



INTERNATIONAL UNION OF GEODESY AND GEOPHYSICS
UNION GEODESIQUE ET GEOPHYSIQUE INTERNATIONALE

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This informal newsletter is intended to keep IUGG Member National Committees informed about the activities of the IUGG Associations, and actions of the IUGG Secretariat. Past issues are posted on the IUGG Web site (<http://www.iugg.org/publications/ejournals/>). Please forward this message to those who will benefit from the information. Your comments are welcome.

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1. Welcome to Costa Rica, a new member of IUGG

By vote by correspondence of the Regular Members of IUGG, Costa Rica has been accepted as a new member of IUGG in Associate status. The Adhering Body is the Costa Rican National Academy of Sciences. The Academy appointed Dr. Marino Protti, Secretary of the Academy, who together with Dr. Walter Fernández, President of the Costa Rican National Council of Science and Technology, will form the National Committee for IUGG. We look forward to collaborations and new friendships.

2. Proposed Changes to IUGG Statutes and By-laws due 1 November

As announced in the March 2010 issue of the E-Journal (Volume 10 No. 3), all Adhering Bodies of IUGG Member Countries, through their National Committees, may submit proposals for modifications to the IUGG Statutes and By-laws. The Committee appointed to accept and coordinate the proposed changes consists of the following members:

Chair: David Kerridge (U.K.)

Members:

Jean-Pierre Barriot, alternate Michel Menvielle (both France)

Priscilla Grew, alternate Robert Engdahl (both USA)
Ronald Stewart (Canada)

All Adhering Bodies of IUGG Member Countries, through their National Committees, may submit proposals for modifications. Proposals must reach the Secretary General by 25 December 2010 so that they can be included in the Agenda Book for the Council Meetings. To permit the Committee to prepare a summary of the proposed changes and their consequences, please send proposals before **1 November 2010** to David Kerridge at the following address:

Dr. David Kerridge
British Geological Survey
Murchison House, West Mains Road
Edinburgh EH9 3LA
Scotland, U.K.
E-mail: djk@bgs.ac.uk
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3. IUGG Association Scientific Assemblies in 2013

The IUGG Associations have selected the venues of their 2013 Scientific Assemblies. While in most cases the dates are not yet firm, the locations of these Assemblies illustrate the international reach of IUGG. IAG has not yet selected their venue, but the others are listed below. More information will be listed on each Association web-site as it becomes available.

IAGA – Merida, Mexico (dates are not yet defined).

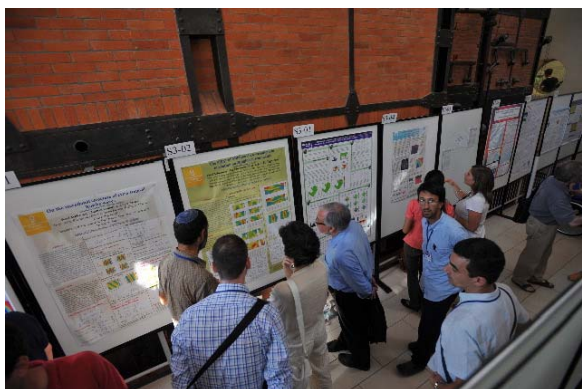
IAMAS-IACS (joint assembly) – Davos, Switzerland, 8-12 July.

IAHS-IAPSO-IASPEI (joint assembly) – Göteborg, Sweden, 22-26 July.

IAVCEI – Kagoshima, Japan, 28 October - 3 November.

