahlström, the U.N. Secretary General’s Special Representative for Disaster Risk Reduction, who delivered a message from Geneva via a pre-recorded video.

Several distinguished experts delivered keynote talks at the Conference: Yoshiaki Kawata (Japan) spoke about the reconstruction plan after the Great East Japan Earthquake and Tsunami; Randolph Kent (UK) about emerging risks; John Handmer (Australia) about the link between hazards and politics; Huadong Guo (China) about recent progress of disaster risk research and mitigation in China; Wadid Erian (Egypt) about challenges and solutions in drought hazards and disasters; Mme Michaëlle Jean (Canada, UNESCO Special Envoy for Haiti and Former Governor General of Canada) about reducing Haiti’s vulnerability and the role of science; Guoxiong Wu (China, Ordinary Member of ICSU Executive Board and Immediate Past President of IAMAS) about formation of the disastrous Asian summer monsoon onset vortex; Susan Cutter (USA, IRDR Vice Chair and AGU Natural Hazards Focus Group Vice Chair) about the characterization of hazards, vulnerability and risk; Allan Lavell (Costa Rica) about understanding decision-making in complex and changing risk contexts, and Andrew Maskrey (Switzerland) about reducing risk and curbing losses through knowledge-based actions. IUGG Secretary General Alik Ismail-Zadeh spoke at the Conference’s special session “Barriers and Bridges”. His speech was related to barriers in extreme geohazards research and bridges between basic science and preventive disaster management.



*The rostrum of the IRDR Conference*



*At the IRDR Conference*

The conference is a major step forward in the IRDR program’s goal to bring together researchers, policy makers, and other stakeholders from diverse geographic, scientific, and institutional backgrounds. The program was founded on the idea that a new approach to disaster reduction was necessary in the face of increasing disaster losses. Co-sponsored by ICSU, ISSC, and the U.N. International Strategy for Disaster Reduction, IRDR was launched in 2010 with the ambition to complete its mission in 10 years. On 1 November Gordon McBean, one of the founders of IRDR and the first Chair of its Scientific Committee, retired from IRDR, and Sálvano Briceño (Venezuela) took the position of the Chair.

### **ICSU CODATA celebrated its 45<sup>th</sup> Anniversary in Beijing**

The year 2011 marks an important milestone in the decades-long history of the ICSU Committee on Data for Science and Technology (CODATA). On Sunday, 30 October 2011, CODATA celebrated its 45th Anniversary with a high-level scientific meeting in Beijing themed “Data-Intensive Science and Discovery – CODATA 45 years on”. Throughout the latter half of the XXth century, and now into the XXIst century, CODATA has played a leading role in promoting improved scientific and technical data management and use for the benefit of science and society in general. The meeting recognized CODATA’s accomplished past, and provided a platform for in-depth discussions on the current state and future of discovery and innovation in the age of data-intensive science. Over 100 experts and senior scientific authorities from CODATA, its national members and task groups, national academies of sciences, international scientific organizations, as well as selected attendees from the IRDR Conference, which took place from 31 October to 2 November, attended the event. ICSU President Y.T. Lee, ICSU President-elect G. McBean, and President of the International Geographical Union (IGU) R. Abler participated in the meeting.



*At the CODATA meeting*



*Y.T. Lee, ICSU President*



*C. Bai, President of Chinese Academy of Sciences*



*A. Ismail-Zadeh, IUGG Secretary General*

IUGG Secretary General A. Ismail-Zadeh was invited to take part in the panel session focused on the CODATA Strategic Plan over the next five years. He emphasized an importance of CODATA tasks groups in developing data science. As CODATA does not have centralized data resources, a closer cooperation between CODATA and the ICSU World Data System is required. IUGG could contribute to the CODATA activities by linking IUGG and Union Associations activities in the area (e.g., Union Commission on Data and Information, IAG program “Global Geodetic Observing System”, IASPEI Commission “International Federation of Digital Seismograph Networks (FDSN)”, IAGA Intermagnet, etc). IUGG appoints Union Liaison officers to CODATA; at present Alexei Gvishiani (Russia) and Mark Parsons (USA) are the IUGG Liaisons. For the last several years IUGG developed a fruitful cooperation with CODATA: IUGG and CODATA initiated two ICSU resolutions on digital divide and the International Polar Year (IPY) data preservation. We were successful in getting an ICSU grant on development of Polar Information Commons. IUGG hopes that the cooperation with CODATA will even greater strengthen in future.

### **World Science Forum, Budapest, Hungary**

Entitled “The Changing Landscape of Science: Challenges and Opportunities”, the 2011 World Science Forum (WSF) was organized by the Hungarian Academy of Sciences in cooperation with UNESCO, the International Council for Science (ICSU), and several other scientific organizations. The Forum was opened on Sunday, 16 November, in the Ceremonial Hall of the Hungarian Academy of Sciences. *Irina Bokova*, UNESCO Director-General, and *József Pálincás*, President of the Hungarian Academy of Sciences and the WSF, addressed the participants of the Forum. The Opening Ceremony was followed by an inauguration of the Photography Exhibition “Environmental Preservation towards Sustainable Development in Oman”, concert and an Opening Reception.



*Irina Bokova*



*Viktor Orban*



*Ban Ki-moon*



*Yuan Tseh Lee*

On 17 November, the Conference continued with the Opening Addresses from *Viktor Orban*, Prime Minister of Hungary, *Ban Ki-moon*, Secretary-General of the United Nations (video message), *Yuan Tseh Lee*, President of ICSU, *Alan Leshner*, Chief Executive Officer of AAAS, *Dominique Ristori*, Director-General of the Joint Research Centre of the European Commission, and the Russian cosmonaut *Sergei Volkov* (video message) who welcomed the participants of the Conference from the International Space Station (ISS). Several plenary sessions discussed the changing landscape of science and related challenges, opportunities, emerging scientific powerhouses, emerging fields of science, higher education's perspectives, policy implications and drivers. On 18 November the conference continued its work in several parallel sessions organized by the Hungarian Academy, AAAS, and ICSU on various topics including scientific collaboration and new generation of science and researchers, forum of global fora (like AAAS Annual Meetings, the EuroScience Open Forum, the OECD Global Science Forum, the STI Global Forum). A special session "Foresight Scenarios: What will international science be like in 2031?" was convened by *Carthage Smith*, Deputy Executive Director of ICSU. Three speakers presented the reports on a foresight analysis related to natural science, social science and global energy, namely, *John Marks* presented the ICSU Taskforce on Foresight, *Francoise Caillods* spoke about the World Social Science Report, and *Nebojsa Nakicenovic* discussed the global energy assessment report. *Attila Havas* of the Hungarian Academy of Sciences, *Michael Keenan* of OECD, and *Yuan T Lee* of ICSU were invited to comment on the report. At the closing session held in the Hungary's Parliament Building on 19 November 2011, Hungary's President *Pál Schmitt* emphasized the importance of international cooperation. Science is not the arena for competition, he said, but of uniting our strengths. The ethical responsibility of science to cause no harm is tied up with its great achievements, said *Katalin Bogyay*, President of the 36th General Conference of UNESCO. The highlight of the WSF closing event was the endorsement of the Declaration on a New Era of Global Science. The Declaration states that the treasure of scientific knowledge and its underlying research approaches are a common heritage of humankind. The next World Science Forum will be held in Rio (Brazil) in 2013.

IUGG was invited to attend the World Science Forum. On behalf of President *Harsh Gupta*, Secretary General *Alik Ismail-Zadeh* attended WSF to represent IUGG at the meeting.

## **ICSU GEOUNIONS**

### **GeoUnions Business Meeting**

GeoUnions (GUs) consortium was set up in 2004 as an informal forum of the leaders of the ICSU Scientific Unions dealing with Earth, space and planetary sciences in order to promote geosciences worldwide and to coordinate their activities. The consortium is comprised of the International Astronomical Union (IAU), the International Geographical Union (IGU), the International Union for Quaternary Research (INQUA), the International Society for Photogrammetry and Remote Sensing (ISPRS), the International Union of Geodesy and Geophysics (IUGG), the International Union of Geological Sciences (IUGS), the International Union of Soil Sciences (IUSS), and the International Union of Radio Science (URSI).

The GUs business meeting was held in Rome, Italy, on Sunday, 25 September 2011 in the Villa Celimontana (Home of Geography). Thanks to the Italian Geographical Society and IGU for arranging the meeting! Each Union reported on progress since the last business meeting in Paris (April 2010). IGU President R. Abler presented new initiative of the Union on International Year of Global Understanding (IYGU). The IGU seeks GeoUnions and UNESCO's support for the proclamation by the UN General Assembly of the IYGU 2014. This initiative aims to bridge the awareness gap between local acts and global effects. It will do this through research, education and information. IUGG Secretary General A. Ismail-Zadeh reported on the activities related to the ENHANS project (<http://www.enhans.org>), an IUGG initiative related to promotion of studies of natural hazards and disaster risk analysis, and to bridging natural and social sciences with engineering as well as science with society. Several Scientific Unions of ICSU and other multi-national and intergovernmental organizations supported the ENHANS project enthusiastically. ISPRS President O. Altan described a new ISPRS-UNSPIDER initiative and the Society's involvement in VALID project. The Value of Geo-Information for Disaster and Risk Management (VALID) project intends to study the economic, humanitarian, operational and organizational benefit, which can be realized by applying geoinformation to disaster management. ISPRS invited GUs to join the initiative. GUs discussed a possible cooperation in the global land cover mapping project presented by ISPRS Secretary General J. Chen.



*Participants of the GUs business meeting in Rome. (Left to right): Chen Jun (ISPRS Secretary General), Phil Wilkinson (URSI President), François Lefeuvre (URSI Past President), Peter Bobrowsky (IUGS Secretary General), Alberto C. Riccardi (IUGS President), Orhan Altan (ISPRS President), William Cavazza (IUGS Treasurer), Alik Ismail-Zadeh (IUGG Secretary General), Ian Corbett (IAU Secretary General), Harsh Gupta (IUGG President). Courtesy of Chen Jun.*

Also the GUs discussed the procedure of nomination of candidates to the ICSU Executive Board, the role of Unions in ICSU interdisciplinary scientific committees, and involvements of GeoUnions in the ICSU Regional Scientific Programs. Gordon McBean (a candidate for the position of the ICSU President-Elect) attended the meeting and presented his position statement. GUs analyzed the agenda topics of the Union Member Forum and the ICSU General Assembly and discussed their involvements in the U.N. Conference on Sustainable Development (Rio+20, <http://www.uncsd2012.org/rio20/>).

### **International Union of Geological Sciences celebrated its 50<sup>th</sup> Anniversary**

The International Union of Geological Sciences (IUGS) was established in 1961. IUGS promotes and encourages the study of geological problems, especially those of worldwide significance, and supports and facilitates international and interdisciplinary cooperation in the earth sciences. To celebrate its 50<sup>th</sup> anniversary and to highlight IUGS achievements for half a century, a special event was held on 21 February 2011 at the UNESCO Headquarters in Paris. IUGS President A. Riccardi, ICSU Executive

Director D. Chen, and Assistant Director General for Natural Sciences of UNESCO G. Kalonji welcomed participants to the anniversary event. Representatives of several organizations including M.-L. Chanin (Academie des Sciences, France) and Orhan Altan (ISPRS President), who spoke on behalf of ICSU GeoUnions, addressed the attendees. A keynote presentation “How Earth made us” was delivered by I. Stewart (University of Plymouth, UK). The event was followed by a conference on the topic “IUGS looking into the future”. IUGG Secretary General Alik Ismail-Zadeh attended the IUGS 50<sup>th</sup> anniversary.

### **IUGG General Assemblies and International Geological Congress**

Following two requests received from the IUGS German National Committee on 17 November 2009 and from the EuroGeoSurveys on 19 April 2010, for a long-term coordination of IGS and IUGG General Assemblies, with the main objective of reducing scheduling and venue conflicts, the International Geological Congress Council (IGCC) in its last meeting (Brisbane, 24-25 June 2010) decided to propose to IUGG the establishment of a working group (WG) to consider the issue. IUGS President Alberto Riccardi sent an invitation to IUGG to accept this proposal.

The IUGG Bureau at its meeting in Cairo discussed this proposal and, considering the importance of consultations in coordination of the Unions’ assemblies, decided to accept the invitation and appointed Dr. Aksel Hansen, Dr. Alik Ismail-Zadeh and Dr. David Jackson (alternate) as members of the IGCC/IUGS - IUGG WG. Dr. Ernesto Abbate, Dr. Peter Bobrowsky, and Dr. Anders Solheim (alternate) will represent IGCC/IUGS.

The first meeting of the WG was held in Paris on 22 February in conjunction with the IUGS Executive Committee meeting. E. Abbate (IGCC), P. Bobrowsky (IUGS) and A. Ismail-Zadeh (IUGG) took part in the meeting. Also A. Ismail-Zadeh attended the IUGS Executive Committee meeting on 22-23 February as a listener.

### **Initiative for the International Year for Global Understanding**

The initiator of the International Year for Global Understanding (IYGU) is the International Geographical Union (IGU), one of eight Scientific Unions of ICSU grouped in GeoUnions. From 12-14 May 2011, the Steering Committee, the Scientific Committee and the Outreach Committee held a meeting in Jena, Germany. In his welcome address the State Minister of Education, Science and Culture Mr. C. Matschie welcomed the members of the committees, those who represent several international bodies and countries from five continents. Mr. C. Matschie particularly emphasized the importance of the initiative for intercultural understanding in a world, in which we are all dependent on mutual cooperation and learning, and highlighted a number of challenges, such as climate change, hunger, sustainability and illiteracy that can only be tackled globally. The participants at the meeting identified another key IYGU point and satisfied another requirement: A binding scientific program was completed that is based on the guidelines for the 2014 UN theme year drafted in Weimar at the beginning of March 2011. Both the Outreach Program draft and the brochure draft have been completed, which will facilitate the application process towards the final UNESCO decision. Decisive stimuli were received for the drafting of the scientific and outreach programs – based on critical reflection of the guidelines drafted at the Weimar meeting – particularly from the conference reports received from diverse fields such as national economy, geodesy and geophysics, sociology, solid state chemistry, nutritional sciences, social and cultural geography, physical geography, educational science, geology, linguistics, philosophy, archaeology and environmental sciences. These contributions and the subsequent substantial discussions offered the points of departure for the drafting of the program brochure. The members responsible for the respective main subjects were identified, as was the constitution of the task forces. Alik Ismail-Zadeh, Secretary General the IUGG, attended the meeting as a member of the IYGU Scientific Committee. (Received from Benno Werlen, Executive Director of the IYGU Initiative.)

### **Closing Ceremony of the International Year of Chemistry**

The Closing Ceremony of the 2011 International Year of Chemistry (IYC2011) was held in Brussels, Belgium, on 1 December 2011. The Participants of the Ceremony were welcomed by the HRH Prince Philippe of Belgium; M. Geoghegan-Quinn, EU Commissioner for Research, Innovation and Science;



and by N. Moreau, President of the International Union of Pure and Applied Chemistry (IUPAC). All speakers highlighted the importance of chemistry in our society and reviewed some of the accomplishments of IYC2011, mainly in the area of education and public outreach. A group of young chemists in research and industry put forward their vision of the future by telling the stories of three accomplished chemical scientists in 2050. In doing so, they highlighted the potential role of chemistry in addressing society's biggest challenges: to guarantee pure water, food, energy, and healthcare for all. They advocated concerted efforts involving industry, academia, government, and the general public. The program continued with lectures on antibiotics by A. Yovath (Nobel Prize in Chemistry, 2009) and on organic light emitting diodes and photovoltaics by J.L. Brédas (Francqui Prize, 1997). There was an interesting panel discussion with scientists and industry leaders on various aspects of the future of chemistry, research, public-private partnership, the role of women in chemistry, and education. The IYC2011 was formally closed by M. Nalecz, Director, Division of Basic and Engineering Sciences at UNESCO, under whose auspices this International Year was organized.

The geophysics community might be interested in two particular achievements of IYC2011:

- A set of 9 lessons has been created for communicating climate change science, targeted at age 16-19 (<http://www.explainingclimatechange.com/>).
- A worldwide chemistry experiment “Water: A Chemical Solution” has been conducted during IYC2011. It actually consisted of running a set of four adaptable experiments focusing on water, aimed at a range of ages from primary school to high school. The experiments include determining the pH and salinity of water, which are parameters of geophysical relevance. The results are reported on the experiment's website (<http://water.chemistry2011.org/>).

This IYC2011 event was quite illuminating for a geophysicist, as it leads one to realize that there are very close ties between chemistry and geophysics. Some of the big challenges that were identified relate directly to geophysical problems. Hydrology plays a major role in addressing the challenge for access to pure water, for instance. The quest for sustainable energy sources involves studies of solar irradiance, greenhouse gas emissions and atmospheric chemistry, carbon capture and sequestration and geologic storage. On behalf of IUGG President H. Gupta, the President of the Belgian National Committee for Geodesy and Geophysics J. De Keyser attended the IYC2011 Closing Ceremony. More information on the IYC can be found at: <http://www.chemistry2011.org/>. (Received from J. De Keyser.)

## **ACTIVITIES OF THE UNION ASSOCIATIONS**

The following reports, prepared by the Secretaries General of the eight Associations of IUGG:

International Association of Cryospheric Sciences (IACS)

International Association of Geodesy (IAG)

International Association of Geomagnetism & Agronomy (IAGA)

International Association of Hydrological Sciences (IAHS)

International Association of Meteorology & Atmospheric Sciences (IAMAS)

International Association of the Physical Sciences of the Oceans (IAPSO)

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

International Association of Volcanology & Chemistry of the Earth's Interior (IAVCEI)

The reports illustrate the impressive range of activities within each Association as well as their dedication to supporting science within developing countries.

# IACS



## International Association of Cryospheric Sciences (IACS)

[www.cryosphericsscience.org](http://www.cryosphericsscience.org)

This report covers the period from January 2011 to February 2012.

### INTRODUCTION

The International Association for Cryospheric Sciences (IACS) is the Association of the International Union of Geodesy and Geophysics (IUGG) that is concerned with snow and ice science and which provides expert advice on cryospheric issues to governmental and non-governmental organisations. The objectives of IACS are to:

- promote studies of cryospheric subsystems of the Earth and solar system,
- encourage research in the above subjects by members of the cryospheric community, national and international institutions and programmes, and individual countries through collaboration and international co-ordination,
- provide an opportunity on an international basis for discussion and publication of the results of the above research,
- promote education and public awareness on the cryosphere, and
- facilitate the standardisation of measurement or collection of data on cryospheric systems and of the analysis, archiving and publication of such data.

### ADMINISTRATION

The business of IACS is managed by a Bureau of elected officers. Many of these officers were newly elected in 2011 at the XXV IUGG General Assembly held in Melbourne, Australia. The 2011-15 Bureau consists of:

President:	Ian Allison	AUSTRALIA	
President-Elect:	Charles Fierz	SWITZERLAND	
Vice-Presidents:	Olga Solomina	RUSSIA	
	Andrés Rivera	CHILE	
	Xiao Cunde	CHINA	
	Andrew Mackintosh	NEW ZEALAND	
	Secretary General:		
Heads of the Divisions:			
	Division I - Snow and Avalanches:	Ethan Greene	USA
	Division II - Glaciers and Ice Sheets:	Cecilie Rolstad Denby	NORWAY
	Division III - Marine and Freshwater Ice:	Hiroyuki Enomoto	JAPAN
	Division IV - Cryosphere, Atmosphere and Climate:	Valérie Masson-Delmotte	FRANCE
Division V - Planetary and Other Ices of the Solar System:	Ralf Greve	JAPAN	

Retiring members of the IACS Bureau include Past President Georg Kaser, Secretary General Manfred Lange, Peter Jansson, Gino Casassa, Kumiko Goto-Azuma, Claude Duguay and Julian Dowdeswell.

