The mission of the IAMG is to promote, worldwide, the advancement of mathematics, statistics and informatics in the Geosciences.
Officers

President: Vera Pawlowsky-Glahn,
Universitat de Girona, Dpt. D’Informatica i Matematica Aplicada,
Campus Montilivi P4, E-17071 Girona, Spain, Tel: +34 972 418 170,
fax +34 972 418 792, E-mail: president@iamg.org

Executive Vice President: Qiuming Cheng,
Dept. of Earth and Space Science and Engineering,
York University, 4700 Keele Street, Toronto, Ontario M3J 1P3,
Canada, Tel: +1 416 736 2100 (Ext: 22842), Fax: +1 416 736 5817,
E-mail: qiuming@yorku.ca

Secretary General: Daniel M. Tetzlaff,
Schlumberger-Information Solutions, 5599 San Felipe, Ste 1700,
Houston, TX 77056, USA, 713-513-2182,
E-mail: dtetzlaff@iol.com

Treasurer: Gina A. Ross,
IAMG, c/o Gina Ross, PO Box 442504,
Lawrence, KS 66044-8939, USA, Tel: +1 785 842 6092,
E-mail: gr_iamg@hotmail.com

Committee Chairs

Awards Committee: Jef Caers
Stanford University - Dept. of Energy Resources Engineering
Green Earth Sciences Bldg., Stanford, CA 94305-2220, USA
Tel: 650-723-1774, Fax: 650-725-2099
E-mail: jcaers@stanford.edu

Curriculum Quality Committee: Maria-Theresia Schafmeister
Institut für Geol. Wissensch., EMAU Greifswald, F.-L.-Jahn-Str. 17a,
D-17487 Greifswald, Germany, Tel: 49 3834 864592, Fax: 49 3834 864572,
E-mail: schaf@uni-greifswald.de

Distinguished Lecturer Committee: Sean McKenna
Technical Staff, Geohydrology Department,
Sandia National Laboratories, P.O. Box 5800 MS0735,
Albuquerque, NM 87185-0735, USA,
Tel: 505-844-2450, Fax: 505-844-7354,
E-mail: samcken@sandia.gov

Meetings Committee: Ricardo Olea
U.S. Geological Survey, 12201 Sunrise Valley Drive, MS 956,
Reston, VA 20192, USA,
Tel: 703-648-6414, Fax: 703-648-6419, E-mail: olea@usgs.gov

Publications Committee: Graeme F. Bonham-Carter
Geological Survey of Canada,
601 Booth St., Ottawa, Ontario K1A 0E8, Canada,
Tel: +1 613 996 3376, Fax: +1 613 996 3376, E-mail: bonham-carter@nrcan.gc.ca

Students Affairs Committee: Helmut Schaeben
Technische Universität Bergakademie Freiberg,
09596 Freiberg, Germany,
E-mail: schaeben@geo.tu-freiberg.de

Historian

Dan F. Merriam, Kansas Geological Survey, University of Kansas,
1930 Constant Avenue, Lawrence, KS 66047, U.S.A., Tel: (785) 864-2127,
Fax: (785) 864-5317, E-mail: dmerriam[at]kgs.ukans.edu

Councilors

George Bárdossy, (Hungarian Academy of Sciences), 1055.Budapest,
V, Kossuth-tér 18, Hungary,
Tel: +36-1-3117-993, E-mail: bar4750[at]jif.hu

Jef Caers, Stanford University, Dept. of Energy Resources Engineering,
Green Earth Sciences Bldg., Stanford, CA 94305-2220, USA,
Tel: 650-723-1774, fax: 650-725-2099,
E-mail: jcaers[at]stanford.edu

Angela DiBiasi, Universidad Nacional de Cuyo, Mathematics
Sarmiento 240, depto. 6, 5500 Mendoza, Argentina,
Tel: 54261-4295-814, E-mail: angeladal[arn]uncu.edu.ar

