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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. Editorial: Goodbye 2012 and Happy New Year!

It becomes a tradition to summarize IUGG activities of the past year in the January issue of the Electronic Journal. The year 2012 was another successful and remarkable year in the history of the Union. The Union was involved in various activities and showed its strength in international cooperation and science promotion. Major activities and events in 2012 are highlighted below.

- IUGG established the Union Commission on Climatic and Environmental Change to promote scientific understanding of climatic and environmental change, to boost research in reducing uncertainties in climate and environmental models, and to define criteria for collaborative trans-disciplinary research on climate and environmental change. This will provide an all-Union perspective on climatic and environmental change and make available the knowledge and insights developed through scientific research to the benefit of society and planet Earth.
- IUGG established the Working Group on History of Earth and Space Sciences to raise the historical consciousness of the Union Members and to spearhead the effort to commemorate the IUGG’s 100th anniversary (to be celebrated in 2019).
- The Kingdom of Saudi Arabia became an IUGG Member.
- The International Association of Hydrological Sciences celebrated its 90th birthday.

- Three Union Commissions of IUGG held conferences: Mathematical Geophysics (in Edinburgh, UK, June), SEDI (in Leeds, UK, July), and GeoRisk (in Orange, USA, December).
- IUGG signed a Memorandum of Agreement with the Cambridge University Press to publish a series of works entitled “Special Publications of the International Union of Geodesy and Geophysics”. The series will be composed of high-quality books, which will review the present state-of-the-art developments, discoveries and/or perspectives in Earth and space sciences (<http://www.iugg.org/publications/special/>).
- IUGG co-sponsored (US\$50,000 in total) fifteen scientific meetings (workshops, symposia, conferences) worldwide (<http://www.iugg.org/meetings/sponsored.php>) and six science education events (<http://www.iugg.org/publications/reports/education.php>).
- IUGG awarded five grants (US\$ 80,000 in total) to support scientific projects of importance to the international geophysical and geodetic community, which will explore new scientific ideas and develop future international initiatives.
- IUGG continued to strengthen the cooperation with other International 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. Particularly,
- IUGG participated in the GeoUnions Joint Board Meeting (Istanbul, Turkey). IUGG co-sponsored the IRDR-IUGG joint workshop on FORIN (Forensic Investigation of Disaster).
- IUGG participates in the 3rd Science and Technology Conference organized by the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO) in Vienna in 2013 (see this E-Journal issue).
- IUGG endorsed the International Year/Decade of Deltas.
- The IUGG Bureau met in Lauterbad, Germany, in October to discuss the Union business and activities in 2013.

The IUGG Bureau thanks the Adhering Bodies and National Committees, Union Associations and Commissions as well as all individuals who helped making the year 2012 exciting and productive in strengthening international Earth and space sciences for the benefit of society.

Best wishes to everyone for a happy, healthy, and prosperous year 2013!

2. IUGG Secretariat in Potsdam, Germany

The office of the IUGG Secretariat is now located at the German Research Centre for Geosciences in Potsdam (GFZ-Potsdam), Germany. The head of the office is Dr. Franz Kuglitsch, Executive Secretary of IUGG / Assistant Secretary General of IUGG.

Please use the following contact details from 1 January 2013 on to reach the IUGG Secretariat:

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3. IUGG Yearbook for 2013

The 2013 Yearbook is now electronically available in PDF format at the IUGG web site (<http://www.iugg.org/publications/yearbooks/yearbook2013.pdf>). The IUGG web site maintains the directory of Union and Association officials and the archive of IUGG memberships and General Assemblies. Thanks to all of the National Committees and the Associations for helping to update the information in the IUGG Yearbook!

During 2013, updates on addresses and other information in the Yearbook should be sent to the Secretariat (secretariat@iugg.org) as soon as they are known. Our aim is to update the Yearbook as needed throughout the year. The 2013 Yearbook will be published together with the 2012 Annual Report and sent to the National Members in May 2013.

4. Working Group on History

Historical awareness enriches our lives generally as human beings and enables us to relate the personal and scientific struggles and triumphs of our predecessors to our own day-to-day challenges and to maintain perspective. The historical awareness also enables one to connect dots across time. In short, a good grounding in the history of thought in various fields of Earth and space sciences can help us to do our science “better, faster and cheaper.”

