



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

## **The IUGG Electronic Journal**

**Volume 12 No. 5 (1 May 2012)**

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. 150 years of International Cooperation in Geodesy (*Feature article*)**

The International Association of Geodesy (IAG) is celebrating its 150<sup>th</sup> anniversary in 2012. At the invitation of the Prussian General Johann Jacob Baeyer (1794-1885), representatives of the states of Prussia, Austria and Saxony met from 24<sup>th</sup> to 26<sup>th</sup> April 1862 in Berlin to discuss Baeyer’s “Proposal for a Central European Arc Measurement” (“Entwurf zu einer mitteleuropäischen Gradmessung”), which he had sent out in 1861 to all Central European states. By the end of 1862, 16 states had already agreed to participate in the project: Austria, Belgium, Denmark, France, seven German states (Baden, Bavaria, Hannover, Mecklenburg, Prussia, Saxony, Saxe-Gotha), Italy, The Netherlands, Poland, Sweden and Norway (in personal union), and Switzerland. This was a great success and the start of an organised international collaboration in geodesy. IAG counts this international scientific (governmental) initiative, and the organisation it spawned, as its origin.

The idea for the project had been submitted by Baeyer to the Prussian Ministry of War in his document “On the size and figure of the Earth: a memorandum on the establishment of a Central European arc measurement, along with a sketch map” (“Über die Größe und Figur der Erde: eine Denkschrift zur Begründung einer Mitteleuropäischen Gradmessung nebst einer Übersichtskarte”). The aim was to connect the numerous Central European astronomical observatories by the existing or to be planned triangulation networks, in order to determine the regional and local anomalies of the curvature of the figure of the Earth (i.e. the deflections of the vertical and thus the relative structure of the geoid). This was the basis for all precise point positioning in science and practice, and the beginning of interpreting these anomalies with respect to the structure and composition of the outer layer of the Earth, which was explicitly mentioned by Baeyer as a scientific challenge.



## Protokoll

der  
am 24., 25. und 26. April 1862 in Berlin  
abgehaltenen vorläufigen Berathungen über das Projekt einer  
Mittleuropäischen Gradmessung.<sup>\*)</sup>

An den genannten Tagen versammelten sich die unterzeichneten Kommissarien bei dem General-Lieutenant z. E. *Dreyer*, um sich vorläufig über die Einleitung der Arbeiten an der Mittleuropäischen Gradmessung im Bereich von Oesterreich, Preussen und Sachsen zu besprechen, und namentlich um eine Verbindung der Triangulationen für die Zwecke der Gradmessung zu vereinbaren.

Man einigte sich unter Vorbehalt der Genehmigung der betreffenden hohen Regierungen über folgende Punkte:

### I. Bis zu welcher Fehlergrenze dürfen die älteren Triangulationen benutzt werden.

Von den Herren Astronomen wurde der durchschnittliche Fehler einer Polhöhebestimmung auf 1/2 Sekunde geschätzt. Eine Sekunde im Meridianbogen zählt etwa 10 Toisen, 1/2 Sekunde in runder Summe 5 Toisen. Nimmt man an, dass astronomische Festimmungen in Entfernungen von 100,000 Toisen vorhanden sind, oder ausgeführt werden, so würde der Fehler der astronomischen Bestimmungen auf 100,000 Toisen 5, also  $\frac{1}{20000}$  der Länge, betragen.

Da die neuen Triangulationen mit viel kleineren Fehlern besetzt sind; auf der anderen Seite aber die Unmöglichkeit vorliegt, alle älteren zu erneuern, so kann man überdies die über für die astronomischen Bestimmungen gefundene Fehlerhaftigkeit d. h.  $\frac{1}{20000}$  der Länge als die Grenze ansehen, bis zu welcher ältere Triangulationen benutzt werden können.

Dreiecksseiten genügen, in denen die Fehler in der Summe der drei Winkel der Dreiecke drei Sekunden nicht, oder doch nur in Ausnahmefällen übersteigen.

<sup>\*)</sup> Unveränderlicher Abdruck des ursprünglich lithographirten Protokolls.