Eric Pirard, Université de Liège, Département GeMMe-MiCa
Géoresources Minérales, Sart Tilman B52/3, B-4000 Liège, Belgium,
Tel: 32 41 66 95 28, fax:+32 41 66 95 20,
E-mail: eric.pirard[at]ulg.ac.be

Christien Thiart, University of Cape Town, Department of Statistical
Sciences, Private Bag Rondebosch 7700, South Africa,
Tel: 27-21-650-3223, fax: 27-21-650-4773, E-mail: christien.thiart[at]uct.ac.za

Special IGC Councilor: Simon Cox,
CSIRO Exploration & Mining, ARRC, PO Box 1130, Bentley, WA
Australia 6102, Tel: +61 8 6436 8639, fax: +61 8 6436 8555,
E-mail: simon.cox[at]csiro.au

Editors

Computers & Geosciences:
Geological Survey of Canada, Natural Resources Canada,
601 Booth St., Ottawa, Ontario K1A 0E8, CANADA,
Tel: +1 613 992 7258, E-mail: egrunsky@iamg.org

Mathematical Geosciences:
Roussos Dimitrakopoulos
Department of Mining, Metals and Materials Engineering,
McGill University, Montreal H3A 2A7, Canada,
Tel: +1 514 398-4986, E-mail: roussos.di@mccill.ca

Natural Resources Research:
Keith R. Long
Western Mineral Resources Science Center,
U.S. Geological Survey - DeConcini Building,
520 North Park Avenue, Room 355, Tucson, AZ 85719, USA
Tel: 520-670-5512, Fax: 520-670-5113, E-mail: klong@usgs.gov

IAMG Monograph Series
Jo Anne DeGraffenreid
P.O. Box 353, Baldwin City, KS 66006-0353, USA,
Tel: +1 785 594 6624, E-mail: msdeg@mchsi.com

IAMG Newsletter and Website
Harald S. Poelchau
10773 Lanett Circle, Dallas, TX 75238, USA,
Tel: 214-221-1080, E-mail: hsp.iamg@hotmail.com

Archivist

Graeme F. Bonham-Carter, Geological Survey of Canada,
601 Booth St., Ottawa, Ontario K1A 0E8, Canada,
Tel: +1 613 996 3387, Fax: +1 613 996 3726, E-mail: bonham-carter@nrcan.gc.ca
The worldwide financial crisis seems to remit and, up to now, IAMG has survived without damage. In that sense, 2010 has been a successful year for us. There is also good news concerning the internal life of our association.

Following a serious discussion about the problems with our office in Kingston, and about the different alternatives we had to solve them, we have moved to a new office, located in Freiberg, Germany. The new office is a fully dedicated IAMG office, not shared with any other organization. This is the first time in IAMG’s history that the Association has its own office. We have also a new membership website. The forum of the web will be, hopefully, very useful for all of us. We count on your understanding and your help in getting the new office running, especially with respect to correcting the errors which might be in the database, concerning addresses, e-mails, and even membership. We also would appreciate it a lot if you could try the registration and payment through the web, use the forum, initiate discussions that might be of interest to all our members, and let us know any bug or any possible improvement you might detect. An improvement of our services will benefit us all!

In 2010, we had our annual meeting in Budapest, organised by János Geiger and his team. It was a really good and interesting meeting, and we could enjoy the contributions and discussions, as well as the wonderful city of Budapest and the horse riding show before an abundant dinner. As is tradition in our association, we had this year two awardees: Lawrence Drew, from the US Geological Survey, who received the John Cedric Griffiths Teaching Award. Both gave interesting talks. Larry spoke about ‘The creation of a mathematical geologist’, Ana about ‘Interfacing statistical teaching and geostatistics’. The George Matheron Lecturer was Donald Allen Singer, from the US Geological Survey, who spoke about ‘Solving the wrong resource assessment and exploration problems precisely’. This year’s Distinguished Lecturer and Editor of Mathematical Geosciences, Roussos Dimitrakopoulos, from McGill University (Montreal, Canada) gave a talk about ‘High-order Geostatistics: Simulating complex, non-Gaussian geological and environmental phenomena’, and Amilcar Soares, from the Instituto Superior Tecnico (Lisboa, Portugal), was presented as our next Distinguished Lecturer. You should use the chance to invite him to your university or lab!

