

# Letter From the President,

## Jan van der Kruk

The coming SEG conference (17-22 October 2010) in Denver offers a broad spectrum of near surface geophysics presented in 8 sessions. This year, we have three oral sessions: “Methodological developments and case studies” 1 & 2, “Surface waves”, two poster sessions “Methodological developments and case studies” 1 & 2, and three special sessions “Geohazards and public safety”, “Hydrogeophysics”, and “Humanitarian and environmental applications of geophysics at the community scale”. In the last session, several project teams of the Geoscientists without Borders are going to present their results. A detailed schedule of all these NSGS sessions can be found in this newsletter.

The annual section's Business Meeting will be held on Monday, October 18, from 4-6 pm (rm 206, Colorado Convention Center). The 2010 annual Near Surface Geophysics Section (NSGS) reception will be held at the Wynkoop Brewing Company, Mercantile Room, 1634 18th St. on Tuesday, October 19. The reception is going to begin with a meeting at 6:30, followed by a dinner/social event at 7:30. During the reception, the Harold Mooney Award is going to be presented to an individual in recognition of long-term, tireless, and enthusiastic support of the near-surface geophysics community.

This is my farewell letter as NSGS president. Being able to serve the NSGS members and working with so many inspiring people was great! We have improved the membership renewal procedure by upgrading our homepage with a new webpage based membership application form (<http://nsgs.seg.org/member-become-application.htm>). We are also in the process of redesigning our NSGS webpage including our logo (see the LOGO design competition in this newsletter). Being a member of the SEG council, I was fortunate to be involved in the SEG governance reform especially concerning the NSGS section. The September issue of The Leading Edge will discuss the governance-reform proposal in more detail. In this last message from me as NSGS president, I'd like to personally thank all of you who have contributed your valuable time to the SEG-NSG section, and I am very happy to introduce the new NSGS president, Klaus Holliger, and the new president-elect, James Irving.

I am looking forward seeing you in Denver.

For questions or suggestions please do not hesitate to email me ([j.van.der.kruk@fz-juelich.de](mailto:j.van.der.kruk@fz-juelich.de))

Best wishes,

Jan van der Kruk

President, Near Surface Geophysics Section of SEG

# SAGEEP Session Proposals & Abstracts

## Session Proposals

The deadline to submit a session proposal has been extended to September 24. The Environmental and Engineering Geophysical Society (EEGS) invites you to submit your proposal before the revised deadline for a session(s) at the 24th Annual Symposium on the Application of Geophysics to Engineering and Environmental Problems (SAGEEP) being held in historic Charleston, South Carolina USA April 10-14, 2011. Submission is done via an online form at the [EEGS web site](#) To date, fifteen session proposals have been accepted.

1. Seismic Refraction Shoot-out: Blind Test of Methods for Obtaining Velocity Models from First-Arrival Travel Times, Colin Zelt, Seth Haines, Michael Powers, Jacob Sheehan and William Doll
2. Agricultural Geophysics, Barry Allred
3. The Use of Geophysical Data for Evidence-Based Groundwater Management, Jessica Reeves, Rosemary Knight
4. Advances in Hydrogeophysical Monitoring, Dale Rucker
5. Karst Geophysics Applied to Environmental and Geotechnical Problems, Mustafa Saribudak, Samuel Peavy, Stephen Moysey
6. Undergraduate Poster Session, Adam Mangel, Catherine Skokan, Gregory Baker
7. Earthen Dams and Levees: Geophysical Reconnaissance, Exploration, and Monitoring, Craig J. Hickey, Lewis E. Hunter, Russell Harmon
8. Geophysics-Assisted Evaluation of Geotechnical/Transportation Process and Construction, Chih-Ping Lin, Xiong Yu
9. Military Geophysics, Ryan North, Russell Harmon
10. Interpretation using Multiple Methods -- An Analogy to Mathematical Boundary-Value Problems, Steve Danbom, Thomas Dobecki (SEG sponsored session)
11. New Developments in Frequency-Dependent Seismic and EM Analyses for Near Surface Geophysics, Ranajit Ghose, John Bradford (SEG sponsored session)
12. Geophysics in Rivers and Streams, Jonathan Nyquist
13. Geophysical Engineering for Geotechnical Site Characterization, Richard Williams, Dayakar Penumadu, Choon Park
14. Migration Imaging of Near-Surface Seismic and GPR Data: New Developments and Case Studies, Rick Miller (SEG sponsored session)
15. UXO/MEC Classification Methods and Examples for Military Munitions Response Projects, Dean Keiswetter

## Abstracts

The abstract submission guidelines have been modified. Expanded, multi-page abstracts for the proceedings will no longer be required, but will instead be optional, based on the desires of the participant. Abstracts will be short (300 words max), and a format template will be prescribed. Submission of an abstract will constitute a commitment to attend the conference, and a \$50 fee will be charged upon submission (applicable toward conference registration). Abstracts will be reviewed for both scientific relevance and absence of commercialism, and notices of acceptance or rejection will be sent in late 2010.

Abstract submission **deadline is Friday, November 19, 2010.**

Authors of accepted papers will then have the option of submitting an expanded abstract, if they choose. These optional, expanded abstracts may range in length from a few pages to ten or more pages, and will retain the format of previous SAGEEP proceedings. They must be submitted by Friday, January 14, 2011, to be included in the abstract volume that will be distributed at the conference.

