



International Association of Geodesy

Newsletter

November 2012

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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

Summary of the Third Meeting of the IAG EC 2011-2015

Place: Singapore, Resorts World Convention Centre, Basement 2, Sagittarius Room

Time: Wednesday, August 15, 2012, 14:00-18:00

Attendees (voting): Ch. Rizos (IAG President), H. Schuh (IAG Vice-President), H. Drewes (IAG Secretary General), M. Sideris (Immediate IAG Past President), T. van Dam (President Commission 1), U. Marti (President Commission 2), R. Gross (President Commission 3), A. Kealy (stand-in for D. Grejner-Brzezinska, President Commission 4), T. Herring, R. Neilan (Representatives of the Services), J. Adam (President of COB)

Attendees (non-voting): N. Sneeuw (President of ICCT), H. Hornik (IAG Assistant Secretary)

Guests: J. Dawson (Chair of SC 1.3e), S. Lynn Choy (Chair of WG 4.5.2), J. Wickert (LOC Scientific Assembly 2013)

Regrets: D. Grejner-Brzezinska (President Commission 4), H. Kutterer (Chair of GGOS), R. Barzaghi (Representative of Services), C. Brunini and R. Wonnacott (Members at Large)

Summary of Agenda Items:

1. Welcome and adoption of agenda

Chris Rizos welcomed the members of the IAG Executive Committee (11 out of 15 voting members, 2 non-voting members and 3 guests). The meeting took place on occasion of the AOGS – AGU (WPGM) Joint Assembly in Singapore, 13 to 17 August 2012. The agenda had been distributed previously by e-mail and on the IAG Office Homepage. It was unanimously adopted after the inclusion of some additional marginal topics.

2. Report of Commissions

T. van Dam reported on the activities of Commission 1 since December, 2011, especially the completion of the terms of reference of various SC's, JSG's and JWG's. The Commission 1 Website <<http://iag.uni.lu>> has been completed by the terms of reference, structure, programme of activities, news and links to sub-commissions. This work will be continued whenever useful. Any contributions are highly welcome. On occasion of the EGU 2012, meetings of SC 1.4 (Interaction of Celestial and Terrestrial Reference Frames), JWG 1.1 (Tie vectors and local ties to support integration of techniques), and JSG 0.4 (Coordinate systems in numerical weather models) took place. The GGFC (Global Geophysical Fluids Centre) held a workshop. An EGU Session was dedicated to "The next International Terrestrial Reference Frame and an update on geocentre motions". Moreover, SC 1.3a (Regional Reference Frame for Europe) held its 2012 EUREF Symposium in Paris, and SC 1.3e (Regional Reference Frame Asia-Pacific) was engaged in workshops and conferences in Rome, Bangkok and the Philippines. SC 1.3b (Regional Reference Frame for Central and South America) will hold its SIRGAS Meeting in Concepción, Chile, in October 2012. JWG 1.1, SC 1.4 and JSG 0.4 are planning splinter meetings together with the GGFC at the AGU 2012. A Commission 1 Workshop 2014 in Luxembourg is under preparation. The Proceedings of the REFAG2010 Symposium are being published in the Springer IAG-Series, an internet version will be available soon by <<http://www.springer.com/earth+sciences+and+geography/book/978-3-642-32997-5>>.

U Marti explained the structure and activities of Commission 2. The contribution to the Geodesist's Handbook has been delivered in early 2012. A considerable number of meetings and conferences (co-)organised by components of Commission 2 has been held or will be held in 2012 and the following years. He mentioned in particular the GGHS 2012 (Gravity, Geoid and Height Systems) in Venice, October 9-12 2012 where Commission 2 took the organisational lead. The conference will have 8 sessions; 162 Abstracts have been received. He emphasised the progress to install a precise gravity geoid for Antarctica. The coverage by terrestrial and airborne gravity data could significantly be improved and the data sets are stored. This work is done within various initiatives, however good efforts are yielded in particular by international cooperation which is meanwhile well established and maintained. By financial support of the IUGG Grants Programme, an initiative of *H. Abd-Elmotaal* for the "Detailed geoid model for Africa" could be started in mid 2012 in cooperation with IASPEI.

As an introduction to the Commission 3 report, *R. Gross* presented the main duties of the Commission and its various components. He then informed that the 17th International Symposium on Earth Tides will not take place in September 2012 in Cairo as previously announced, but it will be held in Warsaw, 15.-19.04.2013. He mentioned several other meetings (co-)organised by Commission 3, e.g. the International Symposia "Space Geodesy and Earth System", Shanghai, 18.-21.08.2012, and "Reconciling observations and models of elastic and viscoelastic deformation due to ice mass change", Ilulissat/Greenland, 30.05.-02.06.2013, as well as the "16th General Assembly of WEGENER", Strasbourg, 17.-20.09.2012. The webpage of Commission 3 will be set up in the next future.