You are reading the 2010 second issue of our Newsletter thanks to the excellent work of our newsletter editor, Harald Poelchau. It is an excellent piece of art! Our journals are doing very well, which is not a surprise given the personal dedication of the editors, Roussos Dimitrakopoulos for Mathematical Geosciences, Eric Grunsky for Computers & Geosciences, and Keith R. Long for Natural Resources Research. The Council has approved several resolutions. The last one was a one-time one-year free IAMG membership for first authors of papers in our journals, but there have been other issues going on. One aspect which we had no time to discuss during the council meeting was the proposal of setting up a Public Awareness Committee. Finally, the election of Faisal Shazad, from the Student Chapter in Freiberg, Germany, as Public Awareness Representative of IAMG was decided. You will soon find him in virtual networks, like Facebook and the like!

I am also very proud of announcing that the Council approved a new Honorary Member in the person of Walther Schwarzacher. Walther has dedicated all his life to the Geosciences, and especially to Mathematical Geosciences centered in Repetitions and Cycles in Stratigraphy. It is worthwhile to read his CV (p. 4), an excellent example of the evolution of a Mathematical Geologist, and a model to follow for new generations. I hope we meet him next year in Salzburg (Austria), his home country, where IAMG’2011 is being organised.

Student Chapters continue their activity; there are already nine, and the tenth application is under discussion! But we need the active participation of all our members to motivate them. You can find the different Student Chapters on our web, under “Student Affairs”. Every chapter has a link to their own webpage. Have a look, and let us know your impression! It is very important, because our members have the right and the duty to check if the association is putting the money we have in the right place to fulfill our mission!

On October 20, 2010, I appointed the following commission to assist the Archivist in setting guidelines for the handling of printed and electronic material in the IAMG archive:

- Graeme Bonham-Carter (Chair)
- Dan Merriam
- Eusebi Jarauta-Bragulat
- Frits Agterberg (President’s representative)

I hope to see soon their conclusions on what to do with the archive we have in Graeme’s basement!

I would like to use this Forum to call for your participation in nominating candidates for our awards. In Salzburg we will award the Felix Chayes Prize and the Andrei Borisovitch Vistelius Award. Do you know a good candidate? Submit your nomination!

My best wishes to all of you for a pleasant and successful year 2011!

Vera Pawlowsky-Glahn

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Letters to the Editor

From the IAMG birth-place Prague

In 2011 the Jubilee Mining Pribram Symposium will be organized at Pribram (50th year), including the 11th international session of GEÖETHICS. It might be interesting to organize at that occasion also the 20th session on Mathematical Geology. There is not at all any intention to concur with the general main stream of ideas as represented by the official IAMG annual conferences. Hannes Thiergartner has suggested for this possible Pribram meeting a small sub-section about the question “What is MATH GEOL, where it came and where it will go?”. Here we could discuss the development up to now and try to forecast the next years. This could be interesting for us “old followers” (e.g. all still active founding members of IAMG, past presidents etc.) and for leading younger colleagues in this field. It is a philosophic, science-historical and ethical circle.

It might be useful to take such a meeting – in case of a sufficient interest - under the umbrella of the IAMG, especially when such a section will be co-organized with one about geoethics (under the umbrella of the Association for Geoethics for International Development - where I have the honour to serve as Vice-President for Europe and Head of the Working Group for Geoethics).

