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IAMG Newsletter

Official Newsletter of the International Association for Mathematical Geosciences

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Call for Proposal

to organize the
IAMG 2013 CONFERENCE

The Association is looking for entrepreneurial and enthusiastic individuals or organizations willing to organize the fifteenth IAMG conference during the Summer or Fall of 2013. Guidelines regulating the IAMG conferences are posted at

http://iamg.org/index.php/publisher/articleview/frmArticleID/43

If you have any questions about the system of IAMG conferences or the preparation of the proposal, please do not hesitate to contact the Chair of the Meetings Committee at olea@usgs.gov

The deadline for submitting the proposals to the Meetings Committee is **February 15, 2011**.

About ten years ago I first ran across a strange new word and phenomenon on the internet: "blogs". Derived as a short form from web log, it was hailed as a great new way to publish opinions and communicate with followers and all kinds of new people. Since then blogs have become a popular and widely accepted tool for disseminating information, as well as opinions, instantly and more or less regularly, leaving the printed media behind.

Because I am neither a blogger nor regular reader of blogs, I was not aware of any blogs that deal with geological issues. So, I was intrigued seeing a brief article in GMIT (the monthly newsletter of German geoscientific societies) about the geoblogosphere by Lutz Geissler (Freiberg) and Robert Huber (Bremen). Lutz has been expanding Robert Callan's 2008 survey of geoblogs and has a nice list of 175 geoblogs ordered by subject with a brief description of each on www.geoberg.de/blog/the-geoblogosphere-a-categorized-list-of-geoblogs, and statistics on geobloggers at www.geoberg.de/blog/geoblogosphaere-web-2-0. And the website geoblogs.stratigraphy.net (under "List Blogs") has an updated list of over 290 geoblogs, not all of which are really about geology. Other bloggers also muse about the geoblogosphere: Mike Welland of sand fame has a column about the subject in his May 6 blog on throughthesandglass.typepad.com.

The majority of blogs are written in English (half of the blogs originate from the US), but there are also 32 in Spanish, 9 in Italian, 17 in German, 3 in French, and even one in Catalan.

There are, of course, a large number of blogs on paleontology, especially dinosaurs. Some blogs show great outcrop photos that entice me to drop everything to get out in the field. Many are about general geological and geophysical topics.

Geology News by Hobart King (geology.com/news) is a good site for links of daily geoscientific news stories, rather than personal opinions or stories. Ramon Arrowsmith has a fairly lively blog (arrowsmith.blog.asu.edu) on active tectonics.

AGU has an official blog on geohazards (blog.agu.org/geohazards). There is a site called GIS Planet (blog.geoblogspot.com) from Russia which has scripts, spreadsheets and notes about new program releases, and others with more personal opinions on GIS by Ron Exler (www.thegeofactor.com), and geofroth.org by Kyle House which looks like a collection of interesting ideas and methods.

But where are the mathematical geosciences? There is only one blog with "math" in the title: Rocks Math! (rocksmath.wordpress.com). It contains occasional references to math but has very few entries. Is there no one in IAMG who has something to contribute to the geoblogosphere on a regular basis? Or do we think that this not the right medium for us? Any thoughts?

Harald S. Poelchau

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PRESIDENT'S FORUM

At the moment when I am writing this report, our Vice President, Qiuming Cheng, is recovering from a serious health problem in the hospital in Wuhan, China. I hope that, when this newsletter gets to you, he is completely recovered and back at home in Canada. Best wishes, Qiuming!

It seems that we are overcoming without serious problems the financial crisis and, although not yet in a brilliant shape, our finances are healthy. My thanks for it go to Gina Ross, our treasurer, who has generously devoted time and efforts to keep IAMG finances in good standing.

Different committees have satisfactorily done their part to keep IAMG running according to schedule. You may have seen on our website that the Matheron Lecturer Committee, chaired by Qiuming Cheng, has selected the speaker for 2010: Dr. Donald A. Singer of the United States Geological Survey. The Awards Committee, chaired by Jef Caers, has announced that the 2010 William Christian Krumbein Medallist is Dr. Lawrence Drew of the United States Geological Survey, and that the 2010 John Cedric Griffiths Teaching Awardee is Ana Fernández Militino, of the Universidad Pública de Pamplona in Spain. Congratulations to all of them and thanks for coming to Budapest! We are looking forward to your talks!

Furthermore, the Awards Committee has elected Daniel Krige as Honorary Member of IAMG, a well deserved honour for his numerous contributions to our field of science.

The Meetings Committee, chaired by Ricardo Olea, has also started to operate. Based on his committee's recommendations, the Council has voted to support this summer the International School of Fluid Geochemistry in Abbadia S. Salvatore, Siena, Italy, and next year CoDaWork'11, which will take place in May in Girona, Spain. Both locations are really pleasant and the contents interesting. I am sure it is worthwhile attending. And more: the guidelines for organising IAMG conferences have been posted on the web, and new guidelines are being written for a proper follow-up of meetings, so that the organisation goes smoothly.

Our annual conference is getting close, and we are looking forward to meeting again, this time in Budapest, where organisation of IAMG'10 is well under way. Janos Geiger and his team are doing an impressive effort. Our annual meeting is a pleasant way not only to meet old friends and make new ones, but also to keep updated on what is going on in mathematical geosciences around the world. Moreover, we will hold a General Assembly during IAMG'10, and it would be great if many of us could attend. Do not miss this important event! I hope to see all of you there!