Standing in for *D. Grejner-Brzezinska*, the Vice-President of Commission 4, *A. Kealy*, started the Commission 4 report presenting the structure. The altogether 6 Sub-Commissions have been involved in numerous symposia, conferences, summer schools etc. in North America, Europe and Asia. A field test campaign of WG 4.1.1 (Ubiquitous positioning systems) was performed in Nottingham, UK, in May 2012. SG 0.2.1 (New technologies for disaster monitoring and management, joint with GGOS) is developing taxonomy of sensor technology and a database for disasters. In the overview of a variety of upcoming events in North America, Australia and Europe, the International Symposium on Space Geodesy and Earth System in Shanghai 2012, the BeiDou/GNSS Summer School on GNSS Frontier Technology in Beijing 2012, and the 2nd Joint International Symposium on Deformation Monitoring in Nottingham 2013 were highlighted.

As a general remark, *H. Drewes* pointed out that all IAG SC's, SG's and WG's have to report on their activities in the IAG Travaux which are published bi-annually on the occasion of IAG General and Scientific Assemblies. A concerning circular will be sent out in the next time as a reminder for the report 2013. If no report is delivered, the respective sub-component shall be dissolved. On behalf of the IAG COB, *J. Adam* asked all organisers of meetings to send the announcements for meetings as well as summarising reports on these events to the COB in order to put these texts into the IAG Website and IAG Newsletter informing the whole community.

3. Report of the ICCT

N. Sneeuw announced that the proceedings of the 2009 Hotine-Marussi-Symposium have been published in January 2012. Since the IUGG General Assembly in Melbourne, altogether 9 Joint Study Groups (JSG) have been set up. A few of them are somehow continuing previous activities with a new focus, but most are new. The actual structure of the ICCT is presented on the Website (<http://icct.kma.zcu.cz>). The next Hotine-Marussi Symposium is planned for 17-21.06.2013 in Rome, the LOC is chaired by *M. Crespi*.

4. Report of the GGOS

Standing in for *H. Kutterer*, *R. Neilan* presented the GGOS status report as the acting Vice-Chair of the GGOS Coordinating Board. A detailed matrix was shown explaining the tasks and subtasks, objectives and activities of GGOS together with the respective deadlines and responsible persons and institutions. All actual positions in the GGOS CB and Science Panel are now filled by adequate persons. The GGOS Coordinating Board held a meeting on 27.04.2012 in Vienna; a GGOS Strategic Retreat took place from 26 to 28 June, 2012 in Frankfurt. The GGOS Consortium will meet on 01.12.2012 in San Francisco, followed by another GGOS CB Meeting. The calendar of all GGOS activities will be regularly updated and submitted to the IAG COB to inform the scientific community. At the recent meeting in Frankfurt the goals for the next period of GGOS Goals with respective Working Groups were formulated. As a particular problem to be dealt with in the next future, *R. Neilan* mentioned the adequate integration of gravity data into the other data sets.

5. Report of the COB

J. Adam reported on the work of the IAG Communication and Outreach Branch (COB). The IAG Newsletter is regularly sent to the numerous addresses. Selected parts are also published in the JoG. The Website is continuously maintained. All colleagues were urged to provide permanently new information for the Newsletter and the Website. Initially there was a plan to have a topic of the week in the IAG Homepage; now there is even a problem to fill the topic of the month. National Correspondents were asked to send information on national data centres, publication series, and educational establishments for the Geodesist's Handbook.

6. Report from the Services

The report on the geometrical Services was presented by *R. Neilan*. It included summaries of the activities of IAS, IDS, IGS, ILRS. She mentioned in particular the problem of the IAS arising by the retirement of the chairperson. *H. Drewes* explained that two calls for the installation of an IAS Central Bureau had been released in the past, but there was no response. A problem of altimetry is the fact that the data collection is often done by groups outside of the IAG and these groups are not interested making their data sets available via IAS. On the

other hand it has to be stated that a reasonable use of the data, e.g. for sea level change, is only possible by analysing and combining different data sets. Therefore a CB taking care of the data collection and adequate provision is urgently required. The IAG should continue with the attempts finding an institution which would be willing to run this CB.

H. Schuh reported on the IVS. He informed that he will retire as the acting chair of the IVS by the end of 2012. The finding of a successor has started.

The report on other Services (BIPM, IBS, IERS, PSMSL) was given by *T. Herring*. He complained that from some Services (BIPM, IBS, PSMSL) no information was delivered. Concerning the IBS, *H. Drewes* mentioned that the BKG is probably not able to continue this task. It was proposed to transfer the bibliography to the COB.

In absence of *R. Barzaghi*, *T. Herring* presented his report on the gravity Services. There were detailed presentations of the IGFS, BGI, IGeS, ICGEM, ICET and IDEMS. It was stated that many institutions, even public organisations, do not deliver their gravimetric data to the BGI. Therefore everyone should help to convince them to provide the information.

7. Report from developing countries

There was no report, because none of the Members at Large was present.

8. Report from IUGG and ICSU

H. Drewes explained that IUGG is funding specific common projects of at least two Associations within periods of two years. At present, the IAG submitted proposals of a project on the African geoid as the lead applicant in cooperation with IASPEI, and a project on deformation and ionosphere in the Caribbean together with IASPEI (lead) and IAGA. The EC was asked to continuously visit the IUGG Homepage, where also the annual IAG reports are published. IAG is involved in several Committees of ISCU (e.g. COSPAR, CODATA) and in the World Data System (WDS) <<http://www.icsu-wds.org/>>, which is the new integration of FAGS and the former WDC. Representatives are delegated by the IUGG. *R. Neilan* was nominated by the IAG.