Another specific reason can be taken into consideration: I hope that the year 2018 will bring again the whole IAMG to Pribram to celebrate its Golden Anniversary in the IAMG birth-place. For strategic purposes some renewed liaison with the country could be useful as well and also some new local people may be attracted in advance to help in development in the future with the Jubilee conference.

At Pribram we continue in the tradition of relatively low budget meetings. The term of the Jubilee Symposium has been already given: October 10-14, 2011. Regularly issued GEOETHICS NEWS are accessible at http://tierra.rediris.es/Geoethics_Planetary_Protection/.

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To summarize: In case of your interest to (re)visit in October 2011 Pribram (and Prague) for reminiscences and friendly discussions about history and achievements of mathematical earth sciences and perhaps also to learn something about new trends in geoethics be so kind to reply (especially prior to the end of this year) to my home address ldmla.nemcova@quick.cz with copies to the office of the Mining Pribram Symposium Secretary marcinioka@DIAMO.CZ; dolezalova@diamo.cz .

Vaclav Nemec


What do IAMG members do that is relevant to IAMG’s mission? Based on presentations at the IAMG’s meeting in 2009 at Stanford, a significant proportion seem to be involved in geostatistical applications. What else are members involved in? It would be interesting to survey the categories of applications. Perhaps that has already be done, but I haven’t heard of it. Anyway, past surveys would likely be out of date, given that mathematical applications in geology and related geosciences seem to be continually evolving, rising and falling in popularity. So here are my two-cents:

First, I’m presently not involved in anything that would seem directly relevant to IAMG’s current mission, although I am working on my memoirs which, among other things, include a history of nearly four decades of mathematical applications at Stanford, from the early 1960s through the late 1990s. Early in this period, the applications were mostly analytical, including trend-surface analysis and factor analysis applied to stratigraphic issues. Later the applications focused on simulating sedimentary processes. During the past decade, however, other than working on the memoirs, I’ve mostly been involved in the oil and gas business, with virtually no focus on mathematical applications. Times change.

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John Harbaugh
Walther Schwarzacher - IAMG’s Latest Honorary Member

Walther Schwarzacher is a charter member of IAMG, a Krumbein Medalist, and published a paper in the first issue of the Journal of Mathematical Geology. Although he did not attend the organizational meeting in Prague in 1968, he has been associated with the Association since the beginning serving on the Council in 1976-80.

Walther was born in Austria in 1925, educated at the University of Innsbruck where he worked with Prof. Bruno Sander studying geology, geophysics, and mathematics. He obtained his PhD in 1949. This relationship led to his interest in carbonates and fabric and structure of sedimentary rocks. He has a postdoctoral scholarship for two years at Cambridge University in England in 1949-51 where he worked with Prof. Percival Allen. It was here that his interest in mathematics and statistics was piqued. He became interested especially in the application of time-series analysis to rock sequences and geological events.

In 1951 he joined the faculty at Queen’s University in Belfast, Northern Ireland, where he taught sedimentology and stratigraphy. He retired in 1991 with emeritus status. During this time he published on repetitions and cycles in stratigraphy, quantitative stratigraphy, models for the study of stratigraphic correlation, use of Markov chains in the study of sedimentary cycles, and simulation of rock sequences. His books, Sedimentation Models and Quantitative Stratigraphy (1975) and Cyclostratigraphy and the Milankovitch Theory (1993), both published in Elsevier’s ‘Developments in Sedimentology’ series have been well received. A brief summary of some of his work appeared in Earth-Science Reviews under the title of Repetitions and Cycles in Stratigraphy in 2000.

In 1967-68 he was a Visiting Research Scientist at the Kansas Geological Survey at the University of Kansas, Lawrence, a Visiting Research Professor at the University of Indiana in Bloomington in the summer of 1970, and Visiting Professor of Geology at Syracuse University in Syracuse, New York in 1975. He has taught courses not only in the US but in Germany and his native Austria as well as many short courses in other countries. He is married to June and they have two boys Wally and Martin.