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## IWAGPR 2011



The International Workshop on Advanced Ground Penetrating Radar is a biannual series of international scientific symposia devoted to the advancements in GPR techniques and applications. The conference is aimed at presenting a wide range of scientific and technical information of high standard to scientists, engineers and end-users of GPR technology. The goal of the workshop is to spread knowledge about GPR technology and its use, as well as, to provide a unique possibility to participants to exchange ideas about the advances in their work and discuss their results. All

papers presented at the conference will be published in the workshop proceedings. The official language of the conference is English.

Contributions are solicited on (but not limited to):

<ul style="list-style-type: none"><li>• Hydrology/Hydrogeophysics</li><li>• Agriculture</li><li>• Archaeology</li><li>• Sedimentology</li><li>• Concrete/Pavements</li><li>• Geology/Geotechnical Engineering</li><li>• Diagnostic of Historical Buildings</li><li>• Glaciology</li><li>• Mining and Tunnelling</li><li>• Utilities detection and mapping</li></ul>	<ul style="list-style-type: none"><li>• Planetary Exploration</li><li>• Demining and UXO</li><li>• GPR wave interaction with the earth</li><li>• Inverse Problems/Tomography</li><li>• Numerical Modelling</li><li>• Data Processing and Interpretation</li><li>• Novel GPR Systems and Antennas</li><li>• Airborne, Borehole GPR</li><li>• Novel Applications</li></ul>
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## Executive Committee

General Chair: Jan van der Kruk (Forschungszentrum Juelich)

Co-chairs: Klaus Reicherter (RWTH Aachen)

Sébastien Lambot (Université catholique de Louvain, Forschungszentrum Juelich)

## Paper Submission:

Authors are invited to directly submit full camera-ready papers of between 4-6 pages.

The Technical Review Panel will review submissions and corresponding authors will be notified on the acceptance or rejection of the paper.

Deadline for papers: **January 28<sup>th</sup>, 2011**

Notification of Acceptance: **March 18<sup>th</sup>, 2011**

For questions regarding the scientific program please contact:

Jan van der Kruk ([j.van.der.kruk@fz-juelich.de](mailto:j.van.der.kruk@fz-juelich.de))

**Welcome to Aachen, Germany!**

Aachen is situated in an area, where the three countries of Germany, Belgium and the Netherlands meet. The source of the city's fame is the Aachen water. Since Roman times, the hot springs at Aachen have been channeled into baths. It is heated by the Eifel volcanos up to a temperature of 74°C and is known to be the hottest volcanic spring water north of the Alps. The Emperor's City is a popular travel destination. This is not just because of its favorable geographical position but also due to its large variety of art and culture, elegant shops and pubs. At the heart of the City lies the Aachen Dom (Cathedral). In 1978 this was the first German building to be included in the Unesco list of World Heritage Sites. The Dom is proud to house the most precious treasures north of the Alps. These can be seen in the Cathedral Treasury. Not far from the Cathedral is the Gothic Town Hall. Its facade is richly decorated with countless figures that remind people of the German coronations that took place in Aachen. A sweet Christmas present has spread Aachen's fame across the globe: The "Printen" are made from a kind of dark and spicy ginger bread and can be bought in the Aachen Christmas Market as well as in many other places in the city.

## **Local Organizing support**

Tanja Weber (Forschungszentrum Juelich)

Erika Wittig (Forschungszentrum Juelich)

Christoph Gruetzner (RWTH Aachen)

For organizational questions please contact:

Tanja Weber ([tan.weber@fz-juelich.de](mailto:tan.weber@fz-juelich.de))

More information can be found at: <http://www.fz-juelich.de/iwagpr2011>

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## **AGU Fall Meeting**

While the abstract submission deadline is past for the AGU Fall meeting, registration is still open. The Fall meeting is in San Francisco, California from December 13 - 17. The housing and discounted registration deadline is November 10, and the online registration deadline is November 19.

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## **Other Meetings**

[71th German Geophysical Society \(DGG\) Conference](#)

21-24 February 2011, Cologne (Köln), Germany

<http://www.dgg-online.de/>

European Geophysical Union (EGU)

3 - 8 April 2011, Vienna, Austria

Abstract deadline: January 10, 2011

[EGU website](#)

73rd EAGE Conference

23 - 26 May 2011, Vienna Austria

Abstract deadline: January 12, 2011

[EAGE events site](#)

Near Surface 2011

12 - 14 September 2011, Leicester, UK

[Near Surface division of the EAGE](#)

## Geoscientists Without Borders®

Communities around the world face crippling water shortages, threats of earthquakes and tsunamis, and other geological hazards. Geophysicists have the knowledge and tools needed to help. Thanks to the crucial support of the geophysical community, eight projects are already underway – including one that is already complete. Some of these projects will present their results in the special session "Humanitarian and Environmental Applications of Geophysics at the Community Level".

More projects are urgently needed. You can help: Explore your opportunities to engage in Geoscientists Without Borders®. Meet the project managers who are leading our efforts to transform the world. Don't miss their special presentations Tuesday at 4:30 PM in the SEG Pavilion.

Keep checking the GWB website (<http://www.seg.org/gwb>) for news on the program

Thanks to dedicated supporters like Schlumberger/WesternGeco, Santos, Global Geophysical, Geophysical Pursuit, CGGVeritas, and individual geophysicists like you, the SEG Foundation is helping geophysicists address critical humanitarian needs worldwide.

