



International Association  
of Geodesy

# Newsletter

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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. 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

### **Call for IAG proposals for the IUGG Support Program of Scientific Meetings in 2025**

We would like to draw your attention to opportunities of support/sponsorship from the IUGG for selected scientific meetings (e.g., workshops, advanced schools, symposia) planned in 2025.

The call for proposals is open, refer to: <https://iugg.org/meetings/guidelines-for-meetings-support/>

If you wish to propose a meeting via IAG, please contact the IAG Secretary General – IAG-Office(at)bkg.bund.de – and submit your request **until 8<sup>th</sup> of October 2024**.

There will be an IAG-internal reviewing process with a decision by end of October.

#### **Proposed scientific meetings for the IUGG Support Program must:**

- Have a well-defined, scientifically relevant and actual topic in the fields of geodesy/geophysics;
- Have scientific merit and a balanced scope w.r.t. IUGG associations i.e. preference will be given to multi- and trans-disciplinary meetings;
- be internationally oriented;
- be inclusive in view of countries/regions, gender and career stage of the participants.

#### **Your request to IAG must specify all entries listed below:**

- Name of meeting, venue and dates
- Primary sponsors and other known co-sponsors
- Name and address of the Chair of the Local Organizing Committee
- Meeting website
- Scientific objective and scope of the meeting
- Estimated number of participants, abstracts, and sessions
- Level of support requested (in US\$) and explanation of how the money will be used
- Additional information as appropriate

Thank you in advance for your interest and kind cooperation!

## Meeting Announcements

### **Geodesy for Africa at the UNGA79**



Science Summit at UNGA79  
10 - 27 September 2024

## Africa Rising: Shaping Our Common Future Through Geodesy

Implementing the UN General Assembly Resolution A/RES/69/266  
“Global Geodetic Reference Frame for Sustainable Development”

Friday, 27 September 2024 | 8:30 am – 3:00 pm ET (UTC-4) | on-site and online event  
Location: CURE, 345 Park Avenue South, New York, NY 10010, United States

join us at

<https://sciencesummitunga.com/science-summit-unga79/>



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GGOS  
Global Geodetic  
Observing System

In addressing global challenges like climate change, urbanization, and sustainable resource management, accurate geodetic data is crucial. We aim to elevate the global geodesy supply chain, align geodetic science with policymaking, and advance research through multidisciplinary cooperation. Central to our agenda is integrating the African perspective to address unique challenges and contributions. This meeting focuses on advancing UN Resolution 69/22, “A Global Geodetic Reference Frame (#GGRF) for Sustainable Development,” fostering discussions among Member States, international organizations, and geospatial experts. One of the key topics to be discussed is the 1st Joint Development Plan for Global Geodesy, aiming to accelerate progress towards the UN Sustainable Development Goals.

