

## October 2008 Newsletter of the AGU Near-Surface Focus Group

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Recent announcements of interest to the NS community (conferences, academic positions, graduate student opportunities etc.) can be found at the AGU NS-Focus Group Web Page: <http://nsg.agu.org>

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### 1. Message from the new NS Executive Committee

As of July 1, 2008, Near Surface Geophysics (NS) entered its second two year term as a focus group of the American Geophysical Union. Under the leadership of previous Chair, Rosemary Knight, the focus group membership has rapidly grown to a current total of 2300 members (with 555 members selecting NS as their primary affiliation in AGU). Rosemary enthusiastically supported the establishment of NS and applied herself 100% to the role of Chair even whilst up to her neck with administrative duties at Stanford University. Rosemary has always been a leader in developing opportunities for engaging and developing the NS community that she is so fond of. Simply put, there was no better person to take on the position of first Chair of our new focus group. Thankfully, Rosemary will stay closely involved in NS. For example, she has agreed to take over as NS representative of the Joint Assembly Planning Committee in 2010. From the new Executive Committee, and all our members, a big 'Thank You' Rosemary!

The new Executive Committee (EC) hopes to build on the success of the first term by encouraging further growth of the membership and awareness of NS within the broad AGU community. We hope to encourage awareness of opportunities for NS related research that impact upon the AGU Sections and other Focus Groups. For example, this month will see the first NS sponsored Chapman Conference. The concentration of this Chapman on the subject of Biogeophysics is relevant to multiple AGU Sections and Focus Groups, such that this meeting will be an approximately 50/50 split of geophysicists and microbiologists/biogeochemists focused on studies of near surface, deep ocean and deep earth microbial environments.

A second primary objective of the Executive Committee is to strengthen collaborations with other societies during the second term. Niklas Linde is serving as our liaison to the European societies and AGU Hydrogeophysics whereas Sue McGeary is serving as liaison to Geological Society of America and American Geophysical Union. George Tsoflias (NS Secretary) recently accepted an invitation to serve on the newly formed "Inter-Section Liaison Committee" of the Near Surface Geophysics Section (NSGS) of the Society of Exploration Geophysicists (SEG). The formation of this committee is testimony to the desire of the SEG community engaged in near-surface research and application for closer collaborations with NS AGU and other organizations.

The Executive Committee always welcomes your suggestions for how NS can better serve our near surface geophysics community. Emails can be directed to Lee Slater ([lslater@andromeda.rutgers.edu](mailto:lslater@andromeda.rutgers.edu)), Louise Pellerin ([pellerin@ak.net](mailto:pellerin@ak.net)) or George Tsoflias ([tsoflias@ku.edu](mailto:tsoflias@ku.edu)).

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2. 2008 Fall AGU Meeting, 15-19 December, San Francisco, CA.

Housing and Pre-registration Deadline: 14 November 2008

For complete information see [www.agu.org/meetings/fm08/](http://www.agu.org/meetings/fm08/)

The Fall 2008 meeting is promising to be another strong year for the Near Surface community with a number of NS sponsored and co-sponsored sessions. NS received 105 abstract submissions. Scheduling oral and poster presentations is under way. Sessions will be announced in next month's newsletter.

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3. Fall AGU Student Lunch Outing. Message from Elliot Grunewald, NS Student Representative

The Fall AGU Meeting brings together NS students from universities across the globe with an incredibly diverse range of backgrounds and research interests. This year, we hope to take advantage of this unique opportunity for students to get to know each other by organizing a casual student lunch outing. Specifics have not yet been arranged, but we will most likely find a day to hold 12:30 reservations at a cheap lunch spot within walking distance of Moscone and have everyone meet at the restaurant. Stay tuned for further details and information about how to RSVP in next month's newsletter.

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4. Environmental and Engineering Geophysical Society News:

The September issue of FastTIMES (EEGS's electronic newsmagazine for the near-surface geophysical sciences) is available for download from [www.eegs.org/fasttimes/latest\\_issue.cfm](http://www.eegs.org/fasttimes/latest_issue.cfm).

SAGEEP Conference Abstract Submission Deadline, October 3.

SAGEEP 2009 will be held in Fort Worth, Texas, March 29-April 2. Abstracts not to exceed 200 words are due October 3, 2008 and may be submitted electronically at [www.eegs.org](http://www.eegs.org). Abstracts that focus on recent developments in near-surface geophysical methods, innovative uses of geophysics for challenging engineering and environmental problems, and case histories are welcome. Upon acceptance of the abstract, expanded proceedings papers (recommended length about four pages) will be due December 12, 2008.

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## 5. SEG 2008 International Exposition: NSG Making its mark

Advanced registration for the 2008 SEG International Exposition has been extended to 15 October 2008. Near Surface Geophysics is making its mark this year at the SEG International Exposition with the following events:

### (1) SEG Forum: Managing our Groundwater Resources for the Future:

The SEG Forum will launch the whole technical program on Monday, 10 November with a distinguished panel that will discuss the role of geophysics in groundwater resource management and the increasing importance of this vital resource.

### (2) NSG Technical Sessions:

- (a) GPR, EM, Electrical & Seismic for Water
- (b) Inversion & Engineering Applications
- (c) Near Surface Seismic
- (d) Near Surface Poster Contributions

### (3) Special Sessions:

- (a) Hydrogeophysics in Practice
- (b) Site Characterization and Geophