International Association of Geodesy Newsletter

May 2016

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Contents

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

General Announcements

Summary of the Third Meeting of the IAG EC 2015-2019

Place: Potsdam, Germany, GFZ German Research Centre for Geosciences, A17
Time: Monday, April 25, 2016, 09:00 – 16:45

Attendees (voting): H. Schuh (IAG President), Z. Altamimi (Vice President), H. Drewes (Secretary General), C. Rizos (Immediate Past President, occasionally via Skype), G. Blewitt (President of Commission 1), R. Pail (President of Commission 2), M. Hashimoto (President of Commission 3), M. Santos (President of Commission 4), P. Novák (President of ICC on Theory), H. Kutterer (Chair of GGOS), J. Adam (President of COB), R. Barzaghi, R. Neilan (occasionally via Skype), A. Nothnagel (Representatives of the Services), L. Combrinck, M.C. Pacino (Members at Large)
Attendees (non-voting): G. Beutler (IAG Past President), F. Kuglitsch (Assistant Secretary)
Guests: J. Kusche (Editor in Chief of the Journal of Geodesy), S. Rózsa (Secretary of COB), A. Craddock, R. Gross (during agenda points 14-19)

Participants of the IAG EC meeting in Potsdam in April 25, 2016.
From left to the right: F. Kuglitsch, A. Nothnagel, M. Hashimoto, R. Pail, R. Barzaghi, H. Kutterer, P. Novák, Sz. Rózsa, M.C. Pacino, J. Kusche, M. Santos, H. Schuh, J. Ádám, L. Combrinck, H. Drewes, G. Blewitt, Z. Altamimi and G. Beutler

Summary of Agenda Items:

1. Welcome and adoption of agenda

The 3rd IAG EC Meeting in the term 2015-2019 took place on 25 April 2016, at the GFZ German Research Centre for Geosciences in Potsdam, Germany, right after the EGU General Assembly 2016 in Vienna, Austria. The agenda was distributed previously by email and was unanimously adopted. *H. Schuh*, the President of the IAG, welcomed the members of the IAG Executive Committee (15 out of 16 voting members, 2 non-voting members and 2 guests), and in particular *G. Beutler*, IAG President 2003-2007 and moderator of the IAG Retreat on 26 April 2016. The EC Members approved the minutes of the second EC Meeting in San Francisco, USA, in December 2015.

2. Final structure 2015-2019 of the Commissions

G. Blewitt gave the presentation on **Commission 1**. He reported about the ToR, the objectives, and the structure of the Commission including its Sub-commissions, Joint Working Groups and the Steering Committee. The website of Commission 1 is hosted by the Vienna University of Technology (http://iag.geo.tuwien.ac.at). In the term 2015-2019, Commission 1 will have 4 Sub-commissions: Sub-commission 1.1 (Coordination of Space Techniques; chaired by *U. Hugentobler*), Sub-commission 1.2 (Global Reference Frames; chaired by *X. Collilieux*), Sub-commission 1.3 (Regional Reference Frames; chaired by *C. Bruyninx*), and Sub-commission 1.4 (Interaction of Celestial and Terrestrial Reference Frames; chaired by *Z. Malkin*). The ToR of the Working Group 1.4.3. "Improving VLBI-Based CRF for Geodesy" and the role of the IAU should be clarified. *H. Drewes* suggested adding a link to COSPAR in the objectives of Sub-Commission 1.1.

R. Pail gave the presentation on **Commission 2**. He reported about the activities since December 2015, the main tasks in the term 2015-2019, and the structure of the Steering Committee, the Sub-Commissions, Working Groups and Study Groups. The website of Commission 2 is hosted by the Technical University of Munich (http://alpha.fesg.tu-muenchen.de/IAG-C2/). In the term 2015-2019, Commission 2 will have 6 Sub-commissions: Sub-commission 2.1 (Gravimetry and Gravity Networks; chaired by *L. Vitushkin*), Sub-commission 2.2 (Methodology for Geoid and Height Determination; chaired by *J. Agren*), Sub-commission 2.3 (Satellite Gravity Missions; chaired by *A. Jäggi)*, Sub-commission 2.4 (Regional Geoid Determination; chaired by *M.C. Pacino*), Sub-commission 2.5 (Satellite Altimetry; chaired by *X. Deng*), Sub-commission 2.6 (Gravity and Mass Transport in the Earth System; chaired by *J. Kusche*). GGHS-2016, a joint meeting with IGFS, will be organized from 19-23 September 2016, in Thessaloniki, Greece. *H. Drewes* suggested renaming Sub-commission 2.2 to avoid the term "Determination". Also, it should be clarified to which Sub-commission a Working or Study Group reports to.