4. Report on the 2010 Conference on Mathematical Geophysics

The 28th International Conference on Mathematical Geophysics was held in Pisa in June 2010. The conference was organized by the IUGG Union Commission on Mathematical Geophysics (CMG), the Istituto Nazionale di Geofisica e Vulcanologia, and the University of Pisa and was co-sponsored by the U.S. National Science Foundation. The theme of the conference was “*Modelling Earth Dynamics: Complexity, Uncertainty and Validation*”. More information about the conference can be found on the website (<http://cmg2010.pi.ingv.it>). Many talks at the conference illustrated the complexities affecting geophysical processes. Novel applications of geophysical fluid dynamics were presented with specific reference to volcanological and subsurface/surface flow processes. Fluid-dynamic models of atmospheric, oceanic, environmental and climatic systems also illustrated the fundamental role of non-linear couplings between the different sub-systems as well as of Earth’s topography to explain the complex stratifications and circulations affecting the domains. Similarly, advances in solid-Earth mathematical geophysics have allowed researchers to obtain the first planet-wide tomographies based on the complete solution of the elasto-dynamic equations in 3D, to formulate non-local and dynamic damage models of rocks, to investigate statistically the triggering, clustering, and synchronization of faults, as well as to develop realistic simulations of the planetary dynamo, plate tectonics, and gravity and magnetic fields.



Uncertainty identification and quantification was the second key theme of the conference. The contributions presented clearly highlighted how an important part of the geophysical community has addressed this issue over some years. Applications of the Bayesian paradigm, development of logic event trees, production of ensemble forecasting of expected processes, reconciliation techniques of sparse geological evidence, as well as expert elicitation techniques have all been developed for several geophysical systems including applications to hazard and risk assessment. The model validation issue was widely discussed during the conference. This theme was also revised in the light of the most recent outcomes of philosophical research. The well-known concepts of model verification and validation were complemented with the terms “confirmation” and “testing”. Direct comparisons between observational data and deterministic and probabilistic modelling forecasts were presented for seismic, volcanological, geodynamical, atmospheric and climatic systems well illustrating the challenging aspects of model evaluation. The conference also hosted a special session “*Can our models only predict the irrelevant?*” in memory of Prof. Albert Tarantola (see the obituary in the IUGG E-Journal, Vol. 10, No. 2, 1 February 2010), an outstanding mathematical geophysicist and former CMG President, which was dedicated to the relevance of mathematical models in terms of predictability in real applications.

Received from Augusto Neri, Chair, Conference Local Organising Committee

5. Business Meeting of the IUGG Union Commission on Mathematical Geophysics (CMG)

The CMG business meeting was held in Pisa on Tuesday, 8 June 2010 during the 28th Conference on Mathematical Geophysics. Attendees at the meeting: Dan Rothman (CMG President), Claudia Pasquero (CMG Secretary), Einat Aharonov and Eli Tziperman (CMG Vice Presidents), Augusto Neri (IAVCEI Representative), Yehuda Ben-Zion (IASPEI Representative), and Mathias

Holschneider (IAGA Representative). Guests: Alik Ismail-Zadeh (IUGG Secretary-General) and Mioara Manda (IAGA Secretary-General).

Unanimously the CMG members expressed their gratitude to the organizers of the 28th Conference on Mathematical Geophysics for the excellent management of the conference and hospitality. Possible locations and chair of local organizing committee for the next CMG, to be held in 2012, were discussed. It was decided to give preference to people who had previously participated in the CMG Conference to allow continuity. A few potential hosts will be contacted and a final decision will be taken before Fall 2010. It was mentioned that IUGG Conferences on Mathematical Geophysics had been held mostly in North America and Europe, and the Union Commission should try to organize a conference somewhere else. The Terms of Reference were discussed, with particular emphasis on the fact that Representatives of the Associations should be elected for a total of no more than 8 years, and that each Association can nominate two Representatives. Finally, it was decided to constitute a mailing list for people interested in Mathematical Geophysics.

Received from Claudia Pasquero, CMG Secretary

6. News from the International Council for Science (ICSU)

In late 2009 the Belmont Forum, a group of scientific foundations of international global change research, invited the International Council for Science (ICSU) to conduct an analysis of the international research capability required to respond to the challenge of delivering knowledge to support human action and adaptation to regional environmental change. This challenge was named the Belmont Challenge and requires regional and decadal prediction, advanced observing systems and the integration of the social sciences.

