



IAMG

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Newsletter

Official Newsletter of the International Association for Mathematical Geology

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Call for Proposals to Organize the IAMG2005 Conference

The Association is now accepting proposals for organizing the ninth annual IAMG conference during the summer or fall of 2005.

The deadline for proposals is February 15, 2003. Individuals or organizations interested in organizing IAMG 2005 should follow the instructions in "Guidelines to prepare IAMG conferences" available at the web site <http://iamg.org/conference.html>. Bids should be sent to the IAMG President. In addition, it would be helpful for planning purposes for the President to receive some forewarning--a notice of intent to submit a proposal--ahead of the official deadline, preferably by December 25, 2002.

Starting with this issue, the Newsletter will not be mailed to all IAMG members anymore. Only a small group (about 20 %) of the addressees marked the checkbox on their membership renewal form to indicate that they preferred to still receive a hardcopy of the Newsletter via the postal service.

From the Editor
From the Editor
From the Editor

From now on the membership will be alerted by e-mail when the Newsletter is uploaded to the IAMG

website (www.iamg.org). It is available there in PDF format and can be either read onscreen or downloaded and printed. By the way, the last eight Newsletters, back to number 56, are also available for viewing or download from the website.

This change is part of the streamlining of the IAMG affairs. See the President's Forum (p. 3) for more on the recent changes. The new IAMG office will also handle the distribution of the Newsletter (both the e-mailing and the mailing) and should be notified when your e-mail address or postal address changes.

This new arrangement will save the Association money with reduced printing, handling and mailing costs and will make the Newsletter available in a more timely fashion. Let us know if you agree or if you have suggestions for improvement of the service.

On another matter: your Newsletter editor keeps moving. After a stint of almost two years as a guest scientist with the Kansas Geological Survey at the University of Kansas in Lawrence, he has opened his new office as "consulting geologist" in Dallas, Texas. This completes the circle back to where he started out almost 40 years ago when he joined Arco Oil & Gas (then Atlantic Refining) in their research department. The company is gone and the city has changed and grown but many old friends are still here to share the memories of the early years. The time in Kansas was a wonderful experience both in terms of interesting research and interactions with great people and being able to get much background on the history of the IAMG, by having access to several of the founders and leaders of the Association. We hope fervently that the Math Geology Group there will find a new home or will manage to reverse their ill fortunes in the near future.

Harald S. Poelchau

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PRESIDENT'S FORUM

By now, most members of IAMG will have realized that there is a different arrangement for handling their membership payments. Membership renewals, questions related to journal subscriptions and similar matters are handled by a company that specializes in providing management services to organizations of all types—mostly professional organizations, including some academic ones. The company is named Events & Management Plus Inc.—E&M for short—and they are situated in Kingston, Ontario, Canada. I signed a contract with them for one year, starting in December 2001. If their performance is satisfactory, I fully expect to renew the contract at least for the balance of this Council. There are some obvious long-term benefits to be gained from a permanent arrangement, such as an office address that does not change every four years, a staff that can deal with member's questions, arrangements with our publishers, and maintenance of our membership database, amongst others.

Until now, these tasks were the responsibility of the Treasurer. The IAMG Treasurer was always a very demanding job, because not only did this person deal with membership renewals and manage the day-to-day problems associated with journal subscriptions (change of addresses, nondelivery of journals, ordering of IAMG Monographs, etc.), but he also had to manage IAMG bank accounts and investments, disburse payments of all kinds, produce annual accounts and deal with an accountant and a broker. For a volunteer position, this was asking a lot, and the final straw that broke the camel's back was when we instituted the option of electronic subscriptions to Computers & Geosciences that needed password protection. Geoff Bohling, with the considerable assistance of his wife Gwen, did an admirable job of coping with all this during 2001, but it became clear that someone with a regular fulltime job could not manage to keep all these balls in the air. In today's world there is little support from many employers for professional activity of this type, something that has changed over the past decade in many organizations. The idea for instituting a permanent office had been suggested previously by Vera Pawlowsky during the run up to the election of the present Council. Thank you Vera, for planting that seed,

...it became clear that someone with a regular fulltime job could not manage to keep all these balls in the air. In today's world there is little support from many employers for professional activity ...

which has now germinated and, I hope, will grow into a long-lived tree.

The E&M office is situated in an old mill on the shore of the Cataraqui River in Kingston. Kingston is a city with a population with over 100,000 on the north shore of Lake Ontario, about 2 hours drive south of Ottawa. It is home to Queen's University, is the birthplace of Canada's first Prime Minister, Sir John A. MacDonald, and by Canadian standards has a long history. Many of the older buildings are constructed from Lower Paleozoic limestones that underlie the area. For a while it was capital of what was then known as Upper Canada. After the war of 1812 between Canada and the US, the British army was called in to build a canal from Ottawa to Kingston, to allow supplies from Montreal to be shipped up the Ottawa River, then down the Rideau canal to Kingston, without having to run the gauntlet of the US navy in Lake Ontario. The canal, with 45 locks, is still in use today for pleasure boating, and is a National Park.

E&M have a permanent staff of about six people. The President and CEO is Elizabeth Hooper, who started the business 21 years ago, and the Vice-President is Pamela Lyons. The person looking after IAMG affairs is Donna Dennison. In mid-November last, Geoff Bohling, who made a special trip from Lawrence, Kansas, for the occasion, Vice-President Frits Agterberg and I drove from Ottawa to Kingston to meet the staff and sign the contract (this was after comparing quotes from several other companies, and reaching a decision endorsed by Council). IAMG's needs were discussed in detail, and we had a good lunch in a restaurant in the same building as the office, overlooking the river. We were impressed by E&M's friendly and professional atmosphere, and the reasonable rates for services—perhaps a benefit of a weak Canadian dollar and lower costs associated with a small city. Time and experience will tell whether this arrangement is durable, but the signs are promising and I hope that this will be the IAMG office for the foreseeable future. Meanwhile, the Treasurer can focus on looking after IAMG's finances without the heavy burden of office management.

Graeme Bonham-Carter

LETTER TO THE EDITOR

TO: IAMG Newsletter

Kansas Geological Survey, Lawrence, KS

February 13, 2002

Dear Sirs from IAMG Newsletter; I would cordially like to thank you for the article published in your December edition about the life and work of my husband Prof.

Vassil Vuchev. I am deeply moved by your attention and I believe that all who knew Vassil will keep the memory for him - as a person and professionalist.

Sincerely yours:

Anna Vucheva



**Annual Conference of the
International Association
for Mathematical Geology**

15 - 20 September 2002, Berlin, Germany

Geoscience Risk Analysis
Application of Remote Sensing And GIS
Geostatistical estimation and simulation
Computer applications and software development
Environmental modelling (inc. climate change)
Mining
History of Mathematical Geology

A programme of workshops is planned for Thursday 11 September and post-conference field trips will take place on Friday 12 September. Further details can be found on the conference web site <http://www.iamg2003.com> and all enquiries, including offers of contributions and suggestions for further symposia should be sent to iamg2003@port.ac.uk

A first circular and call for papers will be distributed shortly, please send an email to the above address if you wish to be added to the mailing list but note that all IAMG members are already included.



**ANNOUNCEMENT AND PROPOSAL
SOLICITATION:**

**STUDENT RESEARCH GRANTS
IN MATHEMATICAL GEOLOGY**

The International Association for Mathematical Geology (IAMG) is pleased to announce the availability of the 2002 Student Grants program. The Student Grants Program supports graduate student research in broad areas of mathematical geology for the purposes of advancing the development and application of quantitative methods in the geosciences. Recipients of the awards, which typically amount to \$2,000 US, must be enrolled in a formal university program in which they are pursuing a graduate degree (i.e., masters or doctoral students). The competition is not restricted to students sponsored by members of IAMG. Project proposals and requests for support should include the following:

- Applicant's name
- Applicant's contact information (postal address, home address, telephone, fax, email address, etc.)
- University in which the applicant is enrolled, degree being pursued, and planned completion date of degree
- Transcripts of undergraduate and graduate course work completed to date (or a statement from the applicant's academic advisor that details the applicants academic credentials)
- Lists of prior awards and honors received by the applicant
- Professional and work experience, as well as extra-curricular activities
- Title of the project proposal, an abstract of no more than 500 words, and the target completion date for the project
- An endorsement of the project signed by at least one faculty member from the academic department in which the student is enrolled
- Detailed project budget

All proposals will be evaluated on the basis of the applicant's academic record, endorsement from the sponsoring university and faculty, relevance and feasibility of the project, and financial need. Additional guidelines concerning the competition can be found on the Internet at www.iamg.org.