M. Hashimoto gave the presentation on **Commission 3**. He reported about the role of the Commission, its objectives, structure incl. Sub-commissions, joint Study and Working Groups, the Steering Committee and activities. Commission 3 has 5 Sub-commissions: Sub-commission 3.1 (Earth Tides and Geodynamics; chaired by *J. Bogusz*), Sub-commission 3.2 (Crustal Deformation; chaired by *Z.-K. Shen*), Sub-commission 3.3 (Earth Rotation and Geophysical Fluids; chaired by *J. Chen*), Sub-commission 3.4 (Cryospheric Deformation; chaired by *S. A. Khan*), and Sub-commission 3.5 (Tectonics and Earthquake Geodesy; chaired by *H. Ozener*). *H. Schuh* mentioned that there is the GGOS focus area "Sea-level Change" which is chaired by *T. Schöne* that should be closely linked to the joint Working Group 3.2.

M. Santos gave the presentation on **Commission 4**. He reported about the structure and the activities of the Commission. The website of Commission 4 is hosted by the University of New Brunswick (http://IAG-Comm4.gge.unb.ca). He mentioned that there will be 4 Sub-commissions in the term 2015-2019: Sub-commission 4.1 (Emerging Positioning Technologies and GNSS Augmentation; chaired by *V. Gikas*), Sub-commission 4.2 (Geo-Spatial Mapping and Geodetic Engineering; chaired by *J. W. Wang*), Sub-commission 4.3 (Atmosphere Remote Sensing; chaired by *M. Schmidt*), and Sub-commission 4.4 (Multi-Constellation GNSS; chaired by *P. Wielgosz*). Also, he mentioned that Commission 4 will have a "Positioning and Applications" from 4-7 September 2016 in Wroclaw, Poland. *H. Schuh* noted to clarify if GNSS-R is also still under GGOS. *M. Santos* mentioned that low-cost sensors for using cell phones are considered by Sub-commission 4.1.

3. Final structure 2015-2019 of the Inter-Commission Committee on Theory

P. Novák gave the presentation about the structure and activities of ICCT. He clarified that all of the 13 study groups are jointly organized with one or more Commissions and have their ToRs ready. The website of ICCT is hosted by the University of West Bohemia (http://icct.kma.zcu.cz). He highlighted the involvement of early-career scientists in the study groups, and the Hotine-Marussi Symposium will be organized in 2018. *Z. Altamimi* noted that the work done by study groups is very relevant for the IAG Services. *P. Novák* agreed asking the study group chairs about developing stronger links to the Services (e.g. in form of Service Representatives). *H. Schuh* emphasised the importance of the joint study group on "Space weather and ionosphere" and suggested adding more than 8 members to this study group.

4. Final structure 2015-2019 of the Communication and Outreach Branch

J. Adám, gave a presentation about the ToR, the structure and the activities of COB. He underlined the need to get regularly news/input for the IAG website and the IAG newsletter. Also, he mentioned that the IAG Brochure and booklet have been updated and are now available on the IAG website (http://www.iag-aig.org/). He asked the EC to approve the Steering Committee composed according to the IAG Bylaws by *J. Adám*, *H. Drewes*, *J. Kusche*, *J. Freymueller*, *S. Rózsa*, *G. Tóth*, *F. Kuglitsch*, and *A. Craddock*. The EC approved the members of the Steering Committee unanimously. *H. Schuh* clarified that *C. Rizos* will no longer submit the reports to GIM

International but the COB will do so. However, *C. Rizos* will still be acting as editor of the text, if required. The scheduling of the monthly report submissions should be mainly organized by the COB.

5. Final structure 2015-2019 of GGOS

H. Kutterer gave the presentation on the structure of GGOS. He reported about the objectives, representatives, working groups, Consortium Coordinating Board and Executive Committee of GGOS. The website of GGOS is hosted by BKG (www.ggos.org). He mentioned that it is a good time now to re-start GGOS activities with GEO.

6. Reports of the Services

R. Barzaghi gave the presentation about the programmes of the International Gravity Field Service (IGFS) and the gravity related services: Bureau Gravimetrique International (BGI), International Service for the Geoid (ISG), International Centre for Global Earth Models (ICGEM), International DEM Service (IDEMS), and International Geodynamics and Earth Tides Service (IGETS). He mentioned that the new IGFS Central Bureau started its activities in April 2016 at the University of Thessaloniki (http://igfs.topo.auth.gr/).

