No. 86 June 2013

IAMG Newsletter

Official Newsletter of the International Association for Mathematical Geosciences

Contents

New Student Research Grants available now for 2013!

The Association invites all students to apply for

Computers & Geosciences
Natural Resources Research
or
Mathematical Geosciences
Research Grants

Application Deadline: June 30, 2013

For general guidelines see page 8 in this publication. For more details for each of these grants please see the IAMG website http://www.iamg.org and click on Student Research Grants Program under the Student Affairs Menu. There is also a link to the new Application Form.

Candidates eligible to apply are currently undertaking Masters or Ph. D. studies and wish to use the award to conduct a period of research related to their thesis, or newly qualified Post Doctoral scientists who are within three years following the completion of their Ph. D. studies at the deadline for application.

Realities of royalties. - IAMG's budget depends to a large degree on royalties from its publications. Elsevier, publisher of our journal Computers & Geosciences, has been paying the largest amount. That contract came up for renewal last year and Graeme Bonham-Carter has applied a lot of time and diplomatic skills in renegotiating the best conditions available for IAMG. The new contract includes a clause, insisted on by the publisher, that $10,000 of the royalties be disbursed for student research grants each year. At first they proposed that the grants be named "Elsevier Grants" but Graeme negotiated the name to be changed to "Computers & Geosciences Research Scholarships". This represents a major change in the way IAMG student grants have been administered. To soften the dominance of C&G as grant giver the Council agreed to establish grants from the other two journals, Mathematical Geosciences and Natural Resources Research, as well. More about these grants and guidelines on page 8.

While giving money to student grants is certainly a worthwhile and laudable system, there has been a movement accusing the large science publishers such as Elsevier of monopolizing the academic publishing industry and improperly benefiting from selling intellectual property that they receive for free from authors who publish in their journals. Last year many mathematicians started a movement titled "The Cost of Knowledge" to boycott Elsevier. Much of the published research comes from projects paid for by government grants (taxpayer dollars or taxpayer euros) or private foundations. Authors turn over their papers to the publishers for free to be included in journals. So, the only expense for publishing houses is printing and marketing (and some royalties negotiated by societies such as IAMG), since much of the editing is done by peer reviewers and, as in our case, society journal editors like Jef Caers, John Carranza and Roussos Dimitrakopoulos. Yet the publishers require high subscription fees from libraries and even charge for articles downloaded from their websites (no printing and shipping costs!). To many scientists this presents an ethical dilemma regarding the idea of free distribution of knowledge.

Now, the problem for institutions like IAMG is that our journals are part of our identity and we rely on royalty income from our journals for our budget. We have been able to have low membership dues because of this income. If we don't like how Elsevier or Springer handles our journals, we could discontinue our relationship with these publishers. However, Elsevier owns the journal name and can continue to use it whether they pay us or not. Starting up a new journal with a new name would present serious obstacles, and it would take a long time to build name recognition and ISI impact factors to attract authors before generating enough income for the Association's budget. Therefore, IAMG's decision for the time being is to continue the relationship with our publishers as long as a suitable contract can be worked out.

Harald S. Poelchau

International Association for Mathematical Geosciences

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PRESIDENT'S FORUM

The past half year was busy and productive both for my personal life and for the management of IAMG. I have made a number of international trips and had the chance to chat with many IAMG members including our Council members and student members. I realize that there are very many things that need to be dealt with for the IAMG each day, week and month. Besides the enormously large e-mail communications among Executives, Council, Committees and other IAMG members, I have had phone communications and met in person with Frits Agterberg, Secretary General, on a number of occasions. In my view as the president of IAMG, I should have two hands to work for the Association: on the one hand, I need to work hard with my team to make sure IAMG business is dealt with wisely and efficiently to maintain our dynamic association; on the other hand, I want to work collectively with IAMG members to explore new opportunities. One of the questions I have had for a long time is what should be the vision of IAMG, at least for the term of the current Council? I should say that it is not easy to develop a vision and I am not quite sure if I eventually will find a vision for IAMG. But in my president's forum published in the previous issue of the NL I included a request asking our members to contribute suggestions about what IAMG should do. These types of suggestions will provide a base for the formulation of a vision. There have been lots of valuable suggestions about running the IAMG and some of these have been already incorporated in the decisions made. I will remain open to further suggestions for discussion of the IAMG vision. In this report I will only introduce some of the activities and resolutions made by the Council over the past several months.

I ought to acknowledge that the IAMG Executives, Council members and many other members are much engaged in keeping the Association's business current. The assistance of Regina van den Boogaart in the Office is invaluable. Important issues have had broader discussions within Council with inputs from other invited participants as well. In this message I am including some remarks on recent progress made by our various committees in order to keep IAMG members informed, and I am also outlining some new issues dealt with by Council collectively.

I am very pleased to congratulate the Organizing Committee of IAMG2013, chaired by Eulogio Pardo Igúzquiza. It has informed the Executive, via the Meetings Committee, that more than 350 abstracts have been received before the deadline for submissions, thus ensuring that IAMG2013 will be a huge success this year. Various keynote lectures have been scheduled. Business meetings for IAMG committees are being arranged to be held during the Conference. Various awards will be offered and celebrated at the conference. I am looking forward to meeting you at the IAMG2013 in Madrid.

The budgets for 2013 and 2014 have been developed, discussed and approved by the Council. Details of numbers can be found in the Treasurer's report on the IAMG website. I can tell that IAMG not only maintains a healthy balanced budget but also creates new activities including new Grants for Students or Postdocs partially due to revenue from our contracts with Elsevier for 2012 and 2013.

This year IAMG offers its student grants from the 2012 competition for which four student winners have been selected by the Student Affairs Committee chaired by Helmut Schaeben. For 2013, new student grants associated with our three Journals have been established which will be awarded to up to nine students or postdoctoral follows each with a monetary prize of at least US $2500. New committees will make the selections for these grants. Guidelines have been developed with the help of the Publications Committee chaired by Graeme Bonham-Carter in consultation with Executive and Publishers. In this issue of newsletter you will find the call for applications for these grants. I encourage all our IAMG members to spread this information to your own and other students who may be interested in submitting applications. The winners will receive their awards at the IAMG annual conference (if they are attending).

The Outreach Committee chaired by Frits Agterberg has been coordinating with Prof. Eduardo de Mulder and his Earth Science Matters team to work on "Compositional Data Analysis" for special outreach. The first results of this will be presented at the IAMG2013 Conference.

The IAMG Awards Committee chaired by Jack Schuenemeyer has selected excellent winners for the two IAMG awards to be presented at IAMG2013. They are Dr. Raimon Tolosana-Delgado (Spain) for the Chayes Prize and Dr. Grégoire Mariethoz (Australia) for the Vistelius Research Award. Both award winners will deliver keynote presentations in Madrid.

The IAMG Lectures Committee chaired by Jennifer McKinley (IAMG Executive VP) has selected Dr. Peter A. Dowd (University of Adelaide, Australia) as the 2013 George Matheron Lecturer, and Dr. Eric Grunsky as the this year's Distinguished Lecturer. Both will make presentations at IAMG2013.

The Meetings Committee (MC) chaired by Ricardo Olea has reported excellent progress on the organization of IAMG2013 and IAMG2014 which are in good standing. MC has received a proposal from Helmut Schaeben, Gerald van den Boogaart and Raimon Tolosana-Delgado which has been approved by Council for hosting the IAMG2015 Annual Conference in Freiberg, Germany. The local organizing committee proposes that IAMG2015 and subsequent annual conferences should be integral operations within IAMG rather than independent operations as they are currently being organized. The pros and cons of his proposal for possible change in philosophy of organizing IAMG annual conferences was discussed within Council. The Executive feels there is a need to thoroughly evaluate the situation and make wise decisions on long term planning. The Council has decided to form a new Meetings Strategy Commission (MSC) chaired by Vice President Raimon Tolosana-Delgado, with two members from the current MC (Jenny, Ricardo), and the Treasurer (David). The main objective and task of the new commission is to coordinate discussions about how to offer conferences that benefit IAMG both by increasing scientific standards and financial profitability. The main change to be considered is to modify the guidelines for financial responsibility of running the annual conference. Such changes are to encourage proposals for hosting annual conferences from local teams from broader regions, especially from places and teams with less experience in hosting conferences; and to increase the profitability for IAMG. MSC will also develop proposals for future revision of the Statutes concerned with our annual conferences to be approved by an Extraordinary General Assembly during IAMG2014.

IAMG should thank Graeme for his excellent leadership and long term involvement in IAMG. Following his suggestion, the Publications Committee will have Dr. Eric Grunsky as its new Chair. Graeme will continue to be our Archivist and I am sure he will always be available for any consultation to the new Committee Chair.

Summer just begins; I wish everybody to have a wonderful summer. For university members, I wish you a successful summer term of studies and good luck with your field work and travel to conferences. I am looking forward to meeting all of you at IAMG2013 in Madrid.

Qiuming Cheng

Association Business

Andrei Borisovich Vistelius Research Award: Grégoire Mariethoz

The winner of the 2013 Andrei Borisovich Vistelius Research Award is Grégoire Mariethoz.

The Andrei Borisovich Vistelius Research Award is awarded biennially to a young scientist for promising contributions in research in the application of mathematics or informatics in any field of the earth sciences. A recipient should be 35 years or younger at the end of the calendar year for which he or she has been selected for the award. Each recipient of the Andrei Borisovich Vistelius Research Award is a keynote speaker at the next IAMG conference or International Geological Congress (IGC), at which time the award is presented with an engraved plaque bearing the recipient's name.

Dr. Mariethoz is a professor at the School of Civil and Environmental Engineering, University of New South Wales in Sydney, Australia.

He did his graduate work in anthropology and his postgrad work in geohydrology, both at the University of Neuchatel, Switzerland finishing with a dissertation on "Geological stochastic imaging for aquifer characterization".

