



IUGG



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Newsletter

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Editor: Gyula Tóth

IAG Communication and Outreach Branch
Department of Geodesy and Surveying
Budapest University of Technology and Economics
H-1521 Budapest, Hungary

Information Service of the International Association of Geodesy

<http://www.iag-aig.org>

newsletter@iag-aig.org

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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

Advances In Space Research

Dear colleagues,

for your information, issue 69(1) of *Advances in Space Research* (COSPAR official journal), was published on January 1, 2022. Elsevier provided a one-year promotional OpenAccess to this first issue of the year. Consequently, all articles published in this issue will remain free-of-charge to anyone without any paid subscription to this journal for the complete year at <https://www.sciencedirect.com/journal/advances-in-space-research/vol/69/issue/1>



While it is a very large issue (64 papers and 846 pages), the few selected articles related to geodesy below could be of scientific interest to our community.

I remind you that ASR publishes 24 issues per year (2 issues of 20-30 papers each per month), that accepted papers appear online with a DOI in “accepted proofs” only a couple of days after acceptance and that this journal accepts electronic supplements and supports OpenAccess. Review process takes on average about 9 weeks before the first decision is sent back to the authors (4 weeks to find proper reviewers and 5 weeks to get their report and make a first decision). Published articles are referenced in ISI Web of Science, Scopus and many other scientific databases. This journal also accepts Special Issues. Its Impact Factor has been steadily increasing in the past few years and is now 2.152.

Submissions can be done electronically at any time using the EES System (<http://ees.elsevier.com/asr>).

More information on this journal can be found at <https://www.journals.elsevier.com/advances-in-space-research>

Pascal Willis
Editor-in-Chief
Advances in Space Research

EARTH MAGNETOSPHERE AND UPPER ATMOSPHERE

Analysis on the Ionospheric Scintillation Monitoring Performance of ROTI Extracted from GNSS Observations in High-latitude Regions, Dongsheng Zhao, Wang Li, Chendong Li, Craig M. Hancock, Gethin Wyn Roberts and Qianxin Wang, *Advances in Space Research*, 69(1), 142-158, 2022.
<https://doi.org/10.1016/j.asr.2021.09.026>

Global Mapping of Total Electron Content from GNSS Observations for Updating IRI-Plas Model, V. N. Shubin and T. L. Gulyaeva, *Advances in Space Research*, 69(1), 168-175, 2022.
<https://doi.org/10.1016/j.asr.2021.09.032>

Effect of 21 June 2020 Solar Eclipse on the Ionosphere Using VLF and GPS Observations and Modeling, Gaurish Tripathi, S. B. Singh, Sanjay Kumar, Ashutosh K. Singh, Rajesh Singh and A. K. Singh, *Advances in Space Research*, 69(1), 254-265, 2022.
<https://doi.org/10.1016/j.asr.2021.11.007>

EARTH SCIENCES

BDS/GNSS Multipath Reflectometry (BDS/GNSS-MR) based Altimetry with New Signals: Initial, Assessment and Comparison, Zhihao Liu, Lan Du, Peiyuan Zhou, Zejun Liu, Zhongkai Zhang and Zheyu Xu, *Advances in Space Research*, 69(1), 282-291, 2022.
<https://doi.org/10.1016/j.asr.2021.08.025>

Detecting Volcanic Plume Signatures on GNSS Signal, Based on the 2014 Sakurajima Eruption, Adam Cegla, Witold Rohm, El _zbieta Lasota and Riccardo Biondi, *Advances in Space Research*, 69(1), 292-307, 2022.

<https://doi.org/10.1016/j.asr.2021.08.034>

Analysis of Earth's Polar Motion and Length of Day Trends in Comparison with Estimates Using Second Degree Stokes Coefficients from Satellite Gravimetry, Leonid Zotov, Christian Bizouard, C. K. Shum, Chaoyang Zhang, Nikolay Sidorenkov and Victor Yushkin, *Advances in Space Research*, 69(1), 308-318, 2022.