A. Nothnagel gave a presentation about the Bureau International des Poids et Mesures (BIPM), International Earth Rotation and Reference Systems Service (IERS), International VLBI Service for Geodesy and Astrometry (IVS), and Permanent Service for Mean Sea Level (PSMSL),

7. Reports from developing countries

L. Combrinck gave a presentation about Geodesy in Africa. He noted that Botswana and Madagascar would be best countries in terms of stability and reliability to collaborate with. *M.C. Pacino* gave then a presentations about (1) geodetic activities in South America and (2) the Argentinean-German Geodetic Observatory. *H. Schuh* noted that this agenda point should be called “Reports of the Members at Large” in future.

8. Status of the Geodesist’s Handbook 2016

H. Drewes reported that not all the reports for the Geodesist’s Handbook 2016 are available yet. He asked the EC Members to check the available documents in May before the final technical edits are made by the IAG Office (*H. Drewes*, *F. Kuglitsch*) and the COB (*J. Adam*, *S. Rózsa*). Also, he requested to get all new URLs of the commissions, and ICCT, GGOS and services if changed.

9. Status of the Prague proceedings

H. Schuh summarized the report about the Status of the Prague proceedings, prepared by *J. Freymueller* and *L. Sanchez*. He mentioned that it should be clarified how to proceed with the Springer Publications. *H. Schuh* and *H. Drewes* noted that the future focus should be on e-books rather than on printed volumes which are getting less attractive. The EC discussed the following three options suggested by *J. Freymueller* about how to proceed with the e-books:

1. Make the IAG Symposia series a part of the individual membership in the IAG, gaining us a larger readership. This would require an increase in the cost of dues, and the cost/benefit of this needs to be considered. It may be too expensive.
2. Make the Symposia series e-book normally part of the meeting fee for all IAG meetings that intend to produce a symposium volume. This is definitely feasible.
3. Continue as now, with the volume available for sale to those who choose to buy it.

H. Drewes noted that in principle IAG could offer e-books with open access (on average 2 per year) but then other expenses of IAG (mostly travel awards for early-career scientists) need to get reduced. He mentioned that for the IUGG2015, IAG offered more than 50 travel grants. The EC concluded (i) to negotiate an offer with Springer to get full open access e-books or (ii) to find a way of combining options 1 and 2, offering alternatively e-books to all IAG members or to the participants of the symposia.

10. Status of the Journal of Geodesy

J. Kusche, Editor-in-chief of the Journal of Geodesy, gave his report about the status of the Journal of Geodesy. He noted that a submitted paper to the Journal of Geodesy gets a minimum of three reviewers, and that the acceptance rate very much depends on the originating country of the authors but that the language is never a reason to reject a paper. *H. Schuh* noted that in future it would be good not changing almost the entire Editorial

Board but to always keep some experienced people for the phase of transition. He also noted some cases of submissions where there were minor revisions requested after the first review and major revisions after the second review. Such cases should be avoided by the Editor-in-chief.

11. Liaisons with other international and professional bodies

H. Drewes presented the liaisons with other international and professional bodies available at http://iag.dgfi.tum.de/index.php?id=326. The IAG representatives to these liaisons as well as to IAG services and IUGG Commissions, Committees and Working Groups are defined by the EC. The current status may be found at http://iag.dgfi.tum.de/fileadmin/IAG-docs/IAG_Representatives_2015.pdf.

12. Position Paper and Road Map on the UN Global Geodetic Reference Frame

H. Schuh reported about the position paper "Description of the Global Geodetic Reference Frame". He mentioned that the EC approved the paper by electronic voting. *H. Drewes* summarized the result: 9 Yes, 5 No, 1 Abstain. *H. Schuh* reported about his very constructive meeting with *G. Johnston*, the UN GGRF Working Group and the UN-GGIM in Vienna, Austria. He mentioned that in the Road Map prepared by the GGRF WG, IAG gets mentioned at least 20 times being responsible for the scientific work. *C. Rizos* had suggested seeing the outcome of this project as a basket or ensemble of various reference systems dealing with geodetic parameters rather than getting a "Super-Frame" that might become reality in the long term future. He further noted that the positon paper is an important document which should primarily serve the IAG as a reference document of its own understanding. However, the position paper should not and does not harm the Road Map. Definitely, the Road Map together with its Executive Summary will be a suitable document for UN bodies, policy-makers and the public. A discussion about the purpose and use of the position paper followed.

13. IAG/IASPEI Scientific Assembly, Kobe, Japan, 2017-07-30 to 2017-08-04

M. Hashimoto reported about the venue, committees, schedule and budget of the Assembly. *H. Drewes* mentioned that the Scientific Committee needs to clarify the themes and names of the IAG symposia and the joint symposia. He further noted that IAG members should receive a discount on the registration fee according to the Bylaws. *R. Pail* suggested organizing a splinter meeting of the four Commission Presidents, the chair of ICCT, the chair of GGOS, a representative of the Services (*R. Barzaghi*) and the IAG Secretary General in the lunch break on 26 May to discuss the Scientific Program.