Grégoire's main research interests are in the development of stochastic methods that characterize the spatial and temporal variability inherent in hydrological systems. He has developed new numerical techniques using high-order, nonparametric statistics which allow using the full richness of modern data sets. His work is at the frontier between Earth modeling and computer science, with a strong emphasis on stochastic models, training images and example-based modeling.

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IAMG2015 Annual Conference in Freiberg

The IAMG Council has accepted a bid to hold the 2015 Annual Meeting in Freiburg, Germany, at the Bergakademie Freiberg, founded in 1765, making it the oldest mining university in the world. The offer was put together by Freiburg IAMG members Helmut **Schaeben** (Student Affairs Chair and recent Griffiths Award winner), Raimon **Tolosana**-Delgado (Vice President and 2013 Chayes Prize winner) and Gerald van den **Boogaart** (2003 recipient of the Vistelius Award).

Along with the approval of the Freiberg venue Council agreed that there should be a new **Meeting Strategy Commission**. The main mandate of this Commission will be to revise existing IAMG Annual Meeting Guidelines to accommodate the new idea that IAMG instead of the local organizers will be financially responsible for the finances of the annual meeting. This may apply for the first time for the 2015 Freiberg meeting. Raimon Tolosana-Delgado has been appointed chairman of this new Commission. Members of the Commission have not been appointed yet, but there will be a report and discussion at the Madrid meeting in September.

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Felix Chayes Prize: Raimon Tolosana-Delgado

The Felix Chayes Prize for Excellence in Research in Mathematical Petrology is a cash award that was endowed by gifts provided in 1996 by Chayes's widow, Dr. Irene Hendry Chayes, and his sister, Mrs. Natalie C. Tenney in 1997. At the meeting of the IAMG's General Assembly during the XXX International Geological Congress in Beijing in 1996, a memorial in honor of Felix Chayes was approved. Each recipient is to receive an engraved plaque bearing the recipient's name. The prize shall be given to recipients of exceptional potential and proven research ability. It shall be presented for outstanding contributions to statistical petrology or related applications of mathematics or informatics. Prospective recipients should be in mid-career.

The 2013 winner of the Chayes Prize, Dr. Raimon Tolosana-Delgado, is a researcher at the department of Geoscience Mathematics and Informatics of TU Bergakademie Freiberg and the Helmholtz-Zentrum Dresden-Rossendorf, Germany.

Raimon obtained his degree in Engineering Geology in 2001, a joint degree of the Technical University of Catalonia and the University of Barcelona (Spain). He got his PhD from the University of Girona (Spain) in 2005, and during that period worked for five months in Greifswald, Germany. From 2006-2008 he did research with Prof. Hilmar von Eynatten in Göttingen (Germany) and then spent a couple of years at UPC Barcelona before moving to Freiberg.

His primary research interests cover Bayesian statistics & modelling, Geostatistics, R (Statistics), and Compositional Data Statistical Analysis

Raimon received the 2007 Andrei Borisovich Vistelius Research Award. He is a Vice President of IAMG and one of the organizers of IAMG2015 in Freiberg.

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Report on the IAMG Website

The present IAMG website has been running in its present form since the beginning of 2008. At the Council Meeting in Brisbane in Sept. 2012 it was decided to take a new look to see if the website and the hosting server arrangement could be improved, especially since the original IAMG membership functions had been shifted from Kingston to Freiberg. A new **Website Commission** was established consisting of Dan **Tetzlaff** (Chair), Eric **Grunsky**, David **Collins**, Gerald van den **Boogaart**, Jenny **McKinley** as the non-voting ex officio member, and Harald **Poelchau**, the website editor. The main concern was that the host, Interspot, was charging us much more than appropriate since the Kingston account has been closed. After discussing various options ranging from a complete redevelopment and moving to a reasonably priced host to minimal changes of the present system, it was decided to accept the proposal from Dragonfly, the designer of our present website and our website manager, to migrate the website to their own server and charge us only $50 a month for hosting.

Shortly after the decision in late December 2012 we were notified that our website had been hacked, apparently with attempts to use it to get into the Bank of America. This prompted Dragonfly to close any editing access to iamg.org with the idea that we could have our new website up and running very quickly and replace the old compromised website.

Beginning in January 2013 Dragonfly started migrating the content of our website. Since then I have worked closely with them, but progress has been slow due to linking and formatting problems. In February I was given access to edit the old website again; I have been updating it since then in parallel with the new one. At this point the new website still needs a lot of work to make it ready to go live and replace the old website.

Harald S. Poelchau

Distinguished Lecturer News

2013 Distinguished Lecturer Pierre Goovaerts: a brief report

Since I received notification of being selected the 2013 IAMG Distinguished Lecturer I have been very busy contacting colleagues all over the world in an attempt to schedule talks in places where IAMG Annual Meetings are not normally held, following the IAMG guidelines for this award. More than 25 talks are already scheduled on all six continents! Ten lectures were given in six different countries between March 4 and April 19. The total audience exceeded 320 participants with an average of 60% students. Half of the talks were my general lecture on "Geostatistics in Practice", followed by the lecture on "Change of Support". I started my lecture tour with the Brazilian National Institute for Space Research – INPE located one hour away from Sao Paulo. I enjoyed a great audience and warm weather which provided a nice break from the long winter we are experiencing this year. This was followed by a two week-tour that brought me first to Morocco where I met colleagues at the Institut Agronomique et Vétérinaire Hassan II Rabat, with whom I studied in Belgium 20 years ago. I also gave a talk at the Office Cherifien des Phosphates (OCP) Benguerir, where the Mohamed VI Polytechnic University is being built in the heart of the new green city. From Morocco, I flew to Turkey to give a couple of talks at the Middle East Technical University in Ankara, which is the best ranked university in the country and has a strong engineering program. Colleagues there expressed interest in organizing one of the future IAMG conferences. I finished this two-week tour with a lecture on geostatistics and medical geology at the Conservatoire National des Arts et Métiers in Paris, France. This building also hosts the Foucault's Pendulum, named after the French physicist Jean Bernard Léon Foucault, who used it in 1851 to demonstrate the rotation of the Earth relative to an inertial frame. Just one week after my return to the US, I flew back to Europe. The first stop was the Netherlands where I was invited by the IAMG student chapter at ITC, University of Twente. In fact, I gave two talks the same day: one at ITC at 9:30 am and one at Utrecht (Department of Earth Sciences) at 1:30 pm. Although Holland is not a large country, this required booking a taxi to travel between the two cities a distance of 95 miles. From Amsterdam I flew to Stockholm where I gave a lecture at the Royal Institute of Technology. A warm welcome contrasted with a cold and rainy weather, but the sun was back on Saturday for a visit of the city. The next trip will be a three-week visit to Taiwan, South Korea and Japan in May with eight talks on the program.

The Institut Agronomique et Vétérinaire Hassan II Rabat, Morocco

Pierre Goovaerts (center) and his host, Professor Sebnem Duzgun (left) of Middle East Technical University, Ankara

Pierre Goovaerts (left), his host, Professor Alfred Stein (right), and Sanaz Salati (center), the graduate student who organized the visit and lecture at ITC

Pierre Goovaerts

IAMG 2012 Distinguished Lecturer, Prof. John **Schuenemeyer**, President of Southwest Statistical Consulting, Colorado, USA —delivered a lecture during a week-long course "Spatial Statistical Tools in Data Processing and Analysis" held during 26-30 Nov 2012 at the Systems Science and Informatics Unit (SSIU), Indian Statistical Institute-Bangalore Centre, India.

B. S. Daya Sagar

IAMG Distinguished Lecturer for 2014: Eric Grunsky

The Lectures Committee, chaired by Jennifer McKinley, has selected Dr. Eric C. Grunsky to be the next Distinguished Lecturer for 2014. Eric who is a graduate of the Universities of Toronto and Ottawa has a long and distiguished career spanning the Ontario Geological Survey, CSIRO in Australia, the British Columbia and Alberta Geological Surveys and the Geological Survey of Canada in Ottawa. Eric is the recipient of the 2012 Krumbein Medal and the 2005 Chayes Prize. He has been a member of IAMG since 1985 and has been Associate Editor and Editor-in-Chief of Computers & Geosciences from1996 to 2011. He initiated the C&G program code ftp site and has served as webmaster for the IAMG website for many years. And, Eric has just been appointed new Chair of the IAMG Publications Committee. (For more details on Grunsky see the Krumbein Laudatio in the last Newsletter, or on the website).

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2014 IAMG AWARDS

Nominations requested!

The Association invites nominations for the following awards:

John Cedric Griffiths Teaching Award

This award shall be presented to honor outstanding teaching, with preference for teaching that involves application of mathematics or informatics to the Earth's nonrenewable natural resources or to sedimentary geology. Age or academic status are not conditions for the award. (IAMG By-Law 14)

William Christian Krumbein Medal

The medal is the highest award given by the Association and the recipient shall be so honored and acknowledged. The Krumbein Medal is awarded to senior scientists for career achievement, which includes (a) distinction in application of mathematics or informatics in the earth sciences, (b) service to the IAMG, and (c) support to professions involved in the earth sciences. There is no stipulated preference for fields of application within the earth sciences. (IAMG By-Law 12)

Membership in IAMG is not a requirement for nomination. For details about prerequisites for nominations please visit the IAMG website http://iamg.org and click on **Awards & Honors**

There is also a list of past recipients and their laudatios on the website. 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 and
- a curriculum vitae of the nominee

Nobody gets an award without a nomination, so please support your colleague when you believe he/she deserves an award by submitting a nomination.