It is highly appropriate that the IAMG recognize this internationally recognized scientist with a Honorary Membership in the Association.

New IAMG Distinguished Lecturer for 2011

Dr. Amilcar Soares is a Professor at the Instituto Superior Técnico in Portugal and he is also head of the Centro de Modelização de Reservatórios Petrolíferos at IST. He has been extremely active in promoting mathematical geology, worldwide, particularly geostatistics, since the 1980’s, and he is one of the world leaders in applying geostatistics in environmental engineering with recent work on characterizing desertification and making considerable impact on applications to practical problems, not just in theoretical developments. Dr. Soares has also organized one of the Geostat Congresses and two of the geoENV conferences and has been an IAMG member for many years.

More information can be found on the web pages of Centro de Modelização de Reservatórios Petrolíferos: http://cmrp.ist.utl.pt/

Anyone interested in hosting a DL visit at their institution, please contact the Chairman of the DL Committee, Sean McKenna, at: samcken@sandia.gov

Member News

Prof. Dr. Jan Harff has been honored with the Serge von Bubnoff Medal by the DGG (Deutsche Geologische Gesellschaft). The photo shows Werner Stackebrandt of DGG on May 20, 2010 presenting Harff with the medal at the University in Greifswald. Harff is presently doing research on a scholarship at the University of Szczecin, Poland.

The GeoUnion Alfred-Wegener-Foundation has awarded the Karl-Heinrich-Heitfeld Prize (which includes a cash prize of 10,000 Euro) to Prof. Dr. Maria-Theresa Schafmeister. This award honors her contributions to groundwater modeling and especially her promotion and support of young scientists who are interested in the application of mathematical and geostatistical methods to groundwater pollution and environmental risk assessment. Schafmeister is Professor for Applied Geology and Hydrogeology at the Ernst-Moritz-Arndt University in Greifswald, Germany.

IAMG Member Sean McKenna led a joint team from Sandia National Laboratories and the US Environmental Protection Agency (EPA) that recently received an R&D 100 Award for the CANARY software. The R&D 100 Awards are given annually by R&D Magazine to recognize the “100 most technologically significant products introduced in the past year.” CANARY is designed to connect to existing monitoring networks through an existing SCADA system to provide real-time identification of anomalous conditions from multivariate signals. It integrates a number of algorithms for time-series forecasting, data fusion and multivariate pattern recognition to accurately detect anomalous conditions while reducing false positive results. The main application to date has been online analysis of water quality monitoring data to detect contamination events within water distribution networks. Additional information on CANARY including software downloads and documentation is available at: <https://software.sandia.gov/trac/canary>

Danie Krige was elected in October 2010 as a member of the U.S. National Academy of Engineering in Washington, D.C. He is the first and only engineer to receive this especially high honour as a South African and a citizen of the African continent. He is a Foreign Associate of NAE in the Primary Section in Earth Resources Engineering.
Red mud catastrophe in Hungary
On October 4, 2010 the dam of the No.10 red-mud reservoir of the Ajka alumina plant collapsed on its northwestern corner. 600-700,000 m³ red-mud spilled out with waves of 1-2 meter height, killing 9 and injuring 122 people, flooding the village of Kolontár and part of the town of Devecser (Figure 1). Many houses were damaged or ruined. An area of about 40 km² was affected. The Torna and Marcal rivers were contaminated and all life extinguished in them. This is the biggest environmental catastrophe in the history of Hungary.