14. Revision of the IAG Bylaws, appointment of a Review Committee

H. Drewes reported that the IAG Bylaws can be modified every four years (at IUGG General Assemblies) and suggested to install a Review Committee (Cassinis Committee) which collects proposed modifications to the IAG Bylaws. He noted that the Immediate Past President (*C. Rizos*) should chair this committee and should propose two committee members.
The EC approved to install a Review Committee (Motion: *H. Schuh*; 2nder: *H. Kutterer*).

15. Report from IUGG and ICSU

F. Kuglitsch reported about the status of the IUGG Member Countries, new publications, geoscience education events in 2016 supported by IUGG, the IUGG Grants Programme 2016-2019, the new composition of IUGG Union Committees and the IAG Council 2016-2019. *H. Schuh* noted that the next IUGG EC Meeting will be held in June 2016 in Paris, France.

16. Report on the IAG Services Assessment, ISA

H. Drewes reported that all the assessment reports about the Services are available on the IAG Office website. He noted that all the Services have been assessed by three reviewers (among the ISA team) but many services have not responded on the report. The EC members were invited to read the assessment reports and to comment. *H. Schuh* noted that *C. Rizos* will continue being the chair of the ISA team but the procedure should come to an end soon.

17. Any other business

H. Schuh reported about recent GIM International publications informing the public about what IAG is doing.

H. Drewes reminded the EC that according to a decision at the first EC meeting, symposia which are organized by either 1 IAG component or 2 sub-components are considered being approved by the EC. Also he noted that IAG travel awards for presentation at IAG symposia can be requested by early-career scientists being not older than 35 years.

18. Next IAG EC meeting

The EC decided to hold its next meeting, on the occasion of the EGU General Assembly 2017, on 28 April 2017 in Vienna, Austria.

19. Adjourn

H. Schuh thanked the participants for their contributions and closed the session at 16:45.

Respectfully submitted
H. DREWES, IAG Secretary General
F. KUGLITSCH, Assistant Secretary General

Activities of IAG Commission 3 "Earth Rotation and Geodynamics" in the term 2015-2019

The Earth is evolving day by day and its surface and interior are continuously changing. Since we are living on the surface of such a restless planet, it is extremely important to understand the motion and dynamics of the Earth. Geodynamics is the study of the deformation of the Earth. Commission 3 plays a key role to promote science of Earth rotation and geodynamics.

Monitoring of the rotation is indispensable to our daily life, because it defines time and their parameters are essential to precise determination of satellite navigation systems. Rotation of the Earth is closely related to its internal structure and is also changing. In 17th century, Newton and Huygens proposed different models of the Earth's rotation; i.e. homogeneous Earth and concentrated mass, respectively. Since then, various discoveries have been made, which deepened our understanding of the Earth's structure. Now, this procedure of research is being applied to other planets.

Deformation of the Earth mainly arises accompanied by the dissipation of heat inside the Earth. Heat is transferred to the surface by convection of mantle, which causes motion of tectonic plates. Tectonic plates move and collide against each other on the surface of the Earth. Monitoring of the movements of tectonic plates is essential to understand the generation of earthquakes and other tectonic phenomena and their related natural hazards. Recent earthquakes and volcanic eruptions caused large deformations. Several geodetic techniques revealed associated deformation and help scientists understand their generation process (Fig. 1).

There are several other important factors that affect the Earth's deformation. Sun, moon and other planets make the Earth deform. This is called Earth tide. The response of ground to the Earth tide also gives us invaluable information on the interior of the Earth. There are a couple of studies showing that its change might be associated with the preparation of earthquake occurrence, as well.

There is plenty of fluid in and around the solid Earth; atmosphere, hydrosphere, groundwater and the Earth's core. They are considered to play a key role in the deformation process at a broad scale in space and time. Furthermore they also affect precise positioning with any kind of geodetic techniques.

Cryosphere is also an important target to be studied, especially from the viewpoint of monitoring of global warming. Melting of ice sheets cause deformation of lithosphere with a long time constant, i.e. glacial isostatic adjustment (GIA), which also gives important information of the structure of the upper mantle.