9. IAG 150 years celebrations

C. Rizos invited all members of the EC to promote the 150 years celebration of IAG. *H. Drewes* informed that the three countries Saxony, Austria, Prussia (now Brandenburg) which participated in the first meeting in 1862 for establishing the Central European Arc Measurement as the forerunner of IAG have already made / will make their own celebrations.

J. Ádám presented various examples for tokens, stickers, tags, key rings etc. to be distributed before and during IAG Scientific Assembly / 150 Years Celebration. The EC selected several of them to be produced in a sufficient number for the event. A number of these objects should be sent to the IAG National Delegates.

10. IAG Scientific Assembly, Potsdam, 2013-09-01 to 2013-09-06

On behalf of the LOC, *J. Wickert* reported on the status of the preparations of the IAG Scientific Assembly 2013 according to a meeting of the LOC held on 5 March 2012, and he presented the Homepage (www.iag2013.org). It will take place in the Dorint Hotel, Potsdam, which accommodates up to 800 participants. The sessions will start on Monday morning, September 2, the opening session will be held in the afternoon. There will be a "Historical Day" on Wednesday afternoon at the GFZ campus with a session of oral presentations, followed by guided walks and a barbeque. The session should be limited to two hours. The regular registration fee ranges from 360 EUR (early bird) to 480 (on-site). IAG members and students will receive reductions of 10% or 30%, respectively. The details of the scientific programme are urgently required from the SOC. The deadline for abstracts is planned for 30 April.

H. Drewes informed on the "Historical Committee", which is formed by the Past IAG Presidents chaired by *I. I. Mueller*. The proposal for the "Historical Session" comprises:

1. Early History (1861/1864 – 1917), the Baeyer-Helmert Era,
2. The Years of the World Wars and Aftermath (1917 – 1959),
3. The Space Age and IAG's Response to Its Challenges (1960 – ...)

The website <<http://www.iag2013.org>> has urgently to be completed, in particular the time table and the agenda for the scientific sessions. This work is up to the Scientific Committee (Chair: *Ch. Rizos*).

11. Report of the Cassinis Committee

M. Sideris repeated his invitation to read critically the IAG Statutes and Bylaws and to collect all ideas for its revision. All proposals may be submitted by the forum in the IAG Homepage. They will be presented and discussed in detail in Potsdam.

12. Any other business

H. Drewes presented the list of IAG sponsored Symposia and other upcoming meetings (see also IAG and IAG Office Homepages). The volume of the IAG sessions on occasion of the 2011 IUGG General Assembly in Melbourne is in progress. The new Geodesist's Handbook 2012 will be published as usual as a volume of the JoG and is in print. It will be online at <http://link.springer.com/article/10.1007%2Fs00190-012-0584-1> as free access or at http://iag.dgfi.badw.de/fileadmin/handbook_2012/Handbook_2012.pdf. A frequently updated version is put at the IAG Office Homepage.

13. Next IAG EC meeting

The EC decided to hold the next meeting on Sunday, April 6, 2013, on occasion of the EGU General Assembly (07.-12.04.2013) in Vienna.

14. Adjourn

Ch. Rizos thanked the participants for their contributions and closed the session at 18:00.

Respectfully submitted
HERMANN DREWES, Secretary General
HELMUT HORNIK, Assistant Secretary

Invitation for proposals for changes to the IAG Statutes and Bylaws

Article 16 of IAG's Statutes specifies that the Association shall review its Statutes and Bylaws to ensure an up-to-date structure of its scientific organization every eight years. The last time such a review was initiated was about eight years ago under the presidency of Gerard Beutler. It is now therefore time that we again take a fresh look at our Statutes and Bylaws. To achieve this goal, a Review Committee (traditionally called the Cassinis Committee) was appointed in the fall of 2011 by the IAG Executive. The committee is chaired by Michael Sideris and includes as members Harald Schuh, Ruth Neilan and Yoichi Fukuda. A proposal with all suggested revisions will be made by the Cassinis Committee for consideration by the IAG Executive and possibly the Council at the 2013 Scientific Assembly. In this way, we are hoping to get the Council's reaction and input to the proposed changes before these are finalized and approved at the next IUGG General Assembly in 2015.

With this announcement, the Cassinis Committee is inviting proposals for changes of any article of the Statutes and Bylaws. Proposals can be submitted through the IAG website Forum (www.iag-aig.org/proposals). The actual Statutes and By-laws can be found on the IAG website. All proposals submitted **between March 1, 2012 and February 1, 2013** will be considered by the Cassinis Committee.

We are very much looking forward to receiving your contributions.

MICHAEL SIDERIS, HARALD SCHUH, RUTH NEILAN, YOICHI FUKUDA

Meeting Announcements

IAG Scientific Assembly 2013

The IAG 2013 conference IAG Scientific Assembly 2013 on the occasion of the 150th anniversary of the IAG in co-operation with the GFZ Potsdam to be held September 1-6, 2013, in Potsdam, Germany.