# Career Opportunities

## Research Geophysicist

National Risk Management Research Laboratory

Ada, Oklahoma

The National Risk Management Research Laboratory (NRMRL) of the United States Environmental Protection Agency is accepting applications beginning 09/01/10 through 09/30/10 for a full-time permanent Geophysicist. The successful candidate must have a demonstrated research background in areas such as the application of principles, theories, and practices of geology (both surface and borehole methodologies) to environmental and ground-water issues; design and operation of geophysical tools (hardware and software) for characterizing and monitoring subsurface environments and ground-water systems; carbon capture and storage with a focus on geological sequestration; and the ability to adapt/modify practices or techniques to solve a variety of problems and accommodate specialized project requirements.

The position includes Full Federal Employment Benefits and a salary range of \$68,809.00 - \$106,369.00 commensurate with qualifications (salary range is subject to increase in January 2011).

Specific job information and application instructions for the position are posted on the USAJOBS Internet site at <http://www.usajobs.gov>.

Vacancy Announcement Number **RTP-ORD-DE-2010-0072**. The U.S. EPA is an Equal Opportunity Employer.

# NSGS Logo Design Competition

The NSGS is currently in the process of redesigning their webpage. In addition to updating our webpage we announce a LOGO design competition to design and create a new logo for our section. Please email Rob Jacob [rob.jacob@bucknell.edu](mailto:rob.jacob@bucknell.edu) indicating your intention to submit a LOGO design. The new LOGO should represent objectives of the Near-Surface Geophysics (NSG) Section of the Society of Exploration Geophysicists that includes the promotion of the rigorous practice of the science of shallow-earth geophysics including engineering, environmental, groundwater, mining, geothermal, and archeological applications (see also our homepage <http://nsgs.seg.org>). Do not hesitate to contact Rob Jacob with any questions. The NSGS executive committee will vote to award the best design received with a copy of Near Surface Geophysics (Investigations in Geophysics No. 13) - edited by Dwain Butler. This book discusses the whole range of Near Surface Geophysics in 732 pages and is published by the SEG (see also SEG's bookmark). If the NSGS adapts your LOGO, you will be given credit with the design on the website. We are looking forward to receiving many logo designs.

Rob Jacob & Jan van der Kruk



## Note: NSGS Membership

In the transition to digital NSGS membership, there were some difficulties for students trying to register as NSGS members. These problems have now been fixed. Please encourage any near-surface students that you know to join the NSGS. It is free for students to join, but students must also be a member of the SEG (also free for students).

As a reminder, NSGS membership is in three classes based on SEG affiliation:

1. Active: active member of the SEG; \$15 a year
2. Affiliate: associate member of the SEG; \$15 a year
3. Student: student member of the SEG; free

Membership applications can be found at the [NSGS website](#).

## The Leading Edge (TLE) Call for Papers

The Leading Edge is accepting submissions to its February 2011 special issue on near-surface geophysics. The deadline for submission is **October 15, 2010**.

For more information, go to the TLE website or contact one of the guest editors:

[Rick Miller](#)

[Greg Baker](#)

# Special Issues & New Publications

## Advances in Near Surface Seismology and Ground Penetrating Radar

A new SEG book titled *Advances in Near Surface Seismology and Ground Penetrating Radar* will be available for review at the SEG Book Mart during the annual meeting in Denver this year. This book combines 29 refereed papers that are sure to interest researcher and practitioner alike. These papers were solicited by the editors from contributors to the 2009 workshop at the annual meeting in Houston and other well-known authors working in these rapidly advancing specialties.

Technologies used in the application of near-surface seismology and ground penetrating radar (GPR) have seen significant advances over the last several years. Both methods have benefited from new processing tools, increased computer speeds, and an expanded variety of applications. Many shallow seismic projects now incorporate analysis results from different parts of the seismic wavefield, allowing greater redundancy and confidence in interpretations without increased acquisition costs. More information is being extracted from GPR data by utilizing the wide range of analysis techniques developed for seismic data in concert with new tools specific to electromagnetic wave analysis.

It is fitting that these two geophysical techniques share the pages of a book that focuses on the highlights of an ever-increasing number of near-surface studies taking advantage of the wide range of processing and analysis approaches applicable to both. This book is designed to bring together the best of the past decade, state-of-the-practice applications of today, and visions for the next decade.

Rick Miller

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## Geophysics Special Section on “Hydrogeophysics - Electric and Electromagnetic Methods“

The July-August *Geophysics* journal contains a special section on hydrogeophysics. In this supplement, more than 20 hydrogeophysics papers are dedicated to revealing properties, and monitoring processes in the vadose zone as well as in aquifers using Self Potential (SP), Electrical resistance tomography (ERT), Induced polarization (IP), Airborne Time domain Electromagnetics (ATEM), Frequency domain Electromagnetics (FDEM), Nuclear Magnetic Resonance (NMR) and Ground Penetrating Radar (GPR). New theory and techniques are discussed and several case studies illustrate the potential of hydrogeophysical techniques for a wide range of application scales.

Two publications in this issue focus on the inversion of SP measurements. Fernández Martínez et al. apply a Particle Swarm optimization technique for the inversion of Streaming Potential measurements over a pumping well. Results are compared with other approaches, and show a very good convergence rate and include the posterior distribution. Martínez-Pagán et al. developed a sandbox experiment showing that time-lapse self-potential tomography can be used to follow the front of a salt plume over time and to detect the source of leakage. The underlying physics of the generation of self-potential signals associated with a salt plume is described and modeled with a finite element code.