*Fig. 1. Johann Jacob Baeyer (1794-1885) and the first page of the Minutes of the Meeting in 1862*

In October 1864, the first “General Conference of the Representatives to the Central European Arc Measurement” took place in Berlin. The organisational structure (Permanent Commission, Central Bureau, and triennial General Conferences) was agreed to and a research programme was set up. IAG considers this conference as its first General Assembly. J. J. Baeyer was appointed Director of the Central Bureau and P. A. Hansen appointed President of the Permanent Commission. The project extended rapidly to other European states, and consequently the name of the organisation was changed in 1867 to “Europäische Gradmessung”, and in 1886 to “Internationale Erdmessung” (in French: “Association Internationale de Géodésie”, in English: “International Geodetic Association”) with additional member states Argentina, Chile, Japan, Mexico, and USA. Baeyer died in 1885, and under his successor, Friedrich Robert Helmert, the Central Bureau moved from Berlin to Potsdam, together with the Geodetic Institute, which is the predecessor of today’s GeoForschungsZentrum (GFZ) Potsdam. After the foundation of the International Union of Geodesy and Geophysics (IUGG) in 1919, the Association became its “Section of Geodesy” and changed in 1946 to the present name “International Association of Geodesy”.

To pay tribute to its origins, IAG will hold its regular quadrennial Scientific Assembly as the official anniversary celebration in September 2013, between the dates of the foundation and first General Conference of the Mittleuropäische Gradmessung, in Potsdam and Berlin.

Hermann Drewes

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Prof. Dr. Hermann Drewes is the Director of the German Geodetic Research Institute (DFGI) in Munich, and the Secretary General of the International Association of Geodesy (IAG). He studied geodesy at the Hanover University of Technology (1965-1970) and got his PhD from the same university in 1975. He continued to work as a scientist at the Hanover University of Technology and got a professorship in the University of Zulia in Maracaibo, Venezuela (1977-1979). He returned to Germany and worked as a scientist at the DFGI (1979-1994). Since 1985 he has lectured at Munich University of Technology and was awarded an Honorary Professorship of the university in 1994. Hermann Drewes was IAG Representative to the American SIRGAS project, Member of the ILRS Governing Board, Bureau Member of the International Lithosphere Project, President of IAG Commission 1 "Reference Frames", IUGG Representative to the Pan-American Institute for Geography and History (PAIGH), IUGG Liaison Officer to the UN Cartographic Office, and Member of the GGOS Steering Committee. Hermann's research interest covers many aspects of geodesy, including the geodetic observing system for geodynamics and global change.

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## **2. Special Publication Series of IUGG to be published by the Cambridge University Press**

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" (hereinafter the Series). 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 around the world. The first volume of the series will be the work entitled "Extreme Natural Hazards, Disaster Risks and Societal Implications" based on the results of the ENHANS Project (<http://www.enhans.org>) led by IUGG and supported by several international, national, and intergovernmental organizations.

The Editorial Board consists of the Editor-in-Chief (IUGG Secretary General) and 8 Board Members (Association Secretaries General). In addition, an Advisory Board of the Series will be appointed to supplement the regional and subject expertise of the Editorial Board and to provide advice to it on the topics of possible volumes and potential editors of the volumes.

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## **3. IUGG co-sponsors science education events at ICTP**

IUGG awarded six grants to support workshops and training schools organized by the Abdus Salam International Centre for Theoretical Physics (ICTP, Trieste, Italy) 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. 11-27 April, Workshop on Science Applications of GNSS in Developing Countries.
2. 21-25 May, Workshop on Atmospheric Deposition: Processes and Environmental Impacts.

3. 30 July - 10 August, Targeted Training Activity: El Nino Southern Oscillation Monsoon in the Current and Future Climate.
4. 29 October - 3 November, Workshop on Geophysical Data Analysis and Assimilation.
5. June (Nepal, Katmandu, two weeks, dates to be decided), Conference and Advanced School on Quantification of Seismic Hazards in the Indo/Asian Collision Zone.
6. 13 August - 17 August, Workshop on the Cooperative Experience for Integrating Land and Water Resources Management in Latin America (Maceio, Brazil)

The first four events will be held in Trieste, Italy, and are the main activities of the Centre.

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](http://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.

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#### **4. Networking of world seismologists: IASPEI - ISC joint project**

*Improving geophysical science link to society during natural extreme events, especially in developing countries (“Networking of 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.