The aluminium industry is important in Hungary, because of large bauxite resources. The bauxite is processed to alumina in the alumina production. The red mud of the Ajka plant contains 40-45% bauxite resources. The bauxite is processed to alumina in the alumina plant started its production in 1942. Its present capacity is 300,000 tons alumina/year. The plant has been privatized in 1997. From the beginning – 1942 – up to these days about 30 million m³ of red mud was produced. Subsequently, ten reservoirs were constructed to the west of Ajka city on a flat surface. The walls of the reservoirs were strengthened by slag of a nearby power plant. The groundwater level is only 1 to 4 meters below the reservoirs, with a slow groundwater movement in westerly direction. A high-level state commission is investigating the reasons of the catastrophe, but so far no statements have been published. My personal opinion is that walls of the No.10 reservoir were not strong enough. The movement in westerly direction. The Ajka alumina plant is in the form of hematite giving the mud its red colour. It contains caustic soda in varying amounts. The pH of the mud is generally 13, with a range of 11-14. I have to stress that the media news about the high radioactivity and high heavy-metal element content of the Ajka red mud are not true. The Ajka alumina plant started its production in 1942. Its present capacity is 300,000 tons alumina/year. The plant has been privatized in 1997. From the beginning – 1942 – up to these days about 30 million m³ of red mud was produced. Subsequently, ten reservoirs were constructed to the west of Ajka city on a flat surface. The walls of the reservoirs were strengthened by slag of a nearby power plant. The groundwater level is only 1 to 4 meters below the reservoirs, with a slow groundwater movement in westerly direction. A high-level state commission is investigating the reasons of the catastrophe, but so far no statements have been published. My personal opinion is that walls of the No.10 reservoir were not strong enough. The movement in westerly direction. The Ajka alumina plant started its production in 1942. Its present capacity is 300,000 tons alumina/year. The plant has been privatized in 1997. From the beginning – 1942 – up to these days about 30 million m³ of red mud was produced. Subsequently, ten reservoirs were constructed to the west of Ajka city on a flat surface. The walls of the reservoirs were strengthened by slag of a nearby power plant. The groundwater level is only 1 to 4 meters below the reservoirs, with a slow groundwater movement in westerly direction. A high-level state commission is investigating the reasons of the catastrophe, but so far no statements have been published. My personal opinion is that walls of the No.10 reservoir were not strong enough. The movement in westerly direction.

George Bárdossy

Student Affairs

Nancy Student Chapter
In October 2010 some of the board members have changed; our president is now Florent Lalier and our webmaster Gautier Laurent.

Newest IAMG Student Chapter in The Netherlands
A group of students at ITC (ISCI) of the University of Twente under the leadership of Xiaogang Ma has formed the latest IAMG affiliated Student Chapter. Their new Website is http://sites.google.com/site/isciatitc/home

Conference Reports

On IAMG and AGU
In the past years, it has become a tradition that the IAMG organizes an exhibition booth at the annual Fall Meeting of the American Geophysical Union. The AGU Fall meeting, while convened by the “American Geophysical Union”, is long recognized as an international meeting (for instance, travel funds may be obtained from funding agencies of other countries, e.g., Deutsche Forschungsgemeinschaft), as the meeting attracts a growing number of scientists (over 15,000 last year). Most people find one cannot afford to not go. The number of international participants (as opposed to US+Canada) is very large and keeps growing.

There is typically a fall meeting in San Francisco and a spring meeting in Baltimore. More scientists tend to go to the traditional fall meeting (although it is always very shortly before Christmas). More importantly, the fall meeting also has the disciplines that IAMG member’s research is most closely related to, and that is closest to the IAMG mission and interests.

Since we (IAMG) are a small organization by number of members compared to the much larger AGU, I find it important that we are recognized by the AGU community, and the fall meeting is the best opportunity to accomplish that. Our best assets are our journals, whose impact is much larger than the comparatively small number of members and those running the journals may indicate. In a world where publications are important at every aspect, informing others about possibilities of publications is worth a lot. IAMG journals are particularly attractive since there are no page charges, and the journals are well-known, high-quality and quite fast at publication. Of course, the meeting provides opportunities to gain new members (who join directly at the meeting or take IAMG membership forms with them to join later). I view a presence at a meeting very valuable – it brings IAMG a lot of visibility, increases membership and contributions to our journals. As I write this note (which emerged from an email exchange with IAMG President Vera Pawlowsky-Glahn) I would like to invite all of you to engage in thinking about ways that IAMG and its members can increase our impact on the course of science.