Vera Pawlowsky Glahn

Letter to the Editor

Let me put my two cents in once again, although I've commented on somewhat similar issues before. What about a contest to identify research opportunities in geology and resource assessment that remain underserved by mathematical applications. Here's one that comes to mind: analysis of topography. The advent of digital elevation files over large regions, such as the United States as a whole, provides a wealth of data that can be analyzed in various ways. Geostatistical tools are important, but there are others, such as Markov chains. Interestingly, while Markovian relationships abound in topography, few analysts have focused on their potential to provide succinct numerical descriptors of relationships. For example, schemes might be devised to isolate and enhance successions of fluvial terraces that commonly become increasingly obscure with progressive downcutting, or alternatively, enhance successions of upraised wave-cut marine terraces that tend to become increasingly obscure with progressive uplift. What else could be suggested?

John Harbaugh

Nominations needed for 2011 IAMG Awards !

The Association invites all members to submit nominations for the **Felix Chayes Prize** and for

the **Andrei Borisovich Vistelius Award**

Deadline: January 31, 2011

For details about prerequisites for nominations please see the IAMG web site **http://www.iamg.org/** and click on **Awards**

There is also a list of past recipients and their laudatios on the web site. Please have a look at it before sending your nominations!

The (informal) documents which should accompany a proposal are:

- a short statement summarizing the relevant qualifications of the nominee
- a curriculum vitae of the nominee

The proposer may also get additional information or support for his proposal from other members of IAMG and from successful examples published on our website.

Please send nominations and supporting documents to:

Jef Caers - Chairman, IAMG Awards Committee
Stanford University - Dept. of Energy Resources Engineering
Green Earth Sciences Bldg.
Stanford, CA 94305-2220 - USA
E-mail: jcaers@stanford.edu

Nominations for other Awards may also be submitted at any time.

Association Business

2010 IAMG Awards

The awards committee has voted and has come to the following decisions:

Winner of the 2010 John Cedric Griffiths Teaching Award:
Ana Fernández Militino

and

Winner of the 2010 William Christian Krumbein Medal:
Lawrence J. Drew

Ana is a Full Professor of Statistics and Operations Research at the Public University of Navarra, in Spain where she teaches a variety of courses on statistics. Her areas of research are Small area estimation (EBLUP estimators, Mean Squared Error (MSE) calculation, models with constraints, GLMM) and Spatial and temporal modelling (geostatistics, lattice data, CAR models, robustness in spatial linear modes).

Ana will present a lecture at the IAMG meeting in Budapest with the title *"Interfacing Statistical Teaching and Geostatistics"*

Larry is at the USGS Eastern Mineral and Environmental Resources Science Center in Reston, VA. His research interests range from oil and gas exploration to mineral deposits to statistical methods and GIS applications. He has been the IAMG Distinguished Lecturer for 2005 and was author of the second volume in the series of Studies in Mathematical Geosciences. Larry was the recipient of the John Cedric Griffiths Teaching Award in 2000.

The title of his acceptance speech at the IAMG meeting in Budapest will be: *"The Creation of a Mathematical Geologist (John Griffiths trains his students)"*

Don Singer - 2010 Matheron Lecturer

The Matheron Lecturer Committee, chaired by our Vice President Qiuming Cheng, has selected Dr. Donald A. Singer of the United States Geological Survey in Menlo Park as the 2010 Georges Matheron Lecturer. He will give a keynote lecture at this year's IAMG Annual Conference in Budapest with title *"Solving the wrong resource assessment and exploration problems precisely"*.

Don retired from the USGS in 2009. He was Chief of the USGS Uncertainty and Risk in Mineral Resources Project that identifies major sources of mineral resource uncertainty and risk and incorporates them in the decision-making process so that controllable risk can be reduced. He taught short courses in quantitative assessment and exploration risk management at universities in Japan, China, Canada, and at the University of Queensland in Australia where has taught as an Honorary Professor for eight years. His research has focused on developing methods of quantitatively assessing undiscovered mineral resources. His work on mineral-deposit models, grade and tonnage models, advanced technologies, economic models, and useful forms of mineral-resource assessments has provided a robust foundation for mineral-resource assessments.

New Honorary IAMG Member: Danie Krige

Dr Danie Krige, known as the Father of Mathematical Mining Geology, has spent his professional career in the South African mining industry. After retirement, he occupied the chair of mineral economics for ten years, as professor, at the University of the Witwatersrand. He is still active as a private consultant. In recognition of his contributions he was awarded the Krumbein Medal, IAMG's highest honor, in 1982. Danie joins Richard Reyment and Dan Merriam as the third Honorary Member of IAMG.

Member News

Dr **Danie Krige** has been elected as a Foreign Associate of the US National Academy of Engineering. This election is a high honour and has been awarded for Dr. Krige's development of geostatistical methods and their application to resource evaluation.

Abani R Samal writes:
It is my pleasure to inform you that the Industrial Minerals Division of the SME (the Society for Mining, Metallurgy, and Exploration, www.smenet.org/) has awarded me " 2009 Young Scientist Award". Also, in SME, I am continuing in the leadership role as the Chair of the Program Committee of the Industrial Minerals Div.. Additionally I am a vice chair of the Technical Committee of the same division.

Abani R Samal
Pincock Allen and Holt
165 South Union Boulevard, Suite 950
Lakewood, CO 80228-2226

The DGG (Deutsche Gesellschaft für Geowissenschaften) has awarded the Serge von Bubnoff Medal to Prof. Dr. **Jan Harff**. The honor is for his work on the development of coastlines, especially along the Baltic Sea but also the northern regions of Greenland, and the coastlines of China and Vietnam. Harff is Emeritus Professor at the Institut für Ostseeforschung, Warnemünde, Germany.

Distinguished Lecturer Report

1. High-Order Geostatistics: Simulating complex, non-Gaussian and non-linear geological phenomena

January 28th, 2010 - Remote Lecture at the University of Kentucky, Earth and Environmental Sciences, Lexington, KY, USA. Organized by Professor D. Ravat.