IACS facilitates the transfer of research methods and explores new avenues in cryospheric science through Standing Groups and Working Groups devoted to a theme or subject and composed of experts in the particular field of study. The currently active Working Groups (WG) of IACS are the WG on Glacier Mass Balance Terminology and Methods and the WG on Flow Law for Polycrystalline Ice. The current Standing Groups (SG) are the Joint Commission on Volcano-Ice Interactions (with the International Association of Volcanology and Chemistry of the Earth's Interior - IAVCEI), the SG on Glacier and Permafrost Hazards in Mountains (GAPHAZ, a joint SG with the International Permafrost Association - IPA) and the Steering Committee of the Global Terrestrial Network for Glaciers (GTN-G).

## ACTIVITIES

During 2011 a new “Glossary of Glacier Mass Balance and Related Terms”, produced by the WG on Glacier Mass Balance Terminology and Methods, was published by the International Hydrological Programme of UNESCO. This, the first comprehensive update of glacier mass balance terms for more than 40 years, provides a systematic, concise and unambiguous mass balance terminology.

The XXV IUGG General Assembly provided a special opportunity to meet and carry out business, and IACS held four meetings (Plenary Administrative Meeting, where new officers were elected, IACS Bureau Meetings 6.1, 6.2, and 7).

IACS also sponsored a Union Lecture and other symposia during the General Assembly. The Union Lecture was given by David Vaughan (British Antarctic Survey) on “The Hidden History of Ice Sheets: The Secret to Predicting Sea-level Rise”. This lecture (the Radok Memorial Lecture) was named in honour of a past President of the International Commission on Snow and Ice (the forerunner of IACS) who died during the last IUGG Quadrennium. In addition, IACS-sponsored symposia at the IUGG General Assembly included J-C01 Arctic System Modelling, J-C02 Snow and Avalanches in the Southern Hemisphere, J-C03 Snow – Atmosphere Interactions in Mountains, J-C04 Ice Shelves and Glacier Tongues – Ice on the Edge, C-01 Remote Sensing of the Cryosphere - linking and validating measurements from satellite, air, and ground, C-02 Ice Cores and Climate, C-04 Morphology of Snow and Ice on the Ground and in the Atmosphere, and C-05 Glacier and Ice Cap Fluctuations.

IACS proposed a Resolution regarding both the Glossary of Glacier Mass Balance and Related Terms and the International Classification of Seasonal Snow on the Ground to the IUGG Council at the General Assembly [urging] ‘all snow and ice scientists, practitioners, and scientists from related disciplines to adopt these new schemes as standards.’ This resolution was adopted by Council and is available on the IUGG website (in English) at <http://iugg.org/resolutions> and (in French) at <http://iugg.org/resolutions/fr>.

H. Gerald (Gerry) Jones was appointed an “Honorary Member of IACS” at the IUGG General Assembly, in recognition of outstanding service, particularly his unselfish and untiring commitment to establishing IACS as the 8th IUGG Association.

A two day symposium, co-sponsored by IACS, the Scientific Committee on Antarctic Research (SCAR) and the International Arctic Science Committee (IASC), was held in Siena, Italy in September 2011 to consider the legacy of the International Polar Year 2007-2008 and any unaddressed aspects of polar science within the context of the International Council for Science (ICSU) Grand Challenges. A statement from this meeting was presented to the ICSU General Assembly in Rome the following week. At the Siena symposium, a Memorandum of Understanding (MoU) between the Association of Polar Early Career Scientists (APECS) and IACS was signed. The MoU identifies a joint commitment to the professional development of early career polar and other cryospheric researchers and the need for a continuum of leadership in polar research and cryospheric sciences as important mutual aims of all Parties.

In May 2011 an IACS representative (G. Kaser) was invited to present an overview on "Ice Changes in Antarctica, the Himalayas and Other Mountain Glacier Regions" to policy-oriented negotiators at a workshop on research held in conjunction with the United Nations Framework Convention on Climate Change (UNFCCC) climate negotiations meeting in Bonn, Germany.

IACS was represented at the IASC Council meeting, held in conjunction with Arctic Science Summit Week, in Seoul, Korea in March. In November 2011, IACS representatives took part in the implementation meeting of the World Meteorological Organisation (WMO) initiative Global Cryosphere Watch (GCW). GCW is envisaged as an international mechanism for supporting key cryospheric in-situ and remote sensing observations, from research and operations, and for implementing the recommendations of the Integrated Global Observing Strategy Partnership (IGOS-P) - Cryosphere theme. Among the many topics on the agenda were the definition and implementation of observation “super” sites, a data portal for cryospheric data from and for both the operational and scientific cryospheric community, and a common terminology.

## **FUTURE ACTIVITIES**

The next Bureau meeting will be held following the “International Conference on Cryosphere: Changes, Impacts and Adaptation” in Sanya, China between November 13-14, 2012.

During 2012 IACS will provide representation at several meetings. This includes a Climate and Cryosphere (CliC) Scientific Steering Group meeting in Innsbruck in March, IASC and SCAR delegate meetings in April and July respectively, and at a GTN-G Executive Board Meeting during the European Geophysical Union (EGU) meeting in Vienna (22-27 April 2012). The President of IACS will provide representation for ICSU within a Steering Group of scientists from organisations with polar interests who will undertake initial concept planning for a possible new long-term polar science initiative.

A "Memorandum of understanding between Organizations acting in the field of Cryospheric Sciences", including IACS, has been negotiated to better co-ordinate the mutual activities, and in particular the organization and planning of symposia, conferences and workshops so as to avoid conflict of those activities. At the present time (February 2012), this MoU is in the final stages of being implemented.

Planning is now well advanced for the Joint International Association of Meteorology and Atmospheric Sciences (IAMAS)/IACS Assembly in Davos, Switzerland in 2013 (DACA-13, the Davos Atmosphere and Cryosphere Assembly 2013 <http://www.daca-13.org/welcome.html>). The theme of the conference is Air, Ice & Process Interactions, and it will comprise a number of self-contained symposia on focused atmospheric and cryospheric topics as well as numerous joint atmosphere-cryosphere symposia/sessions. A Swiss National Organizing Committee was already established in 2010, and they have now had several meetings, in order to organise all aspects of the conference, including the scientific programme, financials, and the venue. The Assembly will be held between 8-13 July 2013 at the Davos Congress Centre. A request for symposia was sent out to the community after IUGG Melbourne, and we currently have around 40 proposed sessions.

Submitted by  
Ian Allison, IACS President  
Charles Fierz, IACS President Elect  
Andrew Mackintosh, IACS Secretary General



## **International Association of Geodesy (IAG)**

Home: <http://www.iag-aig.org>

Office: <http://iag.dgfi.badw.de>

### **INTRODUCTION**

The mission of the IAG is the advancement of geodesy. The mission is implemented by furthering geodetic theory through research and teaching, by collecting, analysing, modelling and interpreting observational data, by stimulating technological development and by providing a consistent representation of the figure, rotation, and gravity field of the Earth and planets, and their temporal variations.

The components of IAG are four Commissions, the Inter-Commission Committee on Theory (ICCT), fifteen international scientific Services, the Global Geodetic Observing System (GGOS), and the Communication and Outreach Branch (COB). The Commissions are subdivided in Sub-commissions, Projects, Study and Working Groups. The ICCT investigates overall geodetic problems in Joint Study Groups with the Commissions. The Services provide scientific products employing Operation, Data and Analysis Centres. GGOS is to provide the observations needed to monitor, map and understand changes in the Earth's shape, rotation and mass distribution, as well as the global frame of reference for measuring and consistently interpreting key global change processes based on the products of the Services. The COB provides communication, public information and outreach links, in particular via the IAG Website (<http://www.iag-aig.org>) and the monthly Newsletters.

The IAG administration is supervised by the Council and operated by the Bureau, the Executive Committee and the Office. The membership of the Council consists of delegates appointed by the adhering bodies; the Bureau is formed by the IAG President, Vice-President and Secretary General; and the Executive Committee includes the Bureau and other members elected by the Council; the Office is to assist the Secretary General. All these entities inform each other at the Executive Committee meetings. The detailed programme is published in the quadrennial Geodesist's Handbook, and reports are given in the bi-annual Travaux de l'AIIG.

### **ADMINISTRATION**

#### **IAG Council**

The IAG Council met twice in 2011 during the IUGG General Assembly in Melbourne, Australia. Main topics were the election process of the new IAG officers, the auditing and approval of the IAG budget, the approval of IAG resolutions, and the election of the venue of the Scientific Assembly 2013, which will be held on the occasion of the 150<sup>th</sup> anniversary of IAG at the place of its creation in Berlin/Potsdam, Germany.

#### **IAG Executive Committee (EC)**

The old IAG EC (2007-2011) met four times in 2011 during the IUGG General Assembly in Melbourne. Most important topics were the final reports of all IAG components (Commissions, ICCT,

Services, GGOS, COB) and of the Editor in Chief of IAG's Journal of Geodesy. The IAG resolutions were discussed and the new Chairs of ICCT and GGOS were appointed. The new IAG EC (2011-2015) consists of:

**IAG Bureau:**

President:	Chris Rizos	AUSTRALIA
Vice-President:	Harald Schuh	AUSTRIA
Secretary General:	Hermann Drewes	GERMANY
Immediate Past President:	Michael G. Sideris	CANADA
Commission Presidents:		
Commission 1:	Tonie van Dam	LUXEMBOURG
Commission 2:	Urs Marti	SWITZERLAND
Commission 3:	Richard Gross	USA
Commission 4:	Dorota Greiner-Brzezinska	USA
Chair, Global Geodetic Observing System (GGOS):	Hansjörg Kutterer	GERMANY
President, Communication & Outreach Branch:	József Ádám	HUNGARY
Representatives of the IAG Services:	Riccardo Barzaghi	ITALY
	Thomas Herring	USA
	Ruth E. Neilan	USA
IAG Members at Large:	Claudio Brunini	ARGENTINA
	Richard Wonnacott	SOUTH AFRICA

The new EC held its constituting meeting at the end of the General Assembly on July 7, 2011. The summaries of all EC meetings are published in the IAG Newsletter in the IAG Journal of Geodesy (Springer Verlag), and in the Homepages of IAG (<http://www.iag-aig.org>) and IAG Office (<http://iag.dgfi.badw.de>).

**IAG Bureau**

The IAG Bureau made the day-to-day decisions via Internet and held regular teleconferences. Formal meetings were held during the IUGG General Assembly in Melbourne. The IAG President and the Vice-President represented IAG in various international meetings (see below). The IAG Secretary General represented IAG at the 150<sup>th</sup> anniversary of the Swiss Geodetic Commission, Zürich, Switzerland, June 10, 2011.

**ACTIVITIES**

**Scientific Assemblies, Symposia and Meetings**

IAG organized 14 symposia (1 Union Symposium, 6 Joint Symposia, and 7 IAG Symposia) and co-sponsored other 15 symposia (8 Union Symposia and 7 Joint Symposia) during the IUGG General Assembly in Melbourne, June 29 – July 6, 2011. In addition, 19 business meetings of IAG components (Commissions, Services) and sub-components (Projects, Study and Working Groups) were held. The proceedings with the accepted papers will be published in the IAG Symposia Series, Springer-Verlag.

Other important meetings of IAG components and IAG sponsored meetings were in 2011:

- Cryosat Validation Workshop, Frascati, Italy, February 1-3, 2011.
- 20<sup>th</sup> EVGA Meetg. & 12<sup>th</sup> VLBI Analysis Workshop, Bonn, Germany, March 29-31, 2011.
- 4th GOCE User Workshop, Munich, Germany, March 31 - April 1, 2011.
- 1st International Workshop “The Quality of Geodetic Observation and Monitoring Systems” (QuGOMS), Garching/Munich, Germany, April 13-15, 2011.
- Third Conference “Earth Observation for Global Changes (EOGC2011)”, Munich, Germany, April 13-15, 2011.
- Meeting of the Working Group on Gravimetry (WGG) of the BIPM Consultative Committee for Mass and Related Quantities (CCM), May 10, 2011.

- 17th International Workshop on Laser Ranging and 23rd General Assembly of the International Laser Ranging Service (ILRS), May 15-20, 2011, Bad Kötzing, Germany.
- Sub-Commission 1.3a “EUREF” Symposium, Chisinau, Republic of Moldova, May 25-28, 2011.
- 2nd GIA Modeling Training School, Gävle, Sweden, 13-17th June 2011.
- International Workshop on GNSS Remote Sensing for Future Missions and Sciences, Shanghai, China, August 7-9, 2011.
- Sub-Commission 1.3b “SIRGAS” General Meeting, Heredia, Costa Rica, Aug. 8-10, 2011.
- 3<sup>rd</sup> International Colloquium “Scientific and Fundamental Aspects of the Galileo Programme, Copenhagen, Denmark, August 31 - September 2, 2011.
- Joint International Symposium on Deformation Monitoring, Hong Kong, China, November 2-4, 2011.

### **IAG Office**

A main activity of the IAG Office in 2011 was the preparation of IAG’s participation in the IUGG General Assembly 2011 (see above). Publication of the Journal of Geodesy and the IAG Symposia series, both in Springer-Verlag, was administered, and reports of IAG’s activities were prepared. Travel grants were assigned to young scientists for participation in symposia. The individual IAG membership was regularly updated and the fee was collected. IAG Council and EC meetings were prepared including detailed minutes for the participants and meeting summaries for publication in the Internet and in the IAG Newsletters.

### **Communication and Outreach Branch (COB)**

The COB maintained the IAG Homepage and published the monthly Newsletters online and in the Journal of Geodesy. The IAG Newsletter is also sent to the Presidents and Secretaries General of the IUGG Associations and members of the Joint Board of Geospatial Information Societies (JBGIS). Another main outreach activity is the compilation and distribution of the IAG leaflet and IAG brochure among institutions and at meetings.

### **Commissions and Inter-Commission Committee**

The four IAG Commissions and the Inter-Commission Committee on Theory (ICCT) are maintaining their individual Homepages. They organized symposia and business meetings, and participated in joint symposia at the IUGG General Assembly and during the year 2011. Several sub-components (Sub-Commissions, Working and Study Groups) held their own symposia (see above: EUREF, SIRGAS, GOCE, GIA, GNSS RS, QuGOMS).

### **Services**

The fifteen IAG Services are maintaining their own Homepages (all accessible via the IAG Homepages) and data servers. They held their regular administrative meetings (Coordinating Board, Directing Board or Governing Board, respectively) and participated in the symposia at the IUGG General Assembly 2011. Several Services participated in international meetings during the year 2011 (see above: Galileo, EVGA, ILRS, GOCE, Cryosat, BIPM).

### **Global Geodetic Observing System (GGOS)**

A complete review of the structure of GGOS during a retreat in February 2011 gave rise to new Terms of Reference and a new structure which were adopted by the IAG Executive Committee. The new structure includes the Consortium composed by representatives of the Commissions and Services, the Coordinating Board as the decision-making body, the Executive Committee, and the Science Panel. The scientific work of GGOS is structured by Themes, Working Groups and Bureaus. The outreach is done by the GGOS Portal, Webpages ([www.ggos.org](http://www.ggos.org)), an exhibit booth, brochures and books. GGOS is representing IAG in the Group on Earth Observation (GEO) and contributes to the GEO Work Plan and GEO System of Systems (GEOSS). The GGOS Inter-Agency Committee (GIAC) held its first meeting in April 2011 with 16 participating agencies.



## **Cooperation with other Organisations**

IAG maintains close cooperation with several organizations outside IUGG. In 2011 there were meetings with the Advisory Board on the Law of the Sea (ABLOS, together with IHO), Group on Earth Observation (GEO, with IAG as a participating organization), International Standards Organization (ISO, with IAG represented in TC211 Geographic Information / Geomatics), Joint Board of Geospatial Information Societies (JBGIS), United Nations Offices for Outer Space Affairs (UNOOSA, with participation in Space-based Information for Disaster Management and Emergency Response, UN-SPIDER, and International Committee on Global Navigation Satellite Systems, ICG).

## **Publications**

The monthly issues of the Journal of Geodesy, the proceedings of the IAG Scientific Assembly 2009 (IAG Symposia Series Vol. 136) and the book “System Earth via Geodetic-Geophysical Space Techniques” were published in Springer-Verlag. The IAG Reports 2011 (Travaux de l’AIG Vol. 37) were published online in the IAG Homepages.

## **Awards, anniversaries, obituaries**

The following medals and prizes were awarded during the IUGG General Assembly 2011:

- Levallois Medal for distinguished service to IAG and geodesy in general to Ruth Neilan, USA;
- Bomford Prize for outstanding contributions to geodetic studies to Johannes Boehm, Austria;
- Young Author Award for important contributions in the Journal of Geodesy to Elizabeth Petrie, UK.

Several travel awards were granted to young scientists (not older than 35 years), in particular for participation in the IUGG General Assembly.

Obituaries were written and published in the IAG Newsletters for former IAG officers and outstanding geodesists who passed away:

- Arne Bjerhammar, Sweden;
- István Fejes, Hungary;
- Andry Finkelstein, Russia;
- Soren Henriksen, USA;

## **PLANNED AND FUTURE ACTIVITIES**

Important activities for the next years are related to the celebration of the 150<sup>th</sup> anniversary of IAG with the culmination in the IAG Scientific Assembly 2013 in Potsdam, Germany. A focus will be laid on GGOS, whose new structure with the three principal themes “Unified Height System”, “Geohazards Monitoring”, and “Sea Level Change” has to be consolidated. The IAG Services will continue in providing regularly products for use in science and practice, and for the benefit of society in general. IAG Commissions and Services will hold their own and actively participate in IUGG and other interdisciplinary symposia and meetings, e.g. of the Fédération Internationale des Géomètres (FIG), the International Astronomical Union (IAU), the Committee on Space Research (COSPAR), the American Geophysical Union (AGU), the Asia Oceania Geosciences Society (AOGS), and the European Geosciences Union (EGU).

Submitted by  
Hermann Drewes, IAG Secretary General



## **International Association of Geomagnetism and Aeronomy (IAGA)**

[www.iugg.org/IAGA/](http://www.iugg.org/IAGA/)

### **INTRODUCTION**

IAGA, the International Association of Geomagnetism and Aeronomy (AIGA - Association Internationale de Géomagnétisme et d'Aéronomie) is one of the eight Associations of the International Union of Geodesy and Geophysics (IUGG). It is a non-governmental body funded through the subscriptions paid to IUGG by its Member Countries. IAGA has a long history and can trace its origins to the Commission for Terrestrial Magnetism and Atmospheric Electricity, part of the International Meteorological Organisation which was established in 1873.

IAGA is the premier international scientific association promoting the study of terrestrial and planetary magnetism, and space physics. IAGA is concerned with the understanding and knowledge that result from studies of the magnetic and electrical properties of:

- the Earth's core, mantle and crust
- the middle and upper atmosphere
- the ionosphere and the magnetosphere
- the Sun, the solar wind, the planets and interplanetary bodies.