Written proposals for 2002 funding, which must be received no later than close of business on August 15, 2002, should be submitted to:

Donna Dennison
Student Grants Committee, IAMG Office
4 Cataraqui St., Suite 310
Kingston, ON K7K 1Z7 Canada
e-mail: office@iamg.org

TECHNICAL PROGRAM

The conference will start on Sunday, September 15th at 18:00 with an icebreaker party followed by three days of plenary and technical sessions. Plenary sessions will include lectures by invited speakers on the state-of-the-art geo-informatics and mathematical 3D/4D-modeling and visualization. Seventeen technical sessions with approximately 275 papers will cover subjects from geostatistics and visualisation to environmental modeling and exogene geodynamics. During the last two days of the conference seven tutorial workshops will be offered. At the end of the conference (Sept. 20) a geological excursion to Rüdersdorf will be offered, the biggest (6 km²) Muschelkalk-quarry in northern Germany and a famous historical and geological site.

SOCIAL PROGRAM FOR ACCOMPANYING PERSONS

An informal three day social programme (Sep 16-18) for spouses and companions will be organized. It is planned to start on Monday with a half day sight-seeing tour visiting the new as well as the old center of Berlin. On the second day attendees are invited to visit the famous Sanssouci Palace in Potsdam which was designated as a world cultural heritage site by UNESCO in 1990. A guided tour through one of the famous museums of Berlin will be offered on the third day.

VISIT OUR WEB SITE

Details of the program, papers, shortcourses and directions to the venue can be found on the conference website:

<http://www.fu-berlin.de/iamg2002/>

The Secretary General of the IAMG would like to inform you that, in accordance with IAMG Statute 5, there will be a General Assembly at IAMG2002, Berlin to discuss Association business. More details will be provided later.

IAMG2003 Annual Conference in Portsmouth

The Annual Conference in 2003 is to be held in Portsmouth, UK from Sunday 7 September to Friday 12 September, hosted by the School of Earth and Environmental Sciences, University of Portsmouth.

In IAMG2003 we wish to highlight the analysis, modelling and simulation of geological hazards whilst also providing a programme of symposia of sufficient breadth to attract state-of-the-art contributions from across the full range of mathematical geology. Across the world, activity and funding in the field of geological hazards has increased dramatically in recent years. We believe it timely that an international conference should highlight the ubiquitous rôle played by mathematical geology in the effective identification, remediation and management of geological hazards.

Contributions, both oral and poster, are invited for symposia under the following headings -

- Predictive Modelling of Geohazards I - Volcanic hazards
- Predictive Modelling of Geohazards II - Glacial hazards
- Predictive Modelling of Geohazards III - Geotechnics
- Predictive Modelling of Geohazards IV - Earthquakes and seismicity
- Predictive Modelling of Geohazards V - Landslide hazards
- Stochastic Modelling I
- Stochastic Modelling II - Geotechnics
- Geoscience Information Systems

Association Business

John Davis to be Distinguished Lecturer

The IAMG Distinguished Lecture Series committee has proposed Dr. John C. Davis of the Kansas Geological Survey as the IAMG's Distinguished Lecturer for 2002-2003. Dr. Davis was nominated in response to the "Call for Nominations" issued to the IAMG membership in the last newsletter and his nomination was unanimously endorsed by the DL committee. As an internationally recognized scientist, experienced public speaker and dedicated teacher, John Davis easily meets the qualifications for a distinguished lecturer established in recommendation #3 of the 2000 Report of the Lecture Series Commission. He has also accepted to perform the duties of a distinguished lecturer established in recommendation #8 of the same report. Upon formal award of the lectureship and his acceptance thereof, the DL committee will work with Dr. Davis to select host institutions and itineraries as financial resources permit. Heinz Burger, organizer of the 2002 IAMG annual meeting, has been asked to allocate 15 minutes or so of the schedule for the announcement of the Distinguished Lecturer and the titles of his selected talks. This will provide visibility to the Lecture Series and an opportunity for potential hosts that are attending the meeting to approach the Lecturer. The next step for the committee will be to work with the speaker in selecting host institutions and planning an itinerary. If you have suggestions for the committee about institutions who would like to invite the Distinguished Lecturer, please contact Alec at desbarat@NRCan.gc.ca. Alec Desbarats and his and his Committee are to be congratulated for an excellent choice.



Call for Award Nominations

The Association invites all members to submit nominations for the **2003 Vistelius Award** and the **2003 Chayes Prize**.

Deadline: January 15, 2003

See the "Guidelines for Awards within the IAMG" section of "Guidelines and Procedures" on the Organization's web page http://iamg.org/awards_guidelines.html

The documents which should accompany each proposal are:

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

Please submit documentation in electronic format (preferably in .rtf format) to:

Heinz Burger
Chair, Awards Committee
Freie Universität Berlin
- Geoinformatik -
Malteserstr. 74-100
12249 BERLIN, Germany
E-mail: hburger@zedat.fu-berlin.de

2002 Krumbein Medal and Griffiths Award

The Awards Committee, consisting of John Cubitt, John C. Davis, André Journel, Hugh Rollinson, IAMG president Graeme Bonham-Carter (non-voting) and chair Vera Pawlowsky-Glahn, has completed selection of award recipients for 2002, who are

2002 Krumbein Medal: Michael Ed. Hohn, USA

2002 Griffiths Award: Ian Lerche, USA

M.E. Hohn was elected from a field of five candidates, I. Lerche had three opponents. Following the By-Laws and guidelines of our Association, evaluation of all nominees was based on resumes and accompanying statements distributed electronically among all members of the Committee. I am happy to say that this time no problems appeared with attached files; a definitive breakthrough in the dynamics of the awards committee.

For the Krumbein Medal there are three criteria, which can be summarized as follows: A. Distinction in application of mathematics or informatics in the earth sciences; B. Service to IAMG; and C. Support to professions involved in the earth sciences, while for the Griffiths awards we have only two: 1. Outstanding teaching in general and 2. Teaching that involves application of mathematics.

All nominees who did not make it in this round will be automatically considered for the next selection, but fresh nominations are welcome. Please look at the front page "Call for Nominations" for 2003. If you do not nominate your favorite geomathematicians, they will never receive the recognition they deserve.

I would like to thank the following persons for their active support to the Awards Committee during the 2002 selection process, either as submitters of nominations and/or writers of laudations. It makes the work much more pleasant and, without their effort, our task would be impossible: **Heinz Burger, Tim Cross, Roussos Dimitrakopoulos, Carol A. Gotway Crawford, Richard McCammon, Ricardo A. Olea, Tetsuya Shoji.**

The list is certainly not very long, and I would like to encourage our rank-and-file to a more active participation. There is no other way to make our awards and our association more prestigious, and this will benefit all of us.

Presentation of the two awards is scheduled to take place in the coming Berlin conference in September 2002. Laudations of the recipients will appear in the proceedings of the conference and in the Association's site at the Internet. Furthermore, citation of the Krumbein medalist will be published in *Mathematical Geology* and of the Griffiths awardee in *Computers & Geosciences*.

And now its time to say good-bye. Heinz Burger was approved by Council as Awards Committee chair for the period 2002-2006 on Dec 13 2000, so he is taking over the task. I wish him good luck and I thank very warmly everybody in the Association for their support and friendship.

Un fuerte abrazo a todos y a todas y ¡hasta la vista!

*Vera Pawlowsky-Glahn, Chair
Awards Committee*

Mathematical Geology Ends at Kansas Geological Survey

On June 3, 2002, M. Lee Allison, Director of the Kansas Geological Survey, announced that the Mathematical Geology Section of the Kansas Survey was to be disbanded and all staff members of the Section, save one, were to be fired effective June 3, 2003. According to Allison, the firings were necessitated by a budgetary shortfall which resulted from the KGS having its State appropriation cut by about \$250,000. Allison stated that the Mathematical Geology Section was chosen for elimination because "it was not central to the mission of the Survey."