Thus, all the processes acting on the Earth are closely related to each other, and issues to be discussed in Commission 3. This commission works to develop cooperation and collaboration in computation, in theory and in observation of Earth rotation and geodynamics. Commission 3 of the term 2015 - 2019 will promote several activities such as symposia and collaborative works. It consists of 5 sub-commissions, one joint study group and 2 joint working groups. These are SC 3.1: Earth Tides and Geodynamics (Chair: J. Bogusz, Poland), SC 3.2: Crustal Deformation (Chair: Z.-K. Shen, China), SC 3.3: Earth Rotation and Geophysical Fluids (Chair: J. Chen, USA), SC 3.4: Cryospheric Deformation (Chair: S. Abbas Khan, Denmark), SC 3.5: Tectonics and Earthquake Geodesy (Chair: H. Ozener, Turkey), JSG 3.1: Intercomparison of gravity and height change (joint with IGFS, Commissions 1 and 2; Chair: S. Rosat, France), JWG 3.1: Theory of Earth rotation and validation (joint with IAU; Chair: J. Ferrándiz, Spain), JWG 3.2: Constraining vertical land motion of tide gauges (joint with Comm. 1; Chair: Alvaro Santamaría-Gómez, France). Three international symposia will be held in 2016. SC3.1 will host the 18th International Symposium on Geodynamics and Earth Tides on June 5 – 9, 2016, Trieste, Italy (http://g-et2016.units.it/). Wegener Symposium will be held in Azores, Spain, on 12-15 September under the auspices of

SC3.5. Vice-President Cheng-Huang Li will host a joint IAU / IAG / IERS symposium, Geodesy, Astronomy AND Geophysics in Earth Rotation (GAGER2016), during 18 - 23 July 2016 at Wuhan, Hubei, China (http://gager2016.sgg.whu.edu.cn/). Zheng-Kang Shen, the chair of the SC3.2, will host a special session, "Geodetic Observations, Modeling Of Earthquake Cycle Deformation, And Tectonics" (SE13), in the coming Asia Oceania Geoscience Meeting on August 1 in Beijing, China. Session proposals to coming AGU/EGU and other conferences are being prepared by SC's. Commission 3 will also contribute to the Joint Scientific Assembly of IAG-IASPEI, which will be held in Kobe, Japan, in 2017.

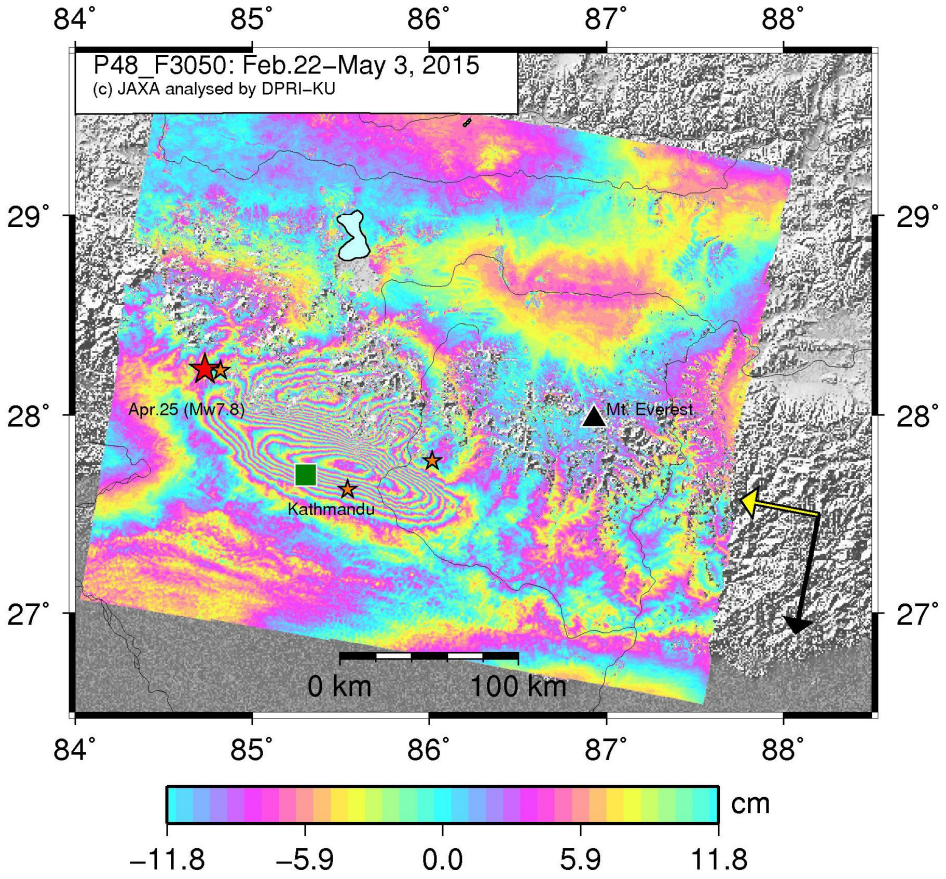
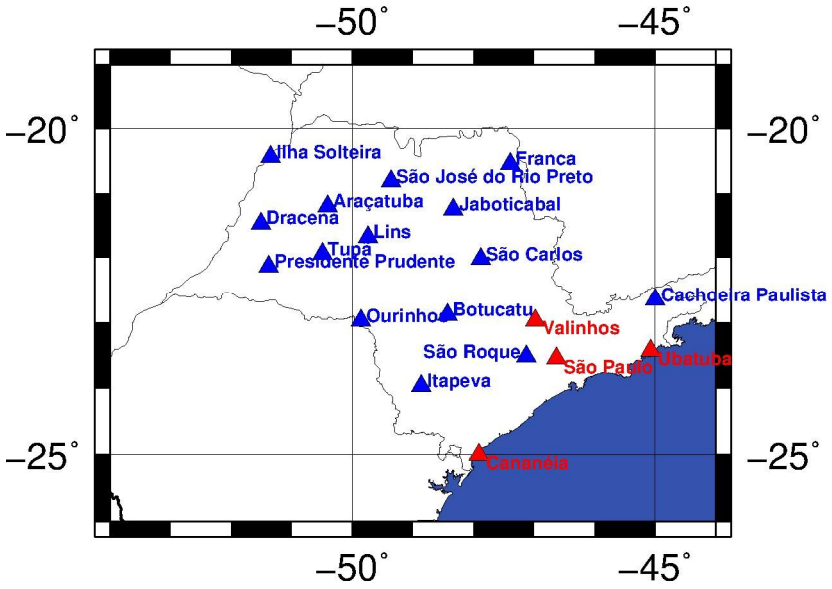