Lecture participants of the remote lecture at the Univ. of Kentucky; Prof. D. Ravat, organizer of the lecture is left in the lower row.

2. High-Order Stochastic Simulation of Complex Spatially Distributed Natural Phenomena using Spatial Cumulants

March 18th, 2010 - Lecture at the Geostatistical Association of Australasia, Perth, WA, Australia. Organized by Professor U. Mueller, ECU, and collaboration from Snowden.

3. Optimization in Mine Design and Production Scheduling with Uncertain Ore/Metal/Waste Supply

April 7th, 2010 – Lecture at the University of Alberta, School of Mining and Petroleum Engineering, Edmonton, Alta, Canada. Organized by Professor C.V. Deutsch.

4. New High-Order Geostatistical Simulations for Complex, Non-Gaussian and Non-linear Attributes of Mineral and Petroleum Deposits

April 8th, 2010 – Lecture at the University of Alberta, School of Mining and Petroleum Engineering, Edmonton, Alta, Canada. Organized by Professor C.V. Deutsch.

Roussos Dimitrakopoulos

Student Affairs

Sun Yat-sen Student Chapter

The new President of the IAMG student chapter at Sun Yat-sen University, Guangzhou, China is **Linfeng Wang**. The student chapter website has been updated and its new web address is http://earth.sysu.edu.cn/iamg/.

IAMG Student Travel Grants

The purpose of the IAMG Student Travel Grant Program is to provide assistance for IAMG student members to attend and give presentations at the IAMG Annual Conference and other conferences sponsored by the IAMG.

The following students were awarded grants in 2009 to attend the MatGEO09 Workshop in Freiburg, Germany:

Güne Ertunc, Turkey

Mohamed Kort USD, France

Mauricio Bermudez. Germany

Muhammad Awais Yahya, Germany

Khalid Amin Khan, Pakistan

Conference Report

3rd I+D+iGME one-day Conference

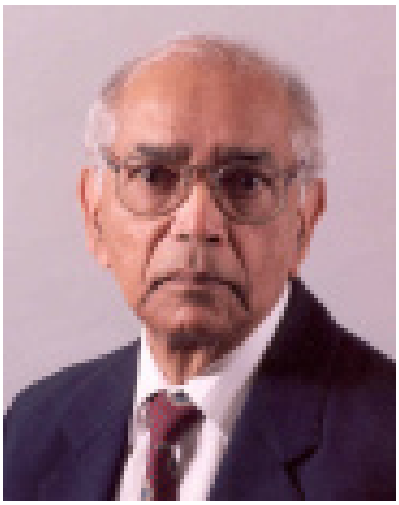
The Instituto Geológico y Minero de España (IGME = Geological Survey of Spain), www.igme.es, had its 3rd I+D+iGME one-day Conference in Madrid, March 26th 2010. The title of the Conference was "Nuevas aplicaciones de las geomatemáticas en Ciencias de la Tierra" (New applications of geomathematics in Earth Sciences). There were 70 participants from diverse areas of the Earth Sciences in Spain. The presentations included keynote lectures by Vera Pawlowsky-Glahn (Universidad de Girona), Juan José Egozcue-Rubi (Universidad Politécnica de Cataluña), Mario Chica-Olmo (Universidad de Granada) and Eulogio Pardo-Igúzquiza (IGME), followed by a round table with presentations by Carolina Guardiola-Albert (IGME), Juan Plata-Torres (IGME) and Juan Grima-Olmedo (IGME) and questions and comments from the participants.

The coordinators of the Conference were Juan José Durán-Valsero (IGME) and Eulogio Pardo-Igúzquiza.

India Science Award for Eminent Statistician C.R. Rao

Eminent statistician C.R. Rao has been named for India's top science award in recognition of his distinguished services to the country.

The India Science Award, instituted by the union government under the science and technology department in 2006, carries Rs.2.5 million (Rs.25 lakh) cash prize, a citation and a gold medal.



The award is announced and presented every year at the Indian Science Congress (ISC) to an outstanding scientist.

Though little known in India barring academic and scientific circles, nonagenerian Rao lives in the US in Pennsylvania.

Intervening during the presentation of other science awards by Prime Minister Manmohan Singh at the inaugural session of ISC 2010 , Indian Science Congress Association general president G. Madhavan Nair told the audience that Science Award for 2010 goes to C.R. Rao.

"Though many of you are aware of popular C.N.R. Rao, the prestigious India Science Award for 2010 goes to Calyampudi Radhakrishna Rao or C.R. Rao in short," Nair said evoking laughter and resounding applause.

Incidentally, distinguished scientist C.N.R. Rao was the first recipient of the India Science Award in 2006.

Rated as one of the brightest stars in the Indian sky of statistics and mathematics, the 90-year-old C.R. Rao was born at Hadagali in Bellary district of north Karnataka.

The statistical wizard caught the attention of the world with his 'theory of estimation'. He was made Fellow of the Royal Society, Britain.

After post-graduation in statistics from Calcutta University, Rao joined the Indian Statistical Institute (ISI) as a technical apprentice in mid-forties.

Padma Bhushan Rao did his doctorate (PhD) from Cambridge University in Britain under the guidance of Ronald A. Fisher, a distinguished English statistician (1890-1962).

On his return to India, Rao re-joined ISI as a professor. He, however, left ISI in 1978 to join University of Pittsburgh in the US.

Rao was honored by President George W. Bush in 2002 with the prestigious National Medal of Science "as a prophet of new age" with the citation "for his pioneering contributions to the foundations of statistical theory and multivariate statistical methodology and their applications, enriching the physical, biological, mathematical, economic and engineering sciences."