The Mathematical Geology Section was founded as the Geologic Research Section in 1962 by Daniel F. Merriam. In 1970, John Davis became Section Chief and has directed the Section ever since. Although the Section's name has changed several times, it has maintained a focus on quantitative geology and the development of computer software for the earth sciences. Over its 30-year plus history, the Section has gained a worldwide reputation as one of the leading centers of mathematical geology and has been a staunch supporter of the IAMG. The Section was the host for IAMG2001, the last annual meeting held in Cancun, Mexico.

Among its other accomplishments, the Kansas group was noted for hosting a succession of Visiting Research Scientists from around the world, including almost all of the leaders in the field. It contributed to the spread of mathematical geology via short courses, training programs, and a policy of welcoming students and professionals from industry and academia. The group also developed widely-used software including programs for contour mapping and geostatistics, petrophysics and log analysis, and more specialized applications.

Scientists to be fired include John Davis, author of *Statistics and Data Analysis in Geology*, 3rd. ed., an IAMG Past President, Krumbein medalist and first IAMG Distinguished Lecturer; John Doveton, first IAMG Griffiths Award recipient and author of the AAPG book, *Geologic Log Analysis Using Computer Methods* and other books on petrophysics; Ricardo Olea, IAMG Past President and editor of IAMG monograph 3, *Geostatistical Glossary and Multilingual Dictionary* and author of *Geostatistics for Engineers and Earth Scientists*; Geoff Bohling, researcher in mathematical modeling of dynamic systems and current IAMG Treasurer; Dave Collins, mineral economist and specialist in GIS applications, and JoAnne DeGraffenreid, IAMG Monograph Editor. Gina Ross, GIS specialist and organizing chairman of IAMG2001, was the only member of the section spared termination.

The members of the Section are uncertain about their future plans. Does anyone need a ready-to-go research and development group?

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IAMG Journal Report



C&G Best Paper Awards 2001

The competition for Best Paper in Computers & Geosciences during 2001 has resulted in a tie for first place. The two winning papers are:

"*Three-dimensional reconstruction and modelling of complexly folded surfaces using Mathematica*" by **Ross R. Moore** and **Scott E. Johnson**: C&G 27(4), 401-418, and

"*STORMSED1.0: hydrodynamics and sediment transport in a 2-D steady-state, wind-and wave-driven, coastal circulation model*" by **Janette Cookman** and **Peter B. Flemings**: C&G 27(6), 647-674.

Ross Moore is an Australian. After a first degree from University of Melbourne, he qualified in 1981 for a DPhil and University of Oxford, after studying Mathematical Physics and Pure Mathematics. He returned to Australia, for a post-doctoral position at the ANU in Canberra, then since 1986 at Macquarie University in Sydney. Ross's main interests are in developing, using and extending computing software for tasks "useful to mathematicians". This includes technical typesetting, as well as working with programs for the graphical display of mathematical concepts. He is on the board of directors for the TeX Users Group, and maintains the website for the forthcoming ICIAM 2003 -- the 5th International Congress in Industrial and Applied Mathematics.



It was at Macquarie University where Ross first met Scott Johnson; rather, it was Scott who found Ross, when looking for someone to help him with mathematical reconstructions of inclusion trails visible in serial thin-sections. This led to several papers, published in Computers & Geosciences and elsewhere. The prize paper recalls this work, and expands on the idea of using general-purpose mathematical software to help describe and model specific concepts in the geosciences.

Scott E. Johnson's research centers around the spatial and temporal relations among deformation, metamorphism and magmatism at convergent tectonic boundaries. He is particularly interested in microstructures and microstructural processes in igneous and metamorphic rocks formed in these environments. Scott earned his B.Sc. degree in 1985 from the University of New Mexico, Albuquerque, and his Ph.D. degree in 1989 from James Cook University, Australia. He held various research fellowships at James Cook University and Macquarie University in Australia from 1989 to 2000, including a Rothmans Foundation Fellowship and an Australian Research Council Queen Elizabeth II Fellowship. He now holds the Structural Geology position at the University of Maine in Orono.



Janette L. (Cookman) Metzger graduated from Michigan Technological University in 1996 with a degree in Geological Engineering and received a Master of Science degree in Geosciences from The Pennsylvania State University (PSU) in 1999. She developed STORMSED1.0 as a M.S. thesis project with Dr. Peter B. Flemings at PSU. She worked as a Geologist in the East Texas Bossier Sand natural gas play at Anadarko Petroleum Corporation in Houston, Texas from 1999-2001, and is currently employed as an Associate Geologist at Brown and Caldwell Environmental Engineers & Consultants in Boston, Massachusetts.



JOURNAL CONTENTS

Mathematical Geology

Volume 33, Number 5 (2001)

Practical Calculation of Non-Gaussian Multivariate Moments in Spatiotemporal Bayesian Maximum Entropy Analysis — D. T. Hristopulos and G. Christakos

A Markov Chain Model for Subsurface Characterization: Theory and Applications — A. Elfeki and M. Dekking

Scale Transitions in Fracture and Active Fault Networks — T. H. Wilson
Teacher's Aide: Geologic Characteristics of Hole-Effect Variograms Calculated from Lithology-Indicator Variables — T. A. Jones and Y. Z. Ma

Teacher's Aide: Modeling Hole-Effect Variograms of Lithology-Indicator Variables — Y. Z. Ma and T. A. Jones

BOOK REVIEW

The Practice of Data Analysis: Essays in Honor of John W. Tukey Edited by D. R. Brillinger, F. T. Fernholz, and S. Morgenthaler — Reviewed by Robert F. Shurtz

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Rate of Convergence of the Gibbs Sampler in the Gaussian Case — A. Galli and H. Gao

Fixed-Domain Asymptotics for Variograms Using Subsampling — M. Fuentes

Gradient Estimation from Irregularly Spaced Data Sets — T. H. Meyer, M. Eriksson, and R. C. Maggio

Kriging with Inequality Constraints — P. Abrahamsen and F. E. Benth

Probabilistic Assessment of Temperature in the Euganean Geothermal Area (Veneto Region, NE Italy) — P. Fabbri

LETTER TO THE EDITOR: Comment on "Correcting the Smoothing Effect of Estimators: A Spectral Postprocessor" by A. G. Journel, P. C. Kyriakidis, and S. Mao — D. G. Krige and W. Assibey-Bonsu

ASSOCIATION ANNOUNCEMENT: Statutes and By-Laws of the IAMG

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Two Artifacts of Probability Field Simulation — M. J. Pyrcz and C. V. Deutsch

Generalized Shifted-Factor Analysis Method for Multivariate Geo-Referenced Data — W. F. Christensen and Y. Amemiya

High-Frequency Sequence Stratigraphy Using Syntactic Methods and Clustering Applied to the Upper Limestone Coal Group (Pendleian, E1) of the Kincardine Basin, United Kingdom. — T. Duan, C.M. Griffiths and S.O. Johnsen

LETTERS TO THE EDITOR:

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Reply to Letter to the Editor by S. Rehder and U. Zier — J. Aitchison, C. Barceló-Vidal, J.A. Martín-Fernández and V. Pawlowsky-Glahn

ASSOCIATION ANNOUNCEMENT: The Tenth General Assembly of the International Association for Mathematical Geology

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Criteria to Compare Estimation Methods of Regionalized Compositions — J.A. Martín-Fernández, R.A. Olea-Meneses and V. Pawlowsky-Glahn

Direct Sequential Simulation and Cosimulation — A. Soares

Empirical Orthogonal Functions Analysis Applied to the Inverse Problem in Hydrogeology: Evaluation of Uncertainty and Simulation of New Solutions. — F. Delay, A. Buoro, and G. de Marsily

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Peter B. Flemings is an Associate Professor with the Pennsylvania State University Department of Geosciences. His research links sedimentation, flow in porous media, and deformation in study of the dynamic behavior of continental margins. He received his B.A. degree from Dartmouth College, and both an M.S. degree and Ph.D. in geology from Cornell University. Before joining Penn State, he was an associate research scientist at Lamont-Doherty Earth Observatory of Columbia University and the Crosby Distinguished Lecturer at the Massachusetts Institute of Technology.