<https://doi.org/10.1016/j.asr.2021.09.010>

Monitoring of Local Deformations and Reservoir Water Level for a Gravity Type Dam based on GPS Observations, J. Rene Vazquez-Ontiveros, Carlos A. Martinez-Felix, G. Esteban Vazquez-Becerra, J. Ramon Gaxiola-Camacho, Angela Melgarejo-Morales and Jorge Padilla-Velazco, *Advances in Space Research*, 69(1), 319-330, 2022.

<https://doi.org/10.1016/j.asr.2021.09.018>

Improving GNSS Triple-frequency Cycle Slip Repair Using ACMRI Algorithm, Fan Zhang, Hongzhou Chai, Guorui Xiao, Changjian Liu, Linyang Li and Zhenqiang Du, *Advances in Space Research*, 69(1), 347-358, 2022.

<https://doi.org/10.1016/j.asr.2021.10.005>

A Novel Method of Ambiguity Resolution and Cycle Slip Processing for Single-frequency GNSS/INS Tightly Coupled Integration System, Dashuai Chai, Wengang Sang, Guoliang Chen, Yipeng Ning, Jianping Xing, Mingwei Yu and Shengli Wang, *Advances in Space Research*, 69(1), 359-375, 2022.

[tps://doi.org/10.1016/j.asr.2021.10.007](https://doi.org/10.1016/j.asr.2021.10.007)

Coseismic and Postseismic Deformation of the 2016 Mw 6.0 Petermann Ranges Earthquake from Satellite Radar Observations, Bingquan Han, Chengsheng Yang, Zhenhong Li, Chen Yu, Chaoying Zhao and Qin Zhang, *Advances in Space Research*, 69(1), 376-385, 2022.

<https://doi.org/10.1016/j.asr.2021.10.043>

Mitigation of Thermal Noise in GRACE Accelerometer Observations, Rebecca McGirr, Paul Tregoning, Sebastien Allgeyer, Herb McQueen and Anthony Purcell, *Advances in Space Research*, 69(1), 386-401, 2022.

<https://doi.org/10.1016/j.asr.2021.10.055>

ASTRODYNAMICS AND SPACE DEBRIS

Analysis of the PPN Two-Body Problem Using Non-osculating Orbital Elements, Pini Gurfil and Michael Efroimsky, *Advances in Space Research*, 69(1), 538-553, 2022.

<https://doi.org/10.1016/j.asr.2021.09.009>

Synchronous Satellites of Venus, Anthony R. Dobrovolskis and José Luis Alvarelllos, *Advances in Space Research*, 69(1), 554-569, 2022.

<https://doi.org/10.1016/j.asr.2021.09.022>

Quantum-inspired Diffusion Monte Carlo Optimization Algorithm Applied to Space Trajectories and Attitude Maneuvers, Federico De Grossi and Christian Circi, *Advances in Space Research*, 69(1), 592-608, 2022.

<https://doi.org/10.1016/j.asr.2021.10.008>

SPACE TECHNOLOGY, POLICY AND EDUCATION

Attitude and Deformation Coupled Estimation of Flexible Satellite Using Low-cost Sensors, Marzieh Ghani, Nima Assadian and Renuganth Varatharajoo, *Advances in Space Research*, 69(1), 677-689, 2022.

<https://doi.org/10.1016/j.asr.2021.08.010>

Initial Assessment of BDS-3 Precise Point Positioning Service on GEO B2b Signal, Weixing Zhang, Yidong Lou, Weiwei Song, Weibin Sun, Xu Zou and Xiaopeng Gong, *Advances in Space Research*, 69(1), 690-700, 2022.

<https://doi.org/10.1016/j.asr.2021.09.006>

Failure Prognosis and Remaining Useful Life Prediction of Control Moment Gyroscopes Onboard Satellites, Venkatesh Muthusamy and Krishna Dev Kumar, *Advances in Space Research*, 69(1), 718-726, 2022.

<https://doi.org/10.1016/j.asr.2021.09.016>

Impact of Higher-order Ionospheric Delay on the Reliability of RTK Ambiguity Estimation, Haitao Zhou, Lei Wang, Wenju Fu, Yi Han, Tao Li, Ruizhi Chen and Yuan Wu, *Advances in Space Research*, 69(1), 727-736, 2022.