In November 2012, the IUGG Executive Committee formed a new Working Group on History (WGH) to raise the historical consciousness of the Union Members. The main focus of the WGH would be to sponsor joint/interdisciplinary sessions at IUGG General Assemblies as well as history sessions at Scientific Assemblies of the Union Associations. The numbers of dedicated historical sessions and historical talks in scientific sessions across all associations will be metrics of our success. The WGH intends to play a role in helping to preserve IUGG and Union Association histories by providing a focal point for history within the IUGG. The WGH will spearhead the effort to commemorate the IUGG’s 100th anniversary. A special focus of the Working Group will be the observance of the IUGG’s centennial in 2019 for which plenary sessions devoted to a review of progress in the various disciplines are envisioned as well as special publications on history of geodesy and geophysics.

The WGH Executive Committee is comprised of two co-chairs, Ed Cliver (IAGA, USA) and Hans Volkert (IAMAS, Germany), the representative(s) of the Union Associations, and two advisors, historians Ron Doel (Florida State University, USA) and Greg Good (Center for the History of Physics, USA).

5. IUGG co-sponsors science education events at ICTP in 2013

IUGG awarded six grants to support workshops and training schools organized by the Abdus Salam International Centre for Theoretical Physics (ICTP, Trieste, Italy) in 2013 as recommended by the IUGG Committee on Capacity Building and Education and in accordance with the Memorandum of Understanding between IUGG and ICTP signed in 2011. The list of the events co-sponsored by IUGG is as follows:

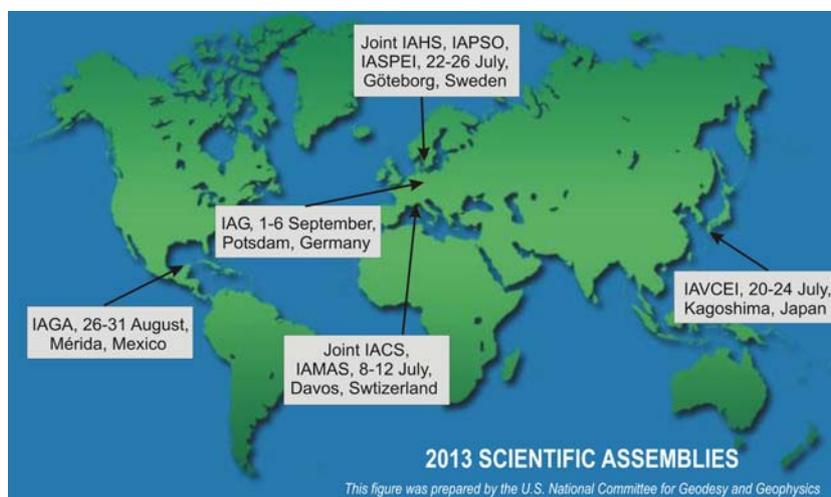
1. Workshop on Mathematical Models of Climate Variability, Environmental Change and Infectious Diseases, 29 April - 10 May

2. Workshop on Water Resources in Developing Countries: Planning and Management in a Climate Change Scenario, 6 - 17 May
3. Workshop on GNSS Data Application to Low Latitude Ionospheric Research, 6 - 17 May
4. Synthetic Aperture Radar: A Global Solution for Monitoring Geological Disasters, 2 - 6 September
5. Fundamentals of Ocean Climate Modelling at Global and Regional Scales, 30 June - 1 September (two weeks), Hyderabad, India
6. Earthquake and Tsunami Risk Reduction: Bridging Education, Research and Communication for a Better Preparedness, 7 - 18 October, Morocco.

Founded in 1964 by the late Nobel Laureate Abdus Salam and co-sponsored by UNESCO, IAEA, and the Italian government, the Abdus Salam International Centre for Theoretical Physics - ICTP (www.ictp.it) seeks to accomplish its mandate by providing scientists from developing countries with the 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. IUGG and ICTP decided to enhance geophysical and geodetic education and science collaboration and 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.

6. Scientific Assemblies of Union Associations in 2013: Important Deadlines

Five Scientific Assemblies of IUGG Associations will be held in 2013:



1. DACA-13, a joint assembly of IACS and IAMAS, Davos, Switzerland, 8-12 July (http://www.daca-13.org/index_EN). Deadline for abstract submission: **31 January**.
2. The IAVCEI Scientific Assembly, Kagoshima, Japan, 20-24 July (<http://www.iavcei2013.com/>). Deadline for abstract submission: **31 January**
3. The IAHS-IAPSO-IASPEI Scientific Assembly, Gothenburg, Sweden, 22-26 July (<http://iahs-iapso-iaspei2013.com/index.asp>). Deadline for abstract submission: **4 February**
4. The IAGA Scientific Assembly, Merida, Yucatan, Mexico, 26-31 August

(<http://www.geociencias.unam.mx/iaga2013/>). Deadline for abstract submission: **13 April**

5. The IAG Scientific Assembly, Potsdam, Germany, 1-6 September

(http://www.iag2013.org/IAG_2013/Potsdam.html). Deadline for abstract submission: **21 April**

Please mark the dates and plan to participate.

