



International Association
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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

New gravity station in Slovakia joined IGETS

New station Hurbanovo located in Slovakia joined IGETS (International Geodynamics and Earth Tide Service, [ISDC: IGETS Data Base \(gfz-potsdam.de\)](https://www.gfz-potsdam.de)) in 2021. The station is equipped with the relative spring gravimeter gPhoneX #108.

The Hurbanovo Gravimetric Observatory (Fig. 1) in southern Slovakia was established in 2019 as a part of the integrated station HUVO (GNSS permanent station and seismic station). HUVO is located on a ground floor in a small building in the vicinity of the Hurbanovo Geomagnetic Observatory, which was founded on September 30, 1900. Integration of InSAR transponder into current station architecture is also planned in 2022.



Fig. 1: View of the Hurbanovo Geomagnetic Observatory and new Gravimetric Observatory. The pillar with the relative gravimeter gPhoneX is located in the small building in the middle of the picture.

The Gravimetric Observatory equipped with the spring gravimeter gPhoneX #108 provides continuous time-varying gravity and atmospheric pressure data. The spring gravimeter gPhoneX #108 is installed on a concrete block isolated from the rest of the building grounding (Fig. 2). The room containing gravimeter is thermally stabilized at around $22 \pm 1^\circ\text{C}$ using an air conditioning unit. An additional thermal polystyrene insulation is placed around the instrument further decreasing temperature variations on its surface.



Fig. 2: Relative metal spring gravimeter gPhoneX #108 in Hurbanovo station.

The operation and maintenance of the HUVO gravimetric instrumentation is done mainly by the staff of the Slovak University of Technology (SUT). HUVO gravimetric observatory is also equipped with the accelerometer Raspberry Shake (4D) installed on the same concrete block as the spring gravimeter, operated by the staff of the Slovak Academy of Sciences.

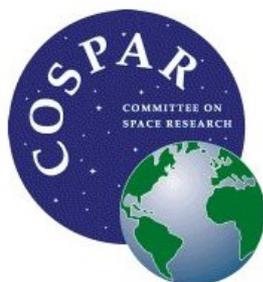
Several other meteorological sensors are also present at the site in the close vicinity of the gPhoneX #108: the meteorological station MWS 9-5, a well equipped with the ground-water level sensor and a total number of 16 sensors measuring the soil moisture. These sensors provide information necessary for modelling the gravity response associated with the variation of local hydrological masses.

Concerning signal to noise ratio, the HUVO station can be characterized as moderately noisy. The Level 1 data from July 2020 are available via IGETS service.

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Meeting Announcements



COSPAR 2022, 44th Scientific Assembly

July 16-24, 2022, Athens, Greece

<https://www.cospar-assembly.org>

<https://cosparathens2022.org>

The next COSPAR meeting will attract about 2500 scientists and engineers from the world over. More than 100 symposia will cover all areas of space science: Space studies of the Earth's surface, meteorology and climate, Space studies of the Earth-Moon, Planets and small bodies of the solar system, Space studies of the upper atmospheres of the Earth and Planets including reference atmosphere, Space plasmas in the Solar system, including planetary magnetospheres, research in astrophysics from space, life sciences as related to space, material sciences in space, fundamental physics in space, and several Panel meetings.

Interdisciplinary lectures will also be given by key scientists and several associated events are planned, such as a meeting organized by Elsevier for young scientists to help them publish or review scientific articles.

In particular, we would like to draw the attention of geodesists to a meeting, organized by the COSPAR Panel on Satellite Dynamics.

The aim of the Panel on Satellite Dynamics is to support activities related to the detailed description of the motion of artificial celestial bodies. This goal should be achieved by improving the current theories of motion and by evaluating their determining forces in a more sophisticated way. Detailed theoretical understanding of the dynamics of satellites should coincide with the results of precise tracking in order to obtain the most precise knowledge possible of the orbit and the corresponding orbital positions.

The scope of the Panel on Satellite Dynamics entails the positioning of a wide range of objects in space, including Earth orbiting satellites for Earth observation such as GRACE-FO, Swarm, Jason series, and the Copernicus Sentinels, and navigation satellite systems such as GPS, GLONASS, Galileo, Beidou, QZSS or tracking systems such as SLR and DORIS. In addition, positioning plays an important role in the success of the continuously growing number of today's and tomorrow's missions to explore the Solar System. Recent and future missions have to deal with complex trajectories and innovative propulsion and breaking techniques to visit multiple bodies (e.g., Cassini, Dawn, JUICE), small unconventional bodies (e.g., Rosetta, OSIRIS-REx, Lucy), and harsh and unknown environmental conditions challenging our technical capabilities (e.g., Messenger, Venus Express, BepiColombo, JUNO). Both advances in the modeling of spacecraft dynamics and the theoretical understanding of space observables (e.g., range, Doppler, VLBI, optical) are required to allow for a more efficient exploration and a deeper understanding of our Solar System.

Limiting errors in Precise Orbit Determination (solar radiation pressure, time variable gravity fields, phase center corrections, attitude variations, etc...) are of critical interest for many stakeholders. Moreover, formations of satellites are being realized and proposed for Earth observation and fundamental sciences, that impose very severe constraints on (relative) positioning and orbit and attitude control solutions (e.g. micro-propulsion). Mini-satellites and cubesats also represent a new frontier for both Earth and planetary exploration, posing new challenges as well as new opportunities.