IAG 2013 THEMES

1: *Definition, Implementation and Scientific Applications of Reference Frames*

ITRF/ICRF, regional frames, WHS, absolute gravity, time, geocentre motion, climate change, post-glacial rebound, inversion of the deformation field, etc.

2: *Gravity Field Determination and Applications*

GRACE/GOCE results, geoid studies, mass transport, gravity studies

3: *Observing, Understanding and Assessing Earth Hazards*

Crustal dynamics, volcanoes, natural hazard apps/techniques, etc.

4: *Science and Applications of Earth Rotation and Dynamics*

Tectonics, deformation, Earth rotation, IAG service contributions, etc.

5: *Observation Systems and Services*

Topics related to observing systems, GGOS, IAG services, user requirements/needs, etc.

6: *Imaging and Positioning Techniques*

GNSS, SAR, Lidar, other RF-based techniques (WiFi, UWB, etc.), sensor integration, etc.

7: *Applications of Imaging and Positioning Techniques*

Engineering geodesy, atmosphere studies, indoor navigation, UAVs, precision farming, traffic monitoring, etc.

Deadline for abstract submission is **April 21, 2013**. For technical instructions how to prepare your abstracts and for further conference information, please see our homepage <http://www.iag2013.org>.

IAG 2013 COMMITTEES

Scientific organizing committee (SOC)

Chair of SOC: Chris Rizos, President of IAG

- Tonie van Dam, President Commission 1
- Urs Marti, President Commission 2
- Richard Gross, President Commission 3
- Dorota Grejner Brzezinska, President Commission 4
- Nico Sneeuw, President Inter-Commission Committee on Theory (ICCT)
- Hansjörg Kutterer, Chair of the Global Geodetic Observing System (GGOS)
- Riccardo Barzaghi, Representative of International Services
- Thomas Herring, Representative of International Services
- Ruth Neilan, Representative of International Services

Local organizing committee (LOC)

Chair of LOC: Harald Schuh, Vice President of IAG, GFZ

Assembly Secretary: Hermann Drewes, IAG Secretary General, DGFI, Munich

GFZ, Potsdam: Melany Bohm, Frank Flechtner, Christoph Förste, Katrin Gundrum, Sibylle Itzerott, Jens Wickert

F&U confirm, Leipzig: Susanne Lange, Ogarit Uhlmann

IAG 2013 LOC

Meetings Calendar

AGU 2012 Fall Meeting

December 3-7, 2012, San Francisco, USA

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

FIG Commission 3 Workshop and Annual Meeting 2012

December 10-14, 2012, Athens, Greece

URL: http://bit.ly/FIG3_Athens2012

ION International Technical Meeting (ITM) 2013

January 28-30, 2013, San Diego, CA, USA

URL: <http://www.ion.org/meetings/?conf=itm>

17. Internationale Geodätische Woche 2013

February 17-23, 2013, Obergurgl, Austria

URL: <http://www.mplusm.at/ifg/programm2013.htm>

Munich Satellite Navigation Summit 2013

February 26-28, 2013, Munich, Germany

URL: <http://www.munich-satellite-navigation-summit.org>

EGU-IVS Training School for the Next Generation Geodetic and Astrometric VLBI

March 2-5, 2013, Helsinki, Finland

URL: http://www.evga.org/vlbi_school.html

21st European VLBI for Geodesy and Astrometry (EVGA) Working Meeting

March 6-8, 2013, Helsinki, Finland

URL: <http://ivscc.gsfc.nasa.gov/pipermail/ivsmail/2012/001311.html>

Cryosat 3rd User Workshop

March 12-14, 2013, Dresden, Germany

URL: <http://www.cryosat2013.org/>

European Geosciences Union General Assembly 2013

April 7-12, 2013, Vienna, Austria

URL: <http://www.egu.eu/meetings/meeting-overview.html>

ETS 2013

April 15-19, 2013, Warsaw, Poland

17th International Symposium on Earth Tides „Understand the Earth”

URL: <http://www.cgs.wat.edu.pl/ETS2013/>

The European Navigation Conference ENC 2013

April 23-25, 2013, Vienna, Austria

URL: www.enc2013.org

International Symposium on Mobile Mapping Technology 2013

April 30 - May 2, 2013, Tainan, Taiwan

URL: <http://conf.ncku.edu.tw/mmt2013/wm02.htm>

Seventh IVS Technical Operations Workshop

May 6-9, 2013, Westford, MA, USA

FIG Working Week 2013

May 6-10, 2013, Abuja, Nigeria

URL: <http://www.fig.net/fig2013/>

5th International Conference on Spacecraft Formation Flying Missions and Technologies (SFFMT)

May 29 - 31, 2013, Munich, Germany

URL: <http://www.sffmt2013.org/>

SGEM 2013

June 16-22, 2013, Albena, Bulgaria

URL: <http://www.sgem.org>

TransNav 2013

June 19-21, 2013, Gdynia, Poland

URL: <http://transnav2013.am.gdynia.pl>

ICEO-SI 2013

June 23-25, 2013, Tainan City, Taiwan

URL: <http://www.iceo-si2012.com/> (announcement)

AOGS2013

June 24-28, 2013, Brisbane, Australia

URL: <http://www.asiaoceania.org/aogs2013/>

International Symposium on Planetary Sciences (IAPS2013)