Fig. 1 Coseismic interferogram of the Gorkha, Nepal earthquake of April 25, 2015 detected by ALOS-2/PALSAR-2 (Hashimoto, 2015).

MANABU HASHIMOTO

Absolute gravity network - Brazil

University of São Paulo and Institute of Geography and Cartography (IGC) are cooperating in the establishment of the Absolute Gravity Network in the State of São Paulo. The observations had the collaboration of IBGE (Brazilian Institute of Geography and Statistics). A total of 15 stations have been established with another 4 re-observations (R). The measurements have been undertaken with A-10 Micro-g LaCoste gravimeter, number 032. The stations are identified by the name of the city as follow: Cananeia (R), São Paulo (R), Ubatuba (R), Valinhos (R), Araçatuba, Botucatu, Cachoeira Paulista, Dracena, Franca, Ilha Solteira, Itapeva, Jaboticabal, Lins, Ourinhos, Presidente Prudente, São José do Rio Preto and Tupã. The figure shows the distribution of the points in the state. The final results are under processing and they will be available very soon.



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Meeting Announcements

Meetings Calendar

Baltic Geodetic Congress

June 2 – 4, 2016, Gdansk, Poland
URL: http://www.bgc.geomatyka.eu/2016/

18th Geodynamics and Earth Tide Symposium 2016

June 5 – 9, 2016, Trieste, Italy
URL: http://www.lithoflex.org/g-et/

ISG Geoid School

June 6 – 10, 2016, Ulaanbaatar, Mongolia
URL: http://www.isgeoid.polimi.it/

6th International Conference on Cartography & GIS

June 13-17 2016, Albena, Bulgaria
URL: http://www.iccgis2016.cartography-gis.com/

ISDE 2016

July 7-8 2016, Beijing, China
URL: www.isde2016summit.org

International Conference "Data Intensive System Analysis for Geohazard Studies"

July 18 – 21, 2016, Sochi region, Mountain cluster, Russia
URL: http://sochi2016.gcras.ru/

GAGER 2016

July 18 – 23, 2016, Wuhan, Hubei, China
Geodesy, Astronomy and Geophysics in Earth Rotation (GAGER2016) – A Joint IAU / IAG / IERS Symposium
URL: http://main.sgg.whu.edu.cn/gager2016/

ESA-JRC Summer School on GNSS 2016

July 18 – 29, 2016, Ispra, Italy
URL: www.esa-jrc-summerschool.org

International Symposium on Geodesy and Geodynamics (ISGG2016)

July 22 – 25, 2016, Tianjin, China
URL: http://isgg2016.csp.escience.cn

ICG+2016

July 27 – 30, 2016, Shanghai, China
IAG/CPGPS International Conference on GNSS+
URL: http://202.127.29.4/meetings/icg2016

41st COSPAR Scientific Assembly

July 30 – August 7, 2016, Istanbul, Turkey
URL: http://www.cospar-assembly.org/

AOGS 13th Annual Meeting

July 31 – August 5, 2016, Beijing, China
URL: http://www.asiaoceania.org/aogs2016/