### **ADMINISTRATION**

IAGA is organised into five Divisions and two Interdivisional Commissions each led by a Chair and Co-Chair. Each Division/Commission may form Working Groups in specialist topic areas and elect officers to run the business of the Working Groups. During the XXV IUGG General Assembly in Melbourne 2011, Earth on the Edge: Science for a Sustainable Planet, IAGA renews its officers. The following link leads to lists of the Division/Commission leadership and the Working Group names and officers: [http://www.iugg.org/IAGA/iaga\\_pages/science/sci\\_structure.htm](http://www.iugg.org/IAGA/iaga_pages/science/sci_structure.htm)

IAGA is administered by an Executive Committee on behalf of IUGG Member Countries in accordance with the Association's Statutes and By-Laws. IAGA communicates with Member Countries through National Correspondents nominated by appropriate national bodies. The election process was conducted using the scheme proposed by David Kerridge, Chairman of the Nominating Committee, and approved by the Conference of Delegates. The newly elected Executive Committee members are:

President:	Kathryn Whaler	UK
Vice-President:	Eduard Petrovsky	CZECH REPUBLIC
Secretary General:	Mioara Manda	FRANCE
Past President:	Eigil Friis-Christensen	DENMARK
Members:	Archana Bhattacharyya	INDIA
	Iver Cairns	AUSTRALIA
	Jeffrey Forbes	USA

Toshihiko Iyemori	JAPAN
Monika Korte	GERMANY
Laszlo Szarka	HUNGARY
Andrew Yau	CANADA

## ACTIVITIES

### The XXV IUGG General Assembly

The year 2011 has been marked by the XXV IUGG General Assembly in Melbourne 2011, Earth on the Edge: Science for a Sustainable Planet. The number of IAGA registrants (536) was smaller than at the previous IUGG meeting in Perugia (669). However, the IAGA presence was remarkable, as IAGA scientists were involved in organising 4 Union symposia, and led 5 Inter-Association symposia; the IAGA-only part of the meeting consisted of 16 symposia, sub-divided into several parts, spanning the full range of IAGA science interests.

The IAGA programme began on 29 July and ran through to the end of the General Assembly. As we move out of a period of exceptionally low and prolonged solar activity, space weather issues are going to become more important, especially given mankind's increasing dependence on satellite technology; alongside this, radiation belt studies, and studies of the electromagnetic earth environment, are crucial. Both these themes featured strongly in the IAGA programme. Other highlights included results from the Decade of Geopotential Research, particularly from the three low Earth orbiting magnetometry satellites Oersted, CHAMP and SAC-C, and anticipating the ESA multi-satellite mission Swarm; and the importance of data assimilation in geodynamo and related studies, incorporating techniques developed from other branches of IUGG science, especially meteorology. The meeting brought many occasion for scientists to discuss all these topics, over breaks, poster sessions, and at the IAGA dinner.



The 'IAGA Medal in Recognition of Valued Services to the IAGA Community over Many Years' was awarded to Bengt Hultqvist. The following young scientists received the 2009- 2010 IAGA Young Scientist Award: Annika Seppälä, Joanna Roszkowska-Remin, Gilda Currenti.

The Finance Committee analysed the IAGA financial situation and concluded that at the beginning of 2011, the total amount of IAGA funds was on the order of three times the total expenditure for a year during which there is an Assembly.

Changes in Statute 15 (Modification of the Status), Statute 16 (Modification of the By-Laws), and By-Law 4 (Honorary Membership of IAGA) were proposed and accepted.

Four resolutions were presented and accepted. They are available (in English and French) on [http://www.iugg.org/IAGA/iaga\\_pages/Resolutions/Resolutions.htm](http://www.iugg.org/IAGA/iaga_pages/Resolutions/Resolutions.htm)

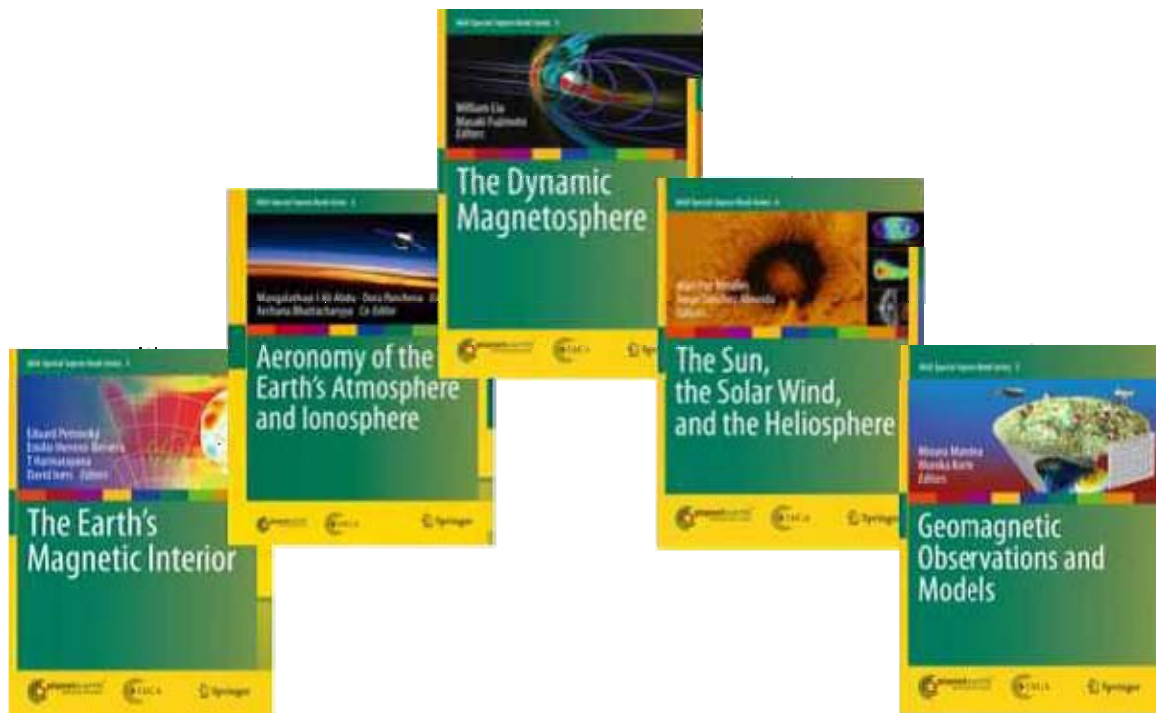
## Sponsored Topical Meetings

IAGA sponsored the following four topical meetings during 2011:

- February, 14-18 4th IAGA/ICMA/CAWSES-II TG4 Workshop on Vertical Coupling in the Atmosphere/Ionosphere System - Prague (Czech Republic)
- May, 9-11 3rd International High Energy Particle Precipitation in the Atmosphere (HEPPA) Workshop - Granada (Spain)
- November, 13-17 IAGA-III-Symposium Heliospheric Physics during and after a deep solar minimum - Luxor (Egypt)
- November 23-26 Second Biennial Meeting of the Latin-American Association of Paleomagnetism and Geomagnetism (Latin-Mag) - Tandil (Argentina)

## Publications

One of the most important achievements of IAGA during the last two years was to publish, with Springer, a series of five books, representing results obtained by the IAGA five divisions over recent years. As well as providing useful reference texts, the income to IAGA from Springer for this venture was used to support scientists attending the last SA in Sopron, Hungary.



IAGA News 48 was distributed at the end of December 2011. It can be found at the IAGA web site [www.iugg.org/IAGA](http://www.iugg.org/IAGA). Among other things, reports from topical meetings co-sponsored by IAGA can be found there.

## PLANNED FUTURE ACTIVITIES

The XIIth Scientific Assembly is going to be held in Mérida Yucatán, Mexico, from August 26 to 31, 2013. The preparation of the scientific program is the core of our future activities.

Submitted by  
Mioara Manda, IAGA Secretary General



## **International Association of Hydrological Sciences (IAHS)**

<http://iahs.info>

### **INTRODUCTION**

IAHS promotes the study of all aspects of hydrology through discussion, comparison, and publication of research results and through the initiation of research that requires international cooperation. IAHS Press publishes the Hydrological Sciences Journal, the Red Book Series, the Benchmark Paper series, and other specialised publications. IAHS maintains strong connections with the International Hydrological Programme of UNESCO and with the Hydrology and Water Resources Programme of the World Meteorological Organisation (WMO).

The following International Commissions of IAHS initiate and conduct conferences, symposia, workshops, courses, and research programmes:

- International Commission on Continental Erosion (ICCE)
- International Commission on the Coupled Land-Atmosphere System (ICCLAS)
- International Commission on Groundwater (ICGW)
- International Commission on Remote Sensing (ICRS)
- International Commission on Snow and Ice Hydrology (ICSIH)
- International Commission on Statistical Hydrology (ICSH) – new from 2011
- International Commission on Surface Water (ICSW)
- International Commission on Tracers (ICT)
- International Commission on Water Quality (ICWQ)
- International Commission on Water Resources Systems (ICWRS)

### **ADMINISTRATION**

At the IUGG General Assembly in Melbourne, Australia, elections were held for officers of the Association and its Commissions. The detailed results are to be found on the Association web site: <http://iahs.info>. The new Bureau officers of IAHS for the term 2011-2013 are:

President:	Gordon Young	CANADA
President Elect:	Hubert Savenije	THE NETHERLANDS
Vice-Presidents:		
Relations with Developing Countries:	Denis Hughes	SOUTH AFRICA
Planning of Assemblies:	Liliang Ren	CHINA
Education & Capacity Building:	Thorsten Wagener	USA
Secretary General:	Christophe Cudennec	FRANCE
Treasurer:	Charles A. Onstad	USA

The Plenary also decided the evolution of the Working Group on statistical hydrology into the International Commission on Statistical Hydrology (ICSH).

There were also two meetings of the IAHS Bureau: one of the old Bureau and one of the new. Among the many other items of business, the Bureau formally terminated the Working Groups on hydrometeorology and on GRACE, and confirmed those on precipitation and on education. The last biennium of the PUB decade has been discussed, to be wrapped up at the IAHS 90th Anniversary meeting to be held in Delft in October 2012. It has been decided to launch a new scientific decade 2013-2022, following the PUB decade. A task force has been set up to shape this new scientific decade.

## ACTIVITIES

The main event of 2011 has been the Melbourne General Assembly, where IAHS organized 14 Symposia and Workshops and co-convened 7 other events. The two Plenary meetings that we held in the second week of the Assembly were well attended. Reports on past activities were presented. Carlos Tucci (Brazil) has been awarded the IAHS-UNESCO-WMO International Hydrology Prize. Emmanuel Pagneux (Iceland) received the Tison Award for young scientist. Funds from IAEA, UNESCO and WMO as well as from Taylor and Francis allowed the provision of grants and banquet invitations to delegates from developing countries.

Other events took place in Melbourne, including general assemblies of commissions, a meeting of National Associations of hydrology, an open brainstorming meeting on the future IAHS scientific decade. A blog has been then set up by the ad hoc task force to continue and enlarge this brainstorming.

In addition to Melbourne, many scientific events have been organized, sponsored or supported by IAHS and its Commissions and Working Groups in 2011. Among them we would like to quote the following:

- Symposium on Climate change challenges in River Basin Management (Oulu, Finland 17-20 January), 4ème Colloque International sur les Ressources en Eau et le Développement Durable (Alger, Algérie, 21-23 February),
- International Symposium on Isotopes in Hydrology, Marine Ecosystems, and Climate Change Studies (Monaco, 27 March-1 April),
- 6e Journées scientifiques du 2iE (Ouagadougou, Burkina Faso, 4-8 April),
- The Status and Future of the World's Large Rivers (Vienna, Austria, 11-14 April),
- 8th International Symposium on Weather Radar and Hydrology (Exeter, UK, 18-21 April),
- International Symposium on Climate Change and Water (Nanjing, China, 19-21 April),
- International PUB Workshop - Putting PUB into Practice (Canmore, Canada, 11-14 May),
- International Balkans Conference on Challenges of Civil Engineering (Tirana, Albania, 19-21 May),
- 5th International Conference on Flood Management (Tokyo, Japan, 27-30 September),
- International Symposium on Impacts of Climate Change on Water Resources in Arid and Semi-arid Regions (Xi'an, China, 21-23 October),
- Kick-off and international Workshop HYPE Open Source Community (Stockholm, Sweden, 23 November).

## IAHS Publications

In 2011 IAHS Press published eight issues of the *Hydrological Sciences Journal*, including two special issues: 1) Water crisis: From conflict to cooperation guest edited by B. Sivakumar; 2) Ecosystem services of wetlands guest edited by Mike Acreman.

IAHS Press published 9 *Red Books*:

- Calibration and Reliability in Groundwater Modelling, edited by Y. X. Yang et al. IAHS Publ. 341.
- Groundwater Management in a Rapidly Changing World, edited by M. Schirmer et al. IAHS Publ. 342

- GRACE, Remote Sensing and Ground-Based Methods In Multi-Scale Hydrology, edited by M. Hafeez et al. IAHS Publ. 343
- Hydroclimatology: Variability and Change, edited by S. Franks et al. IAHS Publ. 344
- Conceptual and Modelling Studies of Integrated Groundwater, Surface Water and Ecological Systems, edited by C. Abesser et al. IAHS Publ. 345
- Cold Regions Hydrology in a Changing Climate, edited by D. Yang et al. IAHS Publ. 346
- Risk in Water Resources Management, edited by G. Bloeschl et al. IAHS Publ. 347
- Assessment of Water Quality under Changing Climate, edited by J. Peters et al. IAHS Publ. 348
- Sediment Problems and Management in Asian River Basins, edited by D. E. Walling IAHS Publ. 349

Two new volumes have been published in the “*Benchmark Papers in Hydrology*” Series:

- Hydrogeomorphology, edited by M. Kirkby, IAHS Benchmark book 6
- Forest Hydrology, edited by D. DeWalle, IAHS Benchmark book 7

The *IAHS TFDC* (Task Force for Developing Countries) continued its action and distributed free of charge all IAHS publications (Hydrological Science Journal and the Books) to more than 60 selected Universities and Research Institutions of Africa, Asia, South-America and Eastern Europe. Three issues of the *IAHS Newsletter* have also been published and widely digitally disseminated. Digitisation of all historical IAHS literature more than 5 years old was complete and all was made available at the website.

#### **Cooperation with UNESCO, WMO and UN-Water**

The close cooperation of IAHS with UNESCO, WMO, the UN-Task Force on Water and Climate and the UN-Water Group has been continued. We have attended the WMO CHy advisory working group, the IHP Bureau meeting, and the Global Runoff Data Center-GRDC steering committee. We also participated to the activities of the UNESCO-WMO International Flood Initiative, including through the Tokyo 5th International Conference on Flood Management. Some preparations had also been made for the next IAHS Assembly, to be held in Gothenburg jointly with IAPSO and IASPEI.

Submitted by  
Christophe Cudennec, IAHS Secretary General



## **International Association of Meteorology & Atmospheric Sciences (IAMAS)**

<http://www.IAMAS.org>

### **INTRODUCTION**

IAMAS is the specialized association of the International Union of Geodesy and Geophysics (IUGG) that deals with all aspects of the gaseous envelope around the Earth and other planets. The main research work is carried out, coordinated and communicated in IAMAS' ten International Commissions (IC), which are in alphabetical order the:

- *International Commission on Atmospheric Chemistry and Global Pollution (ICACGP),*
- *International Commission on Atmospheric Electricity (ICAE),*
- *International Commission on Climate (ICCL),*
- *International Commission on Clouds and Precipitation (ICCP),*
- *International Commission on Dynamical Meteorology (ICDM),*
- *International Commission on the Middle Atmosphere (ICMA),*
- *International Commission on Planetary Atmospheres and their Evolution (ICPAE),*
- *International Commission on Polar Meteorology (ICPM),*
- *International Ozone Commission (IOC),*
- *International Radiation Commission (IRC).*

All ICs, and IAMAS as a whole, play a leading role in global coordination, communication and discussion of the latest research through organization of and participation in a wide range of scientific meetings that are open to all scientists.

### **ADMINISTRATION**

During the XXV General Assembly of IUGG in Melbourne, the national members of the IAMAS General Assembly met twice (30 June and 4 July 2011). The most important items on the agenda were the approval of the updated statutes ([www.iamas.org/statutes /IAMAS\\_StatutesByLaws-2011.pdf](http://www.iamas.org/statutes/IAMAS_StatutesByLaws-2011.pdf)) and the election of new officers and members at large ([www.iamas.org/officers](http://www.iamas.org/officers)). For the term 2011-2015, the IAMAS Executive Committee consists of the following officers:

President:	Athéna Coustenis	FRANCE
Vice-Presidents:	Joyce Penner	USA
	John Turner	UK
Immediate Past President:	Guoxiong Wu	CHINA



Secretary General:	Hans Volkert	GERMANY
Assistant Secretary General (not voting)	Zheng (Jenny) Lin	CHINA
Members at large:	Ernest Hugo Berbery	USA/ARGENTINA
	Vladimir Kattsov	RUSSIA
	Colin Price	ISRAEL
	Daren Lu	CHINA
	Tetsuzo Yasunari	JAPAN
Commission presidents (ex officio):		
ICACGP:	John P. Burrows	GERMANY
ICAE:	Zen Kawasaki	JAPAN
ICCL:	Neil Holbrook	AUSTRALIA
ICCP:	Zev Levin	ISRAEL
ICDM:	Richard Swinbank	UK
ICMA:	Daniel Marsh	USA
IOC:	Christos Zerefos	GREECE
ICPAE:	Sanjay Limaye	USA
ICPM:	Tom Lachlan-Cope	UK
IRC:	Robert Cahalan	USA

Athéna COUSTENIS (France) was elected to serve as president, and Joyce PENNER (USA) and John TURNER (UK) as vice-presidents. Colin PRICE (Israel) and Daren LU (China) were elected as new members at large, serving from 2011-2019. The immediate past-president Guoxiong WU (China) and the assistant secretary general Zheng (Jenny) LIN (China; not voting) will continue contributing their expertise and experience to assist with IAMAS matters.

The past and present members of the IAMAS bureau continue to cooperate closely via email and monthly telephone conference calls. The Secretary General met with officers of most of the commissions and with officers of the other associations at IUGG-2011 and also met with several of his colleagues from IUGG and its associations at EGU in Vienna (April). Issues 11 and 12 of the IAMAS newsletter have been published and are accessible via [www.iamas.org/NewsLetters](http://www.iamas.org/NewsLetters). The website was refurbished and is receiving  $9000 \pm 1000$  hits per month (search engines excluded).

## ACTIVITIES

The primary activity of the Secretary General during 2010 and 2011 was representing IAMAS and its commissions in the planning for IUGG-2011 by joining monthly telephone conferences with the Local Organization Committee (LOC) and meeting the Scientific Programme Committee (SPC) members in person during the EGU assembly in Vienna, Austria (April). IAMAS and its commissions were represented in four Union symposia, took the lead in 13 joint symposia and organized 14 association symposia (see [www.iugg2011.com/pdf/IUGG2011\\_FinalEntireProgram.6June.pdf](http://www.iugg2011.com/pdf/IUGG2011_FinalEntireProgram.6June.pdf); Programme Book, p. 74). 607 participants (of 3392 in total) registered under IAMAS, the largest group among the 8 associations of IUGG. IAMAS covered the registration fee of 67 delegates (with support by LOC) and, additionally, provided 26 grants for local expenses. Generally the XXV General Assembly of IUGG-2011 was considered a considerable success; the collage below gives a flavour of the prevailing atmosphere.



Here a brief selection of activities is reported by IAMAS commissions; the full compilation of commission reports will be posted on [www.IAMAS.org/Reports](http://www.IAMAS.org/Reports). Information is also available on the specified web-sites. Brief statements by the liaisons to other international organizations are also given.