In June 2009, the US National Science Foundation (NSF) and the UK Natural Environment Research Council (NERC) led a meeting in Belmont, Washington DC, attended by representatives of several of the world's major global change research funding agencies and the International Council for Science (ICSU). These agencies, supporting basic and applied research in Earth system science, identified a challenge for the international scientific community to *develop and deliver knowledge in support of national and international government action to mitigate and adapt to global and regional environmental change with an emphasis on regional hazards*. This challenge is hereafter referred to as the *Belmont Challenge*. In response, a panel was assembled by ICSU. It was tasked: to assess the willingness, readiness and capacity of the international research community to respond to the Challenge; and to address issues related to the integration of weather, climate, ecosystem, energy, health, agriculture, engineering and social science research, emphasizing near-term (year-decade), as well as medium-term (20 years) options, challenges, and approaches to the needed level of international activity. This requires a dialogue between stakeholders (political, economic and social actors, either as individuals, groups or organizations), and natural and social scientists.

The environmental problems facing today's society cannot be overcome by a single nation or a single scientific discipline. Responding to these challenges demands highly coordinated and collaborative research and service agendas. The panel proposes a research agenda to provide the scientifically based information needed by local, national and international decision makers, as they take actions for the benefit of society and environmental sustainability. This agenda will mobilize the full spectrum of scientific disciplines. Reducing vulnerability and increasing resilience to environmental stress is a unifying goal of the diverse communities involved in these issues.

The report of the ad-hoc panel entitled “*Regional Environmental Change: Human Action and Adaptation. What does it take to meet the Belmont Challenge?*” is available at http://www.icsu.org/Gestion/img/ICSU_DOC_DOWNLOAD/3400_DD_FILE_ICSU_Belmont_report.pdf

7. Report on the VIII International Workshop “Physics and Forecasting of Rock Destruction”



The Eighth International Workshop “Physics and Forecasting of Rock Destruction” (<http://www.ioffe.ru/kuksenko2010/>) was held in Saint Petersburg, Russia, from 24 to 29 May 2010. The workshop was organized by the Schmitt Institute of Physics of the Earth and the Ioffe Physical Technical Institute, both Institutes of the Russian Academy of Sciences (RAS) and co-sponsored by IUGG, the IASPEI Commission on Earthquake Sources: Modeling and Monitoring for Prediction, the Departments of Earth Sciences and Physics of RAS, the Russian Foundation for Basic Research, and Pradicom Ltd. More than 100 scientists representing eight countries (Belarus, Germany, Greece, India, Kazakhstan, Kyrgyzstan, Russia, and Tadjikistan) participated in the workshop.

Three scientific sessions presented the latest development in the field. Session 1 discussed problems related to the theory of destruction of rocks, mathematical and physical modeling of processes in the sources, spatial-temporal regularities, fractal and multi-fractal structure of seismicity, and triggering and synchronization of processes of rock instability. Problems of catastrophe theory, phase transitions and self-organized criticality in complex systems were considered in session 2, whereas session 3 was dedicated to earthquake precursors, regularities of seismic noise, and new approaches to the earthquake forecast.

The Workshop participants adopted a resolution noting (i) the progress in the understanding of complexity of the physical nature of fracture sources of different scale levels (seismicity, rock bursts, etc.); (ii) the progress in the interpretation of observations of various geophysical fields; (iii) the recent achievements in studies of trigger effects and effects of synchronization of geophysical fields; and (iv) the recent development of research methods in the field of seismology and mining.

Received from Alexey Zavyalov, Chairman of the IASPEI Commission on Earthquake Sources: Modeling and Monitoring for Prediction,

8. International Workshop “Extreme Natural Hazards and Disaster Risk in Africa”

The African leg of the ENHANS (Extreme Natural Hazards and Societal Implications) project will take place from 17 to 20 January 2011 in Pretoria, South Africa. The workshop will provide an opportunity for the research community of the African countries and international experts to discuss and analyse major topics related to extreme natural events and disaster risk. The workshop will also serve as a platform to establish links and networks between African experts and the relevant international organizations.