Present day resistivity and induced polarization data collection instrumentation are capable of collecting large data sets in time-lapse mode. This potential is clearly shown in seven publications discussing recent advances in ERT. Johnson et al. describe a parallel implementation of a finite-element time-domain resistivity and induced polarization inversion code that enable an inversion on a standard desktop computing system and demonstrates this with two examples of inversion for characterization and one example of time-lapse inversion. Jayawickreme et al. accurately quantify the soil moisture changes during a two-year time-lapse ERT study on a forest-grassland ecotone using adopted field practices that generated high consistency data, while maintaining the natural site conditions. Hayley et al. present a new method for creating inversion data that has the effects of temperature variations approximately removed. The method is applied to several time-lapse resistivity examples and compared to other techniques. Monego et al. present surface ERT monitoring results of a saline tracer injection in a shallow aquifer. The use of these data to infer hydraulic properties of the aquifer is presented and discussed. Toran et al. demonstrate the use of electrical resistivity surveys, seepage meter measurements, and drive point piezometers to characterize chloride-enriched groundwater in lakebed sediments of Mirror Lake, New Hampshire. Using a combination of geophysical surveys and hydrologic sampling enhances characterization; resistivity shows an extensive plume beneath the lake inlet, while lakebed samples reveal small-scale heterogeneity not captured by 2D inversion. Greve et al. introduce an electrical resistivity based method for the detection of subsurface soil cracks. Results show that depth profiles of electrical anisotropy allow the monitoring of crack development below the soil surface. Rucker et al. imaged the T tank farm on the Hanford site with electrical resistivity using surface electrodes and wells as long electrodes. The long electrode method was capable of imaging targets that remained hidden using only surface electrodes.

Two publications in this special issue focus on the estimation of hydrogeological properties using IP. Weller et al. derive a robust empirical relation between induced polarization and the specific surface area normalized to the pore volume for an extensive sample database. The authors suggest that the obtained relation can be considered the IP equivalent of the classical Archie empirical relation. Kruschwitz et

al. examine the relationships between low-frequency electrical spectra and physical characteristics of a wide range of sandstones and other porous media. They use published experimental data and new data to study the generality of previously proposed links between textural characteristics and electrical spectra.

Five papers discuss new advances for surface and airborne EM surveys or a combination of both. Moghadas et al. addresses the specific configuration of zero-offset, off-ground electromagnetic induction, which presents significant advantages compared to bistatic systems with respect to full-waveform forward and inverse modeling in terms of accuracy and computing efficiency. Hatch et al. compare three electrically-based geophysical surveys (a towed TEM system, a towed DC resistivity system, and an FDEM system) run over the same stretch of river in south-central Australia to investigate the base of the waterway. They conclude that while the information from all three methods is comparable, there are some significant differences that make a careful evaluation of survey goals important. Dickinson et al. mapped an alluvial aquifer and subsurface lithology using ground TEM to obtain starting values and constraints for the inversion of airborne TEM data. Extents of hydrologically-significant thick silt and clay are well mapped, whereas areas of uncertain lithology remain at depth and in areas of poor water quality. Vrbancich et al. use a floating structure to suspend an airborne electromagnetic (AEM) system in close proximity to the sea surface for measuring seawater depth and sediment thickness whilst being towed at slow speed. 1D inversion of EM decays results in water depths that are in very good agreement with known depths, and sediment thicknesses that agree well with marine seismic reflection data, suggesting that the bathymetric accuracy obtained in this study provides an upper limit to accuracies expected from AEM systems flown at survey altitudes. Ley-Cooper et al. show that the isotropic-horizontally-slowly-varying layered earth assumption devalues and limits AEM's three dimensional detection capabilities and that the need remains for smart fast algorithms that account for three dimensional varying electrical properties.

Wallin presents a sensitivity analysis of vertical magnetic fields for frequencies between 100 kHz and 100 MHz, thereby encompassing the diffusion and propagation regimes that simulate the presence of dense nonaqueous phase liquid contaminants at varying concentrations. The results demonstrate the contribution of variations in the electromagnetic wavenumber and layer thickness to changes in the magnetic field.

Nuclear Magnetic Resonance (NMR) is increasingly used for groundwater exploration. Mueller-Petke and Yaramanci present a new inversion scheme - the QT-inversion (QTI) - that solves the inverse problem by taking the complete surface-NMR dataset into account at once. In this way QTI extracts water content and decay time and satisfies the complete dataset simultaneously.

Five papers discuss recent advances in surface and borehole GPR analysis and

inversion. Moysey investigates the presence of arrival trajectories in transient GPR data resulting from the wetting and drying of soils. A computationally efficient method for calculating the trajectories is introduced, and used to perform a semblance analysis for GPR data collected during a flow experiment in a sand tank to estimate soil hydrologic properties. Arcone et al. discuss a ground-penetrating radar survey of the subbottom stratigraphy of a small lake formerly used as a practice bombing range in New Hampshire. The undisturbed natural strata led them to conclude that high explosive munitions were unlikely to have been detonated in the lake. Giroux and Chouteau derived expressions to quantify the error for the estimation of permittivity due to the use of the low-loss approximation under lossy conditions and to examine the repercussions on water content estimation. Although in most cases the error is negligible, it can be significant for some hydrogeophysical applications involving crosshole measurements or low frequency surface GPR. Hinz and Bradford use a tomographic attenuation difference inversion algorithm that uses a data-driven adaptive meshing algorithm to alter the model space and to create a more even distribution of resolution instead of a traditional grid-based inversion. A numerical example, using modeled attenuation difference ground-penetrating-radar data, shows that conductivity changes are effectively located and that surface-based reflection surveys can produce models as accurate as traditional cross-hole surveys. Van der Kruk et al. show that precipitation events generate shallow low-velocity waveguides, in which the electromagnetic waves are trapped and show a dispersive behavior. Multi-mode inversion of the dispersion curves obtained from numerical and experimental data return reliable medium properties for two-layer waveguides with cost function values significantly lower than those obtained with single-layer waveguide inversion.