7. International cooperation in geodesy in the South American region

On November 7, 2012, at 16:35:46 UTC (10:35:46 local time) a strong earthquake (magnitude 7.4) shook the area located at the southern part of Guatemala, close to the city Champerico. The epicentre was estimated at 13.977°N and 91.876°W and the hypocenter at a depth of about 24 km. To estimate the crustal deformation caused by the earthquake, daily positions of continuously operating stations of the geodetic reference frame of the Americas (SIRGAS) and the Guatemalan geodetic network were computed between November 4 and 10. This processing includes reference stations of the International GNSS Service (IGS) located in North America, the Caribbean, Asia/Oceania and South America as fiducial points. The comparison of pre-seismic and post-seismic station positions shows the largest displacement (43 mm in S-W direction) at station COAT (Coatepeque) and the second largest movement (17 mm in S-W direction) at station HUEH (Huehuetenango). Movements larger than 6 mm were also detected at stations BARI (Huehuetenango), CHIQ (Chicaman), GUAT (Guatemala City) and COTZ (Santa Lucia Cotzumalguapa). The vertical displacements are in the order of the station position uncertainty, and therefore they are not significant.



Horizontal displacements of the SIRGAS Reference Frame estimated after the 2012-11-07 Guatemala M7.4 earthquake

These computations were carried out by the SIRGAS Analysis Centre at DGFI (Deutsches Geodätisches Forschungsinstitut) and are based on the observation data provided by the Instituto Geográfico Nacional (IGN) of Guatemala, the Instituto Nacional de Estadística y Geografía (INEGI) of Mexico, the Instituto Geográfico Agustín Codazzi (IGAC) of Colombia, the Dirección General de Catastro y Geografía (DGCG) of Honduras, and the IGS (International GNSS Service, www.igs.org).

Received from Laura Sánchez, Secretary General, Colombian National Committee for IUGG

8. Report on the IUGG project “Predicting volcanic ash dispersal combining field, experimental and meteorological data into super-computational numerical simulations”

The main target of the granted project was to improve the forecasting of the dispersal of fine ash from explosive volcanic eruptions. The project is part of an ongoing collaboration among Italian, Spanish and Mexican researchers for the study of ash dispersal from three selected volcanoes, Somma-Vesuvius (in Italy), Fuego de Colima and Popocatepetl (both in Mexico), in the case of an explosive eruption of any intensity and magnitude. The main aim of the collaboration is to forecast the concentration of different size ash particles at ground level and in the atmosphere. This is a crucial variable impacting human and animal health, water supply and infrastructure. To date, this is an issue that has been approached only for very small eruptions and with simplified models valid at scales smaller than few hundreds of kilometers. Moreover, except for the potential impact on air traffic managed by Volcanic Ash Advisory Centers, effects of fine ash are poorly addressed by present day mitigation plans. The achievement of the main target has been pursued following three main cross-integrated research lines: i) collection and comparison of field data; ii) laboratory analyses and experiments; and iii) numerical modeling. At present, the results of research lines 1-3 have been merged into large-scale 3D numerical simulations of volcanic ash dispersal at Somma-Vesuvius using super-computational facilities. Similar protocols are being developed for the Colima volcano, for which only preliminary numerical simulations are available. These outputs represent a step forward in the current research in volcanology and civil protection strategies in the study areas.

The grant supported research on ash dispersal mainly at the Colima and Somma-Vesuvius volcanoes, and the IUGG support is acknowledged in 3 published and 2 submitted papers in international journals:

- Caron B., Siani G., Sulpizio R., Zanchetta G., Paterne M., Santacroce R., Tema E., Zanella E. (2012). Late Pleistocene to Holocene tephrostratigraphic record from the Northern Ionian Sea. *Marine Geology* 311-314, 41-51.
- Sulpizio R., Folch A., Costa A., Scaini C., Dellino P. (2012). Hazard assessment of farrange volcanic ash dispersal from a violent Strombolian eruption at Somma-Vesuvius volcano, Naples, Italy: Implications on civil aviation. *Bulletin of Volcanology* 74, 2205-2218.
- Roverato M., Capra L., Sulpizio, R. (2012). First evidence of hydromagmatism at Colima Volcano (Mexico). *J. Volcan. Geother. Res.*, doi:10.1016/j.jvolgeores.2012.10.012.
- Sulpizio R., Alçiçek M.C., Zanchetta G., Solari L. (2012). Recognition of the Minoan tephra in Acigöl Basin, Western Turkey: implications for inter-archive correlations and fine ash dispersal. *Journal of Quaternary Research*, submitted for publication.
- Sulpizio R., Zanchetta G., Caron B., Dellino P., Mele D., Giaccio B., Insinga D., Paterne M., Siani G., Costa A., Macedonio G., Santacroce R. (2012). Volcanic ash hazard in the Central Mediterranean assessed from geological data. *Bulletin of Volcanology*, submitted for publication.