More details can be found at: <http://www.technoscene.co.za/hazardsws/>

The principal goals of the ENHANS project led by IUGG and co-sponsored by several international and inter-governmental organizations (<http://www.enhans.org>) are (i) to improve the understanding of critical phenomena associated with extreme natural events and to analyse 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 the political and economical policies; (iii) to disseminate the 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.

9. Obituary: *Alfred Becker* (1934-2010)



We mourn the death of our colleague Dr. Alfred Becker, who passed away on 18 August, a few hours after his last visit to the Potsdam Institute for Climate Impact Research (PIK) as a retired guest-scientist. Dr. Becker was a staff member of PIK nearly from the beginning of the Institute, and the present international position of PIK in water sciences owes much to Alfred's long-term efforts. Dr. Becker was actively involved in the International Association of Hydrological Sciences since the early 1970s, attending symposia and workshops, collaborating with Journal editors, and holding offices, such as Vice-President of IAHS International Commission on Atmosphere-Soil-Vegetation Relations (ICASVAR) in 1995-1999.

Dr. Becker was also active in other streams of international hydrology, under the aegis of UNESCO, the IGBP's Biospheric Aspects of the Hydrological Cycle, and IPCC.

Received from Pierre Hubert, IAHS SG and Z. Kundzewicz, IAHS Editor

10. IUGG-related meetings occurring during October – December 2010

A calendar of meetings of interest to IUGG disciplines (especially those organized by IUGG Associations) is posted on the IUGG web site (<http://www.IUGG.org/calendar>). Specific information about these meetings can be found there. Individual Associations also list more meetings on their web sites according to their disciplines.

October

- 3-6, EMSEV, IUGG, Orange, CA, USA, Workshop on Electromagnetic Signals Associated with Earthquakes and Volcanoes.
- 3-9, IAVCEI, IUGG, Reunion Island, 3rd workshop on Collapse Calderas "Dynamics of Calderas: Collapse and Unrest".
- 4-8, IAG, France, IAG Commission 1 Symposium 2010: Reference Frames for Applications in Geosciences (REFAG2010).
- 21-22, IAG, Lisbon, Portugal, International DORIS Service Workshop.

- 24-27, CODATA, Cape Town, South Africa, 22nd International Conference “Scientific Information for Society: Scientific Data and Sustainable Development” and the CODATA General Assembly.
- 25-28, IAG, Shanghai, China, Observing and Understanding Earth Rotation.
- 25-29, IHP-UNESCO, IAHS, IUGG, Fez, Morocco, 6th World FRIEND Conference. Global Change: Facing Risks and Threats to Water Resources.
- 30 October – 2 November, IUGG Bureau Meeting, Cairo, Egypt.

November

- 8-10, IASPEI, IUGG, Hanoi, Vietnam, 8th General Assembly of the Asian Seismological Commission.
- 8-10, IAHS, Hanoi, Vietnam, 5th Conference of the Asia Pacific Association of Hydrology and Water Resources.
- 11-12, PAIGH, IAG, IUGG, Lima, Peru, Meeting of PAIGH joint with the General Meeting of the Geocentric Reference System for the Americas (SIRGAS) and IAG-SIRGAS School “Reference Systems”
- 14-16, IAHS, Kyoto, Japan, Conference “Groundwater as a key for adaptation to changing climate and society”
- 15-17, IUGG, ECGS, Luxembourg City, Luxembourg, International Workshop on Induced Seismicity.
- 16-18, IUGG, Agra, India, International Workshop on Seismo-Electromagnetics and Atmospheric Science (IWSE-AS 2010).
- 19-21, IAHS, Nanjing, China, IWRM 2010, 5th International Symposium on Integrated Water Resources Management: Water Resources Sustainability in a Changing Environment.

December

13-17, AGU, San Francisco, California, USA, Fall Meeting of the American Geophysical Union

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Note: Contributions to IUGG E-Journal are welcome from members of the IUGG family. Please send your contributions to Alik Ismail-Zadeh by e-mail (insert in Subject line: *contribution to E-Journal*). The contributions will be reviewed and may be shortened by the Editor.