### **IAMAS-ICACGP**

(<http://www.icacgp.org>)

A number of meetings with international participation were co-organised. These included: the first Regional Workshop on “Changing Chemistry in a Changing Climate: Human and Natural Impacts over Southern Africa – C4-SAR”, 31 May - 2 June, Midrand, South Africa; the ACCENT workshop in Urbino, Italy; the Symposium on Stratospheric Ozone and Climate Change, 7-10 November, Washington, DC, USA; a session at the AGU fall meeting about “Remote sensing of trace gases and aerosols: Air quality applications”. At IUGG-2011, the commission held its business meeting and contributed to symposia that now encompass both classical atmospheric pollution and the biogeochemical cycling of species. Early in 2012, the second regional workshop was planned in Santiago, Chile (9-12 January). Strong input will be given to the 12<sup>th</sup> IGAC and Open Science Conference in Beijing (China; 17-21 September; [http:// www.igbp.net/5.1b8ae20512db692f2a6800015595.html](http://www.igbp.net/5.1b8ae20512db692f2a6800015595.html) ).

### **IAMAS-ICAE**

(<http://icae.jp>)

The 14<sup>th</sup> International Conference on Atmospheric Electricity took place in Rio de Janeiro, Brazil (8–12 August) with 191 participants from 24 countries. 80 oral and 200 poster presentations dealt with a broad selection of topics ([www.icae2011.net.br/](http://www.icae2011.net.br/)). Two detailed newsletters enhance the internal communication. The 15<sup>th</sup> conference is scheduled for 2014 in Oklahoma, USA, one year prior to the next General Assembly of IUGG.

### **IAMAS-ICCL**

(<http://www.iccl-iamas.net>)

At IUGG-2011, Neil HOLBROOK (Australia) was elected as president and Jianping LI (China) as executive secretary. The election of 2 new members brought the membership to 34 persons. The

commission was involved in the organisation of 3 inner-IAMAS and 7 joint symposia. One of the latter on Monsoons received over 200 abstracts, ran over 5 days and was by far the largest symposium of the entire assembly. ICCL contributes to the establishment of a new Union Commission on Climatic and Environmental Change (CCEC).

#### **IAMAS-ICCP**

(<http://www.iccp-iamas.org>)

At IUGG-2011, six symposia were led or supported by the commission. The regular business meeting was held and the planning continued for the 16<sup>th</sup> quadrennial International Conference on Clouds and Precipitation, which is scheduled to take place in Leipzig, Germany (30 July – 3 August 2012; <http://iccp2012.tropos.de/>). During the previous week a cloud modelling workshop will be held in Warsaw, Poland.

#### **IAMAS-ICDM**

(<http://icdm.atm.ucdavis.edu/ICDM.html>)

At IUGG-2011, Richard SWINBANK (UK) was elected as president and Richard GROTHJAHN (USA) as secretary. Three new members were welcomed. One IAMAS-only and five joint symposia were co-convened. In 2012, a special workshop is being planned in Kunming (China; 6-9 August; <http://icdm2012.csp.escience.cn>) entitled “Dynamics and Predictability of High-impact Weather and Climate Events”.

#### **IAMAS-ICMA**

([www.icma-iamas.org](http://www.icma-iamas.org))

At IUGG-2011, Daniel MARSH (USA) was elected as president and Ulrike LANGEMATZ (Germany) as vice-president/secretary. Twelve new members were welcomed. Five joint and four IAMAS-only symposia were co-convened. In October, the co-sponsored 10<sup>th</sup> international workshop “Layered Phenomena in the Mesopause Region” in Blacksburg (USA) was attended by 40 scientists including 8 students ([www.cpe.vt.edu/lpmr/](http://www.cpe.vt.edu/lpmr/)). In 2012, the 7<sup>th</sup> international workshop “Long-Term Changes and Trends in the Atmosphere” is being co-organised in Buenos Aires (Argentina; 11-14 September; [www1.herrera.unt.edu.ar/faceyt/trends2012/](http://www1.herrera.unt.edu.ar/faceyt/trends2012/)).

#### **IAMAS-IO3C**

(<http://ioc.atmos.illinois.edu>)

The commission issued press statements on the conditions of stratospheric ozone in spring and autumn. Commission members were engaged in the compilation of the latest WMO ozone assessment, which appeared in January ([http://montreal-protocol.org/Assessment\\_Panels/SAP/](http://montreal-protocol.org/Assessment_Panels/SAP/)). Further reports are being planned in cooperation with WMO and SPARC. The next Quadrennial Ozone Symposium is scheduled to take place in Toronto (Canada; [www.cmos.ca/QOS2012](http://www.cmos.ca/QOS2012); 26-31 August 2012).

#### **IAMAS-ICPAE**

([www.atm.ox.ac.uk/icpae](http://www.atm.ox.ac.uk/icpae))

At IUGG-2011, Sanjay LIMAYE (USA) was elected as president, Leigh FLETCHER (UK) as vice-president, and Mathieu HIRTZIG (France) as secretary. Two symposia were convened. The website was moved to Oxford and re-launched. Results from several inter-planetary satellite missions were combined in 17 articles of a special issue in the journal “Planetary and Space Science”, Volume 61 ([www.sciencedirect.com/science/journal/00320633/61](http://www.sciencedirect.com/science/journal/00320633/61)).

## **IAMAS-ICPM**

([www.icpm-iamas.aq](http://www.icpm-iamas.aq))

At IUGG-2011, Tom LACHLAN-COPE (UK) was elected as president and Matthew LAZZARA (USA) as secretary. Two well attended symposia were convened. In 2012 the commission will contribute to the 32th SCAR and Open Science Conference in Portland (USA; 16-19 July 2012; <http://scar2012.geol.pdx.edu>) and an Antarctic Weather Station workshop in Boulder (USA).

## **IAMAS-IRC**

([www.irc-iamas.org](http://www.irc-iamas.org))

At IUGG-2011, the commission held its business meeting, where work in the seven working groups was reviewed and the proposal to install a new one 'Polarized Radiative Transfer' was accepted. Four symposia were co-convened. The next quadrennial International Radiation Symposium is scheduled to take place in Berlin (Germany; [www.irs2012.org](http://www.irs2012.org); 6-10 August 2012).

## **Reports of IAMAS liaisons to other organizations**

Commission on Climate and Environmental Changes (CCEC): A committee of Tom BEER (Chair), Jianping LI (Vice-Chair) and Keith ALVERSON (Secretary) plus Association representatives prepared a proposal to build scientific capacity for responsibly addressing the broad, multi-disciplinary issues involved in climatic and environmental change; to provide useful information, understanding, and support to the public and governmental organizations; to interact and cooperate with outside activities that would benefit from the capabilities and resources of the IUGG Associations; and to strengthen links across the Scientific Associations within IUGG, to build new external links to organizations outside IUGG, to strengthen existing links to external organizations and to promote IUGG's contribution to global change research. The proposal was presented to the new IUGG Executive Committee following the General Assembly.

Scientific Committee on Antarctic Research (SCAR): John TURNER, the liaison to SCAR, maintained close contact with the organization during the year. He chairs the SCAR Expert Group on Antarctic Climate Change and the Environment (ACCE) and ensures that the work of IAMAS and particularly the International Committee on Polar Meteorology (ICPM) feeds into the reports prepared by the ACCE group. He is on the organizing committee for the next SCAR Open Science Conference to be held in Portland, Oregon in July 2012, where IAMAS will co-sponsor several sessions. There will be a session on Antarctic clouds that will build on the successful ICPM clouds workshop held during 2010.

Scientific Committee on Oceanic Research (SCOR): Michael MacCRACKEN, substituting for Athéna COUSTENIS as one of IUGG's two new liaisons to SCOR participated in the annual meeting of the SCOR Executive Committee in Helsinki, Finland (12-15 September). The meeting reviewed the status of SCOR Working Groups and the many international ocean research programmes that SCOR oversees, and evaluated proposals for new working groups, moving forward on only one of them due to funding limitations. On the week-to-week activities of SCOR, Athéna COUSTENIS took over as liaison to SCOR following confirmation of her appointment at IUGG-2011.

World Climate Research Programme (WCRP): Tom BEER, past president of IUGG, attended the WCRP Open Science Conference in Denver, USA (24-28 October) as new liaison to WCRP. He replaces Guoxiong Wu who was also a member of the Joint Science Committee (JSC) of WCRP. To maintain this continuity it has been recommended to the IUGG Executive that IUGG should write to WCRP specifically requesting that the IUGG liaison becomes an observer to the meetings of the JSC.

World Meteorological Organization (WMO): The traditional link to WMO was resumed by a visit of the Secretary General (since July also IUGG-liaison to WMO) in Geneva. Meanwhile he accepted an invitation to represent IAMAS within the Management Group of WMO-CAS.

## **FUTURE ACTIVITIES**

As mentioned above, six IAMAS commissions will be involved in the organisation of larger international conferences in 2012 (entries in bold face under [www.iamas.org/meetings](http://www.iamas.org/meetings)).

Planning for the next assembly, jointly with the sister association for the cryosphere (IACS) is well on its way. It will take place in Davos, Switzerland, in July 2013 ([www.daca13.org](http://www.daca13.org)). The new 'Early Career Award' recognizing the achievement of young scientists will be presented there for the first time. The Swiss National Organisation Committee (SNOC) continued its series of planning meeting towards DACA-13; the Secretary General joined one of them in October.

Discussions have started with two other IUGG associations about joining forces for the regular assemblies in 2017, after the next General Assembly to be held in Prague, Czech Republic, in 2015.

Submitted by  
Athéna Coustenis, IAMAS President  
Hans Volkert, IAMAS Secretary General



## **International Association for the Physical Sciences of the Oceans (IAPSO)**

[iaps0.iugg.org](http://iaps0.iugg.org)

### **INTRODUCTION**

IAPSO has the prime goal of "promoting the study of scientific problems relating to the oceans and the interactions taking places at the sea floor, coastal, and atmospheric boundaries insofar as such research is conducted by the use of mathematics, physics, and chemistry." IAPSO works mainly through 1) biennial scientific assemblies; 2) working groups; 3) Commissions; 4) Services and 5) website information. Of special importance to IAPSO is to involve scientists and students from developing countries in the activities.

IAPSO maintains formal liaisons with other scientific commissions and committees. These include the ICSU's Scientific Committee on Oceanic Research (SCOR), and UNESCO's Intergovernmental Oceanographic Commission (IOC).

For more information see <http://iaps0.iugg.org/> (note that the website address is changed).

### **ADMINISTRATION**

The IAPSO office has been situated at the Gothenburg University, Sweden, since July 2007, and the day-to-day business has been managed by the Secretary General (SG) Johan Rodhe, Sweden. The Bureau of IAPSO comprises the President Eugene Morozov, Russia, the Past President Lawrence Mysak, Canada, the SG Johan Rodhe, and the Treasurer Fred Camfield, USA. The SG has been responsible for the IAPSO website.

General Business Meeting and 2 EC Meetings were held during the IUGG General Assembly in Melbourne.

The IAPSO President attended the annual meeting of the Scientific Committee on Oceanic research (SCOR) in Helsinki in September 2011. The SCOR meetings review the progress of current SCOR working groups, evaluate proposed new WGs, decide which of them will be funded, and discuss a number of international scientific programs that are SCOR-related. Details can be found at the SCOR website ([www.scor-int.org](http://www.scor-int.org)). SCOR is an important partner of IAPSO.

Members of the IAPSO Executive Committee (EC) for 2011-2015:

President:	Eugene Morozov	RUSSIA
Secretary General:	Johan Rodhe	SWEDEN
Past President:	Lawrence Mysak	CANADA
Treasurer:	Fred Camfield	USA
Vice Presidents:	Isabelle Ansoerge	SOUTH AFRICA
	Denise Smythe-Wright	UK
EC Members:	Silvia Blanc	ARGENTINA
	Toshiyuki Hibiya	JAPAN
	Chris Meinen	USA
	Ken Ridgway	AUSTRALIA
	Satheesh Shenoi	INDIA
	Stefania Sparnocchia	ITALY

## ACTIVITIES

### 2011 IUGG General Assembly in Melbourne

In 2011, IAPSO participated in the IUGG General Assembly in Melbourne, Australia. Twelve IAPSO-only symposia and 3 joint symposia were organised by IAPSO. IAPSO organized 7 association-specific symposia, and led the organization of 3 association-joint symposia and 1 union symposium. A total of 476 submitted abstracts were accepted for oral or poster presentations in these symposia. IAPSO also co-sponsored 19 symposia led by other associations, to which about 800 abstracts were submitted.

323 delegates registered as IAPSO participants. Among them 20, mainly scientists from developing countries, received travel grants. The registration fee was paid for additional 10 participants. The number of IAPSO participants was thus about the same as at the joint assembly in Montreal 2009 and somewhat higher than encountered in Perugia 2007. The new EC expects that even more IAPSO delegates will attend the IAHS/IAPSO/IASPEI Assembly in Gothenburg in 2013.

### SCOR/IAPSO Working Groups

The following SCOR working groups (WGs), which have received funding from IAPSO, have been active during this period and have published important books and/or special journal issues:

SCOR/IAPSO WG 127 (Chaired by T.J. McDougall): “The Thermodynamics and Equation of State of Seawater”. This WG has now completed their extensive work, which involved the introduction of the Gibbs potential function for seawater and a new salinity formulation called Reference Salinity (SR), expressed in g/kg. The new formulation for the thermodynamics of sea water is published as: IOC, SCOR and IAPSO, 2010: *The international thermodynamic equation of seawater – 2010: Calculation and use of thermodynamic properties*. Intergovernmental Oceanographic Commission, Manuals and Guides No. 56, UNESCO (English), 196 pp. It is also available electronically from <http://www.TEOS-10.org>.

Website: [http://www.scor-int.org/Working\\_Groups/wg127.htm](http://www.scor-int.org/Working_Groups/wg127.htm)

SCOR/IAPSO WG 133 (Co-chaired by T. Rossby and K. Kim): “OceanScope”. This WG held its second meeting in London 12-14 April 2010, and is currently writing up a public document outlining the work plan for this ocean measurement program.

Website: [http://www.scor-int.org/Working\\_Groups/wg133.htm](http://www.scor-int.org/Working_Groups/wg133.htm)

SCOR/WCRP/IAPSO WG 136 (Co-chaired by L. Beal and A. Biastock): “The Climatic Implications of the Greater Agulhas System”. The WG conducted their second meeting in May 2011, joining with a meeting and capacity building workshop in Mauritius. A grant from IUGG was helpful. Publication: “On the role of the Agulhas system in ocean circulation and climate. *Nature*, vol 472, 28 April 2011.

Website [http://www.scor-int.org/Working\\_Groups/wg136.htm](http://www.scor-int.org/Working_Groups/wg136.htm)

### IAPSO Commissions and Services

Commission on Mean Sea Level and Tides (CMSLT), hosted by the Proudman Oceanographic Laboratory, UK. President: Gary T. Mitchum, Vice President: Simon Holgate. Website: <http://www.psmsl.org/>

An IAPSO co-sponsored publication related to the above Commission: *Sea-Level Rise and Variability*. Edited by John A. Church, Philip L. Woodworth, Thorkild Aarup & W. Stanley Wilson. 2010. Blackwell Publishing Ltd.

Old publications from 1931 and onwards are now available at the IAPSO website <http://iapso.iugg.org/home-iapso/publications>

Tsunami Commission (Joint with IASPEI and IAVCEI). Chair: Dr. Vasily V. Titov. Website: [www.iaspei.org/commissions/JCT.html](http://www.iaspei.org/commissions/JCT.html)

GeoRisk Commission (Joint with IAMAS, IAHS, IASPEI and IAVCEI). Website: [www.iugg-georisk.org/](http://www.iugg-georisk.org/)

Permanent Service for Mean Sea Level, hosted by Proudman Oceanographic Laboratory, UK. Contact: Dr. Lesley Richard. Website: [www.pol.ac.uk/psmsl/](http://www.pol.ac.uk/psmsl/)

IAPSO Standard Seawater Service, hosted by OSIL, Havant, Hampshire, UK. Director: Paul, Ridout; Website: [www.osil.co.uk](http://www.osil.co.uk)

The working groups commissions and services report to IAPSO. These reports are posted on the IAPSO website <http://iapso.iugg.org/working-groups>

### **Prince Albert I Medal**

In connection with the assemblies IAPSO selects a winner of the Prince Albert I Medal for excellence in physical and/or chemical oceanography. Dr. Trevor McDougall from CSIRO Marine and Atmospheric Research, Hobart, Australia was presented the Medal in Melbourne 2011 for "his outstanding work on (1) important and fundamental problems of ocean fluid dynamics over the full range of ocean scales, and (2) the thermodynamic properties of seawater".

### **Eugene LaFond Medal**

This Medal, created in honour of Eugene LaFond who was a former SG of IAPSO, is awarded to a scientist from a developing world country for a paper, oral or poster presented at an IAPSO Assembly. In 2011 this Medal was awarded to Towhida Rashid from Bangladesh for her presentation about the sea level change in the Holocene.

### **PLANNED FUTURE ACTIVITIES**

The planning for the Joint (IAHS, IAPSO and IASPEI) Assembly in Gothenburg, Sweden, 22-26 July 2013 is under way. The Local Organization Committee (LOC) met four times during 2011 with Professor David Turner as the chair. He is Dean of the Faculty of Science, Gothenburg University. Professor Leif Andersson, Gothenburg University and the Royal Academy of Sciences, is chairing the Science Programme Committee (SPC) and is member of LOC. IAHS SG Christophe Cudennec, IAPSO SG Johan Rodhe and IASPEI SG Peter Suhadolc are the other members of the SPC. Johan Rodhe was co-opted to the LOC meetings, and the other SsG were kept in contact using e-mail. The Assembly website is: <http://iahs-iapso-iaspei2013.com/>. Congrex is the official congress organizer.

SCOR/WCRP/IAPSO WG is arranging a Chapman conference in October 2012 in Stellenbosch, South Africa: The Agulhas system and its role in changing ocean circulation, climate, and Marine Ecosystems.

Submitted by  
Eugene Morozov, IAPSO President  
Johan Rodhe, IAPSO Secretary General





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

[www.iaspei.org](http://www.iaspei.org)

**INTRODUCTION**

The International Association of Seismology and Physics of the Earth's Interior is the leading international association promoting the studies of the structure and of the geodynamical processes ongoing in our Earth's interior. IASPEI achieves its goals through scientific conferences, primarily those organized by IASPEI and its Commissions, but sponsoring also other international initiatives, fosters international cooperation, both in the monitoring seismic activity, research and education activities, especially in countries that are in the process of working towards full scientific development.

**ADMINISTRATION**

**EC & Bureau meetings**

The IASPEI Bureau and Executive Committee have met several times in Melbourne in June/July.

The members of the new IASPEI Executive Committee are:

President:	Domenico Giardini	SWITZERLAND
First Vice-President:	Ian Jackson	AUSTRALIA
Second Vice-President:	Thorne Lay	USA
Secretary General/Treasurer:	Peter Suhadolc	ITALY
EC Members:	Marcelo Assumpção	BRAZIL
	Kenji Satake	JAPAN
	Michelle Grobbelaar	SOUTH AFRICA
	Alexey Zavyalov	RUSSIA
Past President:	Zhongliang Wu	CHINA

**New regional IASPEI Commissions**

Two resolutions passed at the General Assembly in Melbourne encourage the creation of two more regional Commissions of IASPEI: the African Seismological Commission and the Latin American Seismological Commission to foster more cooperation within these two regions and the organization of regular IASPEI regional meetings.

**Statutes**

After several years of preparation and discussion, revised IASPEI Statutes have been unanimously approved in Melbourne during the IUGG General Assembly.

Changes mainly reflect the changes in practice related to shorter scientific assemblies, the possibilities offered by modern internet era tools, and clarifications of language to avoid ambiguity.

## **Website**

The IASPEI website has been updated continuously, mainly with the help of the IASPEI webmaster Alice Walker. The Website has recently moved to Edinburgh, where it is hosted by the BGS. IASPEI is very much indebted to BGS for this help!