Nominations can be submitted by a single person or by a group via e-mail to jackswsc@q.com, or sent to:

John H. Schuenemeyer - Chairman, IAMG Awards Committee
Southwest Statistical Consulting, LLC
960 Sligo St
Cortez, CO 81321 USA

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

OBITUARY

Professor Danie Krige

Geostatistical Pioneer and Father of "Kriging"

Daniel Gerhardus ("Danie") Krige passed away peacefully on Sunday morning, March 23rd, 2013; he was 93 years old. The funeral was held at the Constantia Kloof Dutch Reformed Church. It was attended by over 200 family, friends and colleagues from industry and universities. His widow, Ansie was surrounded by Danie`s children and grandchildren and supported by her own daughters. Eulogies were given by Oscar Steffen, Richard Minnitt and Winfred Assibey-Bonsu. IAMG Member Isobel Clark was in attendance. Professor Krige was a just and kind man with a great sense of humor. He`ll be missed by all of us.

Born in Bothaville, Orange Free State, South Africa, Danie grew up in Krugersdorp on the West Rand where he matriculated from Monument High School at the age of 15. In 1938 he graduated with a BSc (Eng.) degree in mining engineering from the University of the Witwatersrand and was hired by Anglo Transvaal to work on their gold mines. In 1943 he joined the office of the Government Mining Engineer in South Africa for eight years during which period he participated in uranium negotiations with the U.K. and U.S.A. designing the uranium pricing formula, which resulted in the establishment of South Africa's uranium industry in the early 1950s. In 1951 Danie obtained his MSc (Eng.) from the University of the Witwatersrand defending a thesis containing concepts and techniques also published in the Journal of the South African Institute of Mining and Metallurgy (SAIMM). It advocated the use of regression analysis to extrapolate from known gold assays to estimate mining block averages. This technique can be regarded as a first application of "kriging", which is a translation of the term "Krigeage" originally coined by Georges Matheron who remarked in 1963 that use of this word was sanctioned by the [French] Commissariat à l'Energie Atomique to honor work by Krige on the bias affecting estimation of mining block grades from sampling in their surroundings, and on the correction coefficients that should be applied to avoid this bias. Later, Matheron urged the English-speaking community to adopt the term "kriging" which now is used worldwide.

Danie Krige at his 90th Birthday Celebration, Sept. 5th 2009

Krige`s original paper was translated into French and republished in 1955 in a special issue of Annales des Mines on the use of mathematical statistics in economic geology. It is followed by a paper by Georges Matheron who emphasized "permanence" of lognormality in that gold assays from smaller and larger blocks all have lognormal frequency distributions with variances decreasing with increasing block size. Matheron discusses "Krige's formula" for the propagation of variances of logarithmically transformed mining assays, which says that the variance for small blocks within a large block is equal to the variance for the small blocks within intermediate-size blocks plus the variance of the intermediate-size blocks within the large block. This empirical formula could not be reconciled with the early theory of mathematical statistics but it constitutes a characteristic feature in a spatial model of orebodies previously developed by the Dutch mining engineer Hans de Wijs whose approach helped Matheron to formulate the idea of "regionalized random variable". Rather than using autocorrelation coefficients as were generally employed in time series analysis under the assumption of existence of a mean and finite variance, Matheron introduced the variogram as a basic tool for structural analysis of spatial continuity of element concentration values. This is because the variogram allows for the possibility of infinitely large variance as would result from the de Wijsian model for indefinitely increasing distances between sampling points. Aspects of this model were adopted by Krige in his 1978 monograph "Lognormal-de Wijsian Geostatistics for Ore Evaluation" summarizing earlier studies including his successful application to characterize self-similar gold and uranium distribution patterns in the Klerksdorp goldfield.

From 1952 to 1981 Danie Krige was employed as Financial Engineer for the Anglovaal mining group. In his publications during this period he introduced the geostatistical concepts of "support", "spatial structure", "selective mining units" and "grade-tonnage curves". In 1981, Krige was appointed as the first Chair of Mineral Economics at the University of the Witwatersrand in Johannesburg. Ten years later, after what he called his second retirement, Danie became a private consultant based in Florida Hills, a suburb of Johannesburg, where he continued to work on various projects that helped keep him young.

Also in South Africa, the mathematical statistician Herbert Sichel had introduced a maximum likelihood technique for efficiently estimating mean and variance from small samples of lognormally-distributed, stochastically independent (uncorrelated) gold assays. Later, Krige (in 1960) discovered that a small but significant improvement of this approach could be obtained by using a three-parameter lognormal distribution. Like many of his other papers, this well-researched result was published in SAIMM along with written discussions by several colleagues including one by his good friend Sichel who extended the maximum likelihood technique to include the extra parameter and proposed use of the "compound" lognormal. During the past 65 years, SAIMM has awarded Danie many honors including two Gold Medals. Danie has taught geostatistical short courses on five continents and was a founding member of the IAMG as well as a member of our first Council (1968-1972). He served on various IAMG editorial committees and made numerous other contributions. In 1982 he was the recipient of the William Christian Krumbein Medal, the highest honor awarded by the IAMG to one of its members for exceptional contributions in the field of mathematical geoscience, service to the profession, and support of the Association. In 2010, he became our fourth Honorary Member.

In addition to his work on geostatistics, Danie has made important contributions in business applications. He introduced what is now known as risk analysis of new mining features and was responsible for the design of the [South African] State formula for marginal gold mines enacted in 1968, which enabled a number of mines to survive the critical period of low gold prices. The application of State aid made a significant contribution towards stabilizing the South African gold-mining industry over a difficult period. In 1963, Danie Krige received his D.Sc. (Eng.) degree from the University of the Witwatersrand. In 1981, the University of Pretoria awarded him the Honorary D. Eng. Degree. Other honorary doctorates were received from UNISA, which is the largest university in South Africa (1997), and at the Moscow State Mining University (1997). Numerous other honors and awards received by Professor Krige include the Order for Meritorious Service, Class I, Gold, received in 1988 from Nelson Mandela, South African President at the time. He was not afraid of controversy. In 1999 a disagreement developed with other prominent geoscientists regarding bias and conditional independence in which Krige defended his point of view vigorously including in a Letter to the Editor of Mathematical Geology co-authored with Winfred Assibey-Bonsu in 2001.

Danie helped newcomers in the field on their way. Personally, I have had the privilege of knowing Danie as a friend and esteemed colleague for more than 50 years. As a graduate student at the University of Utrecht I had read Krige's MSc thesis on microfilm at the library in preparation of an economic geology seminar on the skew frequency distribution of mining assays. This resulted in a paper that was read by Danie who wrote me a letter about it. After I had joined the Geological Survey of Canada (GSC), he visited me in Ottawa with his wife and a colleague on the way to the 3rd APCOM meeting held at Stanford University in 1963. APCOM is the acronym of Applications of Computers and Operations Research in the Mineral Industries. Danie persuaded me and also GSC management that I should attend the 4th APCOM hosted by the Colorado School of Mines in 1964. Before the birth of the IAMG in 1968, APCOM meetings provided an important forum for mathematical geologists. In total I attended 14 APCOMs between 1964 and 1999. Other IAMG members regularly participating in early APCOM meetings included John Griffiths, Daniel Merriam, John Harbaugh, Tim Whitten, DeVerle Harris, Michel David, George Koch and Richard Link. Later, the emphasis at APCOM meetings shifted almost entirely to mining engineering applications. Professor Krige contributed papers on geostatistics or mineral economics to all APCOMS and played an essential part as chair and member of the international APCOM organizing committee. APCOM-2003 was held in Danie`s honor in Cape Town. The SAIMM published conference proceedings and also a CD with a selection of Danie`s papers produced since 1952. A few years ago Vera Pawlowsky-Glahn and I helped to make these papers generally available on the internet. I visited Danie and his family three times in Johannesburg. His great hospitality included joint visits to the Kruger National Park and the animal reserve in Krugersdorp, in addition to descents into deep Witwatersrand gold mines. On September 5th 2009, the Geostatistical Association of South Africa hosted Danie's 90th Birthday Celebration in Johannesburg attended by many friends and colleagues who celebrated this occasion together with Danie and Ansie.

Professor Krige`s scientific contributions continue to be highly relevant. An example is as follows: Danie's APCOM-2003 paper is concerned with the use of lognormal models for confidence limits and block distributions. At that time, in South African gold mines, ore reserve blocks were generally valued using a variogram of untransformed grades for ordinary kriging (OK) or simple kriging (SK). Using an extensive simulated data base, errors between estimates and "actuals" were defined by Krige either as differences or as ratios. Various model applications showed that acceptable confidence limits are best based on the variance of the logarithms of the ratios ("actuals"/estimates), which is related to the kriging variance (KV). Similar results were obtained by means of analysis of actual point and block data from a very large mined-out Carbon Leader area. It turns out that choice of lognormal model (two-parameter, three-parameter or "compound") is not critical for obtaining good final results such as tonnage-grade curves. However, maintenance of conditional unbiasedness is essential, and this is achieved by basing the KV on the mean of the original data used for the variogram and not on estimated mean block grade. This is but one example of Krige`s many original contributions. His profound influence will continue to be felt in the future.

Frits Agterberg

Special Commemorative Volume for Danie Krige

"Call for Papers"

Dear Member,

As you may know, our Honorary Member and friend Prof. Danie Krige has passed away recently - see the obituary on p. 6 to the left. The Southern African Institute of Mining and Metallurgy is proposing to publish a special edition of its Journal to commemorate Danie Krige. Prof. Richard Minnitt, University of Witwatersrand, is inviting all IAMG Members to consider submitting a technical paper, a review-type contribution in your area of specialisation, or a contribution on the historical development of an aspect of your particular area of specialisation, with anecdotes and photos if possible. He realizes that the timing is a bit tight and is in the process of arranging that the deadline for submission of papers be extended to the end of October (Could be end of November).