The 2009 IAMG-AT-AGU booth was organized by myself and Helmut Mayer, with active assistance of student members Bruce Wallin and Ian Crocker. Bruce and Ian are Vice President and President of the IAMG Student Chapter at the University of Colorado Boulder. Over the years, I have been able to develop an excellent relationship with AGU exhibits, which gives IAMG a great spot in the exhibit hall while paying the much lower academic organization’s booth fee. Several IAMG members helped the cause of IAMG a great spot in the exhibit hall while paying the much lower academic organization’s booth fee. Several IAMG members helped the cause of IAMG and the AGU community, and the fall meeting is the best opportunity to accomplish that. Our best assets are our journals, whose impact is much larger than the comparatively small number of members and those running the journals may indicate. In a world where publications are important at every aspect, informing others about possibilities of publications is worth a lot. IAMG and the AGU community, and the fall meeting is the best opportunity to accomplish that. Our best assets are our journals, whose impact is much larger than the comparatively small number of members and those running the journals may indicate. In a world where publications are important at every aspect, informing others about possibilities of publications is worth a lot. IAMG journals are particularly attractive since there are no page charges, and the journals are well-known, high-quality and quite fast at publication. Of course, the meeting provides opportunities to gain new members (who join directly at the meeting or take IAMG membership forms with them to join later). I view a presence at a meeting very valuable – it brings IAMG a lot of visibility, increases membership and contributions to our journals. As I write this note (which emerged from an email exchange with IAMG President Vera Pawlowsky-Glahn) I would like to invite all of you to engage in thinking about ways that IAMG and its members can increase our impact on the course of science.

Quantitative Image Analysis of Minerals & Rocks
in Budapest, taught by Patrick Launeau (extreme right in blue) and Eric Pirard (in orange-red). We had in total 16 participants for this two days Short Course taught during the weekend 27-28 August 2010 in between the International Mineralogical Association Congress and the IAMG Conference.

Most represented countries were: Belgium, Finland, Germany, Spain, Switzerland, and Hungary.

Ute Herzfeld
University of Colorado Boulder

George Bárdossy

Eric Pirard
Ana Fernández Militina honored with the Griffiths Award

2010 Matheron Lecturer Don Singer

Banquet at Domonyvölgy
Larry Drew receives the Krumbein Medal

George Bardossy

Gina Ross & Cathy Cheng

Janos Geiger

2010 Budapest

16th Annual Meeting of the International Association for Mathematical Geosciences

November 2010, Budapest, Hungary


Computers & Geosciences

Volume 36, Issue 6 (June 2010)

Photogrammetric mapping and measuring application using MATLAB — S. Madeira, J. Gonçalves, L. Bastos

Integrating river cross section measurements with digital terrain models for improved flow modelling applications — B. Schäppi, F. Perona, P. Schneider, P. Burlando

A method of DEM construction and related error analysis — Chunfa Chen, Tianxiao Yue

Development of new R.C and SDR modules for the SATEEG GIS system — Youn Shik Park, Jungun Kim, Nam Won Kim, Seong Joon Kim, Ji-Hong Jeong, Bernard A. Eng, Wonseok Jung, Kyong Jae Lim

Simulation of river stage using artificial neural network and MIKE 11 hydrodynamic model — Rabindra K. Panda, Niranjana Pramanik, Biplap Bala

A comparison of Latin hypercube and grid ensemble designs for the multivariate emulation of an Earth system model — Nathan M. Urban, Thomas E. Fricker

GSIS: A 3D geological multi-body modeling system from netty cross-sections with topology — Jing Ming, Mao Pan, Honggang Qu, Zhihong Ge