IAG Commission 4 „Positioning and Applications" Symposium

September 4-7, 2016, Wroclaw, Poland
URL: http://www.igig.up.wroc.pl/IAG2016/

18th General Assembly of WEGENER

September 12-15, 2016, Azores, Portugal
WEGENER 2016: Understanding earth deformation at plate boundaries
URL: http://wegener.segal.ubi.pt

ION GNSS+ 2016

September 12-16, 2016, Portland, USA
URL: http://www.ion.org/gnss/index.cfm

16th International Mine Surveying Congress

September 12-16, 2016, Brisbane, Australia
URL: http://www.ism2016.com/

GGHS2016

September 19-23, 2016, Thessaloniki, Greece
URL: http://www.gghs2016.com

13th European VLBI Network (EVN) Symposium

September 20-23, 2016, St. Petersburg, Russia
URL: http://www.ipa.nw.ru/EVN2016/

4th International School on "The KTH Approach to Modelling the Geoid"

September 25-29, 2016, Johor Bahru, Malaysia
URL: https://www.kth.se/en/abe/inst/som/avdelningar/geo/geodesi/handelser-1.78120

First International Workshop on VLBI Observations of Near-field Targets

October 5 – 6, 2016, Bonn, Germany
URL: http://ivscc.gsfc.nasa.gov/meetings/index.html

20th International Workshop on Laser Ranging

October 9 – 14, 2016, Potsdam, Germany
URL: http://iwslr2016.gfz-potsdam.de/international-workshop-on-laser-ranging

INTERGEO, Geodätische Woche

October 11 – 13, 2016, Hamburg, Germany
URL: http://www.intergeo.de/

5th International VLBI Technology Workshop

October 12 – 14, 2016, Haystack Observatory, Westford, MA, USA
URL: http://www.haystack.mit.edu/workshop/ivtw2016/Index.htm

RFI 2016: Coexisting with Radio Frequency Interference

October 17 – 20, 2016, Socorro, NM, USA
URL: http://go.nrao.edu/rfi2016

GGOS Days

October 24 – 28, 2016, Cambridge, MA, USA
URL: http://www.iers.org/IERS/EN/NewsMeetings/ForthcomingMeetings/forthcoming.html

IDS Workshop

October 31 – November 1, 2016, La Rochelle, France
URL: http://ids-doris.org/meetings/ids-meetings.html

SAR Altimetry Workshop

October 31 2016, La Rochelle, France
URL: http://www.aviso.altimetry.fr/en/news/events-calendar.html

OSTST 2016

November 1 – 4, 2016, La Rochelle, France
URL: http://ids-doris.org/meetings/ids-meetings.html

IGNSS 2016

December 6 - 8, 2016, Sydney, Australia
International Global Navigation Satellite Systems 2016 Conference
URL: http://www.ignss2016.unsw.edu.au

AGU 2016 Fall Meeting

December 12 – 16, 2016, San Francisco, California, USA
URL: http://meetings.agu.org/upcoming-meetings/

EGU General Assembly 2017

April 23-28 , 2017, Vienna, Austria
URL: http://www.egu2017.eu/

23rd Working Meeting of the European VLBI Group for Geodesy and Astrometry (EVGA)

May 15-19 , 2017, Gothenburg, Sweden
URL: http://iag.dgfi.tum.de/index.php?id=291

FIG Working Week 2017

May 29 – June 2, 2016, Helsinki, Finland
URL: http://www.fig.net/fig2017/

IAG and IASPEI Joint Scientific Assembly

July 30 – August 4, 2017, Kobe, Japan
URL: http://iag.dgfi.tum.de/index.php?id=291

AOGS 14th Annual Meeting

August 6-11, 2017, Singapore, Singapore
URL: http://www.asiaoceania.org/society/public.asp?view=up_coming

AGU 2017 Fall Meeting

December 11-15, 2017, New Orleans, LA, USA
URL: https://meetings.agu.org/

EGU General Assembly 2018

April 8-13 , 2018, Vienna, Austria
URL: http://www.egu2018.eu/

AOGS 15th Annual Meeting

June 3-8, 2018, Hawaii, USA
URL: http://www.asiaoceania.org/society/public.asp?view=up_coming

10th IVS General Meeting

June 3-8, 2018, Longyearbyen, Spitsbergen, Norway
URL: http://www.iers.org/IERS/EN/NewsMeetings/ForthcomingMeetings/forthcoming.html

42nd COSPAR Scientific Assembly

July 14-22, 2018, Pasadena, CA, USA
URL: https://cosparhq.cnes.fr/events/scientific-assemblies

IAU XXXth General Assembly

August 20-31, 2018, Vienna, Austria
URL: http://astronomy2018.univie.ac.at/

21st International Workshop on Laser Ranging

October 27-31, 2018, Canberra, Australia
URL: http://www.iers.org/IERS/EN/NewsMeetings/ForthcomingMeetings/forthcoming.html

