



International Association of Geodesy

Newsletter

September 2013

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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>

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

The article “On the gravimetric contribution to watt balance experiments” by Z Jiang, V Pálinkáš, O Francis, H Baumann, J Mäkinen, L Vitushkin, S Merlet, L Tisserand, P Jousset, C Rothleitner, M Becker, L Robertsson and E F Arias, has been published in *Metrologia* 50, 5 (2013) 441-451 (<http://iopscience.iop.org/0026-1394/50/5/452>).

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/2vs73lc0ytipsg/IAG_Rio_1997_trim1.wmv
- https://www.dropbox.com/s/8qpz9scdzvp47i0/IAG_Historical_rev1.pptx
- <https://www.dropbox.com/s/5xnyqhx3pgpy0d3/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 Gravimetricque 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)
- Jiancheng Li (WHU, China)
- Urs Marti (Swissstopo, 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)

RICCARDO BARZAGHI

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.

URS HUGENTOBLER
Chair, IGS Governing Board

Meetings Calendar

7th Coastal Altimetry Workshop

October 7-8, 2013, Boulder, USA

URL: <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/>

Geodätische Woche and INTERGEO

October 8-10, 2013, Essen, Germany

URL: <http://www.intergeo.de/>

2nd International VLBI Technology Workshop

October 10-12, 2013, Seogwipo, South Korea

URL: <http://ivtw2013.wikidot.com/>

Ocean Surface Topography Science Team (OSTST) Meeting

October 8-11, 2013, Boulder, USA

URL: <http://sealevel.jpl.nasa.gov/science/ostscienceteam/scienceteammeetings/>

2013 Asia-Pacific Space Geodynamics Symposium

Ohio State University, Oct 17-19, 2013

URL: <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>

SIRGAS Meeting 2013

October 24-26, 2013, Panama City, Panama

URL: <http://www.sirgas.org/index.php?id=193&L=2>

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/>

18th International Workshop on Laser Ranging

November 11-15, 2013, Fujiyoshida, Japan

URL: <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.bauw.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>

AGU 2013 Fall Meeting

December 9-13, 2013, San Francisco, CA, USA

URL: <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>

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.iaia.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

URL: <http://www.iaia.org/conferences2014/GEOProcessing14.html>

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

URL: <http://202.127.29.4/meetings/igfs2014/index.html>

AOGS 11th Annual Meeting

July 28-August 1, 2014, Sapporo, Japan

URL: <http://www.asiaoceania.org/aogs2014/public.asp?page=home.htm>

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/>

AGU 2014 Fall Meeting

December 15-19, 2014, San Francisco, CA, USA

URL: <http://sites.agu.org/meetings/>

European Geosciences Union General Assembly 2015

April 12 – 17, 2014, Vienna, Austria

URL: <http://www.egu.eu>

XXVI IUGG General Assembly

June 22 – July 2, 2015, Prague, Czech Republic

URL: <http://www.iugg.org/assemblies/>

XXIXth IAU General Assembly

August 3 – 14, 2015, Honolulu, Hawaii, USA

URL: http://www.iau.org/science/meetings/future/general_assemblies/1024/

41th COSPAR Scientific Assembly

July 30 – August 7, 2016, Istanbul, Turkey

URL: <http://www.cospar-assembly.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
Technical University of Denmark, Lyngby, Denmark

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 chiostrò 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.



Participants of the VIII Hotine-Marussi Symposium, 17-21 June 2013, Rome,
in the Chiostro of the Basilica of S. Pietro in Vincoli.

NICO SNEEUW

President of the IAG Inter-Commission Committee on Theory

<http://icct.kma.zcu.cz>

*150 Years of International Cooperation in Geodesy:
Scientific Assembly of the International Association of Geodesy
2-6 September 2013, Potsdam, Germany*

In 1862, the Prussian General Johann Jacob Baeyer initiated the Central European Arc Measurement (“Mittleuropäische 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