A WebGIS system for relating genetic soil classification of China to soil taxonomy — Xuezheng Shi, Guoxiang Yang, Dongsheng Yu, Shengxiang Xu, Eric D. Warner, Gary W. Petersen, Weixia Sun, Yongcun Zhao, William E. Easterling, Hongjie Wang

Optimization of well placement geothermal reservoirs using artificial intelligence — Serhat Akın, Mustafa V. Kok, Irtiek Uraz

MetaRep, an extended CMAS 3D program to visualize mafic (CMAS, ACF-S, ACF-N) and pelitic (AFM-K, AFM-S, AKF-S) projections — Lydéric France, Christian Nicollet

Numerical modelling of non-equilibrium graded sediment transport in a curved open channel — Minh Duc Bui, Peter Rutschmann

Application Article

Groundwater recharge study in arid region: An approach using GIS techniques and numerical modelling — Ismail Chenini, Abdallah Ben Mammo

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An optimized solution of multi-criteria evaluation of landslide susceptibility using fuzzy sets and Kalman filter — Pece V. Gorovskiy, Piotr Jankowski

Geo-MHYDAS: A landscape discretization tool for distributed hydrological modeling of cultivated areas — P. Lagacherie, M. Rabotin, F. Colín, R. Moussa, M. Voltz

SURMODERR: A MATLAB toolbox for estimation of velocity uncertainties of a non-permanent GPS station — Giordano Teza, Arianna Pesci, Giuseppe Casula

Parallelization of sequential Gaussian, indicator and direct simulation algorithms — Ruben Nunes, Josè A. Casella

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Parallelization of sequential Gaussian, indicator and direct simulation algorithms — Ruben Nunes, Josè A. Casella

Application Articles

Geometric analysis of superposed folds in the Kimbi area (Cameron Pan-African fold belt) based on the Fold Profiler method — Ganno Sylvestre, Nzenti Jean Almeida

Bidimensional empirical mode decomposition (BEMD) for extraction of gravity anomalies associated with gold mineralization in the Tongo gold field, Western Shandong Uplifted Block, Eastern China — Jingning Huang, Binbin Zhao, Yongqing Chen, Pengda Zhao

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Web service based hydrologic data distribution system — Rahul Kanwar, Ujjwal Narayan, Venkat Lakshmi

A Cellular Automata Breccia Simulator (CABS) and its application to rounding in hydrothermal breccias — M. Lalonde, G. Tremblay, M. Jibrak

An approach for heterogeneous and loosely coupled geospatial data distributed computing — Bin Chen, Honggang Qu, Zhihong Ge

A FORTRAN program to implement the method of finite elements to compute regional and residual anomalies from gravity data — B.N.P. Agarwal, Shalivahan Srivastava

Fourier spectral analysis for unevenly spaced, average value, data — F. Alejandro Nava

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TSOP-CSCOP Joint Meeting: Unconventional Resources, Clean Coal, and Offshore Resources. World Trade and Convention Center. Halifax, NS, Canada, 31 Jul - 4 Aug 2011. Dr. Prasanta Mukhopadhyay; muki@global-geoenergy.com; Mike.Avery@NRCan-RNCan.gc.ca

INTERNATIONAL STATISTICAL INSTITUTE, 58th ISI World Statistics Congress: Includes meetings of the Bernoulli Society, the International Association for Statistical Computing, the International Association of Survey Statisticians, the International Association for Official Statistics, the International Association for Statistics Education, the Irving Fisher Committee on Central Bank Statistics, the International Society for Business and Industrial Statistics, and The International Environmetrics Society, with an invited session of IAMG, to be held in Dublin, Ireland. 21 - 26 August 2011. ISI Permanent Office, P.O. Box 24070, 2490 AB The Hague, The Netherlands. Phone: +31-70-3375373, Fax: +31-70-3860025, E-mail: isi @cbs.nl, Website: http://www.isi2011.ie/


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


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


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