July 1-4, 2013, Shanghai, China

URL: <http://202.127.29.4/meetings/iaps2013/>

GI Forum 2013 – Creating the GISociety

July 2-5, 2013, Salzburg, Austria

URL: www.daca-13.org

2013 Beacon Satellite Symposium

July 8-12, 2013, Bath, UK

URL: <http://people.bath.ac.uk/ee3jarr/beaconsatellite2013/>

Joint IAMAS-IACS Assembly

July 8-12, 2013, Davos, Switzerland

Davos Atmosphere and Cryosphere Assembly 2013, Ice & Air – Process Interactions

URL: www.gi-forum.org

Joint IAHS-IAPSO-IASPEI Scientific Assembly

July 22-26, 2013, Gothenburg, Sweden

URL: <http://www.iaspei.org/meetings/forthcoming.html#iaspei2013>

26th International Cartographic Conference

August 25-30, 2013, Dresden, Germany

URL: <http://www.icc2013.org/>

ISDE 2013

August 26-29, 2013, Kuching, Sarawak, Malaysia

8th International Symposium on Digital Earth 2013

URL: <http://isde2013.utm.my/>

12th IAGA Scientific Assembly

August 26-31, 2013, Mérida, Mexico

URL: www.iaga2013.org.mx

IAG Scientific Assembly

September 1-6, 2013, Potsdam, Germany

URL: <http://www.iag2013.org>

2nd Joint International Symposium on Deformation Monitoring (JISDM)

September 9-11, 2013, Nottingham, UK

URL: www.nottingham.ac.uk/ngi/documents/events-pdfs/jisd2013.pdf

ESA Living Planet Symposium 2013

September 9-13, 2013, Edinburgh, UK

URL: <http://www.livingplanet2013.org/>

TGSMM 2013

September 11-20, 2013, St Petersburg, Russian Federation

IAG Third Symposium "Terrestrial Gravimetry: Static and Mobile Measurements - TGSMM-2013

ION GNSS 2013

September 16-20, 2013, Nashville, TN, USA

URL: <http://www.ion.org/meetings/?conf=gnss>

18th International Workshop on Laser Ranging

November 11-15, 2013, Fujiyoshida, Japan

URL: <http://geo.science.hit-u.ac.jp/lw18>

AGU 2013 Fall Meeting

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

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

40th COSPAR Scientific Assembly

August 2-10, 2014, Moscow, Russia

URL: <http://www.cospar-assembly.org/>

AGU 2014 Fall Meeting

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

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

Reports

SIRGAS General Meeting 2012 and SIRGAS/IAG/PAIGH School on Real Time GNSS Positioning

The IAG Sub-Commission 1.3b, SIRGAS, held its annual meeting in Concepción, Chile, from October 29 to 31, 2012. This meeting included two complementary activities: a SIRGAS/IAG/PAIGH School on real time GNSS positioning from October 24 to 26, and a technical visit of the TIGO (*Transportable Integrated Geodetic Observatory*) facilities. In total, 16 countries were represented: 50 participants attended the School and 135 attendees participated in the Meeting and the technical visit to TIGO.

The program developed within the School encompassed: General concepts on GNSS positioning; real time GNSS measurements; RTCM format; NTRIP protocol; mobile communication systems supporting NTRIP; real time precise point positioning (RT-PPP) methods; real time kinematics (RTK) and networked RTK methods, strengths and weaknesses of real time positioning; present and future applications of real time positioning; real time positioning based on the SIRGAS infrastructure.

The SIRGAS General Meeting 2012 was devoted to present the achievements of the SIRGAS components during the last year, including reports from the Working Groups, the Specific Projects and the National Representatives of the SIRGAS Directing Council. The main topics addressed where: maintenance of the SIRGAS reference frame (17 contributions); contributions of SIRGAS to System Earth measurement and analysis (15); real time GNSS positioning based on the SIRGAS infrastructure (9); advances in the establishment of a globally consistent vertical reference system for SIRGAS (12); practical applications of the SIRGAS reference frame at the national level (19). In addition, the IAG representative to SIRGAS presented an invited speech on the 150 year anniversary of the Association.

Fifty one oral and twenty three poster presentations were accepted by the Scientific Committee; one oral and six poster contributions were cancelled due to problems unrelated to the organization. The presentations comprised: reports of the ten Analysis Centres, the two Combination Centres and the Ionosphere Analysis Centre; reports from the chairpersons of the Working Groups I (Reference System), II (National Activities) and III (Vertical Datum); and reports from the national representatives of Argentina, Bolivia, Chile, Colombia, Costa Rica, Ecuador, Guatemala, Mexico, Panama, Peru, Uruguay, and Venezuela.