The granted project has provided significant steps forward into the comprehension and forecast of ash dispersal during explosive volcanic eruptions. The use of field, laboratory, and meteorological data as input parameters for numerical simulations were merged together, providing an interdisciplinary approach to the study of volcanic ash dispersal. The outputs of these papers represent tools of paramount importance for volcanic hazard managements in densely populated areas such as the Central Mediterranean and Western Mexico.

Received from Roberto Sulpizio, the IUGG project leader

9. CTBTO Science & Technology (S&T2013) Conference

To strengthen its relationship with the broader scientific community, the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO) invites geoscientists to the S&T2013 Conference. The conference goals are (i) to capitalize on scientific and technological innovations for verifying CTBT compliance; (ii) to promote the wider scientific application of data that are used for test-ban verification; (iii) to enhance the exchange of knowledge and ideas between the CTBTO and the broader scientific community; and (iv) to enlarge the scientific community engaged in test-ban monitoring.

One of the main themes of the conference is the Earth as a Complex System. Scientific and technical developments in monitoring the globe for nuclear explosions require a deep understanding of how the Earth's interior influences the relevant signals as they travel from their point of origin to where they are observed. The signals from monitoring networks constitute a huge database and support advances in the Earth Sciences on global, regional and local scales. Seismic and acoustic signals propagate through the Earth, its atmosphere and its oceans. The Earth's atmosphere also transports radioactive materials around the globe in minute concentrations, and its properties are relevant for different kinds of satellite observations. This theme focuses on any dynamic or static properties of the Earth that can be observed with seismic, hydroacoustic and infrasound data, with radionuclide tracer observations, with on-site geophysical measurements or with other monitoring data. In turn, studying the physical and chemical properties of the Earth helps to improve the processing or interpretation of monitoring data.

Authors are invited to submit abstracts of proposed contributions. While authors can indicate their preference for an oral or poster presentation, the final choice will be made by the Scientific Programme Committee. By submitting an abstract, authors implicitly agree to the publication of their abstract and presentation materials by the CTBTO. Abstracts will be made available on the CTBTO website and in a Book of Abstracts. The deadline for abstract submission is **1 February 2013**. Financial support may be available to a limited number of participants. More information can be found about the conference here: <http://www.ctbto.org/specials/snt2013/>.

10. Awards and honors

Anny Cazenave (2011 Union Lecturer at the XXVth General Assembly of IUGG) received the 2012 William Bowie Medal, the American Geophysical Union's (AGU) highest honor, for her outstanding contributions to fundamental geophysics and for unselfish cooperation in research.

Alik Ismail-Zadeh (IUGG Secretary General) was awarded an Honorary Fellowship of the Royal Astronomical Society.

Kuniyoshi Takeuchi (Chair of the IUGG Commission on Geophysical Risk and Sustainability) was awarded the 2012 International Hydrology Prize of the International Hydrological Program (IHP) of UNESCO, the World Meteorological Organization (WMO), and the International Association of Hydrological Sciences (IAHS) in recognition of his outstanding contribution to hydrology.

Guoxiong Wu (Immediate Past President of IAMAS) was awarded an Honorary Fellowship of the Royal Meteorological Society.

The following members of the IUGG family have been awarded Medals of the European Geosciences Union (EGU):

Harry Bryden (Member of the IUGG Honours & Recognition Committee and members of the U.K. National Committee for Geodesy and Geophysics) to receive the 2013 Fridtjof Nansen Medal, for his distinguished research in oceanography.

John Burrows (President of the Atmospheric Chemistry and Global Pollution, IAMAS/IUGG) to receive the 2013 Wilhelm Bjerknes Medal for his distinguished research in atmospheric sciences.

Sierd Cloetingh (President of the International Lithosphere Program) to receive the 2013 Arthur Holmes Medal for his exceptional international standing in Solid Earth Geosciences.

11. IUGG-related meetings occurring during February – March

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.

February

- 24-25, IAHS, Algiers, Algeria, 5th International Conference on Water Resources and Sustainable Development (CIRED 2013)
- 13-16, IGBP, Goa, India, 4th PAGES Open Science Meeting, The Past: A Compass for Future Earth

March

- 11-15, IAMAS/ICMA, Thessaloniki, Greece, School on Impact of Solar Variability on Climate
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End of IUGG Electronic Journal Volume 13 Number 1 (1 January 2013)

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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.