



## International workshop for the Implementation of the Global Geodetic Reference Frame (GGRF) in Latin America

Buenos Aires, Argentina, Sep 16 - 20, 2019

This workshop is a capacity building activity of the project “Implementation of the United Nations’ Resolution on the Global Geodetic Reference Frame (UN-GGRF) for Sustainable Development in Latin America”, sponsored by the International Union of Geodesy and Geophysics (IUGG) with the support of the International Association of Geodesy (IAG), the International Association of Seismology and Physics of the Earth’s Interior (IASPEI), the Argentine-German Geodetic Observatory (AGGO), the Instituto Geográfico Nacional of Argentina, and the International Committee on Global Navigation Satellite Systems (ICG) of the United Nations Office for Outer Space Affairs (UN-OOSA) .

### Objectives

- To present the definition of the GGRF and the roadmap for its implementation, emphasizing its fundamental role for the Earth system monitoring and economic development and sustainability.
- To give a complete overview of the different international organizations contributing to and supporting the implementation of the GGRF to promote a more active participation of the Latin American countries in global and regional related initiatives.
- To identify deficiencies (and possibilities of improvement) in the existing Latin American geodetic infrastructure and to show how fundamental geodetic observatories operate.
- To strengthen the combination of geodetic and seismologic infrastructure and methods to improve the reference in Earth system modelling and mitigation of natural disasters produced by seismic activity.
- To provide the Latin American colleagues responsible for the national geodetic reference frames with scientific and political arguments to convince policy makers about the necessity of investing in geodetic and geophysical infrastructure in their countries.

### Preliminary agenda

	Sep 16	Sep 17	Sep 18	Sep 19	Sep 20
08:30 – 10:00	Registration	Global and regional cooperation frameworks	Global geodetic reference systems and frames	IAG Services	Argentine-German Geodetic Observatory (AGGO)
	Opening			GGOS	
10:00 – 10:30	Coffee break				
10:30 – 12:00	Geodesy of reference in Latin America	Global and regional cooperation frameworks	IAG Services	GGOS	Argentine-German Geodetic Observatory (AGGO)
12:00 – 14:00	Lunch time				
14:00 – 15:30	GGRF definition and organization	Global and regional cooperation frameworks	IAG Services	GGOS	Visit to AGGO
				GEO, AmeriGEOSS, ICG-UN-OOSA	
15:30 – 16:00	Coffee break				
16:00 – 17:30	GGRF definition and organization	Global geodetic reference systems and frames	IAG Services	GEO, AmeriGEOSS, ICG-UN-OOSA	Visit to AGGO

<b>Monday, Sep 16, 2019</b>	
08:00 – 09:00	Registration
<b>Opening session</b>	
09:00 – 09:50	Welcome
09:50 – 10:00	Objectives of the workshop
10:00 – 10:30	Coffee break
<b>Geodesy of reference in Latin America: Overview</b>	
10:30 – 10:50	SIRGAS: Sistema de Referencia Geocéntrico para las Américas – V Mackern, W Martínez, V Cioce, R Pérez-Rodino, SRC de Freitas
10:50 – 11:10	OFA Station in the GGOS Era – AM Pacheco, R Podestá, J Li, L Weidong, J Saunier
11:10 – 11:30	Gravity infrastructure in Latin America – D Blitzkow, ACOC de Matos
11:30 – 11:50	<b>Geoid modelling in South America – ACOC de Matos, D. Blitzkow, C Pacino</b>
12:00 – 14:00	Lunch time
<b>GGRF definition and organization</b>	
14:00 – 14:20	The United Nations Initiative on Global Geospatial Information Management (UN-GGIM) and its Regional Committee for the Americas (UN-GGIM Americas) – P Merodio-Gómez, S Cimbaro
14:20 – 14:40	UN-GGIM Subcommittee on Geodesy and the UN Resolution on the GGRF – G Johnston
14:40 – 15:00	The GGRF roadmap – G Johnston
15:00 – 15:30	Governance arrangements for sustaining the GGRF – D Roman
15:30 – 16:00	Coffee break
16:00 – 16:30	UN Subcommittee on Geodesy and its working group on Education, Training and Capacity Building – M Lilje, C Pacino, A Craddock
16:30 – 17:00	Infrastructure for the GGRF – Z. Altamimi
17:00 – 17:30	Brainstorming 1: UN-GGIM Americas, Subcommittee on Geodesy and SIRGAS: which role should play SIRGAS in UN-GGIM Americas, how can SIRGAS improve its participation in and support to UN-GGIM Americas and the Subcommittee on Geodesy

