

INTERNATIONAL ASSOCIATION FOR MATHEMATICAL GEOSCIENCES

Annual Report to the International Union of Geological Sciences – January 2024

1. Overall objectives

The mission of the International Association for Mathematical Geosciences (IAMG) is to promote the advancement of mathematics, statistics and informatics in the geosciences worldwide. The primary role of the IAMG is to further the development of methods and disseminate the results of new research in its fields of interest with outreach within the geoscience, mathematics and geoinformatics communities. This includes sponsoring students and young scientists by means of research and travel grants.

2. Relate goals to overall IUGS scientific objectives.

Through its four scientific journals, the annual IAMG meeting and many other projects, including travel by its Distinguished Lecturers, the IAMG aims to further the quantification of three-dimensional geoscientific mapping, numerical time-scale development, geological process modelling, spatial and spatiotemporal modelling and estimation. Its contributions to predictive geology include the areas of natural disasters, the delineation of mineral, hydrocarbon and water deposits in the crust of the Earth. Mathematical and geometrical estimates are accompanied by estimates of their uncertainty.

3. Structure and organization.

The IAMG is governed by a Council consisting of its Executive Committee (President, Vice-President, Secretary General and Treasurer), the immediate Past President, six Ordinary Council Members, a special IGC Councillor, and seven non-voting members comprising Editors-in-Chief and Co-Editors-in-Chief of its publications. It has seven standing committees for Awards, Curriculum Quality, Lectures, Meetings, Outreach, Publications and Student Affairs, and various commissions for shorter-term activities.

4. Interaction with other international organizations and projects.

Currently, IAMG membership represents 63 countries across the globe. The IAMG is affiliated with IUGS, IUGG, EAGE and ISI. It is a Scientific International Partner of the Earth Science Matters Foundation (ESM). IAMG has five Student Chapters. In addition, the IAMG financially supported the GISTAM 2022 conference. The immediate Past President of the IAMG (Jennifer McKinley) is a member of the IUGS Executive Council for the period 2020-2024.

IAMG continues to collaborate with other international associations, including the International Union of Geological Sciences (IUGS), International Union of Geodesy and Geophysics (IUGG), American Geophysical Union (AGU), European Geoscience Union (EGU), European Association of Geoscientists and Engineers (EAGE), Earth Science Matters (ESM), Southern African Institute of Mining and Metallurgy (SAIMM), International Association for Young Earth Scientists (YES), Joint Statistical Meetings (JSM), Future Earth Coasts (former LIOCZ), the Geological Society of London (GSL), the

Royal Irish Academy (RIA), the China Union of State Key Laboratories in Solid Earth Sciences, the UNESCO International Centre for Global-scale Geochemistry (ICGG) and the Chinese Academy of Geosciences.

The IAMG continues to be involved in the Global Deep Time Digital Earth initiative (DDE), the first IUGS-recognized Big Science Programme officially launched during the 73rd IUGS Executive Council Meeting held in Beijing (February 2019). Currently, the IAMG is contributing \$10,000 USD per year to this project. This involvement further strengthens the IAMG relationship with IUGS and other associations. The current IAMG President, Professor Peter Dowd, has agreed to take on the role of the IAMG representative for the DDE.

Preparations are underway for the 37th IGC (IGC2024), which will take place in the Bexco Conference Centre, Busan, South Korea. As an affiliated association, the IAMG is an active contributor to the IGC conferences and is represented by the IAMG IGC Councillor, Dr. Jonggeun Choe (South Korea).

5. Chief products

The IAMG publishes four scientific journals (*Mathematical Geosciences*, *Computers and Geosciences*, *Natural Resources Research*, and *Applied Computing and Geosciences*) in partnership with Elsevier and Springer. Annually IAMG publishes two newsletters and the proceedings of its annual meeting on CD and/or book-form. It sponsors the publication of books, including those in the IAMG Monograph Series, in partnership with Oxford University Press. IAMG maintains one primary public website: <http://www.iamg.org>, which contains general information, including Statutes and By-Laws and Minutes of General Assemblies and IAMG Council meetings.

Mathematical Geosciences published 54 articles in eight issues in 2023. Issue 3 was a special issue on Geostatistics and Machine Learning. The 2022-2023 impact factor is 2.508.