Satellite orbit determination requires the availability of tracking systems, well established reference frames and accurate station coordinate solutions, detailed force and satellite models, and high-precision time and frequency standards.

Contributions covering all recent developments and plans in ground, satellite or probe positioning and navigation are solicited as well as contributions on current progress on establishment, maintenance and improvement of reference systems in Geo- and planetary sciences.

Important dates:

11 February 2022: Abstract submission deadline

29 April 2022: end of early registration fees and presenter registration deadline

Heike Peter, Shuanggen Jin

Convenors of the Satellite Dynamic Panel sessions

<https://cosparhq.cnes.fr/scientific-structure/panels/technical-panel-on-satellite-dynamics-psd/>

Meetings Calendar

IAG Sponsored Meetings

IGRF Workshop 2022

April 11 – 13, 2022, Leipzig, Germany

URL: <https://www.iag-aig.org/events/67>

EUREF 2022 Symposium

June 1 – 4, 2022, Zagreb, Croatia

URL: http://www.euref.eu/euref_symposia.html

Spatial Data: science, research and technology 2022

May 23 – 25, 2022, Moscow, Russia

URL: <https://scidata.ru/en2022>

X. Hotine-Marussi Symposium on Mathematical Geodesy

June 13 – 17, 2022, Milan, Italy

URL: http://icct.kma.zcu.cz/index.php?title=Hotine-Marussi_2022

IGS Workshop "IGS 2022: Science from Earth to Space"

June 27 – July 1, 2022, Boulder, CO, USA

URL: <https://www.igsceb.org/event/>

2nd International Symposium of Commission 4: Positioning and Applications

September 5 – 9, 2022, Potsdam, Germany

URL: <https://www.iag-commission4-symposium2022.net/>

Gravity, Geoid, and Height Systems 2022 (GGHS2022)

September 12 – 16, 2022, Austin, Texas, USA

URL: <https://www.csr.utexas.edu/gghs2022/index.html>

REFAG 2022

October 17 – 21, 2022, Thessaloniki, Greece

URL: <https://www.refag2022.org/>

Unified Analysis Workshop (UAW) 2022

October 21 – 23, 2022, Thessaloniki, Greece

URL: <https://ggos.org/event/unified-analysis-workshop-uaw-2022/>

22nd International Workshop on Laser Ranging

October 31 – November 4, 2022, Kunming, China

URL: <http://22ndilrs2020.csp.escience.cn>

20th Assembly of Wegener

October 25 – 29, 2022, Marrakech, Morocco

URL: <https://wegener2021.sciencesconf.org/>

IAG Related Meetings

COSPAR 2022

July 16-24, 2022, Athens, Greece

44th Scientific Assembly of the Committee on Space Research (COSPAR) and Associated Events

URL: <https://www.cosparathens2022.org/>

Reports

2021 SIRGAS Symposium

The 2021 SIRGAS Symposium was held between November 29 and December 1, 2021 as virtual mode and was transmitted through the Zoom platform, with free participation. Following the new SIRGAS events' regulation, this symposium had a simultaneous translation service between the English and Spanish languages, during the technical sessions and the SIRGAS Working Groups meetings.

The organization of the 2021 SIRGAS Symposium was under the coordination of the SIRGAS Executive Committee and the Local Organizing Committee, the National Geographic Institute of Peru. As on previous occasions, it had the valuable support of the International Association of Geodesy and the Pan-American Institute of Geography and History.

The technical sessions of the symposium had the contribution of 59 presentations, 24 oral and 29 poster. There was an attendance average of 120 participants in the technical sessions through the Zoom platform and 720 participants through the YouTube channel.

The complete Symposium program is available at <https://app.ign.gob.pe/simposio/programacion/>.

5 technical sessions were held between 10 a.m. and 1 p.m. (-3 UTC time) and in the afternoons, between 3 p.m. and 4 p.m. (-3 UTC time), the SIRGAS working groups meetings.

The main topics addressed during the symposium were:

- Session 1: Report of the SIRGAS authorities: President of SIRGAS, Presidents of the SIRGAS Working Groups and update of the GRFA of UN-GGIM: Americas;
- Session 2: Development and maintenance of the SIRGAS reference framework;
- Session 3: Modeling of the Earth's gravity field (geoid, gravimetry, international reference system of heights).
- Session 4: Applications of the SIRGAS framework (national reports, real-time applications, etc.). It featured 3 oral presentations and 2 posters
- Session 5: SIRGAS contributions to the modeling of the Earth System (troposphere, ionosphere, seismology, oceanography and hydrography).

The posters are displayed in the gallery, organized per day at <https://app.ign.gob.pe/simposio/galeria/>.

For those who could not follow the technical sessions online, the videos of each day are available at: <https://app.ign.gob.pe/simposio/video/>.

For the 2021 SIRGAS Symposium in particular, the Journal of Geodetic Sciences (JoGS) is developing a special issue of the journal related to it. The authors have been invited to submit original papers and articles focusing on Geodesy and Earth Sciences for the inclusion in this special issue of the journal.

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