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The *IAG Newsletter* is under the editorial responsibility of the Communication and Outreach Branch (COB) of the IAG.

It is an open forum and contributors are welcome to send material (preferably in electronic form) to the IAG COB (*newsletter@iag-aig.org*). These contributions should complement information sent by IAG officials or by IAG symposia organizers (reports and announcements). The *IAG Newsletter* is published monthly. It is available in different formats from the IAG new internet site: [http://www.iag-aig.org](http://www.iag-aig.org)

Each *IAG Newsletter* includes several of the following topics:

I. news from the Bureau Members
II. general information
III. reports of IAG symposia
IV. reports by commissions, special commissions or study groups
V. symposia announcements
VI. book reviews
VII. fast bibliography

Books for review are the responsibility of:
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**General Announcements**

**Recently published paper in Metrologia**


FELICITAS ARIAS  
Director, Time Department, BIPM

**IAG 2013 Information - presentations at Historical Day**

Links to Power-Point presentations with slides and video at Historical Day are:

- https://www.dropbox.com/s/2vs73lc0ytvipsg/IAG_Rio_1997_trim1.wmv
- https://www.dropbox.com/s/8qpz9scdzvp47i0/IAG_Historical_rev1.pptx
- https://www.dropbox.com/s/5xnyqxh3pgpy0d3/cct2218p.pptx

C. C. TSCHERNING

**Meeting Announcements**

**3rd IGFS General Assembly**

**Background & Objectives**

The accurate and precise estimation of the gravity field of the Earth is nowadays required in many geodetic and geophysical investigations. The recent satellite missions devoted to the observation of the gravity field of the Earth have strongly improved the resolution and precision of the estimated global geopotential models. Global mass redistributions in the Earth environment can be observed and modeled through gravity from space and can improve the knowledge of the Earth system and climate changes. A unique height system can be estimated for the whole Earth, which is fundamental in e.g. evaluating sea level variations. The new fields also allow innovative investigations of the solid Earth giving new details of crust and mantle and variation over time. These improvements in the estimation of the global geopotential models also require updated/new methods in modeling the higher frequency of the gravity field and denser local data coverage to achieve 1-cm geoid accuracy, which is likely to be required in few years for practical applications. The 3rd IGFS General Assembly, that will take place in Shanghai, June 30th - July 6th, 2014, at the Shanghai Astronomical Observatory (SHAO), Chinese Academy of Sciences, will be devoted to these topics. The focus of the Assembly is on methods for observing, estimating and interpreting the Earth gravity field as well as its applications. The scientific sessions will be centered on:

- Gravimetry and gravity networks (Bonvalot, Roman)
- Global geopotential models and vertical datum unification (Sideris, Li)
- Local geoid/gravity modeling (Marti, Barzaghi)
- Satellite gravimetry (Pail, Jin)
- Mass movements in the Earth system (Forsberg, Jin)
- Solid Earth Investigations (Braitenberg, Forsberg)
The Assembly is organized by SHAO, the International Gravity Field Service (IGFS) and the Commission 2 of the International Association of Geodesy (IAG). IGFS is an official IAG Service which coordinates and harmonizes the activities of other "Level 1" gravity related Services, namely the Bureau Gravimetric International (BGI), the International Geoid Service (IGeS), The International Center for Earth Tides (ICET), the International Center for Global Earth Models (ICGEM) and the International Digital Elevation Model Service (IDEMS). IAG Commission 2 is a scientific body of IAG that was established to promote and support investigation related to the gravity field of the Earth and its temporal variation.

**Sponsors**
- International Gravity Field Service (IGFS)
- International Association of Geodesy (IAG) Commission 2
- Shanghai Astronomical Observatory (SHAO), CAS

**Scientific Organizing Committee (SOC)**
- Riccardo Barzaghi (Politecnico di Milano, Italy)
- Sylvain Bonvalot (BGI, France)
- Carla Braitenberg (University of Trieste, Italy)
- Rene Forsberg (DTU, Denmark)
- Shuanggen Jin (SHAO, China)
- Jicheng Li (WHU, China)
- Urs Marti (Swisstopo, Switzerland)
- Roland Pail (TUM, Germany)
- Dan Roman (NOAA, USA)
- Michael Sideris (University of Calgary, Canada)

**Local Organizing Committee (LOC)**
- Wenli Dong (SHAO)
- Guiping Feng (SHAO)
- Shuanggen Jin (SHAO)
- Xiaoya Wang (SHAO)

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**First announcement of IGS Workshop 2014**

The next workshop of the International GNSS Service will take place in Pasadena, California, USA, on June 23-27, 2014. The workshop is being held on the occasion of the 20th anniversary of the IGS. Save the dates! More information will be circulated.