Technical terms such as, Cramer-Rao inequality, Rao-Blackwellization, Rao's Score Test, Fisher-Rao and Rao Theorems on second order efficiency of an estimator, and Analysis of Dispersion in multivariate analysis appear in all standard books on statistics. Cramer-Rao Bound and Rao-Blackwellization are the most frequently quoted key words in statistical and engineering literature. Special uses of Cramer-Rao Bound under the technical term, Quantum Cramer- Rao Bound have appeared in Quantum Physics. Rao-Blackwellization has found applications in adaptive sampling, particle filtering in high-dimensional state spaces, dynamic Bayesian networks etc. These results have led to contributions of strategic significance to signal detection, tracking of non-friendly planes and recognition of objects by shape. Other contributions of great practical significance are Rao's U-test in multivariate analysis, and orthogonal arrays used in industrial experimentation. More specialized contributions bearing his name are Fisher-Rao metric, Rao distance, Rao measure, Generalized inverse of matrices, Raos's quadratic entropy and Lau-Rao-Shanbhag theorems on characterization of probability distributions.

by IANS - Thaindian News
and European Academy of Sciences
and thanks to Richard Reyment

Early Landmark Quantitative Geological Publications

by Dan Merriam - IAMG Historian

A half-century ago there appeared several landmark publications on quantitative geology. Because of the rapid acceptance and use of these quantitative methods, these contributions have largely been superseded and some instances forgotten. What were some of these landmarks?

The first one was by Robert L. Miller, a geologist, and James Steven Kahn, a statistician, who wrote a book entitled 'Statistical Analysis in the Geological Sciences' published in 1962. Miller was at the University of Chicago and had a background in sedimentology and biometrics. Kahn was at the Lawrence Radiation Laboratory in Livermore, California and was an expert in sedimentary petrofabric analysis and sampling procedures. They gave a concise history of the application of statistical analysis in geology citing examples in three major stages of development of the subject. Some of the examples were by well-known geologists/paleontologists such as George Gaylord Simpson, William C. Krumbein, John C. Griffiths, and Felix Chayes. They state in the Preface that '...the purpose of this book is to present a reasonable general survey of methods of statistical analysis....within the geological sciences' and they do just that. Subjects included probability, statistical inference, linear regression, multivariate analysis, and time series among others. The statistics were fairly heavy going and the book was definitely well ahead of its time.

In 1964 Alan B. Shaw published his book 'Time in Stratigraphy,' '...a modern quantitative approach to the use of fossils in stratigraphy.' Shaw taught at the University of Wyoming and later worked in the petroleum industry. His background was in palynology and invertebrate paleontology. He stated in the Preface that 'This book is avowedly missionary.' Subject matter included sedimentation in epeiric seas, paleontologic correlation, sampling, and a graphic method for showing paleontologic correlations. It was another contribution definitely well ahead of its time.

William C. Krumbein, a geologist, and Franklin A. Graybill, a statistician, produced their book 'An Introduction to Statistical Models in Geology' in 1965. They noted their reasons for writing the book in their Preface: "During the past ten years several new elements have entered application of statistics to geology. One is an increasing shift from descriptive to analytical statistics, largely through greater use of formal statistical modes. A second element is the growing emphasis on multivariate rather than univariate modes of analysis, brought about mainly by increased availability of the high-speed computer. A third element is the rapid increase in the literature on geological models and their mathematical implementation by statistical counterparts".

This quote sums up the status of the subject well at the mid-1960s mark. Their subjects included statistics, models, numerical data, populations, sampling, analysis-of-variance and linear models, and matrices and vectors. Krumbein, of course, was on the faculty at Northwestern and Graybill was at Colorado State. At the University of Chicago where Krumbein received his doctorate, he was a room mate of M. King Hubbert - a coincidence of Krumbein's interest in numerical geology? Krumbein has been called the *Father of Computer Geology*, because in 1956 he published with coauthor Larry Sloss one of the first computer programs for use by sedimentologists. It was program written in the SOAP programming language that calculated moments and other statistics of grain-size distributions.

Another sedimentologist, John Cedric Griffiths, published his landmark book, 'Scientific Method in Analysis of Sediments' in 1967. Griffiths was a professor at Pennsylvanian State University and had worked in the oil patch prior to teaching at Penn State. He, too, as Krumbein who enlisted Graybill as a co-author, had statisticians check his work and acknowledged their help. His book focused on sediments and their sampling, measurements, distribution, and analysis. Griffiths summarized his book in the following words, 'The defining equation represents the inter-relationships among the fundamental properties of aggregates and may be used as a basis for mathematical formulation of many problems, dealing with their constitution and behavior.' Griffiths has been referred to as the *Dean of Geomathematicians* in recognition of his work..

'Computer Applications in Stratigraphic Analysis' was a book authored by John W. Harbaugh and Daniel F. Merriam and appeared in 1968. By this time computer use had come into use and numerous quantitative methods had been programmed for use on the computer. Harbaugh and Merriam state in the Preface that 'The purpose of this book is to explain and illustrate some of the principal methods of analysis of stratigraphic data by high-speed, electronic digital computers.'

Harbaugh was a professor at Stanford University and Merriam a scientist at the Kansas Geological Survey at the University of Kansas. Their book essentially was the first computer-oriented book on the subject and included the topics of mapping techniques such as time-trend, polynomial trend, and harmonic trend analysis, classification systems, and simulation. The book contained a list of references on computers and programming, glossaries and dictionaries of terms, statistics of geological properties, and sources of computer programs of interest to earth scientists. Many of their examples were based on computer programs and applications published by the Kansas Geological Survey in the *Special Distribution Series* and *Computer Contributions*.