*Attendees of the SIRGAS General Meeting 2012,
Concepción, Chile, October 29 to 31, 2012.*

The main conclusions of the meeting may be summarized as follow:

- The SIRGAS reference frame is officially adopted by most of the countries, which are establishing national densifications of the continental network. Remarkable efforts have been done during the last year in Bolivia, Guatemala and Peru.
- A new Local Analysis Centre for SIRGAS has been installed by the Chilean Geographical Institute (IGM) and, after a successful test of one year, it will start operations as an official SIRGAS Analysis Centre in January 1, 2013.
- Institutions from Costa Rica, Bolivia and Peru will start soon a training period to install new SIRGAS Local Analysis Centres in those countries.
- Several countries reported improvements on their first order levelling networks. It was agreed to hold a workshop on the continental adjustment of these networks in December 2012 at the *Instituto Brasileiro de Geografia e Estatística* (Rio de Janeiro, Brazil) under the coordination of the SIRGAS Working Group III;
- The Ionosphere Analysis Centre of SIRGAS presented a new modelling strategy to compute regional maps of electron density;
- The specific projects installed by SIRGAS reported advances on
 - modelling of non-linear movements in the SIRGAS frame determination,
 - combined analysis of GPS and GLONASS data within the SIRGAS reference frame,
 - improvement of the SIRGAS infrastructure for real time GNSS positioning,
 - computation of perceptible water vapour regional maps.

TIGO is a unique geodetic facility in Latin America comprising co-located VLBI, SLR and GNSS instruments and other high-performance geodetic techniques. The doors of TIGO were generously opened to the SIRGAS community who, in addition to visit to the instruments, received high-qualified explanations provided by the TIGO staff. Among others, the following topics were addressed: General overview of TIGO; the VLBI system; GNSS instruments; the global climate change measured by TIGO; black holes and SMART-1 impact on the Moon observed by TIGO; the SLR system; first SLR measurement of Galileo satellites; the time system of TIGO and its contribution to the BIPM; the absolute and super-conducting gravimeters of TIGO; the LIDAR system; TIGO after the Maule earthquake, 27 February 2010. A set of posters used by the TIGO staff in support of this visit are available at

http://www.tigo.cl/index.php?option=com_content&view=article&id=94&Itemid=212&lang=es.

Many institutions cooperated to make the 2012 SIRGAS Meeting and School possible. The SIRGAS community particularly recognized the *International Association of Geodesy* and the *Pan American Institute of Geography and History* for supporting the assistance of 17 Latin American colleagues; the *Universidad de Concepción* and the *Instituto Geográfico Militar* of Chile for providing the local organization; the *Bundesamt für Kartographie und Geodäsie* (BKG), together with the *Universidad de la República* (Uruguay) and the *Universidad Nacional de Rosario* (Argentina), for supporting the lecturers of the SIRGAS School; the TIGO team for hosting a fruitful technical visit; the German-Chilean Project “*Geodätisches Beobachtungs- und Auswertesystem in seismischaktiven Gebieten Chiles*” for supporting the attendance of the SIRGAS Vice-President and the IAG Representative to SIRGAS.

More details about the SIRGAS 2012 General Meeting and the SIRGAS/IAG/PAIGH School on GNSS Positioning in Real Time may be found at www.sirgas.org.

*C. Brunini, SIRGAS President,
L. Sánchez, SIRGAS Vice-President*

Colloquium of the Leibniz Society of Sciences on Scientific Geodesy September 14, 2012, Berlin

The Leibniz Society of Sciences organized a Scientific Colloquium on the occasion of the 150th Anniversary of today's International Association of Geodesy (IAG) in the form of the Central European Grade Measurement founded in 1862. Since its establishment in 1700 as Brandenburg Society of Sciences, the Leibniz Society traditionally has put particular emphasis on geodesy. Several German geodetic organizations have been related to this Society, especially the Geodetic Institute at Berlin and later in Potsdam. A basic role in founding this exemplary international cooperation and in its development during its first fifty years has been played by three members of this Society: Johann Jacob Baeyer, Peter Andreas Hansen and Friedrich Robert Helmert, who was the director of the Central Bureau of the European Grade Measurement, an extension the Central European Grade Measurement and the predecessor organization of IAG.

Responsible for the preparation of the present memorial colloquium were the Leibniz Society members Erik W. Grafarend (Stuttgart), Heinz Kautzleben (Berlin), Helmut Moritz (Graz) and Reiner Rummel (Munich), under the chairmanship of Heinz Kautzleben. The colloquium was held jointly with the German Association of Geodesy, Geoinformation and Land Management (DVW) Berlin-Brandenburg e.V..

Program

Opening

Dietmar Linke, Vice-President of the Leibniz Society

Hans-Gerd Becker, President of the DVW Berlin-Brandenburg.

Papers

Hansjörg Kutterer, Frankfurt am Main:

Current Activities of IAG and their Importance for German Geodesy

Harald Schuh, Vienna, Austria

Geodetic Very Long Baseline Interferometry (VLBI) and its Future Perspectives

Helmut Moritz, Graz, Austria

Helmert, Bruns, Einstein

Erik W. Grafarend, Stuttgart

Friedrich Robert Helmert: his Solution of the Anholonomy Problem of Geodesy or why is Geodesy Physical?