**Meetings Calendar**

**7th Coastal Altimetry Workshop**
October 7-8, 2013, Boulder, USA  
URL: [http://www.coastalaltimetry.org/](http://www.coastalaltimetry.org/)

**11th International School of Geoid Service: Heights and Height Datum**
October 7-11, 2013, Loja, Ecuador  
URL: [http://www.11iges.utpl.edu.ec/](http://www.11iges.utpl.edu.ec/)

**Geodätische Woche and INTERGEO**
October 8-10, 2013, Essen, Germany
2nd International VLBI Technology Workshop  
*October 10-12, 2013, Seogwipo, South Korea*

Ocean Surface Topography Science Team (OSTST) Meeting  
*October 8-11, 2013, Boulder, USA*

2013 Asia-Pacific Space Geodynamics Symposium  
*Ohio State University, Oct 17-19, 2013*
URL: [http://apsg2013.geodeticscience.osu.edu](http://apsg2013.geodeticscience.osu.edu) (available soon)

School on Reference Systems, Crustal Deformation and Ionosphere Monitoring  
*October 21-23, 2013, Panama City, Panama*
URL: [http://www.sirgas.org/index.php?id=233&L=0](http://www.sirgas.org/index.php?id=233&L=0)

SIRGAS Meeting 2013  
*October 24-26, 2013, Panama City, Panama*

ICAG 2013  
*November 5-13, 2013, Walferdange Underground Laboratory, Luxembourg*
International Comparison of Absolute Gravimeters

GRMSE2013  
*November 8-10, 2013, Wuhan, China*
International Conference on Geo-Informatics in Resource Management & Sustainable Ecosystem
URL: [http://www.ggers.org/](http://www.ggers.org/)

18th International Workshop on Laser Ranging  
*November 11-15, 2013, Fujiyoshida, Japan*
URL: [http://geo.science.hit-u.ac.jp/lw18](http://geo.science.hit-u.ac.jp/lw18)

6th European Workshop on GNSS Signals and Signal Processing  
*December 5-6, 2013, Munich, Germany*
URL: [http://ifen.bauv.unibw.de/gnss-signals-workshop/](http://ifen.bauv.unibw.de/gnss-signals-workshop/)

Gi4DM 2013  
*December 9-11, 2013, Hanoi, Vietnam*
9th International Conference on GeoInformation for Disaster Management; Theme: Earth Observation for Disaster Management.
URL: [http://www.gi4dm2013.com](http://www.gi4dm2013.com)

AGU 2013 Fall Meeting  
*December 9-13, 2013, San Francisco, CA, USA*
URL: [http://sites.agu.org/meetings/](http://sites.agu.org/meetings/)

50th Annual Convention of IGU  
*January 8-12, 2014, CSIR-NGRI, Hyderabad, India*
50th Annual Convention of IGU will be held during 8-12 January 2014 at CSIR-NGRI, Hyderabad, India. Online Deadline of submission of Extended Abstracts is 14.08.2013, closing of online submission of Extended Abstracts is 15.10.2013.
URL: [http://www.igu.in](http://www.igu.in)
17. Internationaler Ingenieurvermessungskurs
January 14-17, 2014, Zurich, Switzerland
URL: http://www.igp.ethz.ch/iv2014/

ION International Technical Meeting (ITM) 2014
January 27-29, 2014, San Diego, CA, USA
URL: http://www.ion.org/meetings/?conf=itm

SPACOMM 2014
February 23-27, 2014, Nice, France
URL: http://www.iaria.org/conferences2014/SPACOMM14.html

IVS General Meeting
March 2-7, 2014, Shanghai, China
URL: http://ivs2014.csp.escience.cn/

GEOProcessing 2014
March 23-27, 2014, Barcelona, Spain

Munich Satellite Navigation Summit 2014
March 25-27, 2014, Munich, Germany
URL: http://www.munich-satellite-navigation-summit.org/

Third International School on “The KTH Approach to Modeling the Geoid”
March 31-April 4, 2014, Johor Bahru, Malaysia
URL: http://www.infra.kth.se/geo/events/geoidschool.html

European Geosciences Union General Assembly 2014
April 27 – May 2, 2014, Vienna, Austria
URL: http://www.egu2014.eu/

IGS Workshop 2014
June 23-27, 2014, Pasadena, CA, USA
URL: http://igscb.jpl.nasa.gov/pipermail/igsmail/2013/008013.html

The 3rd International Gravity Field Service (IGFS) General Assembly
June 30-July 6, 2014, Shanghai, China

AOGS 11th Annual Meeting
July 28-August 1, 2014, Sapporo, Japan

40th COSPAR Scientific Assembly
August 2-10, 2014, Moscow, Russia
URL: http://www.cospar-assembly.org/