The official call for papers is shown below. Intent of contributions, abstracts or papers should be submitted to the SAIMM Publications Coordinator Kelly Matthee at kelly@saimm.co.za.

The Southern African Institute of Mining and Metallurgy
Founded in 1894

SPECIAL EDITION OF THE JOURNAL OF THE SAIMM

and

'Call for Papers'

to commemorate the work of the late Danie Krige

The SAIMM proposes producing a special edition of the Journal, one that will showcase current research and best practices in the field of Geostatistics. We invite experts in geostatistics around the world to submit papers for this special edition. Abstracts of papers should reach the SAIMM Publications Co-ordinator, Kelly Mathee (kelly@saimm.co.za), by the end of July and the final paper is required by the end of September for publication in December 2013.

D. Tudor
Editorial Consultant

G.L. Smith
President

The Southern African Institute of Mining and Metallurgy
Publications Co-ordinator, Kelly Mathee, SAIMM Journal
Special edition of the Journal - Danie Krige
P.O. Box 61127, Marshalltown, 2107, Tel: 27 11 834-1273/7
THE DETAILS OF THIS FORM CAN BE E-MAILED to kelly@saimm.co.za

☐ I intend to submit an abstract of the proposed paper entitled:

Title of paper: .....

Personal Details: Name .....

Address .....

Tel: ..... Fax: .....

E.mail: .....

10 years ago - End of Kansas Geological Survey's Mathematical Geology Section

On a Friday in June of 2002, later dubbed 'black Friday,' the Kansas Geological Survey's Mathematical Geology Section was terminated by the University, although the section had brought national and international attention to the Survey, University, and State. At that time the section consisted of John C. Davis, Section Chief, John H. Doveton, petrophysicist, Ricardo Olea, geostatistician, Geoff Bohling, computer specialist, David Collins, mineral economist, and a Visiting Research Scientist with a research support staff of JoAnne deGraffenreid, research assistant. They were given one year to finish their work and depart.

Kansas GS Math Geology retirement "party" 2003: David Collins, Gina Ross, Ricardo Olea, John Davis, JoAnne deGraffenreid, John Doveton

The termination took place on the KU West Campus in Youngberg Hall and was attended by Dean Associate Vice Provost for Research Jim Roberts, Vice President Vice Provost for Research Robert Barnhill, KGS Director/State Geologist Lee Allison, and Associate Director/State Geologist Bill Harrison.* Explanation for the terminations was 'university budget cuts', and the 'appointments' were just considered 'not renewed'.

An effort was made to reverse the university's decision by colleagues and friends from all over the world, but the appeals were ignored.

'....Letters poured in to the Chancellor's Office from all over the world from concerned colleagues and friends, and a petition with more than one hundred names of internationally known scientists was presented to the university administration, to no avail.'

In the aftermath of the 'firings,' **Gina Ross** was kept in computer mapping/GIS, and in October of 2002 **John Doveton** was rehired in the Petroleum Research Section and **Geoff Bohling** was rehired in the Hydrology Section, but Davis, Olea, Collins, and deGraffenreid were considered 'retired.'

After teaching in the Mathematics Department at Baker University for one year, **John Davis** was appointed Universitäts–Professor in the Department of Petroleum Engineering at the Montanuniversität in Leoben, Austria, and also was hired as (and remains) Chief Geologist of Heinemann Oil GmbH. He retired from the Montanuniversität after four years teaching when he hit the mandatory faculty retirement age in Austria.

After visiting research positions in Chapel Hill, Warnemünde, and Stanford, **Ricardo Olea** in 2006 became Mathematical Research Statistician with the Eastern Energy Resources Science Center (EERSC) of the USGS at Reston, VA.

David Collins took medical disability retirement in Lawrence. He was elected Treasurer of IAMG in 2012.

JoAnne deGraffenreid did 'retire' to her home in Baldwin and continues to edit the Oxford Monograph series "Studies in Mathematical Geosciences".

The Mathematical Geology Section had gone through several changes with time and the name of the section reflected those changes. First, it was Stratigraphic Research, then Basic Geology, to Geologic Research, Advanced Projects, and finally Mathematical Geology. Members of the section published extensively and helped quantify the subject, and were active in several organizations.

**After the termination of Allison by the University in 2005, Harrison was appointed Interim Director/State Geologist and after 2 years was appointed to the position permanently. However, upon the first official review of his performance in that position, Harrison was also terminated. Jim Roberts retired from KU in 2007 and died at the age of 65 in 2009. Robert Barnhill left KU two months after black Friday for a one-year position with the Council of Graduate Schools in Washington, DC.*

References

Kansas Geological Survey members, 2003, AfterMath of Kansas Black Friday: IAMG Newsletter, No. 66, p. 4.

Merriam, D.F., 2011, Observations, recollections, and impressions of the Kansas Geological Survey at The University of Kansas: Univ. Kansas Dept. Geology and Paleo. Inst., Spec. Publ. 7, p. 201.

Dan Merriam
IAMG Historian
with contributions from David Collins

Student Affairs

New IAMG Student Awards

IAMG is launching a new system of awards, linked to the three IAMG journals, starting in 2013, greatly increasing the investment in students starting their careers in geomathematics, geocomputation and geoinformatics.

This new awards program was initiated by Elsevier as part of the latest publishing sponsorship agreement for the journal Computers & Geosciences. Under the new agreement, US$10,000 will be allocated for up to four new annual awards, the Computers & Geosciences Research Scholarships. They are thus co-sponsored by Elsevier and IAMG.

IAMG Executive and Council have supported this development, and have decided to sponsor similar awards linked to the other two IAMG journals: namely, the Mathematical Geosciences Student Awards and the Natural Resources Research Student Awards. There will be up to three annual MG awards totaling $7,500 per year, and up to two annual NRR awards totaling $5,000 per year.

Applications for these awards will be online through the IAMG website using a single application form by the deadline of May 31st each year. For the first year, 2013, the application deadline is June 30th. Applicants must select one of the three award types (C&G, MG or NRR) based on the best subject alignment of their research to the journal Aims and Scope. Applicants for the previous IAMG student grants (successful or unsuccessful) may reapply for the new awards if they wish.

Completed applications will be directed by the IAMG office to one of two different selection committees. The C&G committee will normally comprise five persons: the Elsevier publisher who will act as the chair and handle the administration, plus four technical reviewers consisting of two experts appointed by the C&G Editor(s)-in-Chief, one expert appointed by the IAMG President and a fourth expert appointed by the Chair of the Publications Committee. The second committee will handle both the MG and NRR awards and comprise a chair appointed by the Student Affairs and Publications Committees, plus three technical reviewers, two appointed by the Editors-in-Chief of MG and NRR, and one by the IAMG President. Applicants may apply for only one of the three award types per year, but if unsuccessful may reapply in the following year for the same or different journal award.

The winners will be notified before the IAMG Annual Conference (or IGC every fourth year). Award payments (minus a holdback of $250) will be made to the selected candidates by the IAMG Treasurer by September 30th of the award year. A report and abstract based on the results must be submitted to the IAMG office by September 30th of the year following, whereupon the final holdback amount will be paid. The reports and abstracts will be uploaded to the IAMG members' website, so that all IAMG members can see how the award funds have been used.

Detailed guidelines for each of these awards (and the application form) can be accessed on the IAMG website under "Student Affairs".

The IAMG Council believes that supporting students with this new awards program is in line with the IAMG mission "to promote, worldwide, the advancement of mathematics, statistics and informatics in the Geosciences", and will strengthen membership in the Association.

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IAMG Student Chapters Call for Action

The IAMG2013 meeting taking place in Madrid welcomes all the student chapters of IAMG to present their chapter activities in the Student Chapter Session. The session will take place on 5th of September, the last day of the meeting. Student chapters participating are expected to make a short presentation about their chapter activities and their chapter in general. Although there are no strict guidelines, following are expected from a student chapter presentation:

Brief history of the Student Chapter
Activities in the past year
Future Plans
Organizational Structure

Representatives from student chapters planning to join the session should email Orhun Aydin (orhuna@stanford.edu) for more information and to sign-up. For chapters who are not sending any representative to IAMG 2013, an online system is set up through Skype, so that live presentations can be made via internet.

Student chapters are an important part of IAMG and the entire IAMG community is looking forward to hear from their student chapters all around the world!

Orhun Aydin
President, Stanford Student Chapter

Conference Reports

Workshop on Mathematical Morphology and Pattern Recognition: Theory and Applications

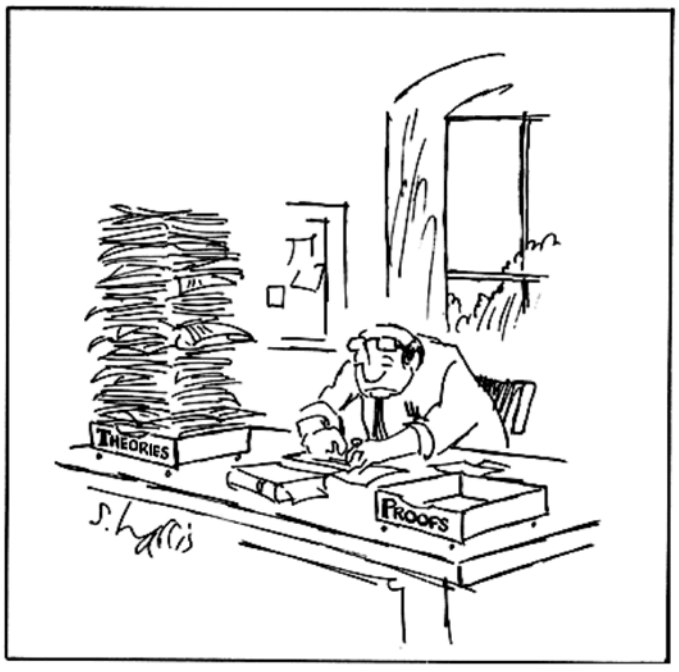
A Three-Day workshop on "Mathematical Morphology and Pattern Recognition: Theory and Applications", was organized during 26-28 March 2013 at the Systems Science and Informatics Unit, Indian Statistical Institute-Bangalore Centre, India. The convenors of this workshop Prof. Daya Sagar and Prof. Saroj Meher delivered a series of 14 lectures on the topics related to mathematical morphology and pattern recognition. The two tracks in this three-day workshop included "Mathematical Morphology: Theory and Applications" and "Pattern Recognition: Theory and Applications". A host of algorithms based on the concepts of mathematical morphology were covered in a series of seven lectures by B. S. Daya Sagar. Applications of both classical and modern Pattern Recognition techniques were covered in a series of seven lectures by Saroj Meher. Conveners (Sagar and Saroj) framed the sequence of lectures in such a way that there was an excellent coherence. These lectures were mainly intended for Postgraduate students, Ph.D. scholars, Post-Docs and young faculty members and scientists. This workshop has been attended by 60 participants drawn from academia, industry, and government organizations and labs. Further details about the three-day workshop are available at:
http://www.isibang.ac.in/~mmprta.