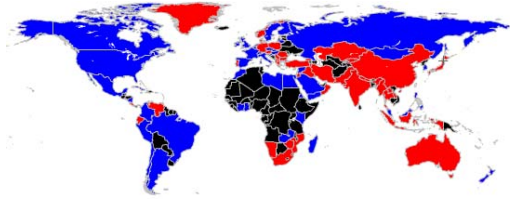
The IUGG grant enables IASPEI and ISC to develop and maintain a worldwide registry of seismologists & geophysicists willing to serve as a point of contact in countries with and without affiliation to IUGG, with a particular focus on developing countries. The registry in its current form is readily available 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).

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.



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 organization(s); and
- in **BLACK** are countries for which we do not currently hold any information.

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<a href="#">Albania</a>	Algeria	Andorra	Angola	<a href="#">Antigua and Barbuda</a>
Armenia	<a href="#">Australia</a>	<a href="#">Austria</a>	Azerbaijan	Bahamas
Bangladesh	<a href="#">Barbados</a>	Belarus	<a href="#">Belgium</a>	Belize

### ***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 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 four further countries belong to the "blue" category.

Received from Peter Suhadolc, IASPEI Secretary General, and  
Dmitry A. Storchak, Director International Seismological Centre.

## **5. Report on the G-EVER1 Workshop**

The first Workshop of Asia-Pacific Region Global Earthquake and Volcanic Eruption Risk Management (G-EVER1) was held at the Geological Survey of Japan in Tsukuba, Japan, 22-24 February 2012. The target of this workshop was to increase international collaboration between geohazard institutes and organizations in the Asia-Pacific region to advance natural science and to discuss how to reduce risks from natural disasters, such as earthquakes, tsunamis and volcanic eruptions. 152 participants from twelve nations and regions attended and 56 national and international institutes supported this workshop. IUGG, IASPEI and IAVCEI co-sponsored the workshop.



*Group photo of the participants of G-EVER1 workshop*

The workshop was composed of four parts, including sessions on 1) Recent earthquakes and volcanic eruptions, 2) Report of Asia-Pacific region, 3) Database and risk management, and 4) Group discussion on the database and risk assessment-management. In total, 35 oral and 25 posters were presented. In the first session, there were 3 presentations on volcanic eruptions, including the 1991 Pinatubo eruption in Philippine (by Chris Newhall), 2010-11 Eyjafjalljokull eruption in Iceland (by Sue Loughlin) and the 2011 Shinmoedake eruption in Japan (by Hiroshi Shinohara) and 4 presentations on earthquakes, including the tsunami during the 2004 Sumatran and the 2011 Tohoku earthquakes (by Kenji Satake), paleotsunami study in Japan (by Yukinobu Okamura), the strong motion observation system in China (by Xiao Jun Li) and the disaster process after the 2011 Tohoku earthquake in Japan (by Norio Maki). In the second session (Report of Asia-Pacific region), results of the recent studies and observations on volcanoes and earthquakes were presented from 8 countries and regions, including Korea, Taiwan, the Philippines, Vietnam, Thailand, Indonesia, New Zealand and Japan.

In the third session, 12 presentations on the database and risk management were presented. For the volcanic hazard, such as the VHub (by Greg Valentine), the monitoring system of volcanic ash eruptions in the north Pacific (by John Eichelberger), the activity of EOS and WOVODat (by Chris Newhall), some case studies on volcanic crisis (by Bruce Houghton), VOGRIPA and GVM (by Sue Loughlin) and activities of COV in IAVCEI and DEVORA in New Zealand (by David Johnston) were introduced. For the seismic hazard, such topics as the PAGER system of USGS (by David Wald), extreme seismic hazards (by Alik Ismail-Zadeh), activities of GEM (Ross Stein), the IISSE

Earthquake Catalog (by Tatsuhiko Hara), the GEO GRID Disaster Response Application (by Masashi Matsuoka) and the National Seismic Hazard Map of Japan (by Hiroyuki Fujiwara) were presented.

In discussions, participants were separated into two groups, with the theme ‘database’ and ‘risk management-assessment’. After the group discussion for half and an hour, there was a general discussion in which the conclusion of each group discussion was reported and several recommendations, including the establishment of a consortium of Asia-Pacific region, developing a hub site, and the convening of the G-EVER workshop every two years, were proposed.

After the workshop, 32 participants joined the field trip from 24 to 25 February to the Fuji and Izu area to observe the volcanic products from Mt. Fuji, tsunami defence along the Suruga Bay and the 1930 surface faulting on the Tanna fault.