Member News

IAMG Treasurer **Geoff Bohling** is recovering from a very serious ski accident in Colorado. A high speed encounter with a tree shattered one of his vertebrae. Miraculously he survived without major nerve damage. He's healed enough to just recently shed his brace, and he reports feeling "almost human" again.



Recent Books of Interest

The book "**Geostatistics Rio 2000**" which contains 15 papers on geostatistics that were presented in IAMG sessions at the 31st IGC held in Rio de Janeiro has just come out in print. Five of the papers are on petroleum geostatistics and the others on applications to mining. The volume, which is dedicated to the memory of Georges Matheron, contains a preface by Ricardo Olea (the IAMG president in 2000). The editors were Margaret Armstrong, Claudio Bettini, Normand Chanpigny, Alain Galli & Armando Remacre. It is published by Kluwer Academic Publishers as Volume 12 in their series "Quantitative Geology & Geostatistics". (ISBN 1-4020-0470-2)

Margaret Armstrong

A new kind of science by *Stephen Wolfram*

Physics and computer science genius Stephen Wolfram, whose Mathematica computer language launched a multimillion-dollar company, now sets his sights on a more daunting goal: understanding the universe. Wolfram lets the world see his work in *A New Kind of Science*, a gorgeous, 1,280-page tome more than a decade in the making. With patience, insight, and self-confidence to spare, Wolfram outlines a fundamental new way of modeling complex systems with simple cellular automata.

Hardcover: 1192 pages ; Dimensions (in inches): 2.47 x 9.70 x 8.08, ca. 2.3 kg, Publisher: Wolfram Media, Inc.; ISBN: 1579550088, \$44.95



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Seismic Hazard Assessment in the Tihamat Asir Region, Southwestern Saudi Arabia — Z. Sen and Khalid Al-Suba'i

Algorithm of Calculation of Lyapounov Coefficients for Analysis of Chemical Auto-oscillations, as Applied to Calcite Crystallization Model — N.A. Bryxina and V.S. Sheplev

BOOK REVIEW: Statistical Tests for Mixed Linear Models by André I. Kuri, Thomas Mathew, and Bimal K. Sinha — Reviewed by Ted Chang and Jean Goslin

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Conditional Simulation of Complex Geological Structures using Multiple-point Statistics. — S. Strebelle

Nonseparable Space-time Covariance Models: Some Parametric Families. — S. De Iaco, D.E. Myers and D. Posa

On the Use of Multivariate Lévy-stable Random Field Models for Geological Heterogeneity. — J. Gunning

On Modeling Discrete Geological Structures as Markov Random Fields. — T. Norberg, L. Rosén, Á. Baran and S. Baran

Conditional Simulation of Non-Gaussian Random Functions. — X. Emery

BOOK REVIEW: Subsurface Flow and Transport: A Stochastic Approach. edited by G. Dagen and S.P. Neuman — Reviewed by E.K. Paleologos

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Multidimensional Self-Affine Distribution with Application in Geochemistry — Shen Wei and Zhao Pengda

Optimization with the Gradual Deformation Method — M. Le Ravalec-Dupin and B. Noetinger

Modeling Conditional Distribution of Facies from Seismic using Neural Nets — J. Caer and Xianlin Ma

Calculation of Uncertainty in the Variogram — J. Ortiz and C.V. Deutsch

Conditioning Channel Meanders to Well Observations — D.S. Oliver

Spatial Association of Mineral Occurrences and Curvi-Linear Geological Features — E.J.M. Carranza and M. Hale

A New Nonparametric Discriminant Analysis Algorithm Accounting for Bounded Data Errors — P. Nivlet, F. Fournier and J.J. Royer

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About BLU estimators and compositional data — V. Pawlowsky-Glahn and J.J. Egozcue.

Revisiting the geometry of a ternary diagram with the half-taxi metric — W. E. Miller

Numerical homogenization of the rigidity tensor in Hooke's law using the node-based finite element method — W. Zijl, M.A.N. Hendriks and C.P.'t Hart.

First and second orders of suture complexity in ammonites: A new methodological approach using fractal analysis — J.A. Perez-Claros, P. Palmqvist and F. Oloriz.

Control function measures for hydrodynamic problems — I. Lerche and E.K. Paleologos.

BOOK REVIEWS:

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Paleomagnetism: Continents and Oceans by M.W. McElhinny and P.L. McFadden — Reviewed by A.E.M. Nairn

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Statistical methods for jointly estimating the decay constant of K-40 and the age of a dating standard — J. Kwon, K. Min, P.J. Bickel and P.R. Renne.

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Environmentalism and natural aggregate mining, by L.J. Drew, W.H. Langer, and J.S. Sacks

Multicriteria geologic data analysis for mineral favorability mapping - application to a metal sulphide mineralized area, Ribeira Valley Metallogenic Province, Brazil, by C.C. de Araújo and A.B. Macedo

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Study of the natural gas hydrate 'trap zone' and the methane hydrate potential in the Sverdrup Basin, Canada, by J.A. Majorowicz, P.K. Hannigan, and K.G. Osadetz

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Some aspects of resource assessment uncertainty and their economic consequences in the 1002 Area of the Arctic National Wildlife Refuge, by E.D. Attanasi and J.H. Schuenemeyer

Correlation between oil production and reserves discovery, by M. Feygin

A new model for heat flow in extensional basins: estimating radiogenic heat production, by D.W. Waples.

Neural network-based estimation of principal metal contents in the Hokuroku District, northern Japan, for exploring Kuroko-type deposits, by K. Koike, S. Matsuda, T. Suzuki, and M. Ohmi.

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Hydrogeologic behavior of an alluvial aquifer, Salta Province, Argentina: simulations of hydraulic conductivity field, groundwater flow and chloride migration, by J. Köhn, E.E. Kruse, and J.E. Santos.

Preliminary cellular-automata forecast of permit activity from 1998 to 2010, Idaho and western Montana, by G.L. Raines, M.L. Zientek, J.D. Causey, and D.E. Boleneus

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A model-based evaluation of horizontal wells for improving the functionality of an urban reservoir system, by E.J. Brown and E. Bardsley

Worldwide estimates of deep natural gas resources based on the U.S. Geological Survey World Petroleum Assessment 2000, by T.S. Dyman, R.A. Crovelli, C.E. Bartberger, and K.I. Takhashi.

Integration of structural, gravity, and magnetic data using the weights of evidence method as a tool for kimberlite exploration in the Buffalo Head Hills, northern central Alberta, Canada, by F. Paganelli, J.P. Richards, and E.C. Grunsky

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Domingo Aerden and Javier Sanchez San Roman — STEREOFIT: A program for fitting directional data to multiple planes and some applications in structural geology

Book Review: B.S. Daya Sagar — GIS and Geocomputation - Peter Atkinson and David Martin (Eds.); Taylor & Francis, 11 Fetter Lane, London, 2000, 276pp, US\$115.00, ISBN 0-7484-0928-9 (Hardcover)

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M. Amore, A. Bonaccorso, F. Ferrari and M. Mattia — Eolo: software for the automatic on-line treatment and analysis of GPS data for environmental monitoring

Book review — Ulrich Zier — Geostatistics for Environmental scientists - R. Webster & M. A. Oliver, John Wiley & Sons, Chichester, UK, 2001, 271+xi pp, GBP £55, ISBN 0-471-96553-7

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Philippe M. Sonnet — EVFIT, a MATLAB® program for selecting the best exchange vectors to represent mineral formulae

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B.M. Hartley — Exact travel time calculations for simple three-dimensional Earth models in seismic exploration using computer algebra

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Christian D. Klose — Fuzzy rule-based expert system for short-range seismic prediction

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Book review: James R. Carr — Practical geostatistics: modeling and spatial analysis - Simon W. Houlding, Springer, Berlin, 2000, 159pp, ISBN 3-540-66820-9 (hardcover+CD-ROM)



"I find I can think better when I stand upright."