B. S. Daya Sagar

European Geosciences Union

Two of my PhD students and my postdoc have been able to help Eduardo de Mulder at the joint IAMG stand at the EGU in April in Vienna. In this photo are pictured Andrew Bell and Martin Robinson.

Jenny McKinley



IAMG Journal Report

2012 Best-Paper Awards Computers & Geosciences

In 2012, the Journal Computers & Geosciences received close to 800 submissions of which nearly 200 were published. In a renewed tradition, a call for nomination for best paper from readers of the Journal was initiated. A total of 12 papers were nominated. A committee of Editors and Board members voted to award the two papers listed below. Congratulations to the authors.

Jef Caers
Editor-in-Chief

"Stress Inversion Using Slip Tendency" authored by John M. McFarland, Alan P. Morris & David A. Ferrill (Vol 41, April 2012, Pages 40–46)

John M. McFarland

Southwest Research Institute, San Antonio, TX, USA

" GeoTools: An Android Phone Application In Geology" authored by Yi-Hua Weng, Fu-Shing Sun & Jeffrey D. Grigsby (Volume 44, July 2012, Pages 24–30)

Yi-Hua Weng

Ball State University, Department of Geological Sciences, Muncie, IN, USA

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Changes for C&G Editor-in-Chief

Michael **Piasecki** has stepped down as co-EiC of Computers & Geosciences. Jef Caers will be the sole EiC at least for the foreseeable future. The Editorial Board will be enlarged to ensure good editorial coverage of geoinformatics, the area that Mike had covered.

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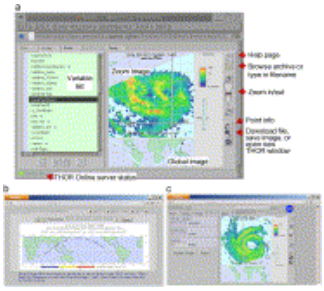
Author generates visualization of Hurricane Sandy

A paper published in the February issue of Computers & Geosciences, describes a case study in which an earth-observing satellite tool, the Tool for High-Resolution Observation Review (THOR), using minimal coding effort, is converted into a practical web-based application, THOR-Online. In addition, a 3D visualization technique is also described in this paper.

Initially only operable from a desktop computer, with the approach outlined in the study, THOR is now accessible online from NASA's Precipitation Processing System website. This allows researchers to remotely examine the 15-year archive of Tropical Rainfall Measuring Mission (TRMM) satellite data. Efforts to improve THOR have been on-going since the 1997 launch of TRMM satellite, which carries first space-borne radar capable of observing detailed three-dimensional structure of regions of precipitation inside of storm clouds. "The 3D display technique can be used to make features of, for example, a hurricane, visually accessible even to those without technical training in meteorology," explained Owen Kelley, author of the study. "The TRMM satellite observed Hurricane Sandy a day before its U.S. landfall affecting New Jersey and New York, among other states. Using this technique, TRMM 3D images of the storm's overflight and other tropical cyclones during the final months of 2012 could be made available through NASA Hurricane Resource Page (www.nasa.gov/hurricanes)."



"Addressing an important problem at intersection of the geosciences (remote sensing, hydrology, meteorology) and computer sciences, this article is a poster child example of what we aim to publish in Computers & Geosciences," explains **Jef Caers**, Editor-in-Chief of C&G. "It uses modern computer science paradigms such as the World Wide Web, code re-use and practical graphical user interfaces to address an important geoscience problem."

The approach outlined in the paper may be of interest to other organizations responsible for earth-observing satellites that have custom desktop visualization tools which may need to be converted to online applications for broader usage, or that have 3D datasets that require the development of an interactive visualization tool.

The paper "Adapting an existing visualization application for browser-based deployment: A case study from the Tropical Rainfall Measuring Mission" can be found at: http://www.sciencedirect.com/science/article/pii/S0098300412003433

The THOR-Online application described in the study can be found at: http://pps.gsfc.nasa.gov/thor/ .

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Mathematical Geosciences

Recognising Outstanding Contributors to the Journal of Mathematical Geosciences: Margaret A. Oliver

After several years of distinguished and productive service, our Editorial Board member Professor Margaret A. Oliver has retired. It is an honour to acknowledge Margaret's contributions over the years to the journal, from Guest Editor of our special issue on the Applications of Wavelets in the Geosciences in 2009 to her exemplary contributions throughout her involvement since 1998. Similarly, one can only express admiration for her contributions to the profession, from being dedicated to her students, to publishing over 100 academic papers, contributing to books, and co-authoring the established textbook Geostatistics for Environmental Scientists, the second updated edition of which was published in 2007 (Webster and Oliver 2007), as well as more recently co-authoring Geostatistical Applications for Precision Agriculture. Margaret is also in the process of co-authoring a second book on precision agriculture.

Margaret has been a leading academic in the field, with her early research focusing on the multivariate and geostatistical analysis of soil data from the Wyre Forest in the Midlands of England. One of her first papers was published in Mathematical Geology in 1989. Since then her research interests have included the application of a wide range of numerical methods to soil and other data including pollen counts, forestry, radon emission, remotely sensed imagery and the incidence of childhood cancer. Her specific interests are in sample design for spatial analysis and eventual mapping, risk analysis associated with prescribed thresholds in relation to soil pollutants or deficiencies of soil nutrients, and the relations between different scales of spatial variation. Her most recent research has been in the field of precision agriculture. The Mathematical Geosciences community is fortunate to have benefited from Margaret's research and achievements.

Margaret retired at the end of September 2004 from her post as Reader in Spatial Analysis at the University of Reading. She has retained a link and a base at the University as a Visiting Professor since January 2005 until the present. She was Co-Editor-in-Chief of Precision Agriculture from 2005 to 2010. In 2011 she became Deputy Editor of the European Journal of Soil Science after serving as an Associate Editor of the Journal of Soil Science (1990–1993) and of the European Journal of Soil Science (1993–1997).

On behalf of the journal Mathematical Geosciences, I would like to offer our sincere thanks and best wishes as Margaret steps down from her editorial duties; we know that her involvement and contribution to the profession will not just stop here. THANK YOU Margaret!

This photograph of Margaret Oliver was taken in Prague in 2011 and serves as a reminder to Margaret of attending her first Mathematical Geology conference there in 1993, the year of the Association's Silver Jubilee.

R. Dimitrakopoulos
Editor-in-Chief Mathematical Geosciences

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A GIS-based software for lifeline reliability analysis under seismic hazard — A. Sevtap Selcuk-Kestel, H. Sebnem Duzgun, Lutfi Oduncuoglu

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IONORT: A Windows software tool to calculate the HF ray tracing in the ionosphere — A. Azzarone, C. Bianchi, M. Pezzopane, M. Pietrella, C. Scotto, A. Settimi

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Detecting grain boundaries in deformed rocks using a cellular automata approach — Pece V. Gorsevski, Charles M. Onasch, John R. Farver, Xinyue Ye

Software for detecting 3D movements: The case of olive tree displacements in an olive grove located on sloping land — M.I. Ramos, J.J. Cubillas, F.R. Feito, A.J. Gil

A simple, interactive GIS tool for transforming assumed total station surveys to real world coordinates - the CHaMP transformation tool — Joseph M. Wheaton, Chris Garrard, Kelly Whitehead, Carol J. Volk

Quantifying multi-element and volumetric uncertainty, Coleman McCreedy deposit, Ontario, Canada — Ryan Goodfellow, Francisco Albor Consuegra, Roussos Dimitrakopoulos, Tim Lloyd

2D mapping of LA-ICPMS trace element distributions using R — Martin Rittner, Wolfgang Müller

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Susceptibility assessment of earthquake-induced landslides using Bayesian network: A case study in Beichuan, China — Yiquan Song, Jianhua Gong, Sheng Gao, Dongchuan Wang, Tiejun Cui, Yi Li, Baoquan Wei

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An areal recharge and discharge simulating method for MODFLOW — Yanhui Dong, Guomin Li, Haizhen Xu

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Relative azimuth inversion by way of damped maximum correlation estimates — A.T. Ringler, J.D. Edwards, C.R. Hutt, F. Shelly

Parallelizing flow-accumulation calculations on graphics processing units — From iterative DEM preprocessing algorithm to recursive multiple-flow-direction algorithm — Cheng-Zhi Qin, Lijun Zhan

A fuzzy-autoregressive model of daily river flows — Roberto Greco

An evolutionary approach to modelling the soil-water characteristic curve in unsaturated soils — A. Ahangar-Asr, A. Johari, A.A. Javadi

Evaluating geo-environmental variables using a clustering based areal model — Bulent Tutmez, Uzay Kaymak, A. Erhan Tercan, Christopher D. Lloyd