We thank all the authors, reviewers and all others that contributed to this special issue!

Jan van der Kruk, André Revil and Evert Slob

## **Student Travel Grants to SEG 2010**

Congratulations to the following recipients of the NSG travel grants:

- 1) Brian Miller, University of Kansas
- 2) Marco Vanic, Belgrade University
- 3) Gigih Wijaya, Gadjah Mada University, Indonesia
- 4) Yang Zhao, University of California, Berkeley

We look forward to see you and your presentations in Denver!

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## **SEG Denver Student Events**

### **SEG Challenge Bowl Finals**

Monday, 18 October 3–6 p.m. Hyatt Regency Denver

The Challenge Bowl competition is an international contest testing students' breadth and depth of knowledge about the field of geoscience. Winners of Regional competitions will compete for the "Grand Prize." Join us for an exciting afternoon of competition, and to cheer on your school or favorite team!

### **Student Networking Event**

Monday, 18 October 6–8 p.m. Hyatt Regency Denver

The Student Networking Event will provide students an opportunity to network with industry recruiters in a relaxed atmosphere. Students can meet sponsors and visit with faculty and friends. Join us for an exciting evening of networking, food, drinks, and fun! Please mark your calendar, because this is one event you won't want to miss! (This event is limited to students, active faculty advisors, and company sponsors only.)

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## **Post Doctoral Fellowship**

High Performance Computing for Geophysical Applications

Memorial University

The project “High Performance Computing for Geophysical Applications”, an interdisciplinary project between the Departments of Earth Science, Physics and Physical Oceanography, and Mathematics and Statistics at Memorial University of Newfoundland, is seeking candidates for two Post-Doctoral Fellowship positions. The purpose of this project is to develop algorithms and software for the numerical modelling and inversion of geophysical data using high-performance, multi-core, shared-memory computer architectures. Development will be carried out on a dedicated large-scale multiprocessor computer that is to be purchased as part of the project.

Particular goals of the project include: the implementation of an interactive 3D pre-stack seismic migration algorithm for multi-core, shared-memory computational environments; the implementation of adaptive beam-forming methodology on a parallel computational architecture; and the development of 3D seismic and joint seismic–gravity–EM inversion algorithms. The two Post-Doctoral Fellows will be expected to contribute towards the attainment of these goals.

The successful candidates will have a PhD in Geophysics, Physics, Computational Science, or similar discipline with a background in scientific computation and experience programming in at least one of the two major languages Fortran and C/C++. Candidates who are in the final year of a PhD programme and who will have completed all the requirements for their programme by the start date of the position will also be considered.

The positions are for two years, with the possibility of extension to a third year subject to budgetary constraints. The start-date for both positions is negotiable, but before April 1st 2011 is preferred. Salary is commensurate with qualifications and experience.

For more information, or to apply for one of the positions, please contact:

J. P. Whitehead, PhD, Professor, Department of Physics and Physical Oceanography, Memorial University, St. John's, Newfoundland and Labrador, Canada, A1B 2X7.

Email: [johnw@mun.ca](mailto:johnw@mun.ca)

# SEG 2010: Denver, Colorado

## NSGS Meeting and Reception

The annual section's Business Meeting will be held at Monday, October 18 from 4-6 pm (rm 206, Colorado Convention Center).

The 2010 annual Near Surface Geophysics Section (NSGS) reception will be held at the Wynkoop Brewing Company, Mercantile Room, 1634 18th St. on Tuesday Oct. 19. The reception will begin with a meeting at 6:30, followed by a dinner/social at 7:30. (No Charge to NSGS Members, Non-members can join on the spot and students are welcome: Student membership free). During the reception, the Harold Mooney Award will be presented to an individual in recognition of long-term, tireless, and enthusiastic support of the near-surface geophysics community through education, outreach efforts, professional service, or development of opportunities with other professional disciplines that employ geophysics.

[View Larger Map](#)

A = Colorado Convention Center

## Other Lunch Meetings

### Gravity and Magnetism

The Gravity and Magnetism section luncheon will be on Tuesday, October 19 from 11:30 - 1:30 in the Convention Center. The guest speaker will be John Wahr from the University of Colorado, and the topic of his talk will be "The GRACE Satellite Mission: Using Time-Varying Gravity to Study the Earth". A summary of the talk and more information can be found at the [SEG website](#).

### Mining and Geothermal

The Mining and Geothermal section luncheon will be on Wednesday, October 20 from 11:30 - 1:30 in the Convention Center. Barbara Filas from Geovic Mining Corp. will talk on "Broad Community Support: The Global Standard for Industry Best Practice". A summary of the talk and more information can be found at the [SEG website](#).

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## NSG-Related Presentations

This year we have three oral sessions, two poster sessions, and special sessions with a near-surface focus.