<b>Tuesday, Sep 17, 2019</b>	
<b>Global and regional cooperation frameworks</b>	
08:30 – 08:50	The International Science Council (ISC) – A Ismail-Zadeh
08:50 – 09:10	The International Union of Geodesy and Geophysics (IUGG) – A Ismail-Zadeh
09:10 – 09:40	Structure, status and recent achievements of the International Association of Geodesy (IAG) – H Schuh
09:40 – 10:00	The role of the IAG sub-commissions in Latin America: SIRGAS and gravity field modelling – H Drewes
10:00 – 10:30	Coffee Break
10:30 – 11:00	IAG vision on the implementation of the GGRF resolution and roadmap – Z Altamimi
11:00 – 11:30	The International Federation of Surveyors (FIG) – M Lilje, D Roman
11:30 – 12:00	The International Association of Seismology and Physics of the Earth's Interior (IASPEI) and its Latin American and Caribbean Seismological Commission – M Assumpção
12:00 – 14:00	Lunch time

14:00 – 14:30	Support of the Pan-American Institute of Geography and History (PAIGH) to the geodetic infrastructure in Latin America – CF Rodríguez Tomeo
14:30 – 15:00	Sustainability of the regional reference frame organisation in Latin America – C Brunini, L Sánchez
15:00 – 15:30	Brainstorming 2: Participation/interaction of the Latin American countries in ISC, IUGG, IAG, IASPEI, FIG, IPGH: pros and cons
15:30 – 16:00	Coffee Break
<b>Global geodetic reference systems and frames</b>	
16:00 – 16:30	International Celestial Reference System and Frame (ICRS/ICRF) – R Heinkelmann
16:30 – 17:00	International Terrestrial Reference System and Frame (ITRS/ITRF) – Z Altamimi
17:00 – 17:30	On the International Gravity Reference System (IGRS) – A Rülke, H Wziontek, S Bonvalot, J Mäkinen, V Pálinkáš, D van Westrum, R Falk, L Vitushkin

<b>Wednesday, Sep 18, 2019</b>	
<b>Global geodetic reference systems and frames (cont)</b>	
08:30 – 09:00	The EGM2020 (Earth Gravitational Model 2020) – DE Barnes, H Small, S Ingalls, J Beale, R Ganley
09:00 – 09:30	International Height Reference System and Frame (IHRS/IHRF) – L Sánchez
09:30 – 10:00	Brainstorming 3: Densification of the global reference frames in Latin America
10:00 – 10:30	Coffee break
<b>Scientific Services of the International Association of Geodesy</b>	
10:30 – 11:00	The International GNSS Service (IGS) – G Johnston, A Craddock
11:00 – 11:30	Presentation of the DORIS system and the International DORIS Service – L Soudarin
11:30 – 12:00	The Science Contributions of DORIS and Synergy with other Geodetic Techniques – F Lemoine
12:00 – 14:00	Lunch time
14:00 – 14:30	International Laser Ranging Service (ILRS) – M Pearlmann
14:30 – 15:00	International VLBI Service for Geodesy and Astrometry – Latin American Aspects – D Behrend, A Nothnagel, H Hase
15:00 – 15:30	International Earth Rotation and Reference Systems' Service (IERS) – R Heinkelmann, B Luzum, D Thaller
15:30 – 16:00	Coffee break
16:00 – 16:20	International Gravity Field Service (IFGS) R Barzaghi et al
16:20 – 16:40	International Gravimetric Bureau (BGI) ?
16:40 – 17:00	International Service for the Geoid (ISG) – M Reguzzoni et al
17:00 – 17:30	ICGEM - International Centre for Global Earth Models Service of IAG – ES Ince, F Barthelmes, S Reissland, K Elger

<b>Thursday, Sep 19, 2018</b>	
<b>Scientific Services of the International Association of Geodesy (cont)</b>	
08:30 – 09:00	International cooperation to provide geodetic reference data and products: global geodetic data analysis and data repositories at the Bundesamt für Kartographie und Geodäsie (BKG) – D Thaller

