

INTERNATIONAL ASSOCIATION FOR MATHEMATICAL GEOSCIENCES

Annual Report to the International Union of Geological Sciences for 2016

1. Overall objectives

The mission of the International Association for Mathematical Geosciences (IAMG) is to promote, worldwide, the advancement of mathematics, statistics and informatics in the geosciences. The main duty of the IAMG is to further method development and disseminate 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

By means of its three 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 and geological process modelling. Its contributions to predictive geology are concerned with natural disasters as well as the delineation of mineral, hydrocarbon and water deposits in the crust of the Earth. The 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, Executive Vice President, Secretary General and Treasurer), two Vice Presidents, Past President, four Ordinary Council Members, special IGC Councillor, three Editors-in-Chief, and Newsletter/Website Editor. It has seven standing committees for Awards, Curriculum Quality, Lectures, Meetings, Outreach, Publications and Student Affairs, respectively, and various commissions for shorter term concerns.

4. Interaction with other International organizations and projects

The IAMG is affiliated with IUGS, IUGG and ISI. It is Scientific International Partner of the Earth Science Matters Foundation (ESM). IAMG has eight Student Chapters and co-organizes international meetings for young earth scientists with YES. IAMG maintains a joint booth with ESM and the International Lithosphere Program. Additionally, the IAMG annually has a booth and co-organizes sessions at the AGU Fall Meeting in San Francisco, U.S.A. An IAMG booth was maintained at the 35th IGC in Cape Town, South Africa. The IAMG Executive Vice President (Jennifer McKinley) is Communications Officer for the IUGS Initiative on Forensic Geosciences (IUGS-IFG). Most recently this involved presenting a workshop on 'Using a GIS Approach to Forensic Search Strategies' at the 5th European Meeting on Forensic Archaeology, August 11-12 2015, Dublin Castle, Ireland. Two IAMG members (Ricardo Olea and Nishi Nishiwaki) serve on the IUGS Nominating Committee.

At the IUGS Executive Meeting in Vancouver, Canada, 27-29 January, 2015, IAMG President Qiuming Cheng reported on the main activities of IAMG in 2014 including our

annual meeting, student activities and interactions with other associations, and gave highlights of scientific progress. He introduced several large-scale (continental to global) projects in the areas of mineral resources and energy assessments conducted during the past few years. IAMG contributions to Society include not only theories and methodologies, but also computer techniques and case studies as well as training of Highly Qualified Personnel. Theories invented and techniques developed by IAMG members are commonly applied in mathematical geoscience as well as in other fields of the geosciences. These techniques include but are not limited to basin simulation and application in oil/gas exploration, 2D to 3D GIS techniques and applications, new models for modeling singularity for geodynamics, new models and methods for mineral and other resource appraisals, new geostatistical and statistical analysis including multiple point geostatistics, image regeneration and compositional data analysis. IAMG has been and will be closely collaborating with IUGS and other organizations to promote and to support the new initiative of resourcing future generations.

As part of our international collaboration, the IAMG continues to work closely with governmental agencies worldwide to advance the role of mathematics, statistics and informatics. IAMG has been actively interacting with other international associations including the International Union of Geological Sciences (IUGS), International Statistical Institute (ISI), International Union of Geodesy and Geophysics (IUGG), European Geoscience Union (EGU), Earth Science Matters (ESM), Southern African Institute of Mining and Metallurgy (SAIMM), International Association for Young Earth Scientists (YES), Future Earth Coast (former LIOCZ), European Association of Geoscientists and Engineers (EAGE), Geological Society of London (GSL), the Royal Irish Academy (RIA) and China Union of State Key Laboratories in Solid Earth Sciences.

The IAMG also contributed \$11,232 to support meetings for the Compositional Data Analysis Association (CODA) – Codawork2017, Geostatistics for Environmental Application (GeoENV) -GeoENV2016 and the International Geostatistical Congress - GeoStat2016. Sponsorship and support of these organizations and meetings are a crucial part of the IAMG mandate and outreach.

5. Chief products

The IAMG publishes three scientific journals (*Mathematical Geosciences*, *Computers & Geosciences* and *Natural Resources Research*) in partnership with Elsevier and Springer. In 2015, about 199 articles were published in *Computer & Geosciences*, 31 articles in *Natural Resources Research* and 46 articles in *Mathematical Geosciences* for a total of 276. 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. IAMG maintains one primary public website: <http://www.iamg.org> and contains general information including Statutes & By-Laws and Minutes of General Assemblies as well as IAMG Council meetings; the other website is for members only.

Student and postdoctoral research is financially supported by research and travel grants including the *Mathematical Geosciences*, *Computers & Geosciences* and *Natural*

Resources Research scholarships. In 2016 there were 11 student travel awards, 10 for attendance at the IGC and one for attendance of Geostats2016. Student research scholarships and student awards came to a total of \$21,250 with an additional \$16,211 provided as travel grants for students. The IAMG also provided \$12,450 in support Student Chapters that are located around the world.

Financial support is also provided in the form of professional awards and recognition, namely, Krumbein Medal, Chayes Prize, Griffith Award, Vistelius Award, Matheron Lecturer and Distinguished Lecturer. Travel support for these awards totalled \$12,000 plus a cash award of \$7,000.

More detailed information on the IAMG and its chief products is available in the updated IAMG brochure that is available on the IAMG website (<http://www.iamg.org>).

6. Chief accomplishments in 2016 and plans for 2017

The IAMG organised a number of well attended sessions, plenary keynote lectures at the 35th International Geological Congress (IGC) held from 27th August to 4th September in Cape Town, South Africa. The 2016 IAMG Distinguished Lecturer, Dr Sean McKenna, presented lectures at a number of international locations including an IAMG sponsored keynote at geoENV2016 in Lisbon, Portugal. The 2017 Distinguished Lecturer, Professor Clayton Deutsch gave a plenary presentation at the 10th International Geostatistical Congress held in Valencia, Spain, 5-9 September, 2016 Geostat2016 in Valencia, Spain. The IAMG sponsored an invited session on compositional data analysis at the Royal Statistical Society (RSS), Manchester University (UK), 5-6 September, 2016.

In 2017, the 18th annual IAMG conference will be held in Perth, Australia. In 2018, the 19th IAMG conference will be held in Olomouc (Czech Republic), 2-8 September, 2018. In conjunction with the conference, a celebration of the 50th anniversary of IAMG's founding will be held in Prague. A Golden Anniversary book: "Fifty Years of IAMG" edited by Professor B.S. Daya Sagar and co-edited by Qiuming Cheng and Frits Agterberg will be published by Springer and launched at IAMG2018 in Olomouc.

7. Specify how any IUGS Allocation for 2015 was used

No IUGS Allocation for 2016 was requested.

8. Budget request with justification for 2016 (only applicable to low income affiliates)

No IUGS Allocation for 2017 is requested.

9. Does your website have a link to IUGS?

YES.

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