### NS 1 Methodological Developments and Case Studies 1

Monday, October 18. Room 205

Session Chairmen: Fred Hilterman and Xianhuai Zhu

**1:30 PM** Imaging lateral heterogeneity at Coronation Field with surface waves -- Matthew M. Haney\*, Boise State U; Huub Douma, ION Geophysical/GXT Imaging Solutions

**1:55 PM** Imaging challenges caused by gas-induced scatterers in the Bohai PL19-3 area -- Xianhuai Zhu, Kirk Wallace, Phil Anno, Qingrong Zhu, Richard Day, Nan Ma, Craig Hartline, Yunqing Shen, and Robert Hofer, ConocoPhillips

**2:20 PM** Hybrid raypath interferometry: Correcting converted-wave receiver statics -- David C. Henley\*, U of Calgary

**2:45 PM** Guided waves in GPR data: Depth imaging and analysis of phase and group velocities -- Kathryn T. Decker\* and Matthew M. Haney, Boise State U

**3:10 PM** Rayleigh wave dispersion curve inversion: Occam versus the L1-norm -- Matthew M. Haney\* and Leming Qu, Boise State U

**3:35 PM** Effect of the overlying sedimentary sequence on the seismic imaging of the bedrock surfaces: McHenry County, Illinois -- Ahmed Ismail\* and Jason Thomason, U of Illinois Urbana-Champaign

**4:00 PM** In-situ soil properties from the integrated poroelastic models -- Alimzhan Zhubayev\* and Ranajit Ghose, Delft U of Technology

**4:25 PM** Joint use of seismic surface waves and multioffset GPR for sandy soil characterization -- Alberto Godio\*, Politecnico di Torino; Georgios Tsoflias, U of Kansas; Claudio Piatti, Roberto Rege, and Valentina Socco, Politecnico di Torino

## SS 4 Geohazards and Public Safety

Tuesday, October 19. Room 203

Session Chairmen: Richard D. Miller and James A. Hunter

**8:30 AM** Some applications of near-surface geophysics to earthquake geohazards investigations: Examples from Eastern Ontario, Canada -- James Hunter\*, Heather Crow, and Andre Pugin, Geological Survey of Canada; Dariush Motazedian, Carleton U

**8:55 AM** Seismic investigations of subsidence hazards -- Richard D. Miller,\* Julian Ivanov, Jianghai Xia, and Shelby L. Peterie, Kansas Geological Survey; Steven L. Sloan, U.S. Army Engineer Research and Development Center

**9:20 AM** Automated multi-offset ground-penetrating radar data collection for monitoring lab-scale infiltration experiments -- Adam R. Mangel\*, Stephen M.J. Moysey, and Jamie C. Ryan, and Joshua A. Tarbuton, Clemson U

**9:45 AM** Locating abandoned coal mines to assess subsidence risk using self-potential and dc resistivity -- Karoline Bohlen\* and André Revil, Colorado School of Mines; Nancy House, EnCana Oil & Gas (USA)

**10:10 AM** Archaeological investigations using geophysics at Chimney Rock Great House, Colorado -- Michael A. Mitchell, Sarah G.R. Devriese\*, Roxanna N. Frary, and Richard A. Krahenbuhl, Colorado School of Mines; Brenda K. Todd, U of Colorado

**10:35 AM** Role of 3D Seismic for Quantitative Shallow Hazard Assessment in Deep Water Sediments -- Nader C. Datta, Randal W. Utech\*, and Dianna Shelander, Schlumberger DCS

**11:00 AM** Sinkholes and Pitfalls in Urban Geophysics -- Thomas L. Dobecki\*, SDII Global Corporation

**11:25 AM** Application of Shallow Shear Wave Seismic Reflection Methods in Earthquake Hazards Studies -- Jamie B. Harris\*, Millsaps College

**11: 50 AM** Airborne EM Mapping of Rock Slides and Tunneling Hazards -- A. A.

Pfaffhuber\*, E. Grimstad, and U. Domaas, Norwegian Geotechnical Institute; E. Auken, U of Århus; M. Halkjær, SkyTEM ApS; N. Foged, University of Århus; and Sara Bazin, Norwegian Geotechnical Institute

## NS P1: Poster Session: Methodological Developments and Case Studies 1

Tuesday, October 19

Session Chairmen: Joe Zhou and Turgut Ozdenvar

**9:20 AM** Near-surface velocity estimation by weighted early-arrival waveform inversion -- Xukai Shen\*, Stanford U

**9:40 AM** Refraction tomography statics without ray tracing for rugged topography -- Hu Ziduo\*, Wang Xiwen, Wang Shujiang, Wang Yuchao, and Yong Yundong, Petrochina

**10:00 AM** VP versus VS to characterize the shallow subsurface -- Michela Giustiniani\*, Flavio Accaino and Umberta Tinivella, Istituto Nazionale di Oceanografia e di Geofisica Sperimentale

**10:20 AM** Geohazards of seismically triggered submarine slides in Kingston, Jamaica: An initial report -- Katie Delbecq\*, Matthew Hornbach, and Paul Mann, U of Texas at Austin; Lyndon Brown, U of Technology, Jamaica

**10:40 AM** 3D design for a near-surface seismic reflection investigation -- Brian E. Miller\*, George P. Tsoflias and Don W. Steeples, U of Kansas

**11:00 AM** Control point uniformity analysis in near-surface structure investigation -- Bai Xuming\*, Deng Zhiwen, Zhang Xueying, Chen Jingguo, Tang Chuanzhang, Zhang Denghao, and Teng Yongzhen, BGP

**11:20 AM** Impact analysis of uphole time on refraction statics and its solutions -- Feng Zeyuan\*, and Xu Hao, BGP

**11:40 AM** Geophysics and rock-mechanic test for dredging in the Arthur Kill Channel, New York -- William F. Murphy III\*, W. Bruce Ward, Beckett Boyd, William Murphy IV, Richard Nolen-Hoeksema, Matthew Art, and Daniel A. Rosales R., e4sciences | Earthworks