ILRS Technical Workshop
October 27-31, 2014, Greenbelt, MD, USA
URL: http://ilrs.gsfc.nasa.gov/about/meetings.html

ICSU GRC Conference “Improving Geophysical Risk Assessment, Forecasting and Management”
November 18-21, 2014, Madrid, Spain
URL: http://www.icsu.org/
Reports

Reconciling observations and models of elastic and viscoelastic deformation due to ice mass change
30 May - 2 June, 2013, Ilulissat, Greenland
http://wwwx.dtu.dk/Subsites/iag.aspx

Patterns of past, present and future sea level vary spatially depending on how the solid Earth responds to changing distribution of ice and ocean mass, known as glacial isostatic adjustment (GIA). Accurate interpretation of observational constraints on GIA requires dialogue between geodesists and those researchers who reconstruct ice sheet geometries, infer Earth structure and rheology and model the solid Earth response to loading.

Within the context of IAG Sub-commission 3.4 “Cryospheric Deformation” (Chairs: Matt King/Shfaqat Abbas Khan) a symposium was arranged at the edge of the Greenland ice sheet to bring together around 60 scientists, including about 25 early career scientists, from across these fields to explore challenges facing observational scientists and GIA modellers. The ultimate desire was to enable a step-change in GIA model accuracy. The location allowed us to witness the rapidly retreating Jakobshavn Glacier located near Ilulissat and the small group setting benefitted interactions between scientists with expertise spanning the relevant, but traditionally separate, disciplines.

New geodetic datasets from Greenland (GNET) and Antarctica (POLENET/ANET) provided greater clarity on the degree to which geodetic observations and GIA model predictions differ in both Greenland, and especially Antarctica. Much of this disagreement rests with uncertainties in ice loading over the Holocene. Substantial advances in reconstruction of Holocene ice loads were presented for many regions but progress remains particularly slow in Antarctica.

The disagreement between observations and GIA models also reinforces the need for exploration of more complex GIA models, including those that incorporate three-dimensional variations in Earth structure. As the GIA models become more complex, however, further geodetic observations of present-day uplift and geological reconstructions of relative sea level and ice history are much needed to constrain the greater number of model parameters.

A particular focus of discussion was on the opportunities and challenges presented by regions underlain by a low-viscosity mantle, which therefore experience more rapid response times to ice loading changes. It is these regions where the influence of transient and/or power-law rheology would be most evident and so they are ideal
locations for making geodetic observations to test the limitations of a linear Maxwell rheology (the most commonly adopted in GIA modelling).

The meeting served as a useful platform to stimulate discussion and initiate collaboration on these topics and was supported by generous funding from IAG, NSF, SCAR SERCE, EGU, ILP DynaQlim and Technical University of Denmark.

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SHFAQAT ABBAS KHAN
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VIII Hotine-Marussi Symposium on Mathematical Geodesy
17-21 June 2013, Rome, Italy

The key venue for theoretical geodesy is the series of Hotine-Marussi Symposia on Mathematical Geodesy. It is eponymously named after Martin Hotine (1898–1968) and Antonio Marussi (1908–1984), two famous theoretical geodesists. The traditional name mathematical geodesy for the series may not fully do justice to the symposium’s broad scope of theoretical geodesy in general. However, the name has been in use since 1965, i.e., the days of Antonio Marussi, which is a good reason to adhere to it. The Hotine-Marussi Symposia have traditionally been organized in Italy. Since 2006 the series is under the responsibility of the ICCT.

From 17 to 21 June this year the VIII Hotine-Marussi Symposium on Mathematical Geodesy was held. The symposium took place for the 2nd time in row at the Faculty of Engineering of the Sapienza University of Rome, Italy, in the ancient chiostro of the Basilica of S. Pietro in Vincoli, famously known for its statue of Moses by Michelangelo.

The symposium attracted over 100 participants who contributed 85 papers (68 oral and 17 poster). The symposium was organized in sessions that were modelled thematically after the Study Group topics and mostly convened by their chairs.

- **Geodetic data analysis**
  W. Kosek, R. Gross, C. Kreemer

- **Geopotential modeling, boundary value problems and height systems**
  P. Novák, M. Schmidt, C. Gerlach

- **Atmospheric modeling in geodesy**
  T. Hobiger, M. Schindelegger

- **Gravity field mapping methodology from GRACE and future gravity missions**
  M. Weigelt, A. Jäggi

- **Computational geodesy**
  R. Čunderlík, K. Mikula

- **Theoretical aspects of reference frames**
  A. Dermanis, T. Van Dam

- **Digital Terrain Modeling, Synthetic Aperture Radar and new sensors: theory and methods**
  M. Crespi, E. Pottier

- **Inverse modeling, estimation theory**
  P. Xu

Additionally a special session at the Accademia Nazionale dei Lincei was organized with 3 keynote presentations. This latter session was taken as an opportunity to honour the activities of Prof. Fernando Sansò (Milano/Como), himself a member of the Accademia, for the advancement of theoretical geodesy in general and his role as the driving force behind the Hotine-Marussi series in particular.