Computers and Geosciences published 125 papers in the 12 issues in 2023. The 2022-2023 impact factor is 5.168. There were no special issues in 2023.

Natural Resources Research published 148 papers in six issues in 2023. The 2022-23 impact factor is 5.609. There were no special issues in 2023.

Applied Computing and Geosciences is an on-line only, open-access journal published by Elsevier and is focused on all aspects of computing in geosciences. A total of 26 papers in four issues were published in 2023, seven of which were articles from the Special Issue on Applications in 3D Geoscience Modelling. Impact Factor 3.4.

The Encyclopaedia of Mathematical Geosciences is a living reference work published by Springer as part of the book series Encyclopaedia of Earth Sciences Series (EESS). It is edited by Professor B. S. Daya Sagar, Professor Qiuming Cheng, Professor Jennifer McKinley, and Professor Frits Agterberg.

Student and post-doctoral research are financially supported by research and travel grants including the *Mathematical Geosciences, Computers and Geosciences* and *Natural Resources Research scholarships*.

The Student Affairs Committee considered university chapter reports and allocated the following funds:

Chapter	No. of members	Funding sought	Funding allocated
Sun Yat Sen University	51	\$US 2,000	\$US 2,000
China Univ of Geosciences	18	\$US 2,500	\$US 2,500
Université de Lorraine	10	€2,500	€2,500

Financial support is also provided in the form of professional awards and recognition. In particular, the Krumbein Medal, Chayes Prize, Griffiths Teaching Award, Vistelius Award, Georges Matheron Lecturer Award and the IAMG Distinguished Lecturer. The awards determined in 2023 for awards in 2023-2024 are:

- 1) The Felix Chayes Prize for Excellence in Research in Mathematical Petrology is awarded in alternate, uneven years. The 2023 award was to Professor Pieter Vermeesch, Department of Earth Sciences, University College, London.
- 2) The Andrei Borisovich Vistelius award is presented biennially to one male and one female early-career scientist for promising contributions in research in the fields of mathematical geosciences or geoinformatics. The 2023 award for a female scientist was to Dr. Shaunna Morrison, Carnegie Institution for Science, Earth and Planets Laboratory, USA. The 2023 award for a male scientist was to Dr. Benham Sadeghi, Commonwealth Scientific and Industrial Research Organisation, Australia.
- 3) The William Christian Krumbein Medal is the highest award given by the IAMG and is awarded in even years. It is awarded to senior scientists for career achievement. The most recent award was in 2022 to Professor E.J.M (John) Carranza.
- 4) The Founders Scholarship is awarded annually to an outstanding student or post-graduate scientist. The award for 2023 is to Dr. Sofia Nerantzaki, a Research Fellow at the University of Saskatchewan, Canada.
- 5) Dionysios Hristopulos is the Georges Matheron lecturer for 2024. He will deliver his lecture in 2025.
- 6) The Distinguished Lecturer for 2024 is Professor Michael Pyrcz, University of Texas at Austin, USA.

More detailed information on the IAMG and its activities is available on the IAMG website (<http://www.iamg.org>).

6. Chief accomplishments in 2023

The 22nd annual IAMG Conference was held in Trondheim (Norway) in August 2023. This was a highly successful event with 211 attendees, excellent formal sessions and keynote lectures.

A new Outreach Committee was agreed in 2023 for implementation in 2024. The current Publications and Outreach Committees will be merged into a single Outreach Committee, which will be responsible for all aspects of outreach. The editors of the IAMG journals, or their nominees, will become members of a re-constituted Outreach Committee.

The components of the new Outreach Committee are:

- Overseeing the IAMG website.
- Overseeing the IAMG journal publications.
- Proposing and ensuring active association agreements with other relevant associations.
- Ensuring effective management of association agreements.
- Promoting the IAMG via social media and other online presences.
- Increasing the IAMG membership and the involvement and engagement of members.
- Responsibility for developing guidelines for supporting other organisations.

7. Specify how any IUGS Allocation for 2023 was used.

No IUGS Allocation was requested for 2023.

8. Budget request with justification for 2023 (only applicable to low-income affiliates)

No IUGS Allocation was requested for 2023.

9. Does your website have a link to IUGS?

YES.

<https://iamg.org/links-and-datasets.html>