## SS 6 Humanitarian and Environmental Applications of Geophysics at the Community Level

Tuesday, October 19. Room 203

Session Chairmen: Louise Pellerin and Jan van der Kruk

**1:30 PM** Geoscientists without Borders: SEG Foundation's program linking students and people in need through humanitarian applications of geophysics – Craig J. Beasley, WesternGeco/Schlumberger

**1:55 PM** Hydrogeophysical investigation for groundwater at the Dayspring Children's

Village, South Africa -- Susan J. Webb\*, David Ngobeni, Michael Jones, and Tamiru Abiye, U Witwatersrand; Madeline Lee, McMaster U; Nirocca Devkurran and Rachael Goba, U Witwatersrand; Darren Burrows, Fugro Airborne; Louise Pellerin, Green Geophysics

**2:20 PM** The importance of education and outreach in geophysics -- Roel Snieder, Colorado School of Mines

**2:45 PM** Locating groundwater resources for aboriginal communities in remote and arid parts of South Australia -- Graham Heinson, Kent Inverarity\* and David Pedler-Jones, U of Adelaide; Adrian Costar, Dept of Water, Land and Biodiversity Conservation, South Australia; Simon Wurst and Grant McLean, South Australian Water Corporation; Craig Simmons, Flinders U of South Australia

**3:10 PM** Student-based archaeological geophysics in northern Thailand -- Emily A. Hinz\*, Lee M. Liberty, and Spencer H. Wood, Boise State U; Fongsaward Singharajawarapan and Suwimon Udphuay, Chiang Mai U; Apichart Paiyarom, Department of Mineral Resources; Jeffrey Shragge, U of Western Australia

**3:35 PM** Southeast Asia applied geophysics workshop: Geoscientists without borders -- Lee M. Liberty\*, Spencer H. Wood, Emily A. Hinz, and Dylan Mikesell, Boise State U; Fongsaward Singharajawarapan, Chiang Mai U; Jeffrey Shragge, U of Western Australia

**4:00 PM** The importance of stakeholders in community-based geophysics programs -- Stephen Moysey\*, Clemson U

**4:25 PM** An integrated ground water study for Chasnigua, Honduras: Accomplishments and challenges -- David Munoz and Catherine Skokan, Colorado School of Mines

**4:50 PM** Assessing tectonics and geohazards near Kingston, Jamaica: An initial report -- Matthew J. Hornbach\*, Paul Mann and Katie Delbecq, U of Texas at Austin; Charles DeMets and Bryn Benford, U of Wisconsin; Lyndon Brown, U of West Indies

## [NS P2: Poster Session: Methodological Developments and Case Studies 2](#)

Tuesday, October 19

Session Chairmen: Sheng Xu and Adel Ei-Eman

**1:30 PM** Characterizing the Arbuckle-Simpson aquifer through electrical methods -- Kumar Ramachandran\*, Bryan Tapp, Tayler Rigsby and Erin Lewallen, U of Tulsa

**2:10 PM** Application of high-resolution resistivity imaging for railway near-surface investigation in SW China: Two case histories -- Li Jian, Lei Xuyou, and Wei Zhenhua, China Railway Eryuan Engineering Group; He Lanfang, and Zhang Zhenheng, BGP

**2:30 PM** Using seismic surface waves generated by motor vehicles to find voids: Field results -- Yang Zhao\* and James W. Rector, U of California, Berkeley

**2:50 PM** Higher modes of surface waves in microtremor analysis -- Tatsunori Ikeda\*,

Toshifumi Matsuoka and Takeshi Tsuji, Kyoto U; Koichi Hayashi, Oyo

**3:10 PM** S-wave velocity from ground roll inversion: Source-receiver tests and statics -- Soumya Roy\* and Robert R. Stewart, U of Houston

**3:30 PM** Near-surface borehole geophysical imaging in a highly structured area, Beartooth Mountains, Montana -- Tania Mukherjee and Robert R. Stewart, U of Houston

## SS 8 Hydrogeophysics

Wednesday, October 20. Room 203

Session Chairmen: Klaus Holliger and André Revil

**8:30 AM** Inversion of multiple intersecting high-resolution crosshole GPR profiles for hydrological characterization -- Baptiste Dafflon\* and Warren Barrash, Boise State U; James Irving, U of Guelph

**8:55 AM** Estimation of vadose zone hydraulic properties from geophysical data using a Bayesian framework: Effects of a correlated prior on posterior uncertainties -- Marie Scholer, U of Lausanne; James Irving, U of Guelph; Andrew Binley, Lancaster U; Klaus Holliger\*, U of Lausanne

**9:20 AM** Long-term time-lapse surface and borehole electrical resistivity monitoring of natural recharge-induced contaminant plume behavior -- Erika Gasperikova\*, Michael B. Kowalsky, Susan S. Hubbard, and John E. Peterson, Lawrence Berkeley National Laboratory; Gregory S. Baker and Meagan Smith, U of Tennessee; David B. Watson, Oak Ridge National Laboratory

**9:45 AM** Frequency-domain surface nuclear magnetic resonance forward modeling on an adaptive octree mesh -- Trevor Irons\*, Colorado School of Mines and USGS; Yaoguo Li, Colorado School of Mines; Jason R. McKenna, U.S. Army Engineer Research & Development Center