Prof. Mattia Crespi (Rome) chaired the local organization committee and hosted the symposium for a 2nd time in row now. Apart from organizing a perfect symposium, they arranged a guided tour through the Villa Farnesina, opposite the Accademia, and a visit to the Capitoline Museums. Through their able organization and improvisation skills, Mattia Crespi and his team have done more than their share in bringing the VIII Hotine-Marussi Symposium to success.
In 1862, the Prussian General Johann Jacob Baeyer initiated the Central European Arc Measurement ("Mitteleuropäische Gradmessung") project. By the end of that year fifteen countries had affirmed their participation, and in 1864 the first General Conference was held in Berlin. General Baeyer’s project is considered the forerunner to today’s International Association of Geodesy (IAG). The IAG celebrated its 150th anniversary with a Scientific Assembly in Potsdam, Germany, 2-6 September 2013.

Over 500 scientists from 50 countries attended the Assembly, held in the Hotel Dorint Sanssouci. The conference was opened on the Monday afternoon with several welcome speeches, including one by Christian Heipke on behalf of the Joint Board of Geospatial Information Societies (JBGIS) and one by Michael Sideris, vice-president of the International Union of Geodesy and Geophysics (IUGG). The JBGIS includes the IAG’s sister geospatial organisations such as the ISPRS, FIG, ICA and GSDI. The IAG is also a foundation association of the IUGG, which comprises today of eight associations covering all fields of the geosciences.

A programme of 241 presentations and 234 posters highlighted the contributions of Modern Geodesy to science and society, under the following themes:

- Theme 1: Definition, Implementation and Scientific Applications of Reference Frames
- Theme 2: Gravity Field Determination and Applications
- Theme 3: Observing, Understanding and Assessing Earth Hazards
- Theme 4: Science and Applications of Earth Rotation and Dynamics
- Theme 5: Observation Systems and Services
- Theme 6: Imaging & Positioning Techniques and Applications

There were 40 oral presentations in the following Theme 1 sessions: Interaction Between the Celestial & Terrestrial Reference Frames; Regional Reference Frames; Reference Frames (Theory, History, Realisation); Strengths, Weaknesses, Modelling Standards & Processing Strategies of Space Geodetic Techniques; Scientific & Other Applications of Terrestrial Reference Frames.

There were 75 oral presentations in the following Theme 2 sessions: Regional Gravity & Geoid Studies (Developments in the Gravity Field Theory); Regional Gravity & Geoid Studies (Gravimetry); Regional Gravity
& Geoid Studies (Improvements in Gravity Field Methodology); Regional Gravity & Geoid Studies (Developments in Approaches Related to Geoid Determination); Unification of Height Systems; Regional Gravity & Geoid Studies (Regional & Local Geoid Determination); Global Gravity Field Models; Satellite Altimetry Analysis & Applications; Mass Transport Studies; Actual & Future Satellite Gravity Missions (GOCE); Actual & Future Satellite Gravity Missions (GRACE); Actual & Future Satellite Gravity Missions (Future Missions & General Studies).

There were 31 oral presentations in the following Theme 3 sessions: Technologies & Methodologies of Hazard Warning Systems; Geometric & Gravimetric Techniques in Observing & Assessing Earthquake Hazards; Geodetic Imaging for Regional & Local Case Studies; Innovative Use of Geodetic Techniques for Volcanic & Meteorological Hazards; The Challenges of Assessing Hazards From Geodetic (and Other) Observations.

There were 11 oral presentations in the Theme 4 session Science & Applications of Earth Rotation & Dynamics.

There were 18 oral presentations in the following Theme 5 sessions: Observation Systems & Services (Services); Observation Systems & Services (Services& Infrastructure); Observation Systems & Services (GGOS).

There were 40 oral presentations in the following Theme 6 sessions: GNSS Algorithms & Methods; Trends in GNSS Positioning, Navigation & Timing; Multi-Constellation GNSS & Emerging GNSS; Imaging & RF Sensor Integration &Modelling.

A future article will discuss some of the highlights of the Scientific Assembly. In the meantime the IAG can look forward to another 150 exciting years!

Website: http://www.iag2013.org

 Participants at the IAG Scientific Assembly

CHRIS RIZOS