S. GROSS

NATURAL HISTORY 7/94

MARMAP System Partnership

Geospatial data form the foundation of an information-based society. Consider a 21st Century digital government scenario of the following nature: "What messages do multicategorical thematic maps and cellular surfaces have about the large landscapes they represent? And at what scale and at what level of detail?...Does the spatial pattern of the map reveal any societal, ecological, environmental condition of the landscape? And therefore can it be an indicator of change?...How do you automate the assessment of the spatial structure and behavior of change to discover critical areas, hot spots, and their corridors?...Is the map accurate? How accurate is it? How do you assess the accuracy of the map? Of the change map over time for change detection? What are the implications of the kind and amount of change and accuracy on what matters, whether climate change, carbon emission, water resources, urban sprawl, biodiversity, indicator species, or early warning? And with what confidence, even with a single map/change-map?"

A primary purpose of MARMAP System Partnership is to develop sound methodology and appropriate software for the quantitative analysis and interpretation of multi-categorical maps and cellular surfaces (inferential geospatial informatics) involving landscape pattern analysis, multiscale landcover landuse change detection, accuracy assessment, critical area detection and delineation, disease mapping and geographic surveillance, prioritization and ranking without having to integrate multiple indicators, and a few more. It will be nice to see you participate in one capacity or the other. The following websites give recent publications together with some relevant exciting events.

Please feel free also to share this material with your potentially interested friends and colleagues.

1. MARMAP and MARMAP Prospectus 1, 2, 3, 4, 5, 6, 7. Website: <http://www.stat.psu.edu/~gpp/newpage11.htm>
2. Multiscale Advanced Raster Map Analysis System: Definition, Design, and Development. Invited Paper for Joint Statistical Meetings (New York City), Portuguese Statistical Congress, International Environmetrics Society, Brazilian Ecological Congress, and Italian Ecological Society. Website: <http://www.stat.psu.edu/~gpp/PDFfiles/TR2002-0203.pdf>
3. Project MARMAP System Partnership Collaboration with EPA STAR Grant Atlantic Slope Consortium for Development, Testing, and Application of Ecological and Socioeconomic Indicators for Integrated Assessment of Atlantic Slope in the mid-Atlantic states. Website: <http://es.epa.gov/ncer/abstracts/grants/00/envind/brooks.html>
4. Project MARMAP System Partnership Collaboration with UNEP Division of Early Warning and Assessment on Human Environment Index based on Countrywide Land, Air, and Water Indicators. Website: http://www.stat.psu.edu/~gpp/current_events.htm
5. Project MARMAP Show and Tell Seminar series: EPA ORD NCEA, EPA ORD NERL, EPA OEL, NASA HQ, NASA GSFC, NCHS, NYSDEH; UMD, GWU, UCB, MSU, UM, SUNY SPH. Website (Powerpoint Presentations): <http://www.stat.psu.edu/~gpp/powerpoint.htm>
6. Ecosystem Health and Its Measurement at Landscape Scale: Towards the Next Generation of Quantitative Assessments. Invited Paper for Ecosystem Health, International Society for Ecosystem Health. Website: <http://www.stat.psu.edu/~gpp/PDFfiles/TR2002-0202.pdf>
7. Multiscale Advanced Raster Map Analysis System for Measurement of Ecosystem Health at Landscape Scale: A Novel Synergistic Consortium Initiative. Invited Paper for Managing for Healthy Ecosystems, International Society for Ecosystem Health. Website: <http://www.stat.psu.edu/~gpp/PDFfiles/TR2002-0301.pdf>
8. Washington DC Conference on Linkages Between Biodiversity, Ecosystem Health, and Human Health, June 6-11, 2002. A Special Session on Ecosystem Health and Its Measurement at Landscape Scale. June 10, 10:00AM - 12:00Noon. Website: http://www.stat.psu.edu/~gpp/current_events.htm
9. Joint Statistical Meetings on Statistics in Era of Technological Change, August 11-15, 2002, New York City. A Special Session on Multiscale Advanced Raster Map Analysis System for Digital Government in the 21st Century. August 13, 2:00PM - 3:45 PM. Website: http://www.stat.psu.edu/~gpp/current_events.htm
10. Short Course and Research Workshop on Multiscale Advanced Raster Map Analysis System for the Map of Italian Nature, University of Parma, Parma, Italy, June 21-22, 2002. Website: http://www.stat.psu.edu/~gpp/current_events.htm

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Conference Reports

Baltic-7 - Kaliningrad

The IAMG co-sponsored the 7th Conference of Baltic Geologists, "Baltic-7", held in Kaliningrad, Russia, on April 21-27, 2002, and organized a technical symposium on "GIS Tools for Mapping Marine Sediments." The Baltic-7 Conference organizer was Prof. Emel Emelyanov of the Atlantic Branch of the Shirshov Institute of Oceanology (Russia). Co-chairmen of the IAMG Session were Profs. John Davis of the Kansas Geological Survey (USA) and Jan Harff of the Baltic Sea Marine Institute and Greifswald University (Germany). Technical presentations on all aspects of geology and oceanography of the Baltic Sea were held in the Kaliningrad Historical Museum. The IAMG Session was held on board the R/V Akademik Mstislav Keldysh, an historic research vessel anchored at the Museum of the World Ocean. Selected papers from the GIS session will appear in a special issue of Natural Resources Research, along with papers on quantitative topics (modeling, statistical analyses, etc.) from the general sessions.



R/V Akademik Sergey Vavilov

All 180 participants in the conference were housed on board the R/V Akademik Sergey Vavilov in Kaliningrad harbor. In addition to the technical sessions, there was a marine field trip for participants to the Kaliningrad barrier island and a bus trip to the world-famous Baltic amber mines. The trips provided opportunities to examine Quaternary stratigraphy of the Baltic coast and coastal changes caused both by regional uplift and by human activities.

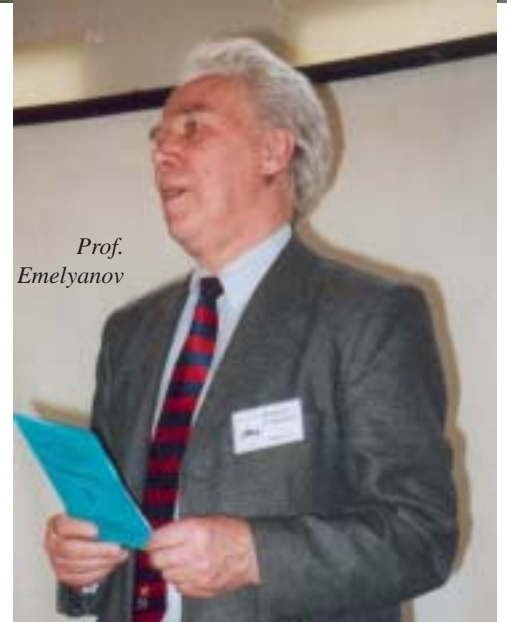
Coffee break in the Kaliningrad Historical Museum



Prof. Emel Emelyanov and IAMG representative John Davis



Amber Mine



Prof. Emelyanov

Meeting of German Hydrogeology Association (FH-DGG) May 9-12, 2002 in Greifswald

Every two years German hydrogeologists meet in order to discuss new developments in research, analytical devices, remediation techniques, as well as strategies to meet legal directives, e.g. the recently developed European guidelines for ground and surface water (EU-WRRL). This year more than 200 scientists and practitioners met at Greifswald, where the chair for Applied Geology/Hydrogeology was newly installed only three years ago.

As usual, the atmosphere was great, which was also due to the fine weather, marvelous landscape at the Baltic Sea and the big support by Greifswald's students at the Institute for Geological Sciences.

During three parallel sessions, 70 oral contributions and about 50 posters were discussed. Subjects like regional hydrogeological aspects (Mexico, Indonesia, Vietnam and many other countries), groundwater recharge and soil water quality, groundwater modeling and spatial heterogeneity of aquifers were presented. Especially the last two subjects had strong mathematical aspects and could as well have been presented at an IAMG meeting.

The highly positive attitude of hydrogeology(-ists) toward mathematical modeling tools is well known, but it was again emphasized by the big interest for the two workshops which preceded the meeting: while H.-J. Diersch (WASY GmbH/Germany) presented the special facilities of his groundwater modeling program FEFLOW to simulate density driven flow and transport, H. Burger and M.-Th. Schafmeister highlighted the possibilities of geostatistics to deal with special problems in soil and groundwater contamination, regionalization and parameter identification for groundwater models.