**10:10 AM** Using a real surface conductivity component to estimate hydraulic conductivity -- Mohamed Ahmed Khalil\*, and Fernando Monteiro Santos, U de Lisboa

**10:35 AM** The effect of inhomogeneous surface relaxivity on nuclear magnetic resonance relaxation rates -- Kristina Keating\*, Rutgers U

**11:00 AM** Conditions leading to non-exponential decay of the surface-NMR signal and implications for water content estimation -- Elliot Grunewald\* and Rosemary Knight, Stanford U

**11:25 PM** Biogeophysics: A new frontier in Earth science research" – Estella Atekwana, Oklahoma State U

## NS 2 Surface Waves

Wednesday, October 20. Room 111/113

Session Chairmen: Yunqing Shen and Christine Krohn

**1:30 PM** Exploiting surface consistency for ground-roll characterization and mitigation -- Christine E. Krohn\* and Partha S. Routh, ExxonMobil Upstream Research Co.

**1:55 PM** Using surface-wave methods for static corrections: A near-surface study at Spring Coulee -- Khaled Al Dulaijan \*, Saudi Aramco; Robert R. Stewart, U of Houston.

**2:20 PM** Multimode inversion of multichannel analysis of surface waves (MASW) dispersion curves and high-resolution linear radon transform (HRLRT) -- Julian Ivanov\*, Richard D. Miller, Jianghai Xia and Shelby Peterie, U of Kansas

**2:45 PM** Estimation of near-surface quality factors by inversion of Rayleigh-wave attenuation coefficients -- Jianghai Xia\*, Richard D. Miller, Julian Ivanov, and Shelby Peterie, U of Kansas

**3:10 PM** Simultaneous joint inversion of refracted and surface waves -- Simone Re\*, Claudio Strobbia, Michele De Stefano and Massimo Virgilio, WesternGeco

**3:35 PM** Surface-wave eikonal tomography in a scattering environment -- Pierre Gouedard\*, Huajian Yao, and Robert D. van der Hilst, MIT; Arie Verdel, Shell International Exploration & Production

**4:00 PM** Surface-wave dispersion curve calculation in TIV medium -- Ganpan Ke\*, Hefeng Dong and Zhengliang Cao, Norwegian U of Science and Technology; Lanbo Liu, U of Connecticut

**4:25 PM** Surface wave analysis for S-wave static correction computation -- Laura Valentina Socco\*, Daniele Boiero, Sebastiano Foti, Margherita Maraschini, Claudio Piatti, Paolo Bergamo, and Flora Garofalo, Politecnico di Torino, Mauro Pastori, and Gilbert Del Molino, eni - e&p division.

### [NS 3 Methodological Developments and Case Studies 2](#)

Thursday, October 21. Room 401/402

Session Chairmen: Richard Miller and Oz Yilmaz

**8:30 AM** The nonseismic data and joint inversion strategy for the near-surface solution in Saudi Arabia -- Daniele Colombo\* and Tim Keho, Saudi Aramco EXPEC Advanced Research Center

**8:55 AM** Geostatistical inversion of seismic and GPR reflection images: What can we actually resolve? -- James Irving, U of Guelph; Klaus Holliger\*, U of Lausanne

**9:20 AM** On the use of a fractal equivalent circuit model to predict the geotechnical

properties of soils -- Fred Boadu\* and Frederick Owusu-Nimo, Duke U

**9:45 AM** Inversion of time-lapse electrical resistivity imaging data for monitoring infiltration -- Vanessa Mitchell\*, Stanford U; Adam Pidlisecky, U of Calgary; Rosemary Knight, Stanford U

**10:10 AM** A radar interpretation pitfall: Velocity push-down due to a footwall loess wedge in the ground penetrating radar imaging of the Ostler Fault, New Zealand -- David C. Nobes\*, Sharon M. Hornblow and Jonathan J. Lapwood, U of Canterbury

**10:35 AM** Ultra-shallow seismic imaging of the top of the saturated zone -- Steven D. Sloan\*, US Army Engineer Research and Development Center; Georgios P. Tsoflias, and Don W. Steeples, U of Kansas; Jason R. McKenna, US Army ERDC

**11:00 AM** Preliminary results for a near surface 3D seismic survey of a geothermal system in Colorado -- Andrew P. Lamb\*, Kasper van Wijk, and Lee Liberty, Boise State U; Andre Revil, Kyle Richards, and Michael Batzle, Colorado School of Mines

**11:25 AM** Seismic profile of the Huangzhuang-Gaoliying fault in Beijing by the Mini-Sosie method -- Xu Chang and Yike Liu\*, Chinese Academy of Sciences; Hongchuan Sun, U of Utah

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## SEG Short Courses and Workshops

### Near-Surface Seismology

Gregory Baker will be teaching a two-day course on Near-Surface Seismology during the SEG meeting. This course is designed to provide background information to help professionals assess or use near-surface seismic methods. This intensive course will cover

1. Basic near-surface seismic theory
2. Instrumentation: including sources, seismographs, and sensors
3. Seismic refraction: including fan shooting, generalized reciprocal method (GRM), and refraction tomography
4. Seismic surface waves: including spectral analysis of surface waves, (SASW) and multichannel analysis of surface waves (MASW)
5. Seismic reflection: including common-offset and common-midpoint (CMP)
6. Seismic data integration and interpretation, including pitfalls and case histories.

More information can be found at <http://seg.org/upcomingcourses> or by contacting [Cecilia Martin](#). Pre-registration is open till October 6, and after this date only limited on-site registration will be available.