Another book, 'Multivariate Morphometrics,' appeared in 1971 coauthored by R.E. Blackith, a zoologist/statistician, and R.A. Reyment, a geologist. Blackith was on the faculty at Trinity College in Dublin, Ireland, and Reyment at the Paleontological Institute in Uppsala, Sweden. They note in their Preface that '...so far as we know, [this is] the first textbook on morphometrics, apart from specialist works...' Some of the subjects included were multivariate morphometrics, canonical variates and correlation, principal components, factor analysis, cluster analysis, and trend-surface analysis - all statistical techniques used in the analysis of paleontologic data. Reyment was instrumental in founding the International Association for Mathematical Geology (IAMG) at the ill-fated International Geological Congress (IGC) in Prague in 1968.

All of these books listed here were intended for use as textbooks in the subject especially in upper level undergraduate and graduate courses in geology and related disciplines. They, also, served as references on the subjects.

This early phase in the development of application of quantitative techniques in the earth sciences essentially ended with the publication of John C. Davis' book 'Statistics and Data Analysis in Geology' in 1973, and Frits Agterberg's book 'Geomathematics,' published in 1974. By the mid-1970s, the use of quantitative techniques implemented on computers was generally accepted by earth scientists, the IAMG was a functioning society as were numerous local and regional interest groups, and several specialized publications were available including the *Journal of Mathematical Geology* with *Computers & Geosciences* just on the horizon. The geological sciences had entered the quantitative stage.

Acknowledgment: I would like to thank John Davis for critically reading the manuscript and suggesting several changes that improved the content and presentation.

(to be continued)

IAMG Journal Report

Natural Resources Research

The hand-off of the editor-in-chief position from Jerry Jensen to myself is now complete. I think I speak on behalf of the IAMG membership and NRRs many authors and readers when I say that Jerry has done a terrific job and is well deserving of our gratitude and best wishes for the future.

Now that the steep part of the new editor's learning curve is behind me, I am turning my attention to issues beyond the daily management of the journal. We recently learned from our publisher (Springer) that NRRs application to ISI was rejected due to low citation activity. An ISI listing is important because many institutions require their members to publish in journals with an ISI impact factor above a certain threshold.

We have learned that ISI calculates impact factors using *only* citations from ISI listed journals. By that criterion, NRR would have an ISI impact factor of 0.143 as opposed to 0.66 as measured by Scimago which uses citations from a much broader range of journals. Not only do we need more papers and more citations, these citations must be in ISI listed journals – which apparently do not include the kinds of journals that would cite NRR papers! I encourage IAMG members to consider NRR when submitting a paper for publication and to cite NRR papers whenever appropriate.

A number of NRR editorial board members have indicated a desire to relinquish their duties. During the next few months I will be looking for new board members with the aim of augmenting the diversity of regions and specialties represented. If you have an interest in this area, please let me know. I am particularly interested in board members from India, China, and other regions outside Europe and North America. We are receiving an increasing number of submissions from scientists from these countries, a trend we want to encourage.

I can be reached at klong@usgs.gov.

Keith R. Long
Editor-in-Chief

NRR Report from an ex-editor

As the last of my NRR editorial responsibilities fades over the horizon, I'd like to put in a good word for the journal. While NRR is still a work in progress, the signs are that it is growing in stature and is helping the association to meet its publications objectives. Not all the news is good; as Keith Long reports elsewhere, the request for ISI listing was declined. Other measures however, such as the NRR's 'A' ranking in the Australian journal ranking exercise (www.arc.gov.au/era/PCE09_trial.htm), suggest that NRR plays an important role in the environmental sciences and resources engineering areas. Keep those manuscripts coming!

I wish to thank everyone for their help during these past 3 years. I've learned a lot and appreciate the generosity and patience of authors and reviewers. Being an editor is quite different than being an author or reviewer and I'm thankful I was given the opportunity. A long time ago, when I was fussing about reviews and inept editors, a colleague pointed out that they are just ordinary folk trying to do the best they can with limited time and resources. I didn't accept that proposition at the time, but I heartily endorse it now.

Jerry L. Jensen

JOURNAL CONTENTS

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Mathematical Geosciences

Volume 42, Number 1 January 2010

Compressed History Matching: Exploiting Transform-Domain Sparsity for Regularization of Nonlinear Dynamic Data Integration Problems — Behnam Jafarpour, Vivek K. Goyal, Dennis B. McLaughlin and William T. Freeman

Pebbles, Shapes, and Equilibria — Gábor Domokos, András Sipos, Tímea Szabó and Péter Várkonyi

Measurement of Areas on a Sphere Using Fibonacci and Latitude–Longitude Lattices — Álvaro González

High-order Statistics of Spatial Random Fields: Exploring Spatial Cumulants for Modeling Complex Non-Gaussian and Non-linear Phenomena

New Books

John Stuart Webb, F. R. Eng., and the history of Applied Geochemistry at Imperial College, London

The death of the English pioneer of applied geochemistry, Emeritus Professor John Stuart Webb in April 2007 marked the end of an era. Under his leadership, the science of exploration geochemistry for orebodies broadened out to embrace regional geochemistry; applied marine geochemistry (especially the investigation of metalliferous brines and manganese nodules); agricultural, and environmental geochemistry; multi-purpose geochemical mapping ; and, in more recent years, urban geochemistry. This work was undertaken in the Geochemical Prospecting Research Centre (later renamed the Applied Geochemistry Research Group) established by him in 1954 in the Department of Geology, Royal School of Mines, Imperial College of Science and Technology, London.

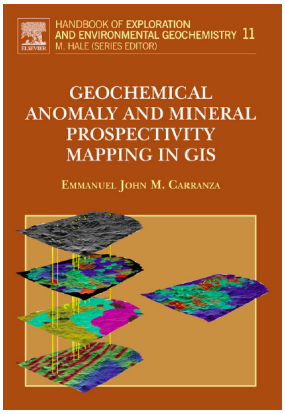
In order to commemorate his life and work, a number of former members of his research group have put together a group of papers on Webb, and the work of his associates and students in the Geochemical Prospecting Research Centre and Applied Geochemistry Research Group. These will be published, in August 2010, by the Geological Society of London as Volume 10, part 3, of the journal *Geochemistry: Exploration Environment Analysis*.