## **Newsletters**

Also the IASPEI Newsletter in its new vest has been regularly sent as pdf file attachment to e-mails. The Newsletters are also available for downloading from the website. Three issues were distributed in 2011.

## **ACTIVITIES**

Most of the IASPEI efforts during 2011 were directed towards the IUGG2011 General Assembly in Melbourne, in particular IASPEI Symposia and the IASPEI-led Inter-Association Symposia. However, several important scientific meetings have been also sponsored by IASPEI and several ongoing projects continued.

### **2011 IUGG General Assembly in Melbourne**

IASPEI participated to the conference with more than 400 (395 officially registered as IASPEI) delegates, of which 78 supported financially with grants. The scientific program included 18 IASPEI and 13 Inter-Association symposia with IASPEI participation.

### **Symposium on the Effects of Surface Geology on Seismic Motion**

The 4th International IASPEI/IAEE Symposium on the Effects of Surface Geology on Seismic Motion (ESG4) was held at the University of California Santa Barbara from August 23 - 26, 2011. It was organized by Ralph Archuleta. It included six plenary sessions. More details on <http://esg.eri.ucsb.edu/Home>

### **Global Earthquake Model (GEM)**

The IAEE-IASPEI Joint Working Group on the International Alliance of Seismology and Earthquake Engineering Professional Associations activities were related to one of its missions: the GEM project, a global risk assessment initiative. D. Giardini, a proxy for P. Suhadolc, GEM Foundation Governing Board member on behalf of IASPEI, has attended two meetings in 2011, in June in Beijing (China) and in December in Pavia (Italy). The GEM initiative is progressing well and a number of Projects have been assigned to groups of the seismological worldwide community to study basic seismological input data for seismic hazard assessment.

### **Sponsored meetings**

IASPEI has sponsored the following workshops/symposia held in 2011:

- Session S4.6 of Seismotectonics and Seismic Hazards in Africa, a session at the CAG23, 7 - 14 January 2011, Johannesburg, South Africa, was sponsored by IASPEI. IASPEI support went to a student from the Ethiopia Geophysical Observatory.
- International Symposium on “Advances in Earthquake Science-2011” held at the Institute of Seismological Research, Raisan, Gandhinagar, India, on January 22-24, 2011, with 169 attendees of whom 15 supported by IASPEI/IUGG funds. Organized by the Institute of Seismological Research, Department of Science & Technology, Government of Gujarat.
- 12th International Workshop on Modeling of Mantle Convection and Lithospheric Dynamics, held in Groß Dölln (Germany) on August 20-25, 2011 with around 120 attendees. It was organized by GFZ under the auspices of the Commission on Earth structure and Geodynamics.
- International Symposium on Geophysical Imaging with Localized Waves, held at Sanya, Hainan Island, China on August 2011. It was organized by Ru-shan Wu under the auspices of

the Task Group on Seismic Scattering and Heterogeneity, IASPEI Commission on Seismological Observation and Interpretation.

- International Course on “Theory and Practice on the waveform inversion to compute the seismic moment tensor, Point- and complex-source modeling using program ISOLA”. Held on September 2-10, 2011 in Costa Rica and organized by Ronnie Quintero (National University and Seismological and Volcanological Observatory of Costa Rica). 21 participants from Latin America attended the workshop, three of whom sponsored with IASPEI funds.

### **Scientific Programs and Projects**

The IDEA (International Digital Earthquake Archives) project of the Committee for Preservation of WWSSN and Historical Seismograms (also called simply *Seismoarchives: Seismogram Archives of Significant Earthquakes of the World*), is continuing under the guidance of Willie Lee. IRIS is archiving the scanned seismograms.

The IUGG-funded IASPEI-ISC Project *Networking of world seismologists (Improving Geophysical Science Link to the Society during Natural Extreme Events, Especially in Developing Countries)* is well underway. IASPEI and ISC are developing and maintaining a worldwide registry of seismologists & geophysicists willing to serve as a point of contact in countries with and without affiliation to IUGG.

IASPEI has set up a Scientific Advisory Board (SAB) for the GEM hazard global component project *Global Instrumental Earthquake Catalogue* under the leadership of ISC. IASPEI has received financial support from this grant for this activity, which is progressing nicely.

### **Publications**

Several publications are available from the IASPEI Secretariat. IASPEI on approval distributes free copies of its publications to institutional libraries in less developed countries.

- IASPEI: Cooperation for Better Understanding of the Earth
- International Handbook of Earthquake and Engineering Seismology (Part A and B)
- New Manual of Seismological Observatory Practice

### **IASPEI medal**

IASPEI has decided to award no more frequently than biennially an IASPEI Medal for outstanding service in furthering the aims of IASPEI.

### **Obituaries**

Obituaries for prominent scientists are regularly published in the IASPEI Newsletters.

### **PLANNED FUTURE ACTIVITIES**

- 33rd General Assembly of the European Seismological Commission, August 19-24, 2012, Moscow, Russia. Website: [www.esc2012-moscow.org](http://www.esc2012-moscow.org)
- 9<sup>th</sup> General Assembly of Asian Seismological Commission 2012, September 17-20, 2012, Ulaanbaatar, Mongolia. Website: [www.asc2012.mn](http://www.asc2012.mn)
- Latin American Seismology Symposium, Lima, Peru, September 23-26, 2012, in the framework of the XVI Peruvian Geological Congress and SEG 2012 Conference.
- IAHS, IAPSO, IASPEI Joint 2013 Assembly in Gothenburg, Sweden, July 22-26, 2013: Knowledge for the Future. Website: <http://iahs-iapso-iaspei2013.com/index.asp>

Submitted by  
Peter Suhadolc, IASPEI Secretary General & Treasurer



## **International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI)**

<http://www.IAVCEI.org>

### **INTRODUCTION**

The International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI) represents the primary international focus for: (1) research in volcanology, (2) efforts to mitigate volcanic disasters, and (3) research into closely related disciplines, such as igneous geochemistry and petrology, geochronology, volcanogenic mineral deposits, and the physics of the generation and ascent of magmas in the upper mantle and crust.

Volcanology over the last 25 years has increased greatly its status as a fundamental discipline in the earth sciences. Its concerns reach from the deep roots of volcanic systems where magma is generated in the Earth's mantle, to the upper atmosphere which was formed originally- and is still being modified - by volcanic eruptions. Furthermore, only part of the scientific interests of IAVCEI centres on active volcanism. Much of the work undertaken to understand volcanic processes is carried out on dormant or extinct volcanoes and in ancient volcanic areas. The earliest crust-forming processes on Earth were volcanic, and large portions of Archaean terrains – the greenstone belts – are entirely volcanic. A small, but dedicated part of the scientific community also studies volcanic processes on the Earth's Moon and on planets such as Mars and Venus.

IAVCEI is run by the Executive Committee, whose membership changes every four years. The Executive Committee determines policies for the Association, enacting them through a series of Commissions and Task Groups. IAVCEI aims to be outward-looking, seeks relationships with other international scientific organisations, and participates in international scientific projects. It aims also to maintain a robust publishing policy, encouraging the presentation of high calibre, volcanological research results, mainly through its premier international journal the *Bulletin of Volcanology*.

### **ADMINISTRATION**

#### **IAVCEI Executive Committee activities**

IAVCEI Executive Committee activities during 2011 have included:

- Election of the new Executive Members for the period 2011-2015. The following IAVCEI members were elected:

President:	Ray Cas	AUSTRALIA
Secretary General:	Joan Martí	SPAIN
Vice-Presidents:	Stephen Self	USA/UK
	Hugo Delgado	MEXICO
Members:	Patricia Mothes	EQUADOR
	Karoly Nemeth	NEW ZEALAND
	Greg Valentine	USA
	Hiroshi Shinohara	JAPAN
	Past-President:	Setsuya Nakada
Editor-in-Chief, <i>Bulletin of Volcanology</i> :	James White	NEW ZEALAND

- Revision and updating of the IAVCEI Statutes and by-Laws, which were approved by the IUGG Council during the IUGG GA held in Melbourne in June/July.
- Meetings of the past EC and the new EC during the IUGG GA held in Melbourne in June/July.
- Revision of IAVCEI Finances, funding support, and potential funding sources and strategies.
- Publication in the IAVCEI website of the new regulation to become member, in which the obligation of contributing with a membership has been removed.
- The website has been revised and updated.
- The President (past and new) and the SG participated in the IUGG EC meetings held in Melbourne, Australia, in June/July where IUGG matters for the next period were discussed.
- A revision of the IAVCEI Commissions and Working Groups, still to be fully completed, has been conducted by the two Vice-Presidents and approved by the EC, in which active commissions have been identified and several inactive commissions have been deactivated.
- The Editorial Board of Bulletin of Volcanology has been completely reorganised.

### **Members**

In 2011 the number of IAVCEI individual members was 714, and 74 of them being Life Members.

### **ACTIVITIES**

#### **Webpage**

The IAVCEI web page has been updated and includes new sections.

#### **Newsletters**

Two issues of the newsletter "IAVCEI News" have been published through the website, one August 2011 and a second one in December 2011.

#### **2011 Meetings, workshops and courses**

The following meetings, workshops, and courses have been (co-)organised or sponsored by one (or more) of the IAVCEI commissions in 2011:

- IAVCEI General Assembly, held during the XXV IUGG General Assembly, Melbourne, Australia, 28 June – 7 July 2011,
- Workshop on Submarine and emergent volcanic arcs and associated volcano-sedimentary basins: facies models, petrology and volcano-tectonics, Cabo de Gata, Spain, 2-7 May 2011, <http://www.ija.csic.es/cabodegata>,
- The XVIII Congress of INQUA (International Union for Quaternary Research), Bern, Switzerland, 21-27 July 2011,
- Conference on Remote Natural Hazards and Environmental Change, National University of Singapore, Singapore, 28 - 29 July 2011,
- Volcano Observatory Best Practices Workshop: Eruption Forecasting, Erice, Italy, 11-15 September 2011, sponsored by IAVCEI,
- 11th Field Workshop on Volcanic Gases, Kamchatka, Russia, September 2011, organised by the Commission on Volcanic Gases.

## PLANNED FUTURE ACTIVITIES

### Forthcoming meetings, workshops and courses in 2012

- Seventh Gulf Seismic Forum Seismology and Earthquake Engineering in the Arabian Gulf Region, Session sponsored by the IAVCEI Commission on Monogenetic Volcanism: “Volcanism and seismicity in monogenetic lava fields”, Saudi Geological Survey, Jeddah, KSA, 22-25 January 2012, Web: [www.sgs.org.sa](http://www.sgs.org.sa); <http://7gsf.info/>
- IAVCEI – IAS 4th International Maar Conference: a multidisciplinary congress on monogenetic volcanism, Auckland, New Zealand, 20 – 24 February 2012, Web: <http://www.4imc.org.nz>. Sponsored by the IAVCEI Commission on Monogenetic Volcanism and Volcanogenic Sediments.
- 1st International Congress on management and awareness in protected volcanic landscapes, Olot, Spain, 21 – 25 May 2012, E-mail: [info@volcandpark1.com](mailto:info@volcandpark1.com). Sponsored by IAVCEI.
- Volcano-Ice Interactions on Earth & Other Planets Conference III, Anchorage, Alaska, USA, 18-22 June 2012, Web: [http://volcanoes.dickinson.edu/iavcei\\_iacs\\_viic/pdfs/vii3\\_first\\_circular.pdf](http://volcanoes.dickinson.edu/iavcei_iacs_viic/pdfs/vii3_first_circular.pdf), Contacts: Chris Waythomas, Alaska Volcano Observatory, USGS, Anchorage: [cwaythomas@usgs.gov](mailto:cwaythomas@usgs.gov), Christian Huggel, University of Zurich: [christian.huggel@geo.uzh.ch](mailto:christian.huggel@geo.uzh.ch). Sponsored by the IAVCEI Commission on Volcano-Ice Interaction.
- Hopi Butte Maar-Diatreme Field Workshop, Winslow, Arizona, USA, October - November 2012 (date is pending, 1 week long field workshop style meeting for about 50 participants), Contact: James D.L. White – [james.white@stonebow.otago.ac.nz](mailto:james.white@stonebow.otago.ac.nz). Sponsored by the IAVCEI Commission on Monogenetic Volcanism and Volcanogenic Sediments.
- 4th International Workshop on Collapse Calderas, Vulcini, Italy, 23 – 29 September 2012, E-mail: [acocella@uniroma3.it](mailto:acocella@uniroma3.it) , [ageyertraver@gmail.com](mailto:ageyertraver@gmail.com), Website: <http://www.gvb-csic.es/CCC.htm>. Sponsored by the IAVCEI Commission on Collapse Calderas
- Cities on Volcanoes 7, Colima, Mexico, 18-23 November 2012, E-mail: [cov7@citiesonvolcanoes7.com](mailto:cov7@citiesonvolcanoes7.com), Website: <http://www.citiesonvolcanoes7.com>. Sponsored by the IAVCEI Cities and Volcanoes Commission.
- Link between rift, tectonism and intracontinental volcanism, Saxony, Germany, May 2013, E-mail: [Joerg.Buechner@senckenberg.de](mailto:Joerg.Buechner@senckenberg.de), Website: will be announced. Sponsored by the IAVCEI Commission on Monogenetic Volcanism and Volcanogenic Sediments.

### Foreseen activities for 2012

- Preparation of the IAVCEI Scientific Program for the Scientific Assembly to be held in Kagoshima, Japan in June 2013.
- Completion of the reorganisation of the IAVCEI Commissions.
- Publication of two IAVCEI newsletters.
- Revision of the state of the art of volcanology in developing countries. Identification of their main drawbacks and needs.

Submitted by  
Joan Martí, IAVCEI Secretary General

# ACTIVITIES OF THE UNION COMMISSIONS AND INTER-ASSOCIATIONS WORKING GROUPS

The following reports illustrate the impressive range of activities within each Union Commission as well as their dedication to supporting science within developing countries. Each Union Commission has a web site where much more information can be found.

## Commission for Data and Information (UCDI)

### INTRODUCTION

In 2008 the IUGG established the Union Commission on Data and Information (hereafter UCDI) to provide IUGG's eight Associations an entity to deal with data and information issues at the Union level and engage with similar bodies in other Unions and Societies.

The Commission provides a focused and sustainable organizational structure that supports and strengthens IUGG science through integrated scientific information activities in order to ensure the availability of modern data and information systems and services. These services are globally distributed, provide universal open access, and must be sustainable.

The UCDI objectives are to:

- provide a focus and single voice within IUGG, spanning all IUGG Associations and Inter-Association bodies.
- connect IUGG and its scientists to other bodies/agencies/initiatives that have interest and responsibility on matters of geo-data.
- advocate and facilitate research and development in the growing field of informatics to improve data and information systems and practices.
- promote open access to data and adoption of inter- operable data sets.

### ADMINISTRATION

#### Membership

Since autumn 2011, the UCDI has now the possibility to host members. In the UCDI webpage it is possible to fill a form to become a member of the Union Commission ([http://www.iugg-ucdi.org/UCDI/UCDI\\_member2011.html](http://www.iugg-ucdi.org/UCDI/UCDI_member2011.html)).

#### UCDI executive

Chair:	Peter Fox	USA	IAGA
Vice-Chair:	Charles Barton	AUSTRALIA	IAGA
Secretary:	Adelina Geyer Traver	SPAIN	IAVCEI
EC Members:	Tim Ahern	USA	IASPEI
	Maria Assunção F. Silva Dias	BRAZIL	IAMAS
	Pierrick Givone	FRANCE	IAHS
	Ruth Neilan	USA	IAG
	Mark Parsons	USA	IACS
	Bernd Richter	GERMANY	IAG
	Anatoly Soloviev	RUSSIA	IAGA
	Satheesh Sheno	INDIA	IAPSO

### **Business meetings**

- 1st EC Meeting: IUGG 2011, 27 June – 8 July 2011 (Melbourne, Australia)
- 2nd EC Meeting: AGU Fall Meeting 2011, 5-9 December 2011 (San Francisco, USA)
- Next EC Meeting: EGU 2012, 22-27 April 2012 (Vienna, Austria)

### **ACTIVITIES**

- IUGG Session: Data Science/Informatics and Data Assimilation in Geophysical Models
- 1st UCDI Newsletter: During 2011, UCDI has published its first newsletter ([http://www.iugg-ucdi.org/UCDI/2011Newsletter\\_UCDI.pdf](http://www.iugg-ucdi.org/UCDI/2011Newsletter_UCDI.pdf)) with a summary of the topics discussed in the meetings, the result of the different sessions at the international conferences and the coming meeting and conferences.
- UCDI Survey: The idea behind the survey is to prepare a document to know state-of-the-art on data and information in the different IUGG Associations. Any Association member can access the survey from the UCDI webpage and fulfil it online. Results obtained from the survey will be published at the UCDI webpage.

### **PLANNED FUTURE ACTIVITIES**

- EGU 2012 Session on Data Science/Informatics and Data Assimilation in Geosciences  
Convener: Adelina Geyer  
Co-Convener: Peter Fox
- IAVCEI 2013 Data Science/Informatics and Data Assimilation in Volcanology Conveners: A. Geyer, M. Bursik

Submitted by  
Adelina Geyer, UCDI Secretary



# Commission on Geophysical Risk and Sustainability (GRC)

<http://www.iugg-georisk.org/>

## INTRODUCTION

The IUGG Commission on Geophysical Risk and Sustainability (IUGG GeoRisk Commission) established by the IUGG Bureau in August 2000 is dedicated (i) to promoting scientific studies applied to the reduction of risk from natural hazards in an increasingly urbanized world and sustainability and (ii) to reducing death and destruction from natural and technological hazards by providing hazards data and information to emergency managers, policy-makers, scientists and the general public in the most timely and effective manner as possible. This includes the integration of knowledge concerning environmental, social and economic processes. The fundamental scope of this Commission is to facilitate communications – between scientists via meetings, workshops and publications, as well as between scientists and decision makers, between scientists and the public, and between scientists and schools.

## ADMINISTRATION

### Meetings

A Business Meeting of the GRC was held on 30<sup>th</sup> June 2011 at the Melbourne Convention Centre, during the IUGG General Assembly in Melbourne, Australia. 16 members were present. Minutes of the meeting will be available on the GRC website.

### Terms of Reference

New Terms of Reference (ToR) for the GRC had been endorsed by the IUGG in 2010 and were put into action during 2011. New aspects of the ToR include the election of an Executive Committee, Advisory Board Members and limited terms of office. Some ambiguities remain in the current ToR and these will be resolved during 2012.

### Membership

New GRC members, including an Executive Committee, 1 new Honorary Member and 4 Advisory Board members were elected during 2011. The membership list for the period 2011 – 2015 is summarized below. Note that Paula Dunbar remains as Treasurer despite having completed 2 terms in this role. This is because a new Treasurer could not be found, despite the best efforts of the Executive Committee. Ms. Dunbar has agreed to remain in the role until a new Treasurer can be found.