The meeting was concluded by two field trips in the vicinity of Greifswald on the Baltic Sea: one presenting the Holocene development of the Baltic coast at the island of Usedom, the second dealing with swamps and springs in the chalk cliffs at Rügen.

Having organized this hydrogeologists meeting in Greifswald in May and being involved in the organization of the upcoming IAMG meeting in Berlin in September, I would strongly recommend (i) that Hydro-Geologists and Mathematical Geologists renew their close contact and (ii) that the participants of the Berlin meeting in September consider the possibility of visiting Germany's Baltic coast.

See you in Berlin

Maria-Th. Schafmeister

Geostatistics-UK

The first Geostatistics-UK meeting for over ten years was held at the University of Leicester on 22 November 1999. The meeting was planned, organised and run by Dr. Alison Riding (ADAS, Research Division), Dr. Nick Tate (Department of Geography, University of Leicester) and myself. For Geostats-UK'99 a field of nationally and internationally recognised presenters was assembled around three core themes of geostatistics (i) characterisation of spatial variation, (ii) spatial prediction and (iii) spatial simulation. Each theme was the focus of a session in the one-day meeting and comprised a presentation by an invited keynote speaker, supported by three additional oral papers and several poster papers. The three keynote speakers were Dr. Margaret Oliver (Department of Soil Science, University of Reading), Prof. Richard Webster (Rothamsted Experimental Station, Hertfordshire) and Prof. Peter Dowd (Department of Mining and Mineral Engineering, University of Leeds). To make the material presented at the conference as accessible as possible the International Association for Mathematical Geology (IAMG) provided sponsorship to produce a small soft-cover proceedings of full written papers. This was distributed at the actual meeting. Of the 18 papers presented, 11 papers made it into the published proceedings. The meeting was a great success, attracting a delegation of over 50 (with participants from countries including Belgium, Cuba, the Netherlands, Spain and Sweden). This number, while small relative to major conferences, facilitated intense interest and debate because of the common interest.

Building on this initial success, the second Geostatistics-UK meeting was held at the University of Reading on 25-26 March 2002, organised by Dr. Margaret Oliver (Department of Soil Science, University of Reading). The second meeting was held in conjunction with the British Society of Soil Science (BSSS), and the International Soil Tillage Research Group (ISTRO) Tillage Erosion and Translocation Working Group (TEGWG). Geostats-UK'02, therefore, was larger than Geostats-UK'99, spanned two days rather than one and attracted a larger international delegation of over 70. The meet-

ing was organised into four sessions with a keynote speaker associated with each:

University of Greifswald starts a special binational training center in Hanoi, Vietnam

On March 25, 2002, the Joint Education and Training Center Hanoi-Greifswald (JETC) was officially opened in the presence of high-ranking representatives of academia and government of both countries, Vietnam and Germany. The JETC is affiliated to Greifswald University and operates within the buildings of the Hanoi University of Sciences.

The main goal of our Center is to establish a one-year training program, the Joint Graduate Education Program (JGEP), which promotes especially gifted Vietnamese bachelors who wish to take up a PhD study in Greifswald, Germany. The motivation is to overcome the gap between the degrees of 'Bachelor' (Vietnam) and 'Diploma' or 'Masters' (Germany), caused by the differences in educational structures. Special courses are held by lecturers from both the German and Vietnamese partner-universities, which aim at the special field of PhD study.

Today we cover five fields of interest: environmental geosciences, biotechnology, biomathematics, physics and community medicine. These disciplines have not been chosen randomly. It is obvious that these five disciplines reflect strongly the special needs of Vietnam, a country characterized by a big population growth rate and consequently a growing need for food (rice, vegetables, fish), a high potential in natural reserves, severe environmental problems and natural hazards like soil and water contamination, landslides, coastline regression, and ground and surface water salinization, phenomena naturally or artificially induced having strong effects on human life conditions and health.

But Vietnam can as well be characterized as a country with a big potential for young students committed to science and knowledge. JETC combines three factors: interested and motivated Vietnamese students, a high demand for research, and German expertise within a framework of training and research activities.

In order to keep the costs as low as possible for Vietnamese students, all courses take place in Hanoi. Twice a year German lecturers visit Hanoi to oversee examinations and teach special courses (spring School). Only successful program participants are then ready to start their PhD study in Germany. During February/March 2002, 30 lecturers held the first classes for more than 60 interested candidates; 50 percent being geoscientists, who – among other courses – completed their formation in fields like coastal processes, mineral-phase analysis, and geochemistry. The broad field of mathematical geology was represented by courses on basin modeling (Jan Harff) and geostatistics (Maria-Th. Schafmeister), respectively.

Our program is not yet complete: other relevant special courses are yet to be included. The departments of Social Sciences, Law, and Languages have already been asked to develop similar programs. But even at this early stage of our program, which is funded for an initial period of three years starting in September, 2001, by the German Academic Exchange Office (DAAD), the high response of Vietnamese students proves the need for this kind of international exchange of knowledge, students, and scientists.

For further information contact Maria-Th. Schafmeister, organizer of the DAAD-program 'JETC Hanoi-Greifswald' (Greifswald University, schaf@uni-greifswald.de) or visit our web-page (<http://www.uni-greifswald.de/~geo/Vietnam/index.htm>).

Maria-Th. Schafmeister

Professor B.W. Silverman, FRS — Wavelets; Dr. M.V. Meirvenne — Geostatistical Assessment of the Risk of Exceeding a Site Specific Contamination Threshold; Dr. G.B.M. Heuvelink — Incorporating Process Knowledge in Spatio-Temporal Interpolation of Environmental Variables; Dr. I. Clark — Using Relationships Between Measurements to Improve Prediction: Illustrated by a Case Study in Aquifer Pollution

Selected papers from Geostats-UK'99 are scheduled for publication as a special issue of Geographical and Environmental Modelling in 2002. A second special issue of Geographical and Environmental Modelling is planned based on papers from Geostats-UK'02. In addition, Geostatistics-UK now has its own dedicated web-site with the following address: <http://boris.qub.ac.uk/gis/gsk/index.htm>. The programme of both meetings can be found at this site. Arrangements are currently being put in place for a sixth meeting in 2004, and details of this will be posted shortly on the Geostatistics-UK web-site. We hope to see you at the next Geostatistics-UK meeting.

Professor Peter Atkinson

Department of Geography, University of Southampton



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Upcoming Meetings

2nd Symp. on COMPUTATIONAL MODELING OF MULTI-SCALE PHENOMENA, National Laboratory of Scientific Computation (LNCC/MCT), Petropolis, Rio de Janeiro, Brazil, **05-08 August 2002**. <http://www.lncc.br/scale-up>, e-mail: scale-up@lncc.br

JOINT STATISTICAL MEETINGS, New York, NY, **11-15 August 2002**. Sponsored by ASA, ENAR, WNAR, IMS, and SCC. ASA, 1429 Duke St., Alexandria, VA 22314-3415; (703) 684-1221, E-mail meetings@amstat.org, <http://www.amstat.org/meetings/jsm/>

2nd Biot Conference on POROMECHANICS, Grenoble, France, **26-28 August 2002**. Jean-Louis Auriault, Université Joseph Fourier, Domaine universitaire, BP 53, F-38041 Grenoble Cedex 9, tel.: (33) (0)4 76 82 51 68, fax: (33) (0)4 76 82 70 43, e-mail: bio2002@hmg.inpg.fr, <http://geo.hmg.inpg.fr/biot2002>

HIGH-LATITUDE OCEAN PROCESSES, L'Estérel Resort, Quebec, Canada, **26-29 August 2002**. American Geophysical Union Meetings Department, 2000 Florida Avenue, NW Washington, DC 20009, EMail: meetinginfo@agu.org Web: <http://www.agu.org/meetings/meetings.html>

Emerging Concepts in ORGANIC PETROLOGY and GEOCHEMISTRY, Banff, Alberta, Canada, **31 Aug -04 Sep 2002**. Dr. Martin Fowler, Geological Survey of Canada, 3303-33rd St. NW, Calgary, Alberta T2L 2A7 Canada, Phone: 403-292-7038, FAX: 403-292-7159, EMail: Mfowler@nrcan.gc.ca, Web: <http://www.cscop-tsop2002.com>

ECMOR VIII, Biennial European Conf. on the Mathematics of Oil Recovery, Freiberg Univ. of Mining and Technology (TU Bergakademie Freiberg), Freiberg, Germany, **3-6 Sept. 2002**. EAGE, PO Box 59, NL-3990 DB Houten, The Netherlands. Phone: +31 30 635 40 55. Fax: +31 30 634 35 24. Email: eage@eage.nl. Internet: www.eage.org/.