The contents of this issue will be as follows: **R.J. Howarth**, Introduction; **R.J. Howarth**, John Stuart Webb, F.R.Eng., and Applied Geochemistry at the Imperial College of Science and Technology, London; **G.J.S. Govett**, Early years in the Geochemical Prospecting Research Centre, Imperial College of Science and Technology, London: exploration geochemistry in Zambia in the late 1950s; a personal recollection; **M. Thompson**, Analytical methodology in the Applied Geochemistry Research Group (1950-1988) at the Imperial College of Science and Technology, London; **M. Hale**, Gas geochemistry and deeply buried mineral deposits: the contribution of the Applied Geochemistry Research Group, Imperial College of Science and Technology, London; **C.R.M. Butt & R.H. Mazzucchelli**, The legacy of John Webb and the Applied Geochemistry Research Group, Imperial College of Science and Technology, London, to geochemical exploration in Australia; **R.J. Howarth** and **R.G. Garrett**, Statistical Analysis and Data Display at the Geochemical Prospecting Research Centre and Applied Geochemistry Research Group, Imperial College, London; **D.S. Cronan**, A synthesis of Applied Geochemistry Research Group and consequent research at the Imperial College of Science and Technology, London, into establishing geochemical exploration techniques for marine minerals; **I. Thornton**, Research in Applied Environmental Geochemistry – with particular reference to geochemistry and health; **C.J. Moon**, Geochemical exploration in Cornwall and Devon: A review.

Non-members of the Association of Applied Geochemists, and other non-subscribers to the journal, may purchase single copies of this special issue for £25 (including postage). Anyone who wishes to pre-order it should contact: The Geological Society Publishing House (Unit 7, Brassmill Enterprise Centre , Brassmill Lane, Bath, BA1 3JN , UK), email: sales@geolsoc.org.uk; Tel: +44 (0)1225 445046; Fax: +44 (0)1225 442836, and an order form will be sent to you in response. Closer to the time of publication it will have an entry in the Geological Society of London's online bookshop (www.geolsoc.org.uk/bookshop).

Richard J. Howarth
(special issue editor)

GEOCHEMICAL ANOMALY AND MINERAL PROSPECTIVITY MAPPING IN GIS



Geochemical Anomaly and Mineral Prospectivity Mapping in GIS, 11

By E.J.M. Carranza, ITC, Enschede, The Netherlands

Included in series Handbook of Exploration and Environmental Geochemistry, 11

The book documents and explains, in three parts, geochemical anomaly and mineral prospectivity mapping by using a geographic information system (GIS).

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Hardbound, 368 pages, publication date: Nov-2008
ISBN-13: 978-0-444-51325-0
ISBN-10: 0-444-51325-6
Imprint: ELSEVIER

— Roussos Dimitrakopoulos, Hussein Mustapha and Erwan Gloaguen

Estimating Intrinsic Formation Constants of Mineral Surface Species Using a Genetic Algorithm — Adrián Villegas-Jiménez and Alfonso Mucci

Log-Ratio Analysis Is a Limiting Case of Correspondence Analysis — Michael Greenacre

A.F. Zuur, E.N. Ieno, E.H.W.G. Meesters: A Beginner's Guide to R. Springer, Dordrecht, 2009, 218 pp., $59.95, soft cover, ISBN: 978-0-387-93836-3 — W. E. Sharp

The Editor's Best Reviewer Awards 2008–2009

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Marco A.R. Ferreira, Herbert K.H. Lee: Multiscale Modeling—A Bayesian Perspective. Springer Series in Statistics, Springer, 2007, XII, 252 pages, US $79.95, ISBN: 978-0-387-70897-3 — Abderrezak Bouchedda

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D.D. Sarma: Geostatistics with Applications in Earth Sciences, 2nd edn. Springer, Dordrecht, and Capital Publishing Company, New Delhi, 2009, xvii+ 205 pages, hardback, ISBN 978-1-4020-9379-1, Eur 79.95, CHF124.50, US$99.00, £72.00 — R. Webster

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Orientation Distribution Within a Single Hematite Crystal — Ralf Hielscher, Helmut Schaeben and Heinrich Siemes

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Upcoming Meetings

7th International Conference on Physical Modelling in Geotechnics, Zurich, Switzerland, **28 June - 1 July 2010**. http://www.icpmg2010.ch

COMPOSITIONAL DATA ANALYSIS - Short course and open seminar. Barcelona, Spain, **5-9 July 2010**. Website: http://congress.cimne.com/codawork10/frontal/default.asp. Contact: codawork@cimne.upc.edu

JOINT STATISTICAL MEETINGS, American Statistical Association, Vancouver, British Columbia, Canada, **31 July - 5 August 2010**. Phone (888) 231-3473, http://www.amstat.org/meetings/jsm/2010/index.cfm

AGU Joint Assembly, Iguassu Falls, Brazil, **8 - 13 August 2010**. Co-sponsored by the Brazilian Geophysical Society, IASPEI, and many other Latin-American organizations. http://www.agu.org/meetings/ja10

Water-Rock Interaction (WRI-13), Guanajuato, Mexico, **16 - 20 August 2010**. http://wri13.cicese.mx

20th General Meeting of the International Mineralogical Association (20th IMA GM), Budapest, Hungary, **21 - 27 August 2010**. Quadrennial world meeting of geochemistry and mineral sciences. www.ima2010.org

5th Mid-European Clay Conference (MECC2010) Budapest, Hungary, **25 - 29 August 2010**. www.mecc2010.org