Chair:	Kuniyoshi Takeuchi	JAPAN	IAHS
Vice-Chairs:	Vladimir Kossobokov	RUSSIA	IASPEI
	David Jackson	USA	IASPEI
Secretary:	Diana Greenslade	AUSTRALIA	IAMAS
Treasurer:	Paula Dunbar	USA	IAPSO
EC Members:	David Boteler	CANADA	IAGA
	Servando de la Cruz Reyna	MEXICO	IAVCEI
	John Labrecque	USA	IAG
	Joan Marti	SPAIN	IAVCEI
	Alan Thomson	UK	IAGA
	Honorary Members:	Tom Beer	AUSTRALIA
Alik Ismail-Zadeh		GERMANY	IASPEI
Advisory Board Members:	Harsh Gupta	INDIA	
	Viacheslav Gusiakov	RUSSIA	
	Gordon McBean	CANADA	
	Uri Shamir	ISRAEL	

## ACTIVITIES

### **IUGG statement on Great East Japan Earthquake and Tsunami**

The GRC proposed the IUGG statement on Great East Japan Earthquake and Tsunami and this was adopted by the IUGG Bureau on 18 April 2011. The statement can be found at:

[http://www.iugg.org/resolutions/IUGG\\_Statement\\_GreatEastJapan\\_Eq\\_Tsu.pdf](http://www.iugg.org/resolutions/IUGG_Statement_GreatEastJapan_Eq_Tsu.pdf)

### **“Natural Hazards and Disaster Risks in the Middle East Region”**

The GRC jointly organised an Extreme Natural Hazards and Societal Implications (ENHANS) session: “Natural Hazards and Disaster Risks in the Middle East Region” on 7 May 2011 in Antalya, Turkey. The Chairs were Alik Ismail-Zadeh and Kuniyoshi Takeuchi. The scientific session as a part of the ICSU ENHANS project (<http://www.enhans.org>) provided an opportunity to discuss and to analyse topics related to extreme natural events and disaster risk management in the Middle East region and to present methodologies and technologies suitable for hazard and risk analysis and disaster management. The invited speakers were:

- Jane Rovins, IRDR IPO, Beijing, China: Integrated Research on Disaster Risk: A New International Programme
- Mohsen Ghafory-Ashtiani, International Institute of Earthquake Engineering and Seismology, Tehran, Iran: Risk of Natural Hazard in Iran and Experience on Risk Reduction Capacity Building
- Cuneyt Tuzun, Mustafa Erdik (Turkey), Domenico Giardini, Karin Sesetyan, Bogazici University, Istanbul, Turkey; ETH Zurich, Switzerland: A Regional Program of GEM: Earthquake Model of Middle East (EMME)
- Abdulaziz Al-Bassam, King Saud University, Riyadh, Saudi Arabia: Natural Hazards in Saudi Arabia
- Tarek Merabtene, University of Sharjah, Dubai, United Arab Emirates: Flood Risk Management in the Middle East: Challenges and Opportunities

### **Union session U02**

At the 25th IUGG General Assembly from 27 June – 8 July 2011, Melbourne, Australia, the Union Symposium U-02 “Grand Challenges in Natural Hazards Research and Risk Analysis” and Open Forum “Natural Hazards: From Risk to Opportunity by Partnership of Science and Society” were held on Wednesday, 29 June 2011 and the Union Symposium U-02 extension “Earth on the Edge - Recent Pacific Rim Disasters” was held on Saturday, 2 July 2011. They were co-organized by the IUGG GRC and the ENHANS Project, co-sponsored by AGU, GOOS, ICSU, IGU, IRDR, ISPRS, IUGG, IUGS, IUTAM, and UNESCO.

The lead conveners were Kuniyoshi Takeuchi (Japan) and Alik Ismail-Zadeh (Germany/Russia) and the co-conveners were Tom Beer (Australia), David Boteler (Canada), Shigeo Haruyama (Japan), David Jackson (USA), Fumihiko Imamura (Japan), Vladimir Kossobokov (Russia), John LaBrecque (USA), Uri Shamir (Israel), Ramesh Singh (India), Gerd Tetzlaff (Germany).

The session U-02 extension was later added as a response to the Great East Japan Earthquake and Tsunami and other recent devastating disasters in the Pacific Rim. They were held in big rooms and very well attended. In addition, 31 posters were presented. Lively discussions were held in all the sessions and the Forum. Pdf files of almost all presentations are available via the GRC Webcyclopedia of Natural Hazards, Risks and Sustainability at <http://www.iugg-georisk.org/> with kind agreement of the speakers.

## **PLANNED FUTURE ACTIVITIES**

The GRC is currently organising the First IUGG GRC Conference on “Extreme Natural Hazards and Their Impacts”. This will be held from December 11-14, 2012 at Chapman University, Orange, California, USA, and sponsored by the IUGG, AGU and Chapman University.

In 2012, the GRC will focus on updating and refurbishing the Commission’s webpage at <http://iugg-georisk.org/> to encourage improved awareness and communication of the Commission’s activities.

Submitted by  
Diana Greenslade, GRC Secretary

## Commission on Mathematical Geophysics (CMG)

<http://www.fys.uio.no/cmg2008/>

### INTRODUCTION

The Committee on Mathematical Geophysics is a Union Commission. Its aims to encourage exchange of ideas and information in all areas of geophysics, with emphasis on the application of mathematics, statistics and computer science to geophysical problems, and to promote the development and application of mathematical methods and appropriate theoretical techniques for the solution of problems across the complete spectrum of geophysical disciplines. The Committee is sponsored by all IUGG Associations.

The earliest incarnation of the present CMG Committee was as the Working Group on Geophysical Theory and Computers (WGGTC), which was founded by Vladimir Keilis-Borok. The first meeting of the WGGTC was held in Moscow and Leningrad in 1964 and the last in Moscow in 1971 with intervening meetings held once yearly. Subsequent to 1971 the group was re-structured as the present Committee on Mathematical Geophysics, which has met on a semi-annual basis since that time, beginning with a meeting in Banff (Canada) in 1972.

The schedule since 1986 has included the following sequence of major CMG sponsored conferences: Oosterbeek (The Netherlands, 1986), Blanes (Spain, 1988), Jerusalem (Israel, 1990), Taxco (Mexico, 1992), Villefranche (France, 1994), Santa Fe (USA, 1996), Cambridge (UK, 1998), Villefranche sur Mer (France, 2000), Torino (Italy, 2002), New York (USA, 2004), Sea of Galilee (Israel, 2006), Longyearbyen (Norway, 2008), Pisa (Italy, 2010).

### ADMINISTRATION

The following are current officers of the Union Commission on Mathematical Geophysics:

Chair:	Yehuda Ben-Zion	USA	IASPEI
Vice-Chair:	Eli Tziperman	USA	IAPSO
Secretary:	Claudia Pasquero	ITALY	IAPSO
EC Members:	Roberto Carniel	ITALY	IAVCEI
	Ralf Greve	JAPAN	IACS
	Shin-chan Han	USA	IAG
	Matthias Holschneider	GERMANY	IAGA
	Dan Rothman	USA	IAMAS
	Malcolm Sambridge	AUSTRALIA	IASPEI
	Daniel Schertzer	FRANCE	IAHS
	Gordon Swaters	CANADA	IAPSO
	Ilya Zaliapin	USA	IUGG

We are in the process of looking for two additional vice-chairs that can contribute to the CMG activities.

A business meeting was held on July 4th, 2011 in Melbourne, Australia, during the XXV IUGG General Assembly. Among the participants were IUGG Secretary General Alik Ismail-Zadeh, Daniel Schertzer (IAHS, Université Paris Est, France), Gordon Swaters (IAPSO, University of Alberta, Canada), Matthias Holschneider (IAGA, University of Potsdam, Germany), Ralf Greve (IACS, Hokkaido University, Japan), and Ilya Zaliapin (IUGG, University of Nevada, USA). At the meeting the Secretary General informed the Members that as Daniel Rothman chaired CMG for more than two terms he agreed to step down, and that Yehuda Ben-Zion agreed to take this position. He suggested nominating new vice-chairs and an advisory board for CMG. He also invited the Committee to look for a developing country to host the 2014 Conference on Mathematical Geophysics. Considering the low attendance at that meeting, no official decisions were taken. The suggestions will be further discussed at the next business meeting that will take place at the next CMG Conference in 2012.

## ACTIVITIES

### 29<sup>th</sup> International Conference on Mathematical Geophysics

The principal activity of the CMG is to sponsor a biennial conference on theoretical geophysics. The 29th International Conference on Mathematical Geophysics will be held in June 18-22, 2012 in Edinburgh, Scotland.

The local organizing committee is chaired by Mark Naylor, University of Edinburgh. Detailed information can be found on the conference website <http://www.cmgedinburgh2012.org.uk/>.

The program of the conference includes the following sessions:

1. Mathematics of Planet Earth  
(anticipating 2013 MPE International year, <http://www.mpe2013.org>)  
Convenor: Mary Lou Zeeman (Bowdoin)  
Mathematics of climate. Application of novel mathematical approaches to the geosciences.  
Collaborative math-geosciences initiatives
2. Earth observation  
Convenor: Andrew Curtis (Edinburgh)  
Seismic interferometry. Imaging fault zones and complex crustal environments. Mantle tomography.  
Remotely sensing geophysical fluid dynamics
3. Earth system dynamics  
Convenors: Antonello Provenzale (Torino) Simon Mudd (Edinburgh)  
Climate landscape interactions. Ice-earth-ocean interactions. Earth-life interactions
4. Crustal dynamics  
Invited speaker: Michel Campillo  
Convenors: Yehuda Ben-Zion (University of Southern California)  
Andrew Bell (Edinburgh)  
Physics of earthquakes and faults. Spatio-temporal seismicity patterns beyond universal scaling laws.  
Bridging among scales and frameworks of crustal deformation.
5. Mechanisms of Atmospheric-climate variability and change  
Convenor Brian Mapes  
Large scale atmospheric patterns and variability. Extreme weather events. Inter-annual tropical and extra-tropical variability.
6. Ocean processes: from small scale to global circulation  
Convenor Henk Dijkstra  
From small scale, sub mesoscale and mesoscale turbulence to large scale  
Circulation. Overturning and horizontal circulations and their interaction. Basin-scale variability and processes, and inter-basin ocean teleconnections.
7. Rationalising models with observations  
Convenor: Ian Main (Edinburgh)  
Are blind tests the only way to validate a model. Getting beyond the noise. Building process into statistical forecasts. Data assimilation
8. Solving geophysical problems  
Convenors: Roel Snieder (Boulder)  
Elegant analytics. Computational methods. Statistical insight. Complex and non-linear physics. Visualising the problem.

Keynote lecturers include:

- Roel Snieder (Colorado School of Mines),
- Felix Ng (University of Sheffield, UK),
- Michel Campillo (Université Fourier, France).

Submitted by  
Claudia Pasquero, CMG Secretary

# Commission on the Study of the Earth's Deep Interior (SEDI)

<http://www.sedigroup.org>

## INTRODUCTION

SEDI is an international scientific organization dedicated to the Study of the Earth's Deep Interior that has been a Union Commission of the International Union of Geodesy and Geophysics (IUGG) since 1987. The intent of SEDI is to amalgamate all sources of data and all points of view to generate the most coherent and consistent picture of the workings of the Earth's deep interior.

The main role of SEDI is holding an international symposium every two years to exchange the ideas and new discoveries and to construct a new relationship between researchers coming from various disciplines.

## ADMINISTRATION

### SEDI session at the 25th IUGG General Assembly

At the 25th IUGG General Assembly in Melbourne, Australia, we organized a Union session entitled "Recent Progress in the Studies of the Earth's Deep Interior" and co-convened by Gauthier Hulot (IPGP, France), Michael Bergman (Simon's Rock College, USA), Greg Houseman (University of Leeds, UK) and Satoru Tanaka (JAMSTEC, Japan). We had an oral session in the Plenary Hall on 5 July, which comprised 7 invited talks: The review of seismic tomography of the mantle by Brian Kennett, the geomagnetic field in the core using geomagnetic data assimilation by Alex Fournier, the estimation of the geomagnetic field in the core using core-mantle coupling by Mathieu Dumberry, the dynamics of a stable stratified layer at the top of the outer core by David Gubbins, melt at the inner core surface by Binod Sreenivasan, seismic studies on the inner core by Hrvoje Tkalčić, dynamics of inner core convection by Therry Alboussiere. We had also a poster session in the lobby of the main venue on 2 July, which comprised 7 posters presenting variety topics of deep Earth studies.

### SEDI Business Meeting

A business meeting was held after the oral session on 5 July. As the IUGG General Assembly also marks the end of the term of the SEDI officers, the first agenda is the renewal of this board.

The current SEDI officers are:

Chair:	Satoru Tanaka	JAPAN	IASPEI
Vice-Chair:	Jonathan Aurnou	USA	IAGA
Secretary:	Michael Bergman	USA	IAGA
EC Members:	Antonio Castro	SPAIN	IAVCEI
	Cathy Constable	USA	IAGA
	Véronique Dehant	BELGIUM	IAG
	Gauthier Hulot	FRANCE	IAGA
	Dominique Jault	SWITZERLAND	IAGA
	Thorne Lay	USA	IASPEI

We newly organized an Executive Committee that comprises Gauthier Hulot (Past Chair), and experts from the IUGG Associations, Cathy Constable (IAGA) and Dominique Jault (IAGA), Veronique Dehant (IAG), Thorne Lay (IASPEI), and Antonio Castro (IAVCEI). We had also renewed the members of the Advisory Committee that is a traditional committee in SEDI.

Following this agenda, Chris Jones, a representative of the LOC of SEDI 2012, presented the progress of the preparation of the symposium in Leeds, UK. SEDI 2012 will be held from 1 to 6 July. Then we also heard the reports of national activities. Interestingly, Richard Holme advertised a national meeting named UKSEDI that would be held in London, UK, in November. This meeting is one of the preliminary activities of the international symposium SEDI 2012. Finally, the participants of the

business meeting briefly discussed possible venues for SEDI 2014. We agreed that SEDI should keep the current symposium style comprising invited review talks and contributed posters.

## **ACTIVITIES**

### **12th SEDI Symposium**

Proceedings of the 12th Symposium of SEDI, which consists of selected 12 papers presented in SEDI 2010, were published in October 2011 as a special issue of *Physics of the Earth and Planetary Interiors* (Volume 188, Issues 3-4, pages 131-270). The guest editors are Michael Bergman (Simon's Rock College, USA), Jon Aurnou (UCLA, USA), Gauthier Hulot (IPGP, France), and Satoru Tanaka (JAMSTEC, Japan). This special issue covers a wide range of deep Earth studies by many disciplines; a laboratory experiment, mineral physics, numerical simulations for mantle convection and geodynamo, seismology, geomagnetism, and so on.

### **Report of the UKSEDI meeting, 11th November 2011 (by Richard Holme, Liverpool, UK)**

A Royal Astronomical Society discussion meeting was held at Burlington House in November 2011 entitled UKSEDI. The aim of the meeting was to bring together members of the deep-Earth community from the UK (and other neighboring countries) to examine interdisciplinary interactions between different areas of the UK Earth Science community in these areas. This was given particular relevance by the establishment of a new NERC initiative focusing on the Influence of Core and Mantle on a Habitable planet. We had a well-attended meeting (over 50 participants) with particularly vibrant discussions. The areas of discussion covered the whole range of the deep Earth, from the mantle transition zone to the inner core. A common theme emerged from many of the presentations, in the linking of regions of the Earth and different subdisciplines through consideration of heat flow within the planet, varying from a new estimate of the upper surface boundary condition on total heat flow from Huw Davies (Cardiff), to the effect of variations on the geodynamo from Andy Biggin (Liverpool) and Julian Aubert (IPGP, Paris). Mantle convection is the controlling process in heat movement; the role and observation of plumes is clearly crucial in this question, as considered by both Carolina Lithgow-Bertilloni (UCL) and Saskia Goes (Imperial College), while Jeroen van Hunen (Durham) considered the importance of subduction. Structural issues were addressed at all scales and locations, particularly the top (George Helffrich, Bristol) and bottom (Jessica Irving, Cambridge) of the core.

The abstract books for talks and posters are still available through the meeting web site at <http://www.liv.ac.uk/~holme/rasmeetsedi.html>. Support of the international SEDI organization and financial support from the British Geophysical Association were extremely important for the meeting. The Royal Astronomical Society provided primary support in both logistics and financial matters; it is hoped to repeat the meeting in two years' time (the "off years" for the international SEDI meeting), and we encourage other more focused topical meetings related to SEDI issues to consider making use of the RAS discussion meeting structure and support.

Submitted by  
Satoru Tanaka, SEDI Chair  
Jonathan Aurnou, SEDI Vice-Chair  
Michael Bergman, SEDI Secretary

# **Inter-Associations (IAGA/IASPEI/IAVCEI) Working Group on Electromagnetic Studies on Earthquakes and Volcanoes (EMSEV)**

<http://www.emsev-iugg.org/emsev/>

## **INTRODUCTION**

Founded in 2001 by IUGG, the EMSEV Inter-Association Working Group focuses its activities on 'Electromagnetic Studies of Earthquakes and Volcanoes' (<http://www.emsev-iugg.org/emsev/>). EMSEV is a transverse working group belonging to IAGA, IASPEI and IAVCEI which encourages research on topics covering the physics of the Earth, volcanic and eruptive processes, electromagnetic (EM) and other geophysical phenomena related to dynamic processes leading to faults rupture and volcanic eruptions.

In order to continually make progress, EMSEV is proceeding in three primary directions. The first concerns endorsement of outstanding research discoveries and their promotion through international meetings and regional workshops. The second is to strongly encourage and support international cooperation with developing countries and on research possibly leading to new findings in the EM field. The third is to actively contribute to the organization of international meetings, specific regional workshops, and to education plans. During these assemblies and EMSEV business meetings, EMSEV encourages new directions of research.

## **ADMINISTRATION**

EMSEV is composed of an elected executive bureau, a nominated assembly of members, and the community interested in electromagnetic phenomena, called corresponding members. During the EMSEV business meeting held at IUGG-2012 in Melbourne, we renewed and enlarged the executive bureau.

The bureau is now composed of the following twelve experts:

Chair:	Jacques Zlotnicki	FRANCE	IAVCEI
Vice-Chair:	Malcolm J.S. Johnston	USA	IASPEI
Secretary:	Toshiyasu Nagao	JAPAN	IASPEI
Past Chair:	Seiya Uyeda	JAPAN	IASPEI
Members at large:	Tirumalachetty Harinarayana	INDIA	IAGA
	Qinghua Huang	CHINA	IASPEI
	Valery Korepanov	UKRAINE	IAGA
	Vincenzo Lapenna	ITALY	
	Jann-Yenq Liu	CHINA-TAIPEI	IAGA
	Antonio Meloni	ITALY	IAGA
	Yoichi Sasai	JAPAN	IAVCEI
	Ramesh Singh	INDIA/USA	IAGA

The WG members are nominated for their expertise and their scientific activity in the EM field or in connected research fields. They can be nominated at any of the EMSEV business meetings. At this point, we have 32 working group members from 16 countries (China, France, Greece, India, Indonesia, Italy, Japan, Kyrgyzstan, Philippines, Poland, Romania, Russia, Taiwan, Turkey, Ukraine, and USA). The number of corresponding members now exceeds 269.

On July 4, 2011, EMSEV held the XIVth business meeting during IUGG General Assembly at Melbourne (Australia). On this occasion, A. Rybin, Director of Bishkek Research Station (RS) in Kyrgyzstan presented 30 years of geophysical observations along Kyrgyzstan faults system. Participants agreed to a plan to develop cooperation between EMSEV and Bishkek RS for research on active faults and on physical processes generating earthquakes in Central Asia. The location of the 2012 EMSEV meeting was scheduled to be in Shizuoka prefecture (Japan). Annual reports, minutes of



the business meetings and activities on the Working Group can be found on EMSEV web site (<http://www.emsev-iugg.org/emsev/>).

## ACTIVITIES

### Meetings

- EMSEV members have organized many sessions in international meetings like:

*EGU, Vienna, April 3-8, 2011 (3 sessions),  
USRI GA, Istanbul Turkey, August 2011,  
AOGS GA, Taipei, Taiwan, August 2011,  
AGU, San Francisco, USA, December 2011*

- EMSEV members were also involved in major meetings dealing with EM phenomena related to Earthquakes and Volcanoes at the 'Second International meeting on Demeter mission' which was held in Paris (France) during October 10-12.