<https://doi.org/10.1016/j.asr.2021.09.031>

Multilevel-teaching/training Practice on GNSS Principle and Application for Undergraduate Educations: A Case Study in China, Xiaoxing He, Kegen Yu, Zhengkai Huang, Jean-Philippe Montillet, Tieding Lu, Xiaoji Lan, Genru Xiao, Xiaping Ma, Haiping Zhou and Yilin Chen, *Advances in Space Research*, 69(1), 778-793, 2022.

<https://doi.org/10.1016/j.asr.2021.11.021>

Meeting Announcements

X. Hotine-Marussi Symposium on Mathematical Geodesy Second Circular Letter and Call for Papers

Milan, Italy, 13-17 June 2022

Dear Colleagues and Friends,

It is both our privilege and pleasure to invite you to the jubilee **X Hotine-Marussi Symposium on Mathematical Geodesy**, which will be held at Politecnico di Milano, Milan, Italy, on 13-17 June 2022, under the scientific coordination of the [Intercommission Committee on Theory \(ICCT\)](#) of the International Association of Geodesy (IAG).

The main goals of the Symposium are aligned with main objectives of ICCT:

- advancing theoretical geodesy,
- developing new geodetic methods reflecting recent advances of geodetic observing sensors,
- interdisciplinary cooperation between geodesy and other Earth and planetary sciences.

All details about the symposium, its scientific programme and venue are available at the symposium website: www.hotinemarussi2022.polimi.it.

Scientific Programme

In particular, contributions from the **following topics** are strongly encouraged:

- gravity field modelling at all spatio-temporal scales,
- theoretical aspects of precise (quasi-)geoid determination
- theory of realizing modern geodetic reference frames,
- modelling Earth rotation, deformation and internal structure using geodetic data,
- advanced numerical methods and data processing techniques in geodesy,
- space weather and atmospheric modelling,
- multi-sensor and time series data analysis,
- theory of multi-GNSS data processing,
- estimation theory and inverse problems in geodesy,
- advancing geodetic theory through new observation sensors,
- geodetic methods in Earth system science,
- establishment and correct use of global geophysical models.

Contributions concerning other **topics related to interactions and mutual benefits between geodetic theory, and other initiatives or projects involving Earth and planetary sciences** are also welcome.

Within the scientific program of the Symposium, **a special session will be organized within which the two main theories used in geodesy for height reference surface determination** will be discussed. Theoretical and practical aspects of precise quasigeoid and geoid modelling will be reviewed including open theoretical and data availability issues, as well as their impact on modelled height reference surfaces.

Venue

The Symposium will be held at the Politecnico di Milano, Milan, Italy, in the Leonardo da Vinci Campus. The venue can be reached by the underground (Piola Station, Green Line).

June is a high-season tourist period in Milan, so that an **early registration and accomodation booking is highly recommended**.

Abstracts, presentations and papers

Deadline for abstract submission is February 18, 2022; both the guidelines and the reference e-mail address are available on the Hotine-Marussi Symposium 2022 website.

Each abstract will be reviewed by the Scientific Committee and its eventual **acceptance will be notified by e-mail to the corresponding author by March 25, 2022**.

Upon abstract submission, the corresponding author will have to indicate **the preference for oral or poster presentation**. However, the final decision on the form of presentation will be taken by the Scientific Committee during the abstract review.

Guidelines for the **full paper** submission for peer-review and related formatting instruction is available through the Hotine-Marussi Symposium 2022 website.

Accepted papers will be published by Springer as a volume of the official IAG Symposia series, see the link <https://www.springer.com/series/1345>.

Registration fees

Three kinds of registration fees are distinguished:

- regular registration: 450 Euro
- young researcher (age < 32 at Symposium): 250 Euro
- one-day registration 100 Euro

An additional 50 Euro fee will be charged to regular and young researcher registration fee in case of for late registration (**after April 1, 2022**).

The registration fee can be paid by bank transfer or by a credit card according to the information published on the Hotine-Marussi Symposium 2022 website.