Automatic radiometric normalization with genetic algorithms and a Kriging model — Shou-Heng Liu, Ching-Weei Lin, Yie-Ruey Chen, Chih-Ming Tseng

Silicic acid flux to the ocean from tidal permeable sediments: A modeling study — Romain Louis Chassagne, Pascal Lecroart, Héloïse Beaugendre, Sylvain Capo, Jean-Paul Parisot, Pierre Anschutz

STcorr: An IDL code for image based normalization of lapse rate and illumination effects on nighttime TIR imagery — Inan Ulusoy, Philippe Labazuy, Erkan Aydar

River suspended sediment estimation by climatic variables implication: Comparative study among soft computing techniques — Ozgur Kisi, Jalal Shiri

Oscillatory numerical experiments in finely layered anisotropic viscoelastic media — Stefano Picotti, José M. Carcione, Juan E. Santos

Predicting the spatial distribution of soil profile in Adapazari/Turkey by artificial neural networks using CPT data — Ersin Arel

A simple procedure for calculating the mean and maximum bed stress under wave and current conditions for rough turbulent flow based on Soulsby and Clarke's (2005) method — J. Malarkey, A.G. Davies

Removing non-ground points from automated photo-based DEM and evaluation of its accuracy with LiDAR DEM — Abdolhamid Dehvari, Richard John Heck

LiDAR data reduction using vertex decimation and processing with GPGPU and multicore CPU technology — Dossay Oryspayev, Ramanathan Sugumaran, John DeGroote, Paul Gray

A generalized Kelvin solution based method for analyzing elastic fields in heterogeneous rocks due to reservoir water impoundment — H.T. Xiao, Z.Q. Yue, X.M. Zhao

Computing surface roughness of individual cells of digital elevation models via multiscale analysis — Ahmad Fadzil Mohamad Hani, Dinesh Sathyamoorthy, Vijanth Sagayan Asirvadam

A comparison of three terrain parameters that may be used to identify denudation surfaces within a GIS: A case study from Wales, United Kingdom — Matt D. Rowberry

GPU-accelerated MRF segmentation algorithm for SAR images — Haigang Sui, Feifei Peng, Chuan Xu, Kaimin Sun, Jianya Gong

Creating infrastructure for seismic microzonation by Geographical Information Systems (GIS): A case study in the North Anatolian Fault Zone (NAFZ) — T. Turk, U. Gümüsay, O. Tatar

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Automated computational delimitation of SST upwelling areas using fuzzy clustering — Susana Nascimento, Pedro Franco, Fátima Sousa, Joaquim Dias, Filipe Neves

DigiSeis — A software component for digitizing seismic signals using the PC sound card — Khalid Amin Khan, Gulraiz Akhter, Zulfiqar Ahmad

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M. Mudelsee, Climate time series analysis: Classical statistical and bootstrap methods (2010) Springer, Dordrecht 978-90-481-9482-7. — Dmitry Divine

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Research Articles

Parallelization strategies to deal with non-localities in the calculation of regional land-surface parameters — Steffen Schiele, Markus Möller, Holger Blaar, Detlef Thürkow, Matthias Müller-Hannemann

Prediction of liquefaction potential based on CPT up-sampling — Javad Sadoghi Yazdi, Farzin Kalantary, Hadi Sadoghi Yazdi

A sequential iterative dual-filter for Lidar terrain modeling optimized for complex forested environments — C. Véga, S. Durrieu, J. Morel, T. Allouis

Feature tracking on the hierarchical equal area triangular mesh — Neil Massey

Sensitivity analysis for volcanic source modeling quality assessment and model selection — Flavio Cannavó

Simultaneous seismic wave clustering and registration — G. Adelfio, M. Chiodi, A. D'Alessandro, D. Luzio, G. D'Anna, G. Mangano

Sequential Monte Carlo methods for parameter estimation in nonlinear state-space models — Meng Gao, Hui Zhang

Efficient parallelization of geostatistical inversion using the quasi-linear approach — Ronnie L. Schwede, Adrian Ngo, Peter Bastian, Olaf Ippisch, Wei Li, Olaf A. Cirpka

Estimating shear wave velocity of soil deposits using polynomial neural networks: Application to liquefaction — Ali Ghorbani, Yaser Jafarian, Mohammad S. Maghsoudi

A grid implementation of the SLUTH algorithm for visualising the depth and structural index of magnetic sources — Richard S. Smith, Jeffrey B. Thurston, Ahmed Salem, Alan B. Reid

Hybrid soft computing systems for reservoir PVT properties prediction — Amar Khoukhi

Application of an evidential belief function model in landslide susceptibility mapping — Omar F. Althuwaynee, Biswajeet Pradhan, Saro Lee

Simulation of axi-symmetric flow towards wells: A finite-difference approach — Andy Louwyck, Alexander Vandenbohede, Mark Bakker, Luc Lebbe

A drill hole query algorithm for extracting lithostratigraphic contacts in support of 3D geologic modelling in crystalline basement — Ernst M. Schetselaar, David Lemieux

Numerical methods for integrating particle-size frequency distributions — Gert Jan Weltje, Sam Roberson

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Multiview 3D reconstruction in geosciences — M. Favalli, A. Fornaciai, I. Isola, S. Tarquini, L. Nannipieri

MohoIso: A MATLAB program to determine crustal thickness by an isostatic and a global gravitational model — Mohammad Bagherbandi

Implementation of Martian virtual reality environment using very high-resolution stereo topographic data — Jung-Rack Kim, Shih-Yuan Lin, Jeong-Woo Hong, Young-Hwi Kim, Chin-Kang Park

Simplified empirical astronomical tide model — An application for the Río de la Plata estuary — Enrique D'Onofrio, Fernando Oreiro, Mónica Fiore

Development of an AutoWEP distributed hydrological model and its application to the upstream catchment of the Miyun Reservoir — Xiaohui Lei, Yu Tian, Weihong Liao, Wei Bai, Yang Wen Jia, Yun Zhong Jiang, Hao Wang

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The semi-automatic interpretation of magnetic dyke anomalies — G.R.J. Cooper

Erratum to "ArcE: A GIS tool for modelling actual evapotranspiration [Comput. Geosci. 37(9), 1468-1475] — Salvador España, Francisco J. Alcalá, Ángela Vallejos, Antonio Pulido-Bosch

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Using Tough2-MP on a cluster — optimization methodology and study of scalability — Nicolas Hubschwerlen, Keni Zhang, Gerhard Mayer, Jean Roger, Bernard Vialay

General-purpose optimization methods for parallelization of digital terrain analysis based on cellular automata — Guo Cheng, Lu Liu, Ning Jing, Luo Chen, Wei Xiong

Computed 3D visualisation of an extinct cephalopod using computer tomographs — Alexander Lukeneder

Fractal projection pursuit classification model applied to geochemical survey data — Fan Xiao, Jianguo Chen

A MATLAB-derived software (geothermMOD1.2) for one-dimensional thermal modeling, and its application to the Corsica-Sardinia batholith — Leonardo Casini

SolEx: A model for mixed COHSCl-volatile solubilities and exsolved gas compositions in basalt — Fred Witham, Jonathan Blundy, Simon C. Kohn, Priscille Lesne, Jacqueline Dixon, Sergey V. Churakov, Roman Botcharnikov

To ontologise or not to ontologise: An information model for a geospatial knowledge infrastructure — Kristin Stock, Tim Stojanovic, Femke Reitsma, Yang Ou, Mohamed Bishr, Jens Ortmann, Anne Robertson

IRTROCK: A MATLAB toolbox for contactless recognition of surface and shallow weakness of a rock cliff by infrared thermography — Giordano Teza, Gianluca Marcato, Eugenio Castelli, Antonio Galgaro

Determination of the most probable slip surface in 3D slopes considering the effect of earthquake force direction — A. Ahangar-Asr, M.M. Toufigh, A. Salajegheh

The multifocus imaging technique in petrology — V. Thiéry, D.I. Green

A Fourier integral algorithm and its GPU/CPU collaborative implementation for one-way wave equation migration — Hong-wei Liu, Hong Liu, Xiao-Long Tong, Qin Liu

Performance of convolutional perfectly matched layers for pseudospectral time domain poroviscoelastic schemes — Bernard Giroux

SWATgrid: An interface for setting up SWAT in a grid-based discretization scheme — H. Rathjens, N. Oppelt

ESCRIPT-RT: Reactive transport simulation in Python using ESCRIPT — T. Poulet, L. Gross, D. Georgiev, J. Cleverley

Multi-scale stochastic simulation with a wavelet-based approach — Snehamoy Chatterjee, Roussos Dimitrakopoulos

Regional morphometric and geomorphologic mapping of Martian landforms — Radu Dan Capitan, Marco J. Van De Wiel

Landslide susceptibility mapping at Hoa Binh

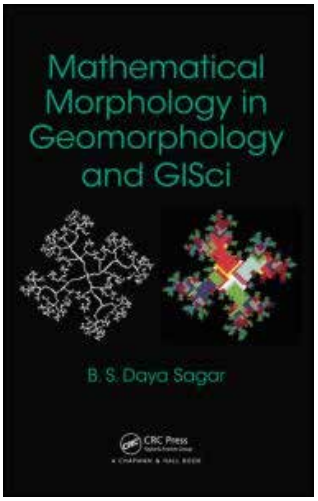
New Books

Mathematical Morphology in Geomorphology and GISci

By Behara Seshadri Daya Sagar

Published May 28th 2013 by Chapman and Hall/CRC – 546 pages
Hardback: $99.95, 978-1-43-987200-0