- A primary contribution was made during the 2011 IUGG General Assembly in Melbourne (Australia, June 27- July 8) where four coordinated sessions were organized under EMSEV responsibility and one additional session was organized by one EMSEV member. These are:

*\* J-S09: Electromagnetic Studies of Earthquakes, Active Faulting and Tsunamis  
Lead Convenors: M. Johnston (United States of America), T. Harinarayana (India)*

*\* J-S10: Electromagnetic studies of active processes using space technology  
Lead Convenors: M. Parrot (France), Y. Hobara (Japan)*

*\* J-S11: Imaging and monitoring active volcanoes and geothermal fields by ElectroMagnetic (EM) and other geophysical techniques  
Lead Convenor: J. Zlotnicki (France), Co-convenors: Y. Sasai (Japan), V. Spichak (Russia)*

*\* J-S12: Towards short-term earthquake prediction - Electromagnetic and other possible precursors and their generation mechanisms  
Lead Convenor: T. Nagao (Japan), Co-convenors: K. Eftaxias (Greece), F. Freund (USA)*

*\* J-A04: Electromagnetic oscillations from space to Earth: Celebrating 150 years and recent developments in ultra-low frequency wave research  
Convenor: Brian J Fraser (Australia), Co-convenors: Malcolm Johnston (USA)*

### EMSEV activity on volcanoes

The Philippines archipelago suffers frequent and large catastrophic natural hazards (volcanic eruptions, earthquakes, cyclones, and tsunamis). These events result in great loss of human life, economic hardship and destruction of social tissue. The Philippines Institute of Volcanology and Seismology (PHIVOLCS, <http://www.phivolcs.dost.gov.ph/>) is in charge of monitoring most of these hazards and provides direct response to Civil Authorities on the likely consequences and risks. In 2003, PHIVOLCS and EMSEV proposed to develop close cooperation on Taal volcano. The volcano is responsible for serious hazards in the region as a result of pyroclastic flows, base surges, and violent phreatic explosions. In 2004, a Memorandum of Agreement was signed and the first field experiments were started.

Late in 2004, a newly formed PHIVOLCS EM team and a Japanese-French EMSEV team instigated plans to image the hydrothermal system, the geological and tectonic discontinuities with combined magnetic, electric, ground temperature and soil degassing surveys. Progressively, the international EMSEV community was enlarged by researchers from Greece (electrical resistivity), Italy (Robust Satellite Techniques), USA (ground deformation, MOPITT observations), and Belgium (Aster thermal imagery). New research methods, done jointly with the PHIVOLCS EM team, were carried out. These include audiomagnetotellurics, resistivity soundings, magnetic and bathymetric mappings of the inner acidic lake, and bottom lake temperature. From these bi-annual field campaigns, new important results were obtained. These are now used in information planning by both the local inhabitants and the Civil Authorities.

Simultaneously with repeated surveys, EMSEV and PHIVOLCS have built a real-time monitoring network based on electromagnetic and other geophysical parameters as magnetic and electric fields, ground temperature and gradients, seismicity, and tilt. Data are automatically transferred to Taal volcano observatory, PHIVOLCS headquarter and EMSEV servers. In February 2010, EMSEV-PHIVOLCS held a second international workshop on 'Monitoring active volcanoes by electromagnetic and other geophysical methods; Application to Asian volcanoes'. The newly signed Memorandum of Agreement for the coming 5-years is the confirmation of long term and successful cooperation between PHIVOLCS and EMSEV.

### **EMSEV activity related to Earthquake Processes**

In 2011, the WG initiated a new EMSEV activity concerned with the electric/magnetic signals related to earthquakes (EQ). The tectonic area under consideration is the Kyrgyzstan range (42-43°N, 72-76°E) where the Russian Academy of Sciences (RAS) of Moscow with Kyrgyzstan International Geophysical Centre (IGRC), has conducted active monitoring of underground electrical conductivity for over thirty years at the Bishkek RS in Kyrgyzstan (Dr A. Rybin, EMSEV member). In particular, about 6 times a day, a magnetohydrodynamic generator injects 600 A in the ground through a 4 km long electrical dipole. Signal can be received up to 70 km away. Observations seem to show that (1) resistivity changes of a few per cents may be observed before EQs of magnitude above 4, (2) a reduction in overall seismicity appears to result when increased small magnitude EQs were induced by the current system, and (3) large injected currents generate an increase of low magnitude EQs during the days following injection. For better understanding of these important observations and the related physical mechanisms, EMSEV and Bishkek RS embarked on a longterm cooperative effort. An initial meeting was held in Bishkek on October 8 to 12 (see EMSEV web site) during which (1) a complete summary of past observations was discussed, and (2) two continuous telluric stations (Japan and France) were installed at two RS receiving stations. Also during this meeting, a 4-year agreement was signed on the development of scientific relations between participants for solving fundamental problems related to the generation of earthquakes and ways to monitor and mitigate them along different active faults in the Central Asian continental lithosphere.

### **PLANNED FUTURE ACTIVITIES**

In 2012, EMSEV will be involved in important international meetings: EGU, AOGS, USRI, AGU, etc. Our most important will be the EMSEV 2012 meeting which will be held in Japan (Sept. 30 to Oct. 4). It is planned to invite researchers and students from Philippines, Kyrgyzstan, and from other developing countries.

Submitted by  
Jacques Zlotnicki, EMSEV Chair



## **THE INTER-UNIONS COMMISSION: International Lithosphere Program (ILP)**

<http://scliip.gfz-potsdam.de>

### **OVERALL OBJECTIVES**

The International Lithosphere Program (ILP) seeks to elucidate the nature, dynamics, origin and evolution of the lithosphere through international, multidisciplinary geoscience research projects and coordinating committees.

The ILP is charged with promoting multidisciplinary research projects of interest to both the geological (IUGS) and geophysical (IUGG) communities.

The ILP seeks to achieve a fine balance between: “*addressing societal needs*”, e.g. understanding natural catastrophes and other solid earth processes that affect society and the biosphere, providing information for improved hazard assessment, resource exploration, geomedicine and environmental protection; as well as “*satisfying scientific curiosity*”.

According to the Terms of Reference published in 2008 and renewed in 2011 ILP is a body of IUGG and IUGS.

### **FIT WITHIN IUGS AND IUGG POLICY**

IUGS and IUGG are represented in the ILP Bureau.

ILP cooperates with IUGS and IUGG on the follow-up initiatives to the International Year of Planet Earth (IYPE); the ILP President was a member of the board of IYPE Corporation. In this context ILP was leading the IYPE theme Deep Earth, published in a special brochure and, in addition, is financially supporting IYPE. ILP will take the lead in representing solid earth sciences in the future Planet Earth Institute.

Now ILP takes again part in the forefront of development and its president is a member of the Board of the new Earth Science Matters initiative.

### **ORGANISATION**

ILP has an international Bureau with members from several countries that meet annually to monitor progress and to select new programmes and activities in close consultation with the representatives of National Committees. The Bureau is chaired by the President, with support from the Secretary General.

The Bureau was restructured during the Bureau meeting in Vienna on 20 April 2009. As new chair person for the National Committees Dr. Victoria, L. Pease was elected. During the Bureau meeting 2010 in Vienna Sierd Cloetingh was re-elected as President and Professor Hans Thybo was nominated as a new associate Bureau member.

## **Bureau membership**

### **Executive Members:**

President:	S. Cloetingh	The Netherlands	
Secretary General:(since mid 2008)	R. Oberhänsli	Germany	
Executive Secretary:	A. Rudloff	Germany	
Chairperson – Committee of National Representatives:	V.L. Pease	Sweden	
Honorary President:	A. Green	Switzerland	
ILP Fellow:	J.F.W. Negendank	Germany	
Representatives of IUGG & IUGS:	K. Furlong	USA	IUGG
	K. C. Sain	India	IUGG
	J. Charvet	France	IUGS
	Y. Tatsumi	Japan	IUGS
	A. Green	Switzerland	IUGS & IUGG
<b>Associate Members:</b>	J.-P. Burg	Switzerland	
	H. Thybo	Denmark	
	A. Morozov	Russia	
	F. Roure	France	
	M. Zoback	USA	
	R. Missotten	UNESCO	
<b>Lifetime Members:</b>	P. Ziegler	Switzerland	
	M. von Knorring	Sweden	
	H. Gupta	India	

The Bureau members evaluate submitted projects (task forces, coordinating committees, workshops) and decide on their approval according to the criteria of ILP.

## **INTERFACE WITH OTHER INTERNATIONAL PROJECTS**

ILP stimulates and supports the Task Forces and Regional Coordinating Committees with 4,000 US \$ per year over a period of 5 years. This basic support (“seed money”) is used by the project leaders to raise additional funds for their scientific activities, while there is a strong existing interface with other projects (e.g. ICDP, TOPO-EUROPE, TOPO-CENTRAL ASIA, TerMeX).

## **MAIN ACCOMPLISHMENTS IN 2011**

### **ADMINISTRATION**

#### **Bureau meeting of ILP, Vienna, Austria, 4 April 2011**

#### **Minutes of the ILP Bureau Meeting during the EGU General Assembly 2011**

**Vienna, Austria, 4 April 2011**

18:00 h – 19:55 h, Austria Centre Vienna, Room SM1

#### **Agenda**

1. Welcome of the delegates
2. Report of the President
3. Report of the Secretary General
4. Report on IYPE
5. Reports of the Task forces
6. All other business

28 scientists attend the ILP bureau meeting, representing Australia, the Czech Republic, Denmark, Finland, France, Germany, Italy, Japan, the Netherlands, Poland, Slovenia, Sweden, Switzerland, Turkey, and the United States. Representatives from IASPEI, IUGG, IUGS, IYPE, and NSF are also present.

### **IUGG EC meeting in Melbourne, Australia, 26 June -7 July 2011**

The President attended the IUGG meeting held Melbourne to report on ILP matters. S. Cloetingh gave a brief report on the scientific achievements of ILP stating that ILP will continue to:

- to launch new Task Forces and Regional Coordinating Committees,
- to involve more young researchers,
- to activate research councils to attract funds,
- to promote strong presence at international meetings,
- to disseminate ILP results through special volumes,
- to promote young scientists through ILP's active award program,
- to strengthen further the links with the industry,
- to further the work on the integration in the solid earth community.

ILP pointed out that a successful program absolutely needs support from the mother organisations IUGG as well as IUGS. As a result of these efforts IUGS raised its funding, although – due to financial constraints – not yet to its original level.

ILP thanks IUGS for this rise in funding.

### **Informal Bureau meeting Utrecht, 11 November 2011**

This informal meeting was held with the president along a PhD defense in Utrecht ILP matters were discussed in the light of the IGC Year and the anniversary in Paris Feb 2012.

### **Relations to "Planet Earth Institute" and "Earth Science Matters"**

As far as the Planet Earth Institute is regarded ILP signaled its interest and made a supportive contribution. Regarding "Earth Science Matters" The president of ILP Sierd Cloetingh is member of the board.

## **SCIENCE AND RESEARCH**

This section compiles symposia and workshops that were organized under the auspices of ILP.

### **EGU General Assembly, April 2011, Vienna**

During the 2011 meeting the following Task Forces organized sessions and special symposia:

TF II: "Volcano tectonics", Chairs: A. Gudmundson, V. Acocella.

TF V: "The Lithosphere-Asthenosphere Boundary (LAB) Dilemma" (GD2.4/SM4.1/TS10.2) 14 oral and 13 poster presentations.

TF IX: "'Geodynamics, petrology and seismology of the subduction interface: what do we know exactly?'" (3 oral blocks 47 contributions), Chairs: P. Agard, B. Hacker.

CC 3: "Glacial Isostatic Adjustment: Observations and Modeling for Earth Rheology, Dynamics, and Environmental Change" (co-organized) Convener: Markku Poutanen | Co-Conveners: Bert Vermeersen, Volker Klemann, Thomas James Six oral and 18 poster presentations.

Glacial Isostatic Adjustment on regional scales: Modeling and observations" (coorganized) Convener: Volker Klemann | Co-Conveners: Markku Poutanen, Bert Vermeersen, Thomas James Six oral and 11 poster presentations.

## **Goldschmidt Conference 2011, August 14-19 Prague**

TF IV: “Deep subduction of crustal rocks into the mantle: observations, experiments, models”  
Conveners: Dobrzhinetskaya, L., Geria, T., Faryad, S. W. and Perchuk, A.

## **AGU Fall meeting 2011**

TF IV: “VGP V43 - Ultrahigh-pressure Metamorphism: New Paradigms (2 Oral and 1 Poster Sessions). Conveners: Dobrzhinetskaya, L., Green, H., Liou, J. G. and Hacker, B.

TF IX: “Physical and Chemical state of subducting slabs and the slab-mantle interface: Forearc, subarc and beyond. Conveners: Agard, P., Okay, A.

## **GV & GSA Meeting Munich**

TF VII: Special session on modelling geodynamic processes

## **ILP Workshop in the Alps**

TF IX: Nature of the plate interface in subduction zones (5 days, 67 registrations from 12 countries)

## **Penrose Conference “Past and present accretionary orogens”**

CC-1/4

## **Task Forces & Coordinating Committees in the realm of the major ILP themes:**

### **I. Geoscience of global change**

- TF 3: Bridging the gap from microseismicity to large earthquakes
- TF 10: The Unconventionals

### **II. Contemporary dynamics and deep processes**

- TF 4: Continental Collisional Orogens: from Atomic Scales to Mountain Building
- TF 8: Tracking supercells through Earth history
- TF 9: DISC - Deep Into the Subduction Channel

### **III. Continental lithosphere**

- TF 1: CALE - Circum Arctic Lithosphere Evolution
- TF 2: Volcanoes and society: environment, health and public outreach
- TF 3: Bridging the gap from microseismicity to large earthquakes
- TF 4: Continental Collisional Orogens: from Atomic Scales to Mountain Buildings
- TF 5: LAPBOX - The lithosphere-asthenosphere boundary depth paradox
- TF 6: Sedimentary Basins
- TF 7: 3D Geomechanical modelling of geodynamic processes in the lithosphere

### **IV. Oceanic lithosphere**

- TF 1: CALE - Circum Arctic Lithosphere Evolution

### **Coordinating Committees:**

- TOPO-EUROPE
- TOPO-Central Asia
- DynaClim
- MEDYNA - Mantle Dynamics and Plate Architecture Beneath North Africa

The activities are documented in the bibliography (see homepage).

## WORKPLAN FOR 2012

- Attending of the IGCP Anniversary Paris 22. Feb. 2012
- Publications in *EOS*, *Episodes* and in *Earth Science Reviews* in preparation
- Advertising for new support by national science foundations and industry
- Several sessions at EGU-meeting Vienna, 22 – 27 April 2012
- ILP Bureau meeting and ILP-session at EGU in Vienna
- IGC Brisbane August 2012

## FINANCIAL SUPPORT

ILP is basically financed by IUGS and IUGG (each 15,000 US \$ up to 2008). In 2009 IUGS lowered its support, and the Bureau has raised and is still raising funds via the national committees and other bodies from the participating countries (e.g. National Science Foundations, Academies; see list of contributing countries 2008 and 2009). As a result France became a supporting member of ILP in 2009. During 2010 several efforts in raising national support and acquainting new member countries were undertaken. In this context the Arab Emirates, Jordan and Saudi Arabia were approached. The new head of the national committees initiated systematic efforts to contact additional countries. For the 2010 Potsdam meeting our Bureau hosting organisation the Deutsches GeoForschungsZentrum Potsdam and the University of Potsdam supported ILP with logistics and finances.

ILP is greatly indebted to the GFZ German Research for Geosciences at Potsdam for its continuing and long-lasting support.

### Voluntary contributions:

Country/Institution:	Contribution 2010:	Contribution 2011:
China	2,000.00 USD (2011)	2,000.00 USD (2012)
Czech Republic	400.00 USD	400.00 USD
Denmark	2,000.00 USD	2,000.00 USD
Finland	1,000.00 USD	1,000.00 USD
France		5,000.00 USD (2010)
		5,000.00 USD (2011)
Germany	5,000.00 EUR (2009)	5,000.00 EUR (2010)
India		2,000.00 EUR (2010)
		2,000.00 EUR (2011)
The Netherlands (ISES)	5,000.00 EUR	
Sweden	3,400.00 USD	
Switzerland	2,000.00 EUR	2,000.00 EUR
USA	8,000.00 USD	8,000.00 USD
IUGG	15,000.00 USD	15,000.00 USD
IUGS	10,000.00 USD	15,000.00 USD
<b>Total:</b>	<b>41,800.00 USD</b> <b>12,000.00 EUR</b>	<b>53,400.00 USD</b> <b>11,000.00 EUR</b>

In future ILP will make special effort towards emerging countries and will intensify its partnership with industry.

Submitted by  
Sierd Cloetingh, ILP President  
Roland Oberhänsli, ILP Secretary General  
Alexander Rudloff, ILP Executive Secretary

# IUGG FINANCIAL REPORT 2010

## General introduction

This report describes the status of the IUGG finances for the year 2010, the third year of the quadrennium 2008-11. The report is sent to the Finance Committee and the Bureau. It will be included as back ground material for the GA in Melbourne, July 2011.

The 2010 budget was approved at the Council meeting in Perugia, July 24, 2007. A few changes have been added since (ICSU is paid in EUR; the ILP and GeoRisk (GRC) contributions were changed to 15K and 8K respectively).

The price of 1 unit in 2010 was lower than 2009, \$1,730 as compared to \$1,750. The price in a given year is determined according to an inflator index in September in the year before according to the decision of the GA, Boulder 1995.

By the end of 2010 IUGG had 69 members representing 283 units. 5 members are associate members. On January 1, 2011, 1 member is supposed to have withdrawn: Croatia (expected to be a paying member in 2011 again). F.Y.R Macedonia, Azerbaijan and Costa Rica all joined IUGG as new members in 2010. On January 1st, 2010, 9 members were in arrears with their dues. By the end of the year the number was down to 5. In 2011 the number of observers went up to 15. At the time of writing, June 1, the number of members in arrears with their dues is down to 9 again, including Morocco and Ghana.

The downward trend in membership in the period 2004-2008 has now stopped. IUGG seems to be in a more stable period, and there are signs that new recruiting initiatives in fact will increase the number of members.

The membership dues are the economical basis for the activities of IUGG. The situation is right now stable (a relative large sum of money has accumulated over a longer period of time). The money gives possibilities for new initiatives for the next quadrennium. But in several countries a value for money debate is taking place. Therefore, IUGG must keep focus on the membership issue in the foreseen future.

Realizing that several members have EUR currencies and several associations are located in the EUR zone it is now made possible to do transactions in EUR as well as in USD and DKK.

The accounts of the treasurer's office are audited by a chartered auditor.

A student assists me with the keeping order in my files, writing letters etc. Since 2007 I have not had an Assistant Treasurer.

## Content:

1. A review of "The summary of the IUGG accounts in US dollars for 2009" page 88-90
2. An overview of administrative and travel expenses in 2009 page 90
3. An overview of IUGG grants, allocations and inter-association activities in 2009 page 91
4. Some Membership information and statistics (July 25) page 92-93



## 1) Comments to The summary of the IUGG accounts in US dollars for 2009

IUGG has now accumulated more cash than 1 years turn over. It is noticed that IUGG always has at least \$100.000 as reserve for the next GA.