Horst Montag, Brandenburg an der Havel

Sea Level and Earth Rotation Vector—two Modern Directions of Research Originating from the Central European Grade Measurement

Heinz Kautzleben, Berlin

Development of the Organized International Cooperation in Scientific Geodesy from Central European Grade Measurement to the Era of Satellite Geodesy – the German Approaches

Petr Holota, Zdíby, Praha-východ, Czech Republic

Successful Road to the 3rd General Assembly of the IUGG in Prague, the Facts and Subsequent Developments in Geodesy

Juhani Kakkuri, Helsinki, Finland

The Baltic Geodetic Commission and the Baltic Geodetic Ring

Joachim Höpfner, Potsdam

Johann Jacob Baeyer – an Outstanding Geodesist of the 19th Century

Oliver Schwarz, Siegen

Activities in Thuringia within the Frame of Central European Grade Measurement

Reinhard Rummel, Munich

Concluding Remarks

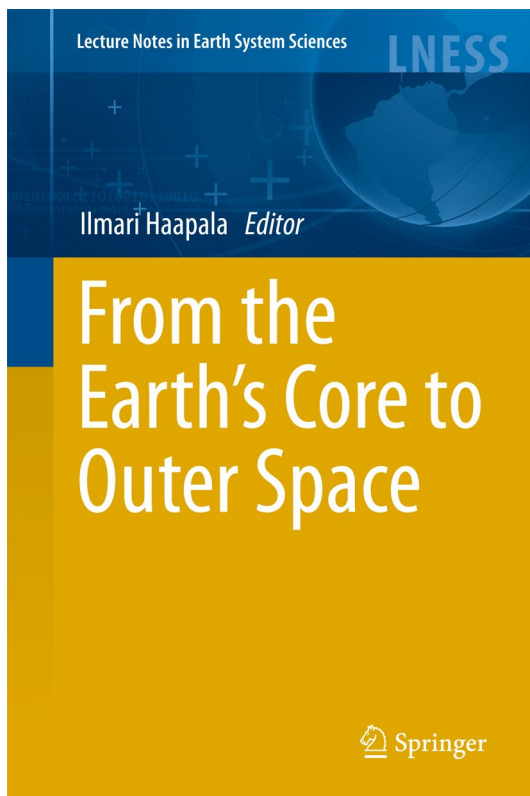
The meeting covered key topics of almost all geodesy, both from a historic perspective and from a scientific point of view, to the most recent developments in geodesy in theory, measuring techniques, and international cooperation, as Reiner Rummel remarked in his fulminant conclusion. The meeting also showed that national geodetic cooperation was possible already at a time (1862) when Germany was split up into a confederation of several smaller states.

The papers will be published in the *Sitzungsberichte der Leibniz-Sozietät*.

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Graz University of Technology

Book Review

Ilmari Haapala (ed): From the Earth's Core to Outer Space



Title: From the Earth's Core to Outer Space
Author: Ilmari Haapala (ed)
Publisher: Springer Verlag Heidelberg – Dordrecht – London – New York
ISBN: 987-3-642-25550-2
Year: 2012
Price: 129.95 €/ £ 117
Details: Hard cover, 340 pages

In the Series “Lecture Notes in Earth Sciences”, edited by *Ilmari Haapala*, there appeared the fascinating book “From the Earth's Core to Outer Space” for the centennial anniversary of the *Finnish Academy of Sciences and Letters*. This remarkable contribution, also with contribution from Geodetic Science, includes reviews of the Earth's Evolving Crust, Changing Baltic Sea, Climate Change, and Planet Earth, Third Stone from the Sun.

Part One is oriented to the Earth's Evolving Crust. *S. Mertanen and L.J. Pesonen* (29 pages) introduce those impressive Paleo-Mesoproterozoic Assemblages of Continents: Paleomagnetic evidence for near Equatorial Supercontinents. They use paleomagnetic methods to reconstruct the Precambrian supercontinents during the third period 2.45-1.05 Ga. Seismic structures of the Earth's Crust in Finland were reviewed by *P. Heikkinen* (10 pages). The famous Moho was defined as the boundary where the P-wave velocity reaches a value more than 7.6 km/s. An overview is given on what we know about the crustal structure of Finland based on seismic surveys.

The evolution of the Bedrock of Finland as an overview is presented by *R. Lahtinen* (13 pages). The author divides the evolution of the Finnish Bedrock in four stages: (i) Archean evolution, (ii) Paleoproterozoic rifting stage, (iii) Paleoproterozoic orogenic and (iv) Paleo- to Mesoproterozoic Rapakivi granite. *H. O'Brien and M. Lehtonen* (20 pages) review Craton Mantle Formation and Structure of Eastern Finland Mantle: Evidence from Kimberlite-derived mantle Xenoliths, Xenocrysts and Diamonds. Latest ideas of how cratons are formed and how these processes may have resulted in the formations of the Karelian craton are presented. Metallic mineral resources in Finland and Fennoscandia: A major European raw materials sources for the future are reviewed by *P.A. Nurmi and P. Eilu* (21 pages). Briefly the potential of Fennoscandia for the future with respect to metals are estimated. We take reference of Figure 6.4 for a summary. *O.T. Ramo* (24 pages) presents isotopic microanalysis: in side constraints on the origin and evolution on the Finnish Precambrian, since the 1960s, the isotopic laboratory of the Geological Survey of Finland has been established providing invaluable boundary conditions for the Fennoscandian bedrock across the country. A geodetic highlight is the review contribution of *J. Kakkuri* from the *Finnish Geodetic Institute* about a central geodetic topic, the Fennoscandian Land Uplift: past, present and future. He reviewed the oldest documents: *Z. Topelius* (1893), *J. Donner* (1995), *E. Kääriäinen* (1966), *E. Niskanen* (1939) who presented first the isostatic point of view, *M. Sauramo* (1918, 1923) and *Tikkanen and Oksanen* (2002). See the land uplift visions of Figure 8.3, based on tide gauges and first, second and third Levellings of Finland. The eustatic rise and the uplift of the Geoid have left the relative land uplift.