09:00 – 09:30	Recent gravity field modelling studies and future plans at GFZ – ES Ince, Ch Foerste, Ch Dahle, Ch Voigt, R Koenig, F Flechtner, et al.
<b>Global Geodetic Observing System (GGOS)</b>	
09:30 – 10:00	The Global Geodetic Observing System of the International Association of Geodesy – R Gross
10:00 – 10:30	Coffee break
10:30 – 11:00	GGOS Bureau of Networks and Observations – M Pearlmann
11:00 – 11:20	Recent Activities of the GGOS Standing Committee on Performance Simulations and Architectural Trade-Offs (PLATO) – D Thaller
11:20 – 11:40	GGOS Bureau of Standards and Products – D Angermann, T Gruber, M Gerstl, R Heinkelmann, U Hugentobler, L Sánchez, P Steigenberger
11:40 – 12:00	GGOS working group on Digital Object Identifiers (DOI) for geodetic data – A Craddock
12:00 – 14:00	Lunch time
14:00 – 14:20	Essential geodetic variables – R Gross
14:20 – 14:40	GGOS External relations: an overview – A Craddock
<b>GEO, AmeriGEOSS, ICG-UN-OOSA</b>	
14:40 – 15:10	Group on Earth Observations (GEO) – A Craddock
15:10 – 15:30	<b>The Sendai Framework for Disaster Risk Reduction</b>
15:30 – 16:00	Coffee break
16:00 – 16:30	<b>UN 2030 Agenda for Sustainable Development</b>
16:30 – 17:00	<b>AmeriGEOSS</b>
17:00 – 17:30	The International Committee on Global Navigation Satellite Systems (ICG) of the United Nations Office for Outer Space Affairs (UN-OOSA) – S Gadimova

<b>Friday, Sep 20, 2019</b>	
<b>Argentine-German Geodetic Observatory (AGGO)</b>	
08:30 – 08:50	Contributions of BKG to core geodetic infrastructure – T Schüler
08:50 – 09:20	The AGGO geodetic fundamental station at La Plata – H Hase
09:20 – 09:40	The Satellite Laser Ranging System of AGGO – M Häfner
09:40 – 10:00	German efforts and challenges to install and maintain AGGO operational – J Bouman
10:00 – 10:30	Coffee break
10:30 – 10:50	Argentine efforts and challenges to install and maintain AGGO operational – C Brunini
10:50 – 11:20	Learnings and recommendations from the Argentine-German cooperation to install fundamental geodetic observatories – C Brunini, J Boumann
11:20 – 12:00	Brainstorming 4: how to reproduce geodetic observatories like AGGO in other Latin American countries?
12:00 – 15:00	Lunch time and moving to AGGO (by bus, only foreign participants)
15:00 – 18:00	Visit to AGGO

## Speakers

- **Zuheir Altamimi**  
Laboratoire de Recherche en Géodésie (LAREG), Institut National de l'Information Géographique et Forestière (IGN), Paris, France  
President of the International Association of Geodesy (IAG)  
Lead of the UN-GGIM Subcommittee on Geodesy Working Group on Geodetic Infrastructure  
Primary scientist at the IERS Product Centre for the International Terrestrial Reference System (ITRS) and representative to the Directing Board of the International Earth Rotation and Reference Systems' Service (IERS)
  
- **Marcelo Assumpção**  
Institute of Astronomy, Geophysics and Atmospheric Sciences, University of São Paulo (USP), São Paulo, Brazil  
Executive Secretary of the IASPEI Latin American and Caribbean Seismological Commission (IASPEI-LACSC)
  
- **Daniel E Barnes**  
National Geospatial-Intelligence Agency (NGA), Arnold, MO, USA
  
- **Dirk Behrend**  
US National Aeronautics and Space Administration (NASA), Goddard Space Flight Center, Greenbelt, MD, USA  
Director, Coordinating Center, International VLBI Service for Geodesy and Astrometry (IVS)
  
- **Denizar Blitzkow**  
Escola Politécnica, Universidade de São Paulo, São Paulo, Brazil
  
- **Johannes Bouman**  
Director of the Department of Geodesy, Bundesamt für Kartographie und Geodäsie (BKG), Frankfurt, Germany
  
- **Claudio Brunini**  
Science Director of the Argentinean-German Geodetic Observatory (AGGO), Universidad Nacional de La Plata, CONICET, La Plata, Argentina  
Past President (2007 – 2015) of SIRGAS
  
- **Sergio Cimbaro**  
Director of the Instituto Geográfico Nacional, Buenos Aires Argentina  
South America Board Member of the United Nations Initiative on Global Geospatial Information Management Regional Committee for the Americas (UN-GGIM Americas)
  
- **Allison Craddock**  
NASA Jet Propulsion Laboratory, Pasadena, CA, USA  
Manager External Relations of the Global Geodetic Observing System (GGOS)  
Central Bureau Director and Secretariat of the International GNSS Service (IGS)
  
- **Hermann Drewes**  
Technische Universität München, München, Germany  
Past Secretary General (2007 – 2019) of the International Association of Geodesy (IAG)  
IAG Representative to SIRGAS

- Sharafat **Gadimova**  
Executive Secretariat, International Committee on Global Navigation Satellite Systems (ICG),  
United Nations Office for Outer Space Affairs (UN-OOSA), Vienna, Austria
  
- Richard **Gross**  
NASA Jet Propulsion Laboratory, Pasadena, CA, USA  
Vice-president of the International Association of Geodesy (IAG)  
Acting president of the Global Geodetic Observing System (GGOS)
  