International Association for MATHEMATICAL GEOLOGY 7th Int'l Conference, Berlin, Germany, **15-20 September 2002**. IAMG'2002 - Conference Secretariat, Freie Universität Berlin, Malteserstr. 74-100, D-12249 Berlin, Germany, phone +49-30-838 70570, fax +49-30-838 70723, email: iamg2002@zedat.fu-berlin.de, <http://www.fu-berlin.de/iamg2002/>

Gambling with GEOLOGIC HAZARDS and Dealing with SUSTAINABILITY, Reno, NV, USA, **22-29 Sept. 2002**. AIPG and AEG. Kelvin Buchanan, HB Engineering Group, P.O. Box 2391, Reno, NV 89505-2391, Phone: (775) 786-4515, FAX: (775) 786-4324, EMail: summitcrk@aol.com, Web: <http://www.aipg.org>

GITA - Geospatial Information & Technology Association, GIS for Oil & Gas Conf. and Exhibition 2002, Houston, Texas, **23-25 Sept. 2002**. GITA, 14456 East Evans Avenue, Aurora, CO 80014. Phone: 303-337-0513. Fax: 303-337-1001. Email: staff@gita.org, Internet: www.gita.org.

SEG - Society of Exploration Geophysicists, Annual Meeting and International Exposition, Salt Lake City, UT, **6-11 Oct. 2002**. SEG, P.O. Box 702740, Tulsa, OK 74170-2740. Phone: 918-497-5500. Fax: 918-497-5557. Email: meeting@seg.org, Internet: www.seg.org/.

SUBSURFACE SCIENCE Symposium, Boise, Idaho, USA, **13-16 Oct. 2002**. Dr. Gautam Pillay, 151 N. Ridge Ave., Suite 140, Idaho Falls, ID 83402, Phone: 208-524-4800, FAX: 208-524-4994, EMail: sss02@inra.org, Web: <http://www.inra.org>

Geological Society of America (Annual Meeting), Denver, Colo., USA, **28-31 October 2002**. GSA Meetings Dept., P.O. Box 9140, Boulder, CO 80301-9140, USA; tel: +1 303 447 2020; fax: +1 303 447 1133; e-mail: meetings@geosociety.org; Website: <http://www.geosociety.org/meetings/index.htm>

Nov 11-14 Continent-Ocean Interactions within the East Asian Marginal Seas, San Diego, California, USA, **11-14 November 2002**. American Geophysical Union, Meetings Department, 2000 Florida Avenue, NW Washington, DC 20009, Phone: 800-966-2481, +1-202-462-6900, EMail: meetinginfo@agu.org, Web: <http://www.agu.org/meetings/meetings.html>

SIAM Conf. on Mathematical and Computational Issues in the GEOSCIENCES (GS03), Austin, Texas, **17-20 March 2003**. meetings@siam.org

EGS, AGU, and EUG Joint Assembly, Nice, France, **7-11 April 2003**. Meetings Department, 2000 Florida Avenue, NW; Washington, DC 20009 USA, Phone: +1-202-462-6900, FAX: +1-202-328-0566, EMail: meetinginfo@agu.org, Web: <http://www.copernicus.org/egsagueug/>

GeofluidsIV: 4th int'l conf. on fluid evolution, migration and interaction in sedimentary basins and orogenic belts, Utrecht, The Netherlands, **12-16 May 2003**. TNO-National Geological Survey, Ms. J.M. Verweij, PO Box 80015, 3508 TA Utrecht, The Netherlands, Phone: +31 30 256 4600 FAX: +31 30 256 46 05 EMail: j.verweij@nitg.tno.nl Web: <http://www.nitg.tno.nl>

May 18-24 39th Forum on the Geology of Industrial Minerals, Sparks, Nevada, USA, **18-24 May 2003**. Nevada Bureau of Mines and Geology, Nevada Division of Minerals, and Nevada Mining Association. Terri Garside, NBMG/MS 178, University of Nevada, Reno, NV 89557-0088, Phone: 775-784-6691 ext 126, FAX: 775-784-1709, EMail: tgarside@unr.edu, Web: <http://www.nbmgs.unr.edu/imf2003.htm>

2003 JOINT STATISTICAL MEETINGS, San Francisco, CA, **3-7 August 2003**. ASA, 1429 Duke St., Alexandria, VA 22314-3415; (703) 684-1221, E-mail meetings@amstat.org, <http://www.amstat.org/meetings/jsm/>

ISI - International Statistical Institute, 54th Biennial Session (includes meetings of the Bernoulli Society, the International Association for Statistical Computing, the International Association of Survey Statisticians, the International Association for Official Statistics and the International Association for Statistical Education), Berlin, Germany, **13-20 August 2003**. ISI Permanent Office, Prinses Beatrixlaan 428, P.O. Box 950, 2270 AZ Voorburg, The Netherlands. Tel.: +31-70-337-5737; Fax: +31-70-386-0025. Email: isi@cbs.nl, www.isi-2003.de

IAMG 2003 Portsmouth, United Kingdom, **7-13 Sept 2003**. Dr John Whalley, IAMG 2003, School of Earth and Environmental Sciences, Univ. of Portsmouth, Burnaby Rd Portsmouth PO1 3QL, UK, Tel: +44 23 9284 2259 Fax: +44 23 9284 2244, info@iamg2003.com and iamg2003@port.ac.uk

10th International Congress on MATHEMATICAL EDUCATION, Technical University of Denmark, Copenhagen, **4-11 July 2004**. Congress Consultants, Martensens Alle 8, DK-1828 Frederiksberg C, Denmark, Tel: +45 70 20 03 05, Fax: +45 70 20 03 15, E-mail: icme@congress-consult.com, www.ICME-10.dk

IGC - International Geological Congress, Florence, Italy, **15-22 Aug. 2004**. Internet: www.iugs.org

RECENT DEVELOPMENTS IN GEOSTATISTICS

The IAMG is sponsoring an Invited Paper Session at JSM 2002 to be held in New York City, New York, **August 11-15, 2002**. This session on "Recent Developments in Geostatistics" is organized by Frits Agterberg in Royal Ballroom B at the Sheraton New York Hotel on Monday afternoon, 2:00 PM to 3:50 PM, August 12th, and will be chaired by Carol Crawford.

The program is:

- Andre Journel - Multiple-Point Geostatistics: A New Challenge
- George Christakos - The Emergence of Parmenidean Knowledge Synthesis in Spatiotemporal Modeling
- Timothy Haas - Nonlinear Spatio-Temporal Statistics via Monte Carlo Methods Implemented in a JavaSpaces Distributed Computer
- Noel Cressie - Finding Large-Scale Spatial Trends in Massive, Global, Environmental Datasets

The four oral presentations will be followed by a Floor Discussion.

JSM (the Joint Statistical Meetings) is the largest gathering of statisticians held in North America. It is held jointly with the American Statistical Association, The International Biometric Society (ENAR and WNAR), the Institute of Mathematical Statistics, and the Statistical Society of Canada. Attended by over 4000 people, activities of the meeting include oral presentations, panel sessions, poster presentations, continuing education courses, and exhibit hall (with state-of-the-art statistical products). The theme of JSM 2002 is "Statistics in an Era of Technological Change". For information, contact meetings@amstat.org or phone (703) 684-1221.