The registration fee will include:

- symposium proceedings (on-line form)
- coffee breaks
- social tour and social dinner

The Hotine-Marussi Symposium is an official IAG meeting. Young scientistists from IAG member countries may apply for the IAG Travel Award to assist them in presenting results of their research, for more details, please see https://iag.dgfi.tum.de/fileadmin/IAG-docs/Rules_for_Travel_Awards.pdf.

Social programme

The scientific programme will be complemented with a social one, including a tour in Milan and a social dinner.

Pandemia-related issues

The symposium is planned as a standard meeting with on-site attendance. In case of valid Covid-related travel restrictions, it will be possible to switch to a hybrid form (in this case, the registration fees for those attending online will be 50% of the standard ones). However, due to the nature of the Hotine-Marussi Symposia, the physical form of the symposium will be preferred.

We look forward to welcome you in Milan!

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: www.hotinemarussi2022.polimi.it

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

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

URL: <https://www.igscb.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/>

Obituary

Steve Kenyon (1957 - 2021)



Steve C Kenyon passed away on Christmas morning 2021, at a way too young age. Steve was an allround geodesist, having a big impact on global gravity field geodesy through the securing of data and development of the pioneering global gravity field models EGM96, EGM2008, and the upcoming EGM2022. Many of his colleagues in geodesy around the world will remember Steve's good spirit, his humor, and easy-going attitude at numerous IAG meetings and symposia, as well as his impact on global gravity field data cooperation, the involvement in the formation of the IAG International Gravity Field Service (IGFS) and in the cooperation with the Bureau Gravimetric International (BGI). He also played a key role in many major international activities, such as the Arctic Gravity Project of the 1990's, SIRGAS and South American gravity field activities, and support for global altimetry and airborne projects, to name a few.

Steve started his carrier 1983 with the US Defense Mapping Agency Aerospace Center in Cheyenne, Wyoming, now known as the National Geospatial-Intelligence Agency. He transferred later to NGA St. Louis, and studied for his M.Sc. at Ohio State University 1995-97, under the tutelage of professor Dick Rapp. This is where Steve met many international colleagues, and provided a base for his later appointments as NGA Branch Chief under the Gravity and Geophysics department, and eventually the 2002 position as Senior Scientist for Global Partnerships, a position he held until his retirement in 2017. During his work at NGA, he was instrumental in facilitating the advancement of geodesy both within NGA and globally. In concert with this effort, he also helped boost global recognition of NGA as key geodesy partner.

Steve was part of a group of three young geodesists send on long-term training in physical geodesy at the National Geodetic Agency (KMS) in Copenhagen 2004, with numerous later visits to set up joint projects, a cooperation which started with the first continental-scale airborne gravity survey of Greenland 1991-92 by the US Naval Research Laboratory in cooperation with NGA and KMS, and later airborne and satellite altimetry projects. Even though he was retired, Steve was still planning yet another visit to Copenhagen in June 2022, to be timed with the Tour de France départ (Steve was an avid bicyclist, cycling the US east to west, and north to south along the Rocky Mountains, (which his friends will remember many stories about).

Steve was very involved in global in-situ and airborne gravimetry projects, as for instance in South America (e.g. Chile and Brasil), Asia (especially Mongolia), and many African regions. Steves Mongolian adventures brought him travelling across Eastern steppe, the Gobi Desert and Western Altai mountains, to explore the gravity field by helicopter, car, horse and camel in cooperation with local survey teams ("National Geographic stuff", in his own words). His contributions to secure modern height system development across Mongolia and many other countries have been widely recognized.

Steve participated in the numerous IAG and other technical meetings around the world (e.g. in Alaska, Greenland, Russia, Italy, Germany, Argentina and Australia, to name a few). Steve published and co-authored more than 50 papers in international journals, but his main recognition is really as a promotor and coordinator of global geodesy, playing an important role in also improving the global gravity field data acquisition and sharing, an important part of the global present and future geodetic infrastructure, impossible to do from space alone.

Steve leaves behind his wife, and two adult children. He will be missed by his geodetic friends around the world.

René Forsberg, DTU Space, Denmark
Mijidorj Saandar, MONMAP, Mongolia
Sylvain Bonvalot, BGI, France