Mathematical Morphology in Geomorphology and GISci presents a multitude of mathematical morphological approaches for processing and analyzing digital images in quantitative geomorphology and geographic information science (GISci). Covering many interdisciplinary applications, the book explains how to use mathematical morphology not only to perform quantitative morphologic and scaling analyses of terrestrial phenomena and processes, but also to deal with challenges encountered in quantitative spatial reasoning studies. For understanding the spatiotemporal characteristics of terrestrial phenomena and processes, the author provides morphological approaches and algorithms to: (i) Retrieve unique geomorphologic networks and certain terrestrial features, (ii) Analyze various geomorphological phenomena and processes via a host of scaling laws and the scale- invariant but shape-dependent indices, (iii) Simulate the fractal-skeletal-based channel network model and the behavioral phases of geomorphologic systems based on the interplay between numeric and graphic analyses, (iv) Detect strategically significant sets and directional relationships via quantitative spatial reasoning, and (v) Visualize spatiotemporal behavior and generate contiguous maps via spatial interpolation. Incorporating peer-reviewed content, this book offers simple explanations that enable readers—even those with no background in mathematical morphology—to understand the material. It also includes easy- to-follow equations and many helpful illustrations that encourage readers to implement the ideas. More details about this book at http://www.routledge.com/books/details/9781439872000/



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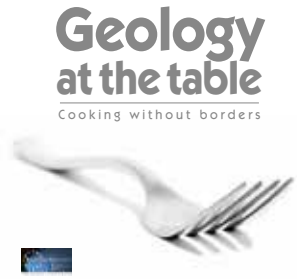
Geology at the table. Cooking without borders

by EuroGeoSurveys



The book illustrates how every day each person consumes its quote of geology and how our national dishes are the result of "geological action." From what you eat and drink, to the way our food is prepared, geology always plays a role. Every time we sit down at the table to enjoy a meal, our favorite dishes contain references to our past, present and future.

The publication is a collection of 27 recipes from 25 different European countries. Each recipe and its ingredients have been analyzed and explained by geology.

Publication date: January 2013. Pages 115. Format: 200x200

SBN-NUMMER : 9789090273754

If you are interested in acquiring a copy of the book, please send an email to info@eurogeosurveys.org and we will get back to you as soon as possible.

Distribution: The book is available throughout Europe via each country's National Geological Survey.

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An enhanced Gibbs sampler algorithm for non-conditional simulation of Gaussian random vectors — Daisy Arroyo, Xavier Emery, María Peláez

Reducing the number of orthogonal factors in linear coregionalization modeling — Xavier Emery, María Peláez

Using sound to represent spatial data in ArcGIS — Nick Bearman, Peter F. Fisher

Three-dimensional midpoint displacement algorithm for the generation of fractal porous media — Jonathan Jilesen, Jim Kuo, Fue-Sang Lien

Comparison of 2D and 3D time-reverse imaging – A numerical case study — Brian Steiner, Erik H. Saenger

MATLAB code for estimating magnetic basement depth using prisms — Ibrahim Aydin, Erdinc Oksum

Ionospheric total electron content anomalies due to Typhoon Nakri on 29 May 2008: A nonlinear principal component analysis — Jyh-Woei Lin

An algorithm for the measurement of shoreline and intertidal beach profiles using video imagery: PSDM — A.F. Osorio, R. Medina, M. Gonzalez

A new parallel tool for classification of remotely sensed imagery — Sergio Bernabé, Antonio Plaza, Prashanth Reddy Marpu, Jon Atli Benediktsson

Automated inverse computer modeling of borehole flow data in heterogeneous aquifers — J.R. Sawdey, A.S. Reeve

Transforming geocentric cartesian coordinates to geodetic coordinates by using differential search algorithm — Pinar Civicioglu

PROMETHEE II: A knowledge-driven method for copper exploration — Maysam Abedi, S. Ali Torabi, Gholam-Hossain Norouzi, Mohammad Hamzeh, Gholam-Reza Elyasi

Spectral analysis of observed aquifer water level fluctuations — Stephen McLin

Support vector machine for multi-classification of mineral prospectivity areas — Maysam Abedi, Gholam-Hossain Norouzi, Abbas Bahroudi

Comparative study of different wavelets for hydrologic forecasting — R. Maheswaran, Rakesh Khosa

A density-based spatial clustering algorithm considering both spatial proximity and attribute similarity — Qiliang Liu, Min Deng, Yan Shi, Jiaqiu Wang

A computer program (TSecSoft) to determine mineral percentages using photographs obtained from thin sections — N. Yesiloglu-Gultekin, A.S. Keceli, E.A. Sezer, A.B. Can, C. Gokceoglu, H. Bayhan

Comparison of different models for susceptibility mapping of earthquake triggered landslides related with the 2008 Wenchuan earthquake in China — Chong Xu, Xiwei Xu, Fuchu Dai, Arun K. Saraf

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WaveAR: A software tool for calculating parameters for water waves with incident and reflected components — Blake J. Landry, Matthew J. Hancock, Chiang C. Mei, Marcelo H. García

Spectral decomposition aids AVO analysis in reservoir characterization: A case study of Blackfoot field, Alberta, Canada — Wang Jung Yoon, Mohammed Farfour

SDI-based business processes: A territorial analysis web information system in Spain — Rubén Béjar, Miguel A. Latre, Francisco J. Lopez-Pellicer, Javier Nogueras-Iso, F.J. Zarazaga-Soria, Pedro R. Muro-Medrano

A graphical user interface application for evaluation of the gravitational tensor components generated by a level ellipsoid of revolution — Michal Sprlák

ArcMine: A GIS extension to support mine reclamation planning — Sung-Min Kim, Yosoon Choi, Jangwon Suh, Sungchan Oh, Hyeong-Dong Park, Suk-Ho Yoon, Wa-Ra Go

GICUDA: A parallel program for 3D correlation imaging of large scale gravity and gravity gradiometry data on graphics processing units with CUDA — Zhaoxi Chen, Xiaohong Meng, Lianghui Guo, Guofeng Liu

The use of automated feature extraction for diagnosing double inter-tropical convergence zones — Andrew Geiss, Gad Levy

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From science to e-Science to Semantic e-Science: A Heliophysics case study — Thomas Narock, Peter Fox

Corrigendum to "Quantile regression neural networks: Implementation in R and application to precipitation downscaling [Comput. Geosci. 37(9) (2011) 1277-1284] — Alex J. Cannon

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Towards a Geoprocessing Web

Editorial by Peisheng Zhao, Feng Lu and Theodor Foerster

The Geoprocessing Web — Peisheng Zhao, Theodor Foerster, Peng Yue

Availability of the OGC geoprocessing standard: March 2011 reality check — Francisco J. Lopez-Pellicer, Walter Rentería-Agualimpia, Rubén Béjar, Pedro R. Muro-Medrano, F. Javier Zarazaga-Soria

WPS mediation: An approach to process geospatial data on different computing backends — Gregory Giuliani, Stefano Nativi, Anthony Lehmann, Nicolas Ray

GeoPWTManager: a task-oriented web geoprocessing system — Ziheng Sun, Peng Yue, Liping Di

Geo-information processing service composition for concurrent tasks: A QoS-aware game theory approach — Haifeng Li, Qing Zhu, Xiaoxia Yang, Linrong Xu

Automated geospatial Web Services composition based on geodata quality requirements — Sérgio A.B. Cruz, Antonio M.V. Monteiro, Rafael Santos

WPS orchestration using the Taverna workbench: The eScience approach — J. de Jesus, P. Walker, M. Grant, S. Groom

BPELPower — A BPEL execution engine for geospatial web services — Genong (Eugene) Yu, Peisheng Zhao, Liping Di, Aijun Chen, Meixia Deng, Yuqi Bai

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Spatio-temporal aggregation of European air quality observations in the Sensor Web — Christoph Stasch, Theodor Foerster, Christian Autermann, Edzer Pebesma

Using SensorML to construct a geoprocessing e-Science workflow model under a sensor web environment — Nengcheng Chen, Chuli Hu, Yao Chen, Chao Wang, Jianya Gong

Identifying orthoimages in Web Map Services — A.J. Florczyk, J. Nogueras-Iso, F.J. Zarazaga-Soria, R. Béjar

GWASS: GRASS web application software system based on the GeoBrain web service — Fang Qiu, Feng Ni, Bryan Chastain, Haiting Huang, Peisheng Zhao, Weiguo Han, Liping Di

Utilizing geometric coherence in the computation of map transformations — Padraig Corcoran, Peter Mooney, Michela Bertolotto

Development of a Web-based visualization platform for climate research using Google Earth — Xiaojuan Sun, Suhung Shen, Gregory G. Leptoukh, Panxing Wang, Liping Di, Mingyue Lu

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Extracting magnetic anomalies based on an improved BEMD method: A case study in the Pangxidong Area, South China — Weisheng Hou, Zhijun Yang, Yongzhang Zhou, Liping Zhang, Wenlong Wu

A robust method of thin plate spline and its application to DEM construction — Chuanfa Chen, Yanyan Li

Tree-based genetic programming approach to infer microphysical parameters of the DSDs from the polarization diversity measurements — Tanvir Islam, Miguel A. Rico-Ramirez, Dawei Han

Comparison of the KTH and remove-compute-restore techniques to geoid modelling in a mountainous area — Ramazan Alpay Abbak, Bihter Erol, Aydin Ustun

Comparison of drainage-constrained methods for DEM generalization — Yumin Chen, John P. Wilson, Quansheng Zhu, Qiming Zhou

EPR-based material modelling of soils considering volume changes — Asaad Faramarzi, Akbar A. Javadi, Amir M. Alani

3D magnetic inversion based on probability tomography and its GPU implement — Guofeng Liu, Xiaohong Meng, Zhaoxi Chen

Using microtomography, image analysis and flow simulations to characterize soil surface seals — Jari Hyväluoma, Mahesh Thapaliya, Jarno Alaraudanjoki, Taisto Sirén, Keijo Mattila, Jussi Timonen, Eila Turtola