IAMG 2010, Eötvös Lóránd University, Budapest, Hungary, **29 August - 2 September 2010**. http://www.iamg2010-budapest.hu/

The 11th Congress of the International Association for Engineering Geology and the Environment. (IAEG2010), SkyCity Convention Centre, Auckland, New Zealand, **5-10 Sep 2010**. IAEG. Phone: +64 9 360 1240, Fax: +64 9 360 1242, EMail: iaeg2010@tcc.co.nz, Web: http://www.iaeg2010.com

GeoENV 2010, 8th International Conference on Geostatistics for Environmental Applications, Gent, Belgium, **13th - 15th September 2010.** http://www.geoenv.ugent.be/

EAGE Geomodel 2010 (in Russian), Gelendzhik, Russia, **13 - 17 September 2010**. http://www.eage.org/events/index.php?eventid=484

SPE Annual Technical Conference and Exhibition, Florence, Italy, **20 - 22 Sept 2010**. http://www.spe.org/atce/2010/

AEG Annual Meeting, Charleston, SC, United States, **20 - 25 Sept. 2010**. Association of Environmental & Engineering Geologists. http://www.aegweb.org/i4a/pages/index.cfm?pageID=4565

Society of Economic Geologists, 2010 Conference, Keystone, Colorado, USA, **30 September - 9 October 2010.** Phone: 720.981.7882, ext. 210, FAX: 720.981.7874, EMail: seg@segweb.org, http://www.seg2010.org/

SEG (Society of Exploration Geophysicists) 80th Annual Meeting, Denver, Colorado, U.S.A., **17–22 October 2010**. meetings@seg.org

Geological Society of America (GSA), Denver, CO, USA, **31 October - 3 November 2010**. www.geosociety.org/meetings/2010/

AGU Fall Meeting. San Francisco, California, USA, **13 - 17 December 2010**. Contact: armelle.sedibud@gmail.com, http://www.agu.org/meetings/

SIAM Conference on Mathematical & Computational Issues in the Geosciences (GS11), Long Beach, California, USA, **21-24 March 2011**. http://www.siam.org/meetings/gs11/

AAPG, Annual Convention & Exhibition, Houston, USA, **10 - 13 April 2011**.

CoDaWork'11: International Workshop on COMPOSITIONAL DATA ANALYSIS. Sant Feliu de Guixols (Girona), Spain. **9-13 May 2011**. Website: http://congress.cimne.com/codawork11/frontal/default.asp. Contact: codawork@cimne.upc.edu

2011 JOINT STATISTICAL MEETINGS, Miami Beach, Florida, USA, **30 July - 04 August 2011**. ASA Meetings, Phone: (888) 231-3473, Fax: 703-684-8069, Email: meetings@amstat.org

INTERNATIONAL STATISTICAL INSTITUTE, 58th ISI World Statistics Congress: Includes meetings of the Bernoulli Society, the International Association for Statistical Computing, the International Association of Survey Statisticians, the International Association for Official Statistics, the International Association for Statistics Education, the Irving Fisher Committee on Central Bank Statistics, the International Society for Business and Industrial Statistics, and The International Environmetrics Society, with an invited session of IAMG, to be held in Dublin, Ireland, **21 - 26 August 2011**. ISI Permanent Office, P.O. Box 24070, 2490 AB The Hague, The Netherlands. Phone: +31–70–3375737, Fax: +31–70–3860025, E-mail: isi @cbs.nl, Website: http://www.isi2011.ie/

IAMG 2011, Salzburg, Austria, **5 - 9 September 2011**

ModelCare 2011, The 8th International Conference on Calibration and Reliability in Groundwater Modelling. Organised by Helmholtz Centre for Environmental Research. Leipzig, Germany, **19 - 22 September 2011**. Website: modelcare2011@fu-confirm.de

GSA Annual Meeting, Minneapolis, Minnesota, USA, **9 - 12 October 2011**. http://www.geosociety.org/meetings/2011/index.htm

The Mining Pribram Symposium, Pribram, Czech Republic, **10 - 14 October 2011**. Joint meeting of the Working Group for Geoethics established by AGID. Contact: lidmila.nemcova@quick.cz, http://www.bgs.ac.uk/agid

34TH INTERNATIONAL GEOLOGICAL CONGRESS (IGC), Brisbane Australia, **2-10 August 2012**. Includes IAMG symposia and General Assembly. http://www.34igc.org

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IAMG 2011 in Salzburg

"Mathematical Geosciences at the Crossroads of Theory and Practice"

Besides covering IAMG core topics like geostatistics, reservoir modelling, 3D modelling or geo-process modelling, the IAMG 2011 in Salzburg, Austria, shall address mathematical geosciences issues which are specific to alpine regions. Austria keeps many society-relevant challenges for applied geosciences: examples are water resource management in mountainous regions, engineering geological problems linked to traffic infrastructure construction, or the handling of geo-hazards such as land slides and rock fall in densely populated alpine valleys. Bridging theory and practice, the IAMG 2011 shall be a forum for exchanging mutual ideas on theory and practical application of a broad spectrum of mathematical geosciences.

Moreover, as from the close association of the Salzburg based Austrian Academy of Sciences GIScience Research Institute and the University of Salzburg Centre for Geoinformatics, GIS and remote sensing with an emphasis on object based image analysis as well as non-destructive 3D reconstruction of rock macro- and microstructures will be highlighted.

The conference will be jointly run by the following two institutions:

Austrian Academy of Sciences GIScience Research Institute ÖAW-GIScience, www.oeaw.ac.at/GIScience

University of Salzburg Centre for Geoinformatics Z_GIS, www.zgis.at.