### SUMMARY OF IUGG ACCOUNTS 2010

US dollars	Accounts	Budget
<b>RECEIPTS</b>		
1. Membership Subscription	452.265,62	449.700,00
2. ICSU Grants	0,00	
3. Assembly Surcharge	0,00	
4. Contracts with ICSU	39.525,69	
5. Sales of Publications	64,33	200,00
6. Miscellaneous		
a. Interest	-130,80	12.500,00
b. Gain on exchange	10.632,55	
c. Other	0,00	
7. Total Receipts	502.357,39	462.400,00
8. Balance on 1/1 2010	883.917,58	648.800,00
10. Check Sum	1.386.274,97	1.111.200,00
<b>EXPENDITURES</b>		
11. Administration		
11.1 Personnel	14.830,94	20.000,00
11.2 Equipment	0,00	5.000,00
11.3 Supplies	0,00	5.000,00
11.4 Communications	5.799,29	8.000,00
11.5 Travel, Administration only	21.306,05	35.000,00
11.6 Miscellaneous	12.993,54	1.000,00
11.6a ENHANS	18.589,99	0,00
11.7 Travel, representation	4.798,39	5.000,00
12. New initiatives	64.926,22	25.000,00
13. General Assemblies		
13.1 Organization	0,00	0,00
13.2 Travel	0,00	0,00
14. Symposia	19.607,47	20.000,00
15. Annual allocations		
15.1 Annual allocations		
15.1a Associations	298.383,66	215.600,00
15.1b WCRP, EMSEV	5.855,07	4.700,00
15.2 Intr. of IACS	0,00	20.000,00
16. Dues and Grants		
16.1 ICSU	20.156,79	17.000,00
17. Union activities		
17.1 GeoRisk, SEDI, CMG	19.873,52	28.000,00
17.2 Inter-Union Science (FAGS, ILP)	16.031,62	29.000,00
18. Contries in need		
18.1 Travel grants	0,00	0,00
19. Miscellaneous		
19.1 Miscellaneous	0,00	0,00
19.2 Professional services	6.824,16	3.000,00
19.3 Fees	2.209,05	2.000,00
19.4 Loss on exchange	0,00	0,00
20. Contingencies	0,00	6.250,00
21. Total Expenditures	532.185,74	449.550,00
22. Balance on 31/12 2010	854.089,23	661.650,00
23. Total	1.386.274,97	1.111.200,00

		DKK pr USD
Exchange rates:	Line 8	5,150 =DEC 31, 2009
	Line 22	5,675 =DEC 31, 2010
	Other:	5,657
		USD pr EUR
	Line 8	1,443 =DEC 31, 2009
	Line 22	1,314 =DEC 31, 2010
	Other:	1,318

Copenhagen, June 6, 2011

Aksel Walløe Hansen

The summary of the IUGG accounts is in USD. It is based on three USD, EUR and DKK accounts with Danske Bank. In addition IUGG also has a Mastercard account which is used mostly in connection with traveling. Occasionally, one more account is involved: whenever the level of interest makes it relevant a certain amount is set aside for a specified period of say 3 - 6 months. I keep track of such agreements in the US2 og KR2 accounts.

Since 2008 a EUR account allow European members to pay dues directly in EUR and IUGG to do relevant transfers in EUR (several Associations have accounts in EUR).

**The accounting:**

My accounting is based on a cash flow model. This means that the balances on December 31 may not reflect the net financial status of the union.

The numbers quoted here can deviate from the actual values in the accounting due to fluctuations in the exchange rates from day to day.

**Notes:**

Receipts

**1**

The payment of dues is very close to the budget. Right now (June 1, 2011) we have received payments equivalent to a total 268 units for 2010 as compared to 276 for 2009 one year ago. The total number of units is 283 for the year 2010.

**2, 3**

No activities

**4**

An ICSU grant to the ENHANS project was initiated in 2010 (€30.000). IUGG has added \$30K to the project.

**5**

The royalties from AGU are slowly fading away.

**6.a**

Danske Bank didn't pay interest for our deposits in 2010.

**6.b**

This line (gain of exchange) – a loss is shown in line 19.4 - is used to balance the accounts. In 2010 there is a significant gain on exchange. This is explained by large fluctuations in the US\$/€ ratio during the year.

Expenditures

**11.1**

We spend less on personnel than budgeted in Perugia in 2007. From 2009 and onward the assistant secretary is paid by German funds. Right now IUGG is paying a web master and a student assistant.

**11.2 through 11.7**

Line 11.5 covers representative expenses and expenses in connection with the Bureau meeting in Cairo, Oct-Nov 2010. 11.7 covers other travel expenses.

There were no travel expenses paid to liaison officers in 2010.

**12**

The 2010 spending is higher than the amount specified in the budget because of UCDI, 2010/11.

**13**

No activities

## 14

The 2010 spending is close to the budget.

See page 6 for details. Two grants were not paid because no contact could be established.

## 15.1a

All 8 associations have received their allocations for 2010. The total allocated amount includes the 20 K added by the union to the normal 50% share of the net income during the previous year.

The new distribution percentages for 2008 – 2011 and the allocations in 2010 are shown here:

	%	2010
IACS	9,340	\$26,400
IAG	12,140	\$34,314
IAGA	17,415	\$49,225
IAHS	11,030	\$31,177
IAMAS	15,765	\$44,561
IAPSO	10,765	\$30,428
IASPEI	14,205	\$40,151
IAVCEI	9,340	\$26,400

## 15.1b, 16.1

As of 2007 IUGG is paying its ICSU contribution in EUR as requested by ICSU (approved at EC meeting in Karlsruhe, August 2008). Also the contribution to WCRP is now paid in EUR.

## 17.1

Liaison officers's travel expenses are moved to line 11.7.

Over many years IUGG supported several ICSU related activities through the FAG organization. In the process of the change to a new structure the usual money has not been paid in 2009 and 2010.

## 22

The balance by the end of 2010 is about \$30K less than one year earlier, but still substantially higher than the budget value, the reason being a combination of higher income from members and less pay out than assumed in the budget, one example is 2 unsuccessful Africa initiatives.

## 2) An overview of administrative expenses and travel expenses in 2010.

The Bureau Meeting, Cairo, October-November 2010	\$19,686	
Bureau related travelling expenses	\$11,657	
Liaison Officers	\$ 0	
<b>Total</b>		<b>\$31,343</b>

**3) An overview of IUGG grants, allocations, inter-association activities and union activities in 2010**

**i) Line 11.6a and 12**

ENHANS project South Africa, Pretoria	\$30,000	(line 12)
Brazil meeting	\$15,483	
San Francisco meeting, AGU	\$ 3,207	
<b>Total</b>		<b>\$48,690</b>

**ii) Line 12 (New initiatives grants, including “Geophysics in Africa”)**

EMSEV, TAAL volcano	\$ 4,300	
Colloquium Africa Geology	\$ 1,000	
IAVCEI grant, volcanic ash dispersal	\$10,000	
IAGA grant, Extension of INTERMAGNET	\$10,000	
<b>Total</b>		<b>\$25,300</b>

**iii) Line 14 (IUGG 2010 Symposia grants)**

IACS	"Cryospheric Changes and Influences - Cryospheric Issues in Regional Sustainable Development"	\$ 1,000	
IACS	"International summer school/workshop in glaciology"	\$ 1,000	
IACS	Ice and Climate Change: A View from the South. VICC-2010	\$ 1,000	
IAG	V Congreso Agrimensura	\$ 1,000	
IAG	PAIGH, SIRGAS & IAG-SIRGAS joint meeting	\$ 1,000	
IAGA	20th Electromagnetic Induction Workshop	\$ 1,500	
IAHS	BALWOIS 2010	\$ 1,000	
IAHS	6th World FRIEND Conference	\$ 1,500	
IAMAS	CACGP / IGAC Joint Conference "Atmospheric Chemistry: Challenging the future"	\$ 2,000	
IAMAS	Workshop on Antarctic Clouds at the Byrd Polar Research Center	\$ 1,000	
IASPEI	8th ASC General Assembly	\$ 2,000	
IASPEI	VIII international workshop "Physics of forecasting of rock destruction"	\$ 1,000	
IASPEI	"Managing Waveform Data and Related Metadata for Seismic Networks"	\$ 1,000	
GRC (GeoRisk)	"Breaking Seismo-ill-Logical Circulus Vitiosus" at ESOF2010	\$ 1,500	
COSPAR	38th COSPAR Scientific Assembly	\$ 2,000	
<b>Total</b>			<b>\$19,500</b>

**iv) Line 15.1b (Inter-Association Activities)**

WCRP, converted from EUR	\$ 3,855	
EMSEV	\$ 2,000	
<b>Total</b>		<b>\$ 5,855</b>

**v) Lines 17.1, 17.2 (Union Activities)**

GeoRisk, 2010	\$ 8,000	
SEDI, 2009+2010	\$ 8,000	
CMG, 2010+2011	\$ 4,000	
UCDI, 2010+2011	\$10,000	
ILP, 2010	\$15,000	
<b>Total</b>		<b>\$45,000</b>

#### **4) Some Membership information and statistics**

At the time of writing (June 1, 2010) IUGG has 69 members (compared to 65 a year ago) representing 283 units. The Philippines have returned as a paying member, and Azerbaijan and FYR Macedonia are new cat. 1 members. Costa Rica is a new A member. 5 members are in associate status and 9 members are in observer status.

The 9 members in observer status are

##### In category 1

Albania (2. year as observer)

Armenia (3. year as observer)

Croatia (5. year as observer) (has promised to pay in June 2011)

Ghana (1. year as observer)

Morocco (2. year as observer)

##### In category 2

Egypt (1. year as observer)

South Korea (1. year as observer)

##### In category 3

Greece (1. year as observer)

Philippines (1. year as observer)

In addition another 5 members started 2010 as observers, but all of them have paid their dues for 2010 and earlier as of this date (June 1).

The 9 observer countries together represent 17 units (and a debt of US\$ 36,070 in total).

Croatia is considered to have withdrawn by the end of 2010. Recently, Croatia has informed the IUGG secretariat that they plan to pay their dues in arrears.

Morocco and Ghana are treated as an observer, because they didn't pay dues in 2009-2010. The 2008 dues were paid by Royal Society, UK. The future of their membership is uncertain.



## ADDITIONAL UNION MATTERS

### Awards and Honors

In 2011, the American Geophysical Union (AGU) elected new Fellows. Among the Fellows elected this year are the following IUGG experts: **Yehuda Ben-Zion** (University of Southern California, Los Angeles, USA), a member of the IUGG Commission on Mathematical Geophysics; **Michael Kendall** (University of Bristol, UK), a member of the U.K. National Committee for IUGG; **Alan Robock** (Rutgers University, USA), IAVCEI life member and a current or past member of several commissions of IAVCEI and IAMAS including the Commission on Volcanism and the Earth's Atmosphere, the International Climate Commission, and the International Commission on the Middle Atmosphere.

**Günter Blöschl** (Austria; President of the IAHS International Commission on Water Resources Systems) and **Mioara Mandea** (France; IAGA Secretary General) have been elected President-Elect and Secretary General (respectively) of the European Geosciences Union (EGU).

The IAG Guy Bomford Prize was presented to **Johannes Böhm** (Technische Universität Wien, Austria) for his outstanding contributions to geodetic studies of atmospheric effects on microwave measurements (VLBI, GNSS, DORIS). Dr. Böhm is a member of various Study and Working Groups of IAG Commissions and the International VLBI Service (IVS).

**Yun-tai Chen** (China Earthquake Administration, Beijing), IUGG Bureau Member (2003-2011), delivered a prestigious Axford Lecture at the 8th Annual Convention of the Asia Oceania Geosciences Society (AOGS) in Taipei, Taiwan.

The 2011 Wager Medal of the International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI) was awarded to **Amanda Clarke** (Arizona State University, USA). The medal is given to a single mid-career scientist, who has made outstanding contributions to volcanology, particularly in the eight-year period prior to the awards.

The Prime Minister of India Dr. M. Singh appointed **Harsh Gupta** (IUGG President) as a Member of the Indian National Disaster Management Authority (NDMA), which is chaired by the Prime Minister.

**Alexei Gvishiani** (President of the Russian National Committee for Geodesy and Geophysics) was elected a Full Member (Academician) of the Russian Academy of Sciences at the Annual Meeting of the Academy in December 2011.

**H. Gerald (Gerry) Jones** (Université du Québec, Canada) was awarded an "Honorary Member of the International Association of Cryospheric Sciences (IACS)" in recognition of outstanding service, particularly his unselfish and untiring commitment to establishing IACS.

**Gordon McBean** (The University of Western Ontario, London, Canada) is awarded the Order of Ontario, Ontario's highest honor. He is a leading scientist and authority on climate change and natural disasters. Gordon is a former IUGG Bureau Member (1987-1995) and ICSU President-elect.

**Trevor McDougall** (CSIRO Marine and Atmospheric Research, Australia) received the Albert I Medal of the International Association for the Physical Sciences of the Oceans (IAPSO) for his outstanding contribution to the ocean physics and chemistry. Dr. McDougall was leading the SCOR/IAPSO Work Group on the New Equation of Seawater State.

**Ruth Neilan** (JPL, California Institute of Technology, USA) received the Levallois Medal of the International Association of Geodesy (IAG) in recognition of her international service related to the geodetic and geophysical applications of the Global Positioning System (GPS). Ruth Neilan is an IAG Executive Committee member, Director of the International GNSS Service (IGS) Central Bureau, and Vice-President of the Global Geodetic Observing System (GGOS).

**Emmanuel Pagneux** (University of Iceland, Iceland) received the Tison Award for young scientists (age below 41 years) for the best paper published in an IAHS publication.

**Elizabeth J. Petrie** (Newcastle University, United Kingdom) received the IAG Young Authors Award for her paper published in the *Journal of Geodesy*, Vol. 84, No. 8, 491-499 (together with Matt A. King, Philip Moore and David A. Lavallée) “A first look at the effects of ionospheric signal bending on a globally processed GPS network”.

The IAPSO LaFond medal for young scientists from the developing countries was presented to **Towhida Rashid** (Dhaka University, Bangladesh) at the IUGG General assembly in Melbourne.

**Roland Schlich** (member of the French National Committee for IUGG and former IUGG liaison to SCAR) is elected Treasurer of the European Geosciences Union (EGU) for the term 2011–2013. He will be inaugurated during the next EGU Plenary meeting on 4 April 2011 in Vienna, Austria.

The Vening Meinesz Medal of the European Geosciences Union (EGU) was presented to **Harald Schuh** (Technical University of Vienna, Austria; President of the Austrian National Committee for IUGG and Vice-President of IAG) at the EGU General Assembly (3-8 April 2011) in Vienna for his work in the field of Very Long Baseline Interferometry (VLBI) and his important contribution to space geodetic research.

IUGG sponsored a special IUGG Prize at the 2011 BHP Billiton Science Awards. These awards are given for the best science projects undertaken by a secondary school student. The winner of the IUGG Prize was **Tanvi Srinivasan** from Queensland (Australia) for a project on the examination of salinity in wetlands. The prize was awarded at a ceremony on 15 February 2011 held at Scienceworks, the Victorian science museum in the Melbourne suburb of Spotswood.

**Carlos Tucci** (Fevale University in Novo Hamburgo, Brazil) received the 2011 International Hydrology Prize of the International Association of Hydrological Sciences (IAHS), the World Meteorological Organisation (WMO) and UNESCO for his outstanding regional and global contributions to hydrology. Dr. Tucci was IAHS Vice President (1999-2003).

The 2011 George Walker Award of IAVCEI was presented at the IUGG General Assembly in Melbourne to **Joe Dufek** (Georgia Institute of Technology, USA). The award recognizes the achievements of a recent outstanding graduate under the age of 35 in the fields of research encompassed by IAVCEI.

**Murugesu Sivapalan** (University of Illinois, USA) received the 2011 Robert E. Horton Medal of the American Geophysical Union. Dr. Sivapalan is a founding member of the IAHS Decade on “Prediction in Ungaged Basins”.



## LIST OF ACRONYMS

AAAS	American Association for the Advancement of Science
AGU	American Geophysical Union
AOGS	Asia Oceania Geosciences Society
APECS	Association of Polar Early Career Scientists
CAST	China Association for Science and Technology
CCTF	Consultative Committee for Time and Frequency
CEA	China Earthquake Administration
CMG	Commission on Mathematical Geophysics
CNC-IUGG	Chinese National Committee for Geodesy and Geophysics
CODATA	Committee on Data for Science and Technology
COSPAR	Committee on Space Research
CTBTO	Comprehensive Nuclear-Test-Ban Treaty Organization
DFG	German Research Foundation
EGU	European Geosciences Union
EMSEV	IAGA/IASPEI/IAVCEI Inter-Association Working Group on Electromagnetic Studies of Earthquakes and Volcanoes
GEO	Group on Earth Observation
GGOS	Global Geodetic Observing System
GOOS	Global Ocean Observing System
GRC	Commission on Geophysical Risk and Sustainability
IACS	International Association of Cryospheric Sciences
IAEA	International Atomic Energy Agency
IAG	International Association of Geodesy
IAGA	International Association of Geomagnetism and Agronomy
IAHS	International Association of Hydrological Sciences
IAMAS	International Association of Meteorology and Atmospheric Sciences
IAPSO	International Association for the Physical Sciences of the Ocean
IASPEI	International Association of Seismology and Physics of the Earth's Interior
IAU	International Astronomical Union
IAVCEI	International Association of Volcanology and Chemistry of the Earth's Interior
ICACGP	International Commission on Atmospheric Chemistry and Global Pollution
ICAE	International Commission on Atmospheric Electricity
ICAO	International Civil Aviation Organization
ICCL	International Commission on Climate
ICCP	International Commission on Clouds and Precipitation
ICDM	International Commission on Dynamical Meteorology
ICMA	International Commission on the Middle Atmosphere
ICPAE	International Commission on Planetary Atmospheres and their Evolution
ICPM	International Commission on Polar Meteorology
ICSU	International Council for Science
ICTP	Abdus Salam International Centre for Theoretical Physics
IGCP	International Geoscience Programme
IGOS-P	Integrated Global Observing Strategy Partnership
IGU	International Geographical Union
IHP	International Hydrological Programme
ILP	International Lithosphere Program
INQUA	International Union for Quaternary Research
INTERMAGNET	International Real-time Magnetic Observatory Network
IOC	UNESCO Intergovernmental Oceanographic Commission
IOC	International Ozone Commission
IRC	International Radiation Commission
IRDR	Integrated Research on Disaster Risk
ISC	International Seismological Centre
ISPRS	International Society for Photogrammetry and Remote Sensing
ISSC	International Social Sciences Council
IUGG	International Union of Geodesy and Geophysics
IUGS	International Union of Geological Sciences
IUSS	International Union of Soil Sciences
IUTAM	International Union of Theoretical and Applied Mechanics
JBGIS	Joint Board of Geospatial Information Societies
NKGG	German National Committee for Geodesy and Geophysics
OECD	Organisation for Economic Co-operation and Development
ÖNK	Austrian National Committee for IUGG
PAIGH	PanAmerican Institute of Geography and History

PHIVOLCS	The Philippines Institute of Volcanology and Seismology
ROA	ICSU Regional Office for Africa
ROAP	ICSU Regional Office for Asia & the Pacific
ROLAC	ICSU Regional Office for Latin America and the Caribbean
SCAR	Scientific Committee on Antarctic Research
SCOR	Scientific Committee on Ocean Research
SCOSTEP	Scientific Committee on Solar-Terrestrial Physics
SEDI	Study of the Deep Interior of the Earth
UCDI	Union Commission on Data and Information
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNISDR	United Nations International Strategy on Disaster Reduction
UNOOSA	United Nations Office for Outer Space Affairs
UN-SPIDER	United Nations Platform for Space-based Information for Disaster Management and Emergency Response
URSI	International Union of Radio Science
WCRP	World Climate Research Programme
WDS	ICSU World Data System
WMO	World Meteorological Organization
WSF	World Science Forum
VAACs	Volcanic Ash Advisory Centers
VASAG	Joint WMO-IUGG Volcanic Ash Scientific Advisory Group