A special section is devoted to the Geoid as an equipotential surface of the Gravity Potential with respect to Mean Sea Level. The Gravimetric Geoid of the Nordic Countries by *R. Forsberg* has been discussed as well as the Bouguer Gravity Anomalies in Finland in Figures 8.4 and 8.5 interpreted. *M. Vermeer* (2010) discussed the Molten Ice from Greenland fleeing to the Southern Hemisphere. The interrelation of the gravity effect on the ocean surface causing the regional Sea Level Rise after removal of ice from Greenland including the effects of (i) self gravitation, (ii) elastic rebound of the Lithosphere and (iii) Earth's rotation perturbations is reflected in the reference of *J.X. Mitrovica et al.* (2001).

Part Two is a review of "Changing Baltic Sea". *M. Lepparanta* (11 pages) concentrates on the future of the Baltic Sea Seasons. The Baltic Sea Water Exchange and the oxygen balance is the topic of *P. Malkki and M. Perttala*. The importance of Marie Carbon Dioxide is precisely demonstrated by *M. Perttala* (8 pages), *M. Viitasalo* (14 pages).

Part Three is concentrated on the key issue of our time, Climate Change. *J.A. Karhu* (11 pages) shortly reviews of evolution of the Earth's atmosphere. Further details of the late Quaternary Climate History of Northern Europe are presented by *A.E.K. Ojala* (20 pages). *M. Kulmala, J. Riipinen and V.M. Kerminen* (8 pages) discuss the impact of Aerosols on Climate Change. Enhanced Greenhouse Effect influencing Climate Change in Northern Europe is reviewed by *J. Raisanen* (13 pages). *E. Kuusisto* (13 pages) asks himself "Will there be water enough in Europe?" Finally, Part Four is the highlight of the book: "Planet Earth, Third Stone of the Sun". Fascinating is the first contribution of *H. Neyanlinna* (8 pages) on trends in Space Weather since the nineteenth century by *H. Koskinen* (14 pages). A geodetic highlight is the contribution of *M. Poutanen* on Space Geodesy: Observing Global Change (14 pages). Starting with Sputnik he discusses "Under the Clouds" the various satellite systems, Gravity wags the satellite, and following *Heinrich Bruns* (1878) (astronomer, mathematician) "Three Pillars of Geodesy": measuring the geometric shape of the Earth's surface, and its kinematics. Earth rotation and positioning in space and determining and monitoring the gravity field in Space and Time. Figure 20.4 illustrates nicely these three pillars. Space geodetic techniques including global networks, namely Altimetry, SLR, LLR, VLBI, GPS, LEO, as well as the role of the Metsähovi Observatory as a Fundamental Station and the Challenge of the Global Change are key topics.

The destination of the Planet Mars is the key topic of *R. Pellinen* (14 pages). From the history of Mars we are led to the first missions, the Space Era, Mars today, near future plans and remote future, Human Exploration and an Epilogue based on new data. The last contribution of "In Search of a Living Planet" by *H.J. Lehto* (20 pages) discusses the characteristics of life, its requirements and limits, searching for life in our Solar System, Mars, Europa, Titan, Enceladus, Comets, other planetary systems, Kepler, Super WASF, MOST, COROT, GAIA, JWST, "SETI", and, finally the consequences of finding Extraterrestrial Life.

The book is a brilliant example of Earth Sciences, in short *Geosciences*. The complements must go to the Editor *Ilmari Haapala* and all contributors representing the rich body of the JUGG, in particular Geodetic Sciences (IAG) in Finland. The largest Geodetic Research Institute of Europe is located in Masala close to Helsinki, the capital of Finland. About 90 co-workers study geodetic problems. At my time I took reference to *W. Heiskanen*, also the founder of the Department of Geodetic Science, Columbus / Ohio / USA, *T.J. Kukkamäki, J. Kakkuri, R. Kuittinen* and presently *H. Kossinen* as Directors General. I would have expected key contributions from the Department of Geodesy and Geophysics headed by *M. Poutanen* with responsibility of Metsähovi Observatory as well as Department of Positioning and Navigation headed by *R. Chen*. There is only one chair of geodesy in Finland headed by our colleague *M. Vermeer*, Alvar Aalto University of Helsinki. At a time of 5000 active satellites rotating with the Earth I might have the question: Where is Satellite Geodesy? Where are contributions about the celebrated satellites CHAMP, GRACE and GOCE? I miss also any contribution about GPS, for instance Galileo.

For general information on the state-of-the-Art of Geosciences, in particular in Finland, the book offers a wonderful introduction. In summary, I can recommend the book to any Geoscientist who wants information on neighboring sciences.

ERIK GRAFAREND