- Hayo **Hase**  
Argentine-German Geodetic Observatory (AGGO), Bundesamt für Kartographie und Geodäsie  
(BKG), La Plata, Argentina
  
- Michael **Häfner**  
Argentine-German Geodetic Observatory (AGGO), Bundesamt für Kartographie und Geodäsie  
(BKG), La Plata, Argentina
  
- Robert **Heinkelmann**  
Head of the VLBI group, Space Geodetic Techniques, Helmholtz Centre Potsdam, GFZ German  
Research Centre for Geosciences, Potsdam, Germany  
Analysis Coordinator, International Earth Rotation and Reference Systems' Service (IERS)
  
- Elmas Sinem **Ince**  
Helmholtz Centre Potsdam, GFZ German Research Centre for Geosciences, Potsdam, Germany  
Director of the International Centre for Global Earth Models (ICGEM)
  
- Alik **Ismail-Zadeh**  
Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany  
Russian Academy of Sciences, Moscow, Russia  
Secretary of the International Science Council (ISC)  
Past Secretary General (2007 – 2019) of the International Union of Geodesy and Geophysics (IUGG)
  
- Gary **Johnston**  
Branch Head, Geodesy and Seismic Monitoring, Geoscience Australia, Canberra, Australia  
Chair of the Governing Board of the International GNSS Service (IGS)  
Co-chair of the UN-GGIM Subcommittee on Geodesy
  
- Frank **Lemoine**  
US National Aeronautics and Space Administration (NASA), Goddard Space Flight Center,  
Greenbelt, MD, USA  
Chair of the International DORIS Service (IDS)
  
- Mikail **Lilje**  
Head of Department of Geodetic Infrastructure, Lantmäteriet (the Swedish mapping, cadastral and  
land registration authority), Gävle, Sweden  
Lead of the UN-GGIM Subcommittee on Geodesy Working Group on Education, Training and  
Capacity Building  
Vice-president of the International Federation of Surveyors (FIG)
  
- Virginia **Mackern**  
Universidad Nacional de Cuyo and Universidad Juan Agustín Maza, Mendoza, Argentina  
Vice-president of SIRGAS

- Ana María **Pacheco**  
Observatorio Astronómico Félix Aguilar, Universidad Nacional de San Juan, Argentina
  
- Michael **Pearlman**  
Harvard-Smithsonian Center for Astrophysics, Cambridge, MA, USA  
Director of the Bureau of Networks and Observations of the Global Geodetic Observing System (GGOS-BNO)  
Director of the Central Bureau of the International Laser Ranging Service (ILRS)
  
- César Fernando **Rodríguez Tomeo**  
Secretary General, Pan-American Institute of Geography and History (PAIGH), Mexico City, Mexico
  
- Daniel **Roman**  
Chief Geodesist, National Geodetic Survey (NGS), US National Oceanic and Atmospheric Administration (NOAA), Silver Spring, MD, USA  
US Representative to the UN-GGIM Subcommittee on Geodesy Working Group on Governance  
Chair of Commission 5 (Positioning and Measurement) of the International Federation of Surveyors (FIG)
  
- Axel **Rülke**  
Bundesamt für Kartographie und Geodäsie (BKG), Leipzig, Germany
  
- Laura **Sánchez**  
Deutsches Geodätisches Forschungsinstitut, Technische Universität München (DGFI-TUM), München, Germany  
Lead of the Focus Area Unified Height System of the Global Geodetic Observing System (GGOS)  
Member of the GGOS Bureau of Products and Standards (GGOS-BPS)  
Past vice-president (2007 -2015) of SIRGAS
  
- Laurent **Soudarin**  
Collecte Localisation Satellites (CLS), Ramonville Saint-Agne, France  
Director of the Central Bureau of the International DORIS Service (IDS)
  
- Harald **Schuh**  
Director of the Department of Geodesy and Head of section Space Geodetic Techniques, Helmholtz Centre Potsdam, GFZ German Research Centre for Geosciences, Potsdam, Germany  
Past President (2015 - 2019) of the International Association of Geodesy (IAG)
  
- Torben **Schüler**  
Geodetic Observatory Wettzell, Bundesamt für Kartographie und Geodäsie (BKG), Bad Kötzing, Germany
  
- Daniela **Thaller**  
Bundesamt für Kartographie und Geodäsie (BKG), Frankfurt, Germany  
Director Central Bureau, International Earth Rotation and Reference Systems' Service (IERS)  
Chair of the Standing Committee on Performance Simulations and Architectural Trade-Offs (PLATO) of the Global Geodetic Observing System (GGOS)