Information entropy as a measure of DEM quality — Stephen Wise

Deterministic seismic hazard map for Taiwan developed using an in-house Excel-based program — Jui-Pin Wang, Duruo Huang, Zijiang Yang

Three-dimensional colour functions for stress state visualisation — Martin Bednárik, Igor Kohút

IESID: Automatic system for monitoring ground deformation on the Deception Island volcano (Antarctica) — Luis Miguel Peci, Manuel Berrocoso, Raúl Páez, Alberto Fernández-Ros, Amós de Gil

MINERAL: A program for the propagation of analytical uncertainty through mineral formula recalculations — Sarah M.H. De Angelis, Owen K. Neill

Parallel, 'large', dense matrix problems: Application to 3D sequential integrated inversion of seismological and gravity data — R. Tondi, C. Cavazzoni, P. Danecek, A. Morelli

Crustal evolution of an ore district illustrated - 4D-animation from the Skellefte district, Sweden — Pietari Skyttä

Tectonic lineament mapping of the Thaumasia Plateau, Mars: Comparing results from photointerpretation and a semi-automatic approach — David A. Vaz, Gaetano Di Achille, Maria Teresa Barata, Eduardo Ivo Alves

Implementation of a 3-D groundwater flow model in a semi-arid region using MODFLOW and GIS tools: The Zéramdine-Béni Hassen Miocene aquifer system (east-central Tunisia) — Fethi Lachaal, Ammar Mlayah, Mourad Bédir, Jamila Tarhouni, Christian Leduc

Aquifer nitrate vulnerability assessment using positive and negative weights of evidence methods, Milan, Italy — Alessandro Sorichetta, Marco Masetti, Cristiano Ballabio, Simone Sterlacchini

Constrained multiple indicator kriging using sequential quadratic

SIAM Conference on the Mathematical and Computational Issues in the Geosciences (GS13), Centro Congressi Padova, Padova, Italy, **17-20 June 2013**. www.siam.org/meetings/gs13/

2013 JOINT STATISTICAL MEETINGS, Montreal, Canada, **3-8 August2013**. www.amstat.org/meetings/jsm.cfm

59th ISI World Statistics Congress, Hong Kong, S.A.R. China, **24-31 August 2013**. 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, www.isi2013.hk.

19th IMACS - International Association for Mathematics and Computers in Simulation. Real Centro Universitario El Escorial - Maria Cristina, Madrid, Spain, **26 - 30 August 2013**. http://www.imacs2013.it

IAMG 2013 Annual Conference, Madrid, Spain, **2 - 6 September 2013.** www.igme.es/internet/iamg2013/

GEOMODEL 2013: 15th science and applied research conference on oil and gas geological exploration and development, Gelendzhik, Russia, **09 - 12 September 2013**. www.eage.org/events/index.php?eventid=981&Opendivs=s3

Society of Exploration Geophysicists SEG Annual Meeting, Houston, TX, USA, **22-27 September 2013**.

6th International Symposium on SUBMARINE MASS MOVEMENTS and their Consequences, GEOMAR, Kiel, Germany, **23 - 25 September 2013**. http://iugs.org

6th International Conference on FRACTALS AND DYNAMIC SYSTEMS in Geoscience, Perugia, Italy, **26 Sept. - 2 Oct. 2013**. http://www.fractgeosci2013.unipg.it/

GEOPHYSICS in Elephant Country. SAGA-AEM conference. Skukuza Camp, Kruger National Park, South Africa, **7 - 11 October 2013**. http://www.saga-aem2013.co.za/

Estimating Rates and Sources of SEA LEVEL CHANGE During Past Warm Periods. Rome, Italy, **21 - 24 October 2013**. www.pages-igbp.org/calendar/upcoming/pages/325-sea-level-change

GSA Annual Meeting and Exposition. Denver, Colorado, USA, **27 - 30 October 2013**. http://www.geosociety.org/meetings/2013/

AGU Annual Fall Meeting. San Francisco, California, USA, **9 - 13 December 2013**. http://sites.agu.org/meetings/

WORLD LANDSLIDE Forum III: "Landslide Risk Mitigation Towards a Safer Geo-Environment", Beijing, **2 - 6 June 2014**. http://iplhq.org/category/iplhq/world-lanslide-forum-iii/

76th EAGE Conference & Exhibition Amsterdam, Netherlands, **16 - 19 June 2014**. http://www.eage.org/events

2014 Joint Statistical Meetings, Boston, Massachusetts, **2 - 7 August 2014**. http://www.amstat.org/meetings/jsm.cfm

IAMG 2014 Annual Conference, Jawaharlal Nehru University, New Delhi, India. **17-20 October 2014.** http://www.jnu.ac.in/Conference/IAMG2014

GSA Annual Meeting Vancouver, BC, Canada, **19–22 October 2014**. http://www.geosociety.org/meetings/2014/

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CoDaCourse at UdG 1-5 July 2013

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A week's course on compositional data analysis will be imparted on the premises of the University of Girona (UdG). The course provides an introduction to the theoretical and practical aspects of statistical analysis of compositional data, as well as an informal discussion forum on more advanced modelling topics. This course will present the current state of the art in this field of active research and will cover the following topics:

1. Hypothesis underlying statistical data analysis (sample space, scale);
2. The Aitchison geometry of the simplex;
3. Coordinate representation; distributions on the simplex;
4. Exploratory analysis (centering, variation array, biplot, balances-dendrogram);
5. Linear processes in the simplex; regression;
6. Irregular data: missing data, zero values, and outliers; and,
7. Introduction to multivariate analysis: cluster and discriminant

The CoDaCourse is accredited by the International Association for Mathematical Geosciences and supported by the Statistical Modelling Society. Special discounts for students and SMS members are applied to fees. http://www.compositionaldata.com//pages/codacourse_form.html

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IAMG 2013 15th CONFERENCE MADRID

Eulogio Pardo Igúzquiza, chair of the Organizing Committee of IAMG2013, has informed us that at last count 370 abstracts have been received before the deadline for submissions which ensures that IAMG2013 will be a great success this year. Dr. Raimon Tolosana-Delgado (Spain), Chayes Prize winner, and Dr. Grégoire Mariethoz (Australia), Vistelius Award recipient, will deliver keynote presentations. Dr. Peter A. Dowd (University of Adelaide, Australia) has been selected as the 2013 George Matheron Lecturer.

After a lapse of several years, the conference proceedings are going to be released in printed form as a Springer book of extended abstracts http://www.springer.com/earth+sciences+and+geography/geology/book/978-3-642-32407-9

Prior to conference and the main technical sessions, the Executive will meet on Saturday and the IAMG Council meeting will be held on Sunday afternoon, September 1 at the Geological Survey of Spain. Business meetings for IAMG committees are being scheduled to be held during the Conference.

INTERNATIONAL ASSOCIATION FOR MATHEMATICAL GEOSCIENCES MEMBERSHIP APPLICATION FOR 2013

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☐ "Statistical Methods for Estimating Petroleum Resources" by P. J. Lee	US$	93.75
OPTIONAL: IAMG Conference Proceedings		
Note: Proceedings are freely downloadable to members at: http://www.iamgmembers.org/phpbboard/		
☐ Proceedings IAMG 2001 – 2011, C&G Silver – DVD	US$	15.00
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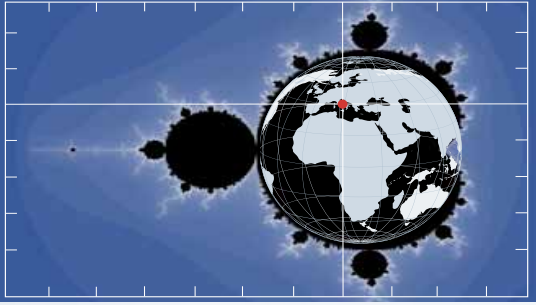

6th International Conference on

Fractals and Dynamic Systems in Geoscience

Perugia, Italy
26 Sept. - 02 Oct. 2013

- First Circular -

Fractals, multifractals, non-linear processes and chaotic dynamical systems are becoming increasingly fundamental for analyzing data and understanding processes in the Earth and Environmental Sciences.

The aim of this conference is to present the latest research and techniques in the application of fractals and dynamic systems to Earth systems, with emphases on predictability of geological risks, natural resources and climate change.

The conference welcomes contributions on all applications of fractals and dynamic systems in the Earth and Environmental Sciences.

The conference will be preceded by three days of workshops aimed at training researchers on the practical use of fractals and dynamic systems on following topics:

- **Anisotropy and Inhomogeneity Quantification of Rock Fabrics** (*J.H. Kruhl & M. Peternell*, Technical University Munich and Johannes Gutenberg Universität Mainz, DE)
- **Fractals and Natural Resources** (*T. Blenkinsop*, James Cook University, AU)
- **Fractal-Geometry-Based Treatment of Geohazards** (*C. Suteanu*, Saint Mary's University, CA)

Invited Speakers include **Shaun Lovejoy** (McGill University, CA), **Ian Main** (The University of Edinburgh, UK) **Heinz Otto Peitgen** (Jacobs University Bremen, DE), **Hans Joachim Schellnhuber** (Potsdam Institute for Climate Impact Research, DE), **Cristian Suteanu** (Saint Mary's University, CA).

Contact: Diego Perugini (Department of Earth Sciences, University of Perugia, IT)
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www.fractgeosci2013.unipg.it

Scientific committee: Perugini D. (chair), Blenkinsop T., De Campos C.P., Kruhl J.H., Lovejoy S., Peternell M., Poli G., Storti F., Suteanu C., Telesca L.
Organizing committee: Perugini D. (chair), Comodi P., Frondini F., Kruhl J.H., Poli G., Telesca L.

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