Find more at <https://sciencesummitunga.com/science-summit-unga79/>

Laura Sanchez

## **Meetings Calendar**

### **IAG Sponsored Meetings**

#### **GGOS Topical Meeting on the Atmosphere**

*October 7 – 9, 2024, Potsdam, Germany*

URL: <https://ggos.org/event/ggos-topical-meeting-atmosphere/>

#### **GGOS Days 2024**

*October 10 – 11, 2024, Potsdam, Germany*

URL: <https://ggos.org/event/ggos-days-2024/>

#### **IAG Workshop on Asia Pacific Gravity, Geoid, and Vertical Datums**

*November 6 – 8, 2024, Manila, Philippines*

URL: <https://iagworkshop2024.dge.upd.edu.ph/>

#### **SIRGAS 2024 Symposium**

*November 18 – 21, 2024, Bogotá, Colombia*

URL: <https://sirgas.ipgh.org/simposio-2024/en/home-2/>

#### **6th Joint International Symposium on Deformation Monitoring (JISDM)**

*April 7 – 9, 2025, Karlsruhe, Germany*

URL: <https://jisdm2025.gik.kit.edu/>

#### **IAG Scientific Assembly 2025**

*September 1 – 5, 2025, Rimini, Italy*

URL: <https://www.iag-aig.org/events/107>

## **Geodesy Related Meetings**

#### **Geodesy for Africa at the UNGA79**

*September 27, 2024, New York, USA and online*

URL: <https://sciencesummitunga.com/science-summit-unga79/>

#### **GRACE/GRACE-FO Science Team Meeting 2024**

*October 8 – 10, 2024, Potsdam, Germany*

URL: <https://www.gstm-2024.eu/>

## **2025 Glacial Isostatic Adjustment workshop: Advancing Models and Observational Constraints**

June 2 – 6, 2025, Sydney, British Columbia, Canada

URL: <https://polenet.org/2025-gia-workshop/>

## **IAU Symposium 401: Advancing Reference Systems, Ephemeris, and Standards**

August 4 – 9, 2025, La Plata, Buenos Aires, Argentina

URL: <https://iaus401.fcaglp.unlp.edu.ar/>

## **Reports**

### ***Technical workshop on the assimilation of GRACE and GRACE-FO data into hydrological models***

During a virtual event on 18 and 19 January 2024, 13 scientists from various groups (NASA Goddard, Universities Bonn, Stuttgart, Aalborg, Newcastle, Asian Institute of Technology) presented recent progress and challenges ahead in the assimilation (DA) of GRACE/-FO TWSA data into land surface and hydrology models. The online workshop was designed to identify technical issues, open questions and challenges in methodology, implementation and evaluation, and a potential path towards standard procedures for GRACE/-FO DA. The workshop was timely since space agencies and institutions prepare for the data processing of the foreseen GRACE-C and NGGM missions.

Open issues that were identified include

#### 1. Modeling

- Limited dynamic range in simulating e.g. groundwater variability may limit the possible impact of GRACE DA
- Model calibration needed / possible with GRACE data?

#### 2. GRACE data

- Data assimilation with monthly GRACE data cannot deal well with short-term snow variability
- Assimilating GRACE data can degrade model output in cases where the data exhibits leakage of a fine scale signal (e.g., mountain snowpack) over a larger area.
- Does it make sense/are there ways to downscale TWSA before DA?
- Which corrections need to be applied to the GRACE data (earthquakes, lakes, ...)?
- What GRACE filtering method is most appropriate? Pros/cons of mascon vs grids from SHC solutions

#### 3. Data assimilation techniques

- Nonlinear processes (e.g baseflow) and resulting non-Gaussian pdfs
- Perturbation approaches – forcing vs. state vs. parameter perturbation
- Depending on the model, which storages should be updated and which not
- Optimality of model and observation error choices
- Realism/representativeness of GRACE/-FO error covariance matrices and derived error covariance representations
- Numerical issues, stability and possible relation to error and state covariance
- Using coarse-scale GRACE data and applying a filter without accounting for spatial correlation at the finer model resolution inevitably causes a poor distribution of water over regions with strong variation in water storage: Filtering with accounting for spatial correlation is needed with spatial aggregation of model forecasts to the observation resolution.
- Applying the increment at the beginning or end of the month, or spread over the month?
- Assimilating daily GRACE products shows promise
- It is valuable to relocate the effects of lakes and reservoirs during GRACE DA
- Multivariate assimilation can produce improved results through enforcement of multiple constraints on the water cycle.

#### 4. Validation

- Validation data, e.g. for groundwater well data, are not all publicly available which makes comparison across different studies difficult. Same for specific yield maps.

General recommendations across presentations / from several colleagues

- Develop ways of including daily spherical harmonic or swath-type GRACE/-FO TWSA solutions into DA frameworks (temporal vs. spatial resolution tradeoff)
- Develop ways of taking into account GRACE/-FO error correlation
- Ensemble-DA seems the preferred method. EnKS appears superior to EnKF
- Localization filtering seems beneficial
- Develop a way for preprocessing/accounting for mass change effects in GRACE/-FO that are unaccounted for in models (e.g. seasonal/long-term glacier mass, large Earthquakes)
- Bayesian merging for GRACE downscaling, using copula's, might be a possibility
- Assimilating range observations instead of TWSA solutions?
- Find self-correcting scale-factors to downscale GRACE data during DA?
- Potential of multi-sensor & multi-variate DA, incl. GRACE DA.
- Can anything be learned from ML to extend the GRACE dataset?
- Can we agree on a „benchmark validation data set“?

February 24, 2024

Jürgen Kusche, Matt Rodell, Gabrielle deLannoy, Anne Springer