News from Freiberg

Geoinformatik (Geoscience Informatics) – A New Curriculum at Freiberg (Germany) University of Mining and Technology

Since this winter term 2001/2002, Freiberg University of Mining and Technology offers a new diploma curriculum entitled "Geoinformatik" which translates to "Geoscience Informatics". The new curriculum is jointly organized by the department of geosciences and the department of mathematics and computer sciences and offers students a well balanced combination of sciences (geological, physics, chemistry), applied mathematics and computer sciences directed towards geoscience applications of informatics which encompass the entire scope of geological science.

Informatics is the study of information technology, its development and application. Geoscience informatics is the field of study that deals with the collection, processing, availability and dissemination of geoscience data, analytical and numerical modeling of processes in the geo-sphere described by the data, and presentation and communication of geo-information and knowledge with digital media. It is based on methods of applied mathematics and informatics as well as on explorative methods for the geo-sphere and inferential methods for its governing processes. The creative combination of both informatics and geoscience methods is required for successful applications of geoscience informatics in geoscience education, research, exploration, and enterprise.

Relevant technologies and approaches include the formal study of geological information seeking and use, knowledge analysis and storage, user behavior and cognition, retrieval analysis, and preservation of information. Practical use of the Internet and Web, data mining, artificial intelligence and electronic publishing are but a few of the future applications.

Geoscience informatics incorporates virtually all areas of geology's affiliates including: Environmental Geology, Hydrogeology, Engineering Geology, Economic Geology, Energy and Mineral Resources, Geophysics, Geodesy, Tectonics, Volcanology, Petrology, etc.

The graduate programme of Freiberg's curriculum features Geodynamics, Numerical Modeling of Solid and Fluid Media, Management of Natural Resources, and Geomonitoring.

For more and continuously updated information the reader is referred to <http://www.geo.tu-freiberg.de/geoinformatik> (in German). Personal information available upon request from the Dean for Students Affairs, Helmut Schaeben.

PhD for K. Gerald van den Boogaart

K. Gerald van den Boogaart received his PhD from the Department of Mathematics and Computer Sciences of Freiberg University of Mining and Technology, Germany, on completion of his PhD thesis "Statistics for individual crystallographic orientation measurements" supervised by Helmut Schaeben.

The objective of the thesis is the development of methods for the statistical analysis of crystallographic orientation data stemming from automated electron back scatter diffraction (EBSD) orientation measurements. Crystallographic orientations differ from other statistical data by their scale and their spatial dependence. As left cosets of rotations they do not belong to any of common scales of statistical data, and for physical reasons they do not generally comply with the independence assumption of classical statistics.

To handle this non-linear scale the statistical moments are replaced by the C-coefficient derived from the characteristic representations of the corresponding group. They provide a simple method to consider crystallographic symmetries and to correct estimators for their bias. Moreover, the crystallographic exponential family is introduced for this scale. Two independent and complementary stochastic models of the spatial dependence are developed and applied to infer the variance of estimators. The first approach, motivated by the notion of crystal grains, allows to infer the estimation error based on knowledge of the microstructure. It requires some restrictive assumptions concerning the interaction between grains. The second approach, motivated by spatial statistics, is based on the sole assumption of a known finite range of dependence and applies generally.

The theory provides for the first time the means to do quantitative orientation data analysis including simulation conditional to a distribution and a spatial dependence estimated from experimental data.

Diploma for Katrin Lademann

Katrin Lademann received her Diploma in Geology from the Department of Geology, Geotechnology and Mining of Freiberg University of Mining and Technology, Germany, on completion of her diploma thesis "Texture and microstructure investigations of high-grade metamorphics of the Saxonian granulites" supervised by Helmut Schaeben and Uwe Kroner (kroner@geo.tu-freiberg.de).

The objective of her thesis was to clarify some aspects of the intricate relationship of texture and microstructure. She combined analysis of individual orientation measurements with electron back-scattering diffraction (EBSD) and orientation mapping with classical methods of microstructural analysis. Her major result is to have shown that a unique crystallographic form, the positive rhombohedra, predominates the development of lattice preferred orientation as well as the orientation of grain boundaries in quartz during dynamic recrystallization at high temperatures and pressures. She will continue her studies as a PhD student in the graduate college of spatial statistics.

Diploma for Alexander Brenning

Alexander Brenning received his Diploma in Applied Mathematics from the Department of Mathematics and Computer Sciences of Freiberg University of Mining and Technology, Germany, on completion of his diploma thesis "Geostatistics without stationarity assumptions within geographical information systems" supervised by Helmut Schaeben.

The objective of this thesis is to relax the assumption of stationarity to generic stationarity and account for the relative lack of structure imposed on the process by additional data as usually stored in a GIS. Generic stationarity reflects the belief in the existence of natural laws that determine a process' distribution law depending on local geology. It provides a means for stationarizing in stationarity conditional on local geology in the sense that "the less stationary" the process is the more additional knowledge of local geology is necessary to determine the process' distribution laws. Thus, the concept of process stationarity is replaced by a stationarity of the governing influence relating the local semivariogram and the local geology as stored in a Geographical Information System (GIS). A construction method is used which can meaningfully incorporate additional spatial information from a GIS like smoothly varying geology in the investigated area or geological faults interrupting continuity, mountainous morphology inducing spatially varying anisotropy, soil and hydrogeological properties, measured contaminant concentrations, etc. Least-squares parameter estimation is used to fit in stationarity semivariogram models in typical example situations, leading to non-linear optimization problems.

Many situations of local anisotropy can be modeled using the class of elliptical semivariograms, which was studied in detail. Using the code developed for the present work, such models were successfully fitted, and in an example situation it could be seen that the corresponding kriging results are also consistent with our knowledge of local anisotropy of the process, in contrast to isotropic or geometrically anisotropic semivariograms.

*Helmut Schaeben
Freiberg, Germany*

schaeben@geo.tu-freiberg.de

Request for Cover Graphics

Readers of **Mathematical Geology**, the time has come for a new cover for our important journal. Please pull out your favorite mathematical geology graphic and send it to Ed Sharp at the Department of Geological Sciences, University of South Carolina, Columbia, South Carolina, 29208 USA. If all goes well, the best submission will be reproduced in full color starting with the January 2003 issue.

Ed Sharp

Short Course Announcement

The second short course "**Textures in Geology**" will be held at the Geology Department of Freiberg University of Mining and Technology, Saxony, Germany, Feb. 10-14, 2003, and chaired by Helmut Schaeben. The course will provide an initiation to preferred crystallographic orientation and texture analysis for graduate students, PhD students, and junior scientists in geology, geophysics, mineralogy, crystallography, and spherical tomography.

The lectures will address the physical experiments to measure texture, in particular X-ray, neutron and synchrotron radiation goniometry, and EBSD individual orientation measurements, the mathematical analysis of texture data, and their geological interpretation.

Lecturers will be Florian Heidelbach, Bayreuth, Germany, Renée Heilbronner, Basel, Switzerland, Karsten Kunze, Zürich, Switzerland, Heinrich Siemes, Aachen, Germany, Holger Stünitz, Basel, Switzerland, Kurt Walther, Potsdam, Germany, and faculty members of Freiberg.

Contact: schaeben@geo.tu-freiberg.de

GEOLOGIC REASONING

A Workshop to take place immediately following the IAMG2003 conference in Portsmouth, UK on September 14, 2003.

Convenor: Cyril A. Pshenichny, Petrography Dept., Faculty of Geology, St. Petersburg State University, Universitetskaya Naberezhnaya 7/9, 199034 St. Petersburg, Russia,
email: pshenich@kp1306.spb.edu

Investigation of Geologic Reasoning as a New Objective of Geoscience and Geohazard Assessment

Geology is a realm of both logic and intuition. We are going to pursue the paths the mind follows when studying geologic phenomena - the lines of induction and deduction, webs of analogies, tales of experience and prescriptions of models. This will be a collective adventure of scientists, from geologists to philosophers (and whom-ever else interested), aiming to give a new vision of geoscience, in which philosophic concepts turn into a computer string, and intuition of every geologist is given strict form and becomes common treasure of science.

In advance of the workshop, Dr Pshenichny will this year be launching an email discussion group on logic and reasoning in geoscience: for further information and to join this group, or for further information about the planned workshop, please send him an email at pshenich@kp1306.spb.edu. An extended abstract is available at <http://www.btinternet.com/~stephen.henley/silicondale/silicon34.htm>