AGU 2018 Fall Meeting

December 10-14, 2018, Washington, D.C., USA
URL: https://meetings.agu.org/

EGU General Assembly 2019

April 7-12 , 2019, Vienna, Austria
URL: http://www.egu2019.eu/

27th IUGG General Assembly

July 8 – 17, 2019, Montreal, Canada
URL: http://www.iugg.org/assemblies/

AOGS 16th Annual Meeting

July 28 – August 2, 2019, Singapore, Singapore
URL: http://www.asiaoceania.org/society/public.asp?view=up_coming

Reports

2nd IVS Training School on VLBI for Geodesy and Astrometry

The IVS organized its 2nd training school at the Hartebeesthoek Radio Astronomy Observatory (HartRAO), South Africa, 9–12 March 2016. The purpose of the training school was to help prepare the next generation of researchers to understand VLBI systems and inspire them in their future careers. The 45 participants included 32 students from institutions in different countries in Africa and Asia, Europe, and North America as well as 13 professionals (including postdocs) from the VLBI community and other fields of space geodesy. Participants came from Kenya (10), Zambia (9), Germany (7), Austria (4), U.S.A. (4), China (2), Finland (2), France (2), Sweden (2), Ghana (1), Italy (1), and Spain (1). Students were enrolled in M.S. and Ph.D. programs, involved in the use and analysis of VLBI data, and indeed some were second-time VLBI school attendees. Some professionals came from space agencies or geodetic research institutes (ASI, BKG, CNES, NASA) with a view to integrating VLBI into a combined analysis of space-geodetic data. A large group of attendees included students from different countries in Africa with the aim to develop expertise in geodesy and especially VLBI as part of an effort to build new stations in Africa and integrate them into the global VLBI network. We all hope this effort will come to fruition, because it will enhance the accuracy and strength of the geodetic technique and bring new groups and new countries into the VLBI community.

The thirteen lectures (18 hours and 45 minutes over four days) covered the general theory of VLBI, the technical equipment of the stations, data acquisition, data formats and data transfer, experiment scheduling and actually observing an experiment, the use of correlators, and post-correlator analysis, an introduction to geophysical modeling and analysis of VLBI data, the characterization of radio sources, and the development of celestial reference frames. The lectures were complemented with exercises on some of the presentation topics—so the participants had a chance to apply what they had been shown. The lecturers obviously spent a lot of time preparing their presentations and lectures which was highly appreciated. The lectures were recorded and will be made available on the Web, so they will be an invaluable resource for the attendees to review in coming weeks and months. For many of the attendees, the most exciting part of the VLBI school was to run the "sked" software to schedule a VLBI experiment involving Hartebeesthoek and Wettzell, and then watch Alexander Neidhardt remotely operate the Wettzell telescope via his laptop in the room with the class in South Africa, while the HartRAO 26-m (visible right outside the windows of the classroom) moved in tandem to observe the same radio sources. It gave all the attendees a demonstrable and clear sense of participation and understanding of how VLBI data are acquired.

For all the attendees at the school, the retreat format with the abundant time for interaction and discussion during the class and the coffee breaks were especially useful. It's much easier to approach people with questions in this type of retreat format, than in a crowded conference setting such as the EGU or the AGU with their tsunami wave of attendees (10,000–20,000 people). As a senior researcher, I found the contact and presence of the many students to be invigorating. It bodes well for the future of the discipline.

All the attendees appreciated the organization by school organizers and lecturers, and especially by the HartRAO observatory. HartRAO prepared a room with PCs where everyone could follow directly the presentations, search for reference material on the Web, or run the programs involved in the class exercises. This is a recipe that should be followed for future VLBI schools if at all possible. In the evening of the last day, after the end of astronomical twilight, the northern hemisphere attendees had the pleasure of contemplating Alpha and Beta Centauri as well as the Southern Cross in a setting devoid of light pollution, crowning a truly memorable week.

Acknowledgement. *The 2nd IVS Training School was supported by HartRAO (e.g., by providing the lecture room, transportation, coffee, lunches & barbecue). MT Mechatronics (Mainz, Germany), Hat-Lab (an Istituto Nazionale di Astrofisica spin-off company), and Callisto (France/UK space communications company) provided financial support allowing the actual student participants of the school to receive a travel grant in the amount of 2900 ZAR.*

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2nd IVS Training School on
VLBI for Geodesy and Astrometry
2016, March 9-12
Hartebeesthoek Radio Astronomy Observatory (South Africa)

Attendees of the IVS Training School in front of the HartRAO 26-m radio telescope

In the classroom during a VLBI school exercise