Conference Chair: **R. Marschallinger** (ÖAW&Univ. Salzburg, AT) Conference Vice Chair: **F. Zobl** (ÖAW, AT)

IAMG 2011 Conference Secretariat: e-mail: iamg2011@oeaw.ac.at web: www.oeaw-giscience.

INTERNATIONAL ASSOCIATION FOR MATHEMATICAL GEOSCIENCES
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❑ Check this box to exclude your name from the IAMG web site electronic directory.

IAMG DUES (for membership benefits, see the IAMG web page at www.iamg.org)

❑	Ordinary member – 1 year	US$	12.00
❑	Ordinary member – 4 years	US$	48.00
❑	Ordinary member – Lifetime	US$	144.00
❑	Student member (proof of enrollment required)	US$	6.00
❑	Institutional member (includes library subscriptions to all 3 journals, etc)	US$	3,500.00

OPTIONAL: Discounted rates on our journals

❑	Mathematical Geosciences (print and electronic versions), regular	US$	45.00
❑	Mathematical Geosciences (print and electronic versions), student (proof of enrollment required)	US$	22.50
❑	Computers & Geosciences, regular	US$	96.00
❑	Computers & Geosciences, student (proof of enrollment required)	US$	48.00
❑	Computers & Geosciences, electronic subscription, regular or student	US$	47.00
❑	Natural Resources Research	US$	55.00

OPTIONAL: IAMG Monograph Series

❑	#5: “Computers in Geology: 25 Years of Progress” edited by J.C. Davis and U.C. Herzfeld.	US$	127.50
❑	#6: “Modern Spatiotemporal Geostatistics” by George Christakos	US$	82.50
❑	#7: “Geostatistical Analysis of Compositional Data” by V. Pawlowsky-Glahn and R.A. Olea	US$	82.50
❑	#8: “Statistical Methods for Estimating Petroleum Resources” by P. J. Lee	US$	93.75

OPTIONAL: CD’s

❑	Computers & Geosciences Silver CD: 25 years of computer code	US$	25.00
❑	Proceedings IAMG'2001 in Cancun	US$	10.00
❑	Proceedings IAMG'2002 in Berlin	US$	10.00
❑	Proceedings IAMG'2003 in Portsmouth	US$	10.00
❑	Proceedings IAMG'2005 in Toronto	US$	10.00
❑	Proceedings IAMG'2006 in Liège	US$	10.00
❑	Proceedings IAMG'2007 in Beijing	US$	10.00

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Budapest
August 28-29, 2010

Jointly sponsored by :

International Mineralogical Association
IMA
IMA-CAM Commission
for Applied Mineralogy

International Society for
Mathematical Geosciences

International Society for
Stereology & Image Analysis

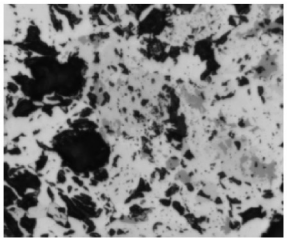
International Short Course

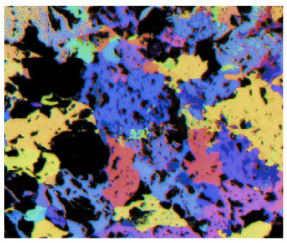
Quantitative Image Analysis of Minerals and Rocks

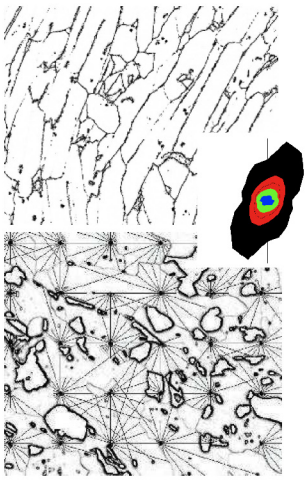
The two day Short Course is intended to initiate mineralogists and geologists to the use of quantitative tools in microscopy. This includes the appropriate use of image acquisition technologies in 2D and 3D, as well as an introduction to the principles of stereology and image analysis. Particular attention will be given to the measurement of size and shape distributions of grains and particles as well as to the fabric and textural properties of rocks.

The Short Course will be taught by leading scientists in their fields who will illustrate theoretical aspects with a series of case studies in mineralogy, particle science and petrography.

This Short Course is being organized in between IMA2010 and IAMG2010 both held in Budapest. Participants are warmly invited to attend these international conferences.







About the lecturers :

Patrick Launeau *is professor at Université de Nantes (FR). He published several papers on the quantitative analysis of rock fabrics with special attention to the use of intercepts. He is also involved in imaging and remote sensing of natural environments.*

Eric Pirard *is professor at Université de Liège (BE). He has extensive experience in quantitative image analysis of ores and particle characterization. His interest for geo-imaging also includes remote sensing and industrial vision of ornamental stones and aggregates.*

Indicative Short Course Program

Day 1

Welcome
Image Analysis vs. Stereology
From minerals to pixels :
- *Sampling and probing rocks*
- *Digital imaging techniques*

Classification of pixels
- *Spectral tools*
- *Spatial tools*

Modal analysis of rocks
Individual Blob/Grain analysis
- *Size parameters*
- *Shape parameters*

Day 2

Fabric analysis
- *Shape preferred orientation (SPO) vs. strain quantification.*
- *Intercepts in digital images : a tool to analyze interconnection of grains in rocks vs. inertia tensor of individualized grains*
- *Ellipsoid of SPO and strain by combining 3 ⊥ images.*

Applications to various images from SEM microscopy to field.
Open discussion with participants based on their own samples.

Number of participants: min. 12 - Max. 24
Price per participant: 150 € (incl. coffee breaks, lunch, closing event)
260 € (for participants not registering for either IMA 2010, MECC2010 or IAMG 2010)
For more information, please contact : gemme@ulg.ac.be