Received from Shinji Takarada, a Workshop co-organizer

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## **6. IUGG Conference on Mathematical Geophysics**

The 29th IUGG Conference on Mathematical Geophysics, “Confronting Models With Data” will be held in Edinburgh, Scotland, United Kingdom from 18 to 22 June 2012. The conference aims to draw together key contemporary issues in mathematical geophysics, including solid Earth, ocean, atmosphere, cryosphere, climate observations and data assimilation, modeling of the Earth system and its components, model validation and the solving of contemporary earth science problems. An opening session on Mathematics of the Planet Earth will anticipate the 2013 year emphasis on the subject. The conference will be held in the National Museum of Scotland in the heart of Edinburgh’s old town. The classic geology of the highlands is close and accessible by either public transport or car hire from Edinburgh.

Conference website: <http://www.cmgedinburgh2012.org.uk/>

Invited speaker profiles: [www.cmgedinburgh2012.org.uk/invitedSpeakers.html](http://www.cmgedinburgh2012.org.uk/invitedSpeakers.html)

Session program: [www.cmgedinburgh2012.org.uk/scientificProgram.html](http://www.cmgedinburgh2012.org.uk/scientificProgram.html)

Registration and abstract submission: [www.cmgedinburgh2012.org.uk/registration.html](http://www.cmgedinburgh2012.org.uk/registration.html)

Received from Yehuda Ben-Zion, Chair, IUGG Commission on Mathematical Geophysics

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## **7. CODATA Conference “Open Data and Information for a Changing Planet”**

The 23<sup>rd</sup> International CODATA Conference “Open Data and Information for a Changing Planet” will take place on 28-31 October 2012 in Taipei. The conference website can be accessed on <http://www.codata2012.com/>. The Call for Nominations for the prestigious CODATA Prize can be found on <http://www.codata2012.com/page/codata-prize-deadline-is-25th-may-2012>. The winner will receive a fully paid trip to the conference and will be asked to present his/her work. The deadline for receipt of abstracts and sessions is 25<sup>th</sup> of May

<http://www.codata2012.com/page/call-for-abstracts-deadline-is-friday-25th-may-2012>

<http://www.codata2012.com/page/call-for-sessions-deadline-is-friday-25th-may-2012>.

If there is a side event you would like to organize around the conference, see details at <http://www.codata2012.com/page/call-for-co-location-proposals>.

## 8. IUGG-related meetings occurring during May – July

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.

### May

- 16-19, IUGG, EGU, Bacau, Romania, First International Conference on Moldavian Risks - from Global to Local Scales
- 20-25, JpGU, Chiba-city, Japan, Japan Geoscience Union Meeting
- 21-24, IAHS, Prague, Czech Republic, GwFR2012 - International Conference on Groundwater in Fractured Rocks
- 21-25, IAVCEI, Olot, Spain, 1st International Congress on management and awareness in protected volcanic landscapes

### June

- 4-14, IAGA, San Fernando, Cadiz, Spain, XVth IAGA Workshop on Geomagnetic Observatory Instruments, Data Acquisition and Processing
- 10-20, IACS, IUGG, McCarthy, Alaska, USA. International summer school/workshop in glaciology
- 18-22, IUGG, Edinburgh, United Kingdom, XXIXth Conference on Mathematical Geophysics
- 18-22, IAVCEI, IACS, Anchorage, Alaska, USA, Volcano-Ice Interactions on Earth & Other Planets Conference
- 25-28, IAMAS, IUGG, Boulder, Colorado, USA, Comparative Climatology of Terrestrial Planets

### July

- 1-6, IUGG SEDI, Leeds, UK, SEDI Conference 2012
- 9-11, IACS, IUGG, Tarfala, Sweden, Workshop on measurement and uncertainty assessment of glacier mass balance
- 13-25, SCAR, Portland, Oregon, USA, XXXII Open Science Conference
- 14, SCAR, IASC, WMO, Portland, Oregon, USA, Ice-Sheet Mass Balance and Sea Level (ISMAL) Kick-off Workshop
- 14-22, COSPAR, IUGG, Mysore, India, 39th COSPAR Scientific Assembly
- 25-31, IAGA, IUGG, Darwin, Australia, 21st Electromagnetic Induction Workshop
- 28 July – 3 August, IAMAS, IUGG, WMO, Leipzig, Germany, International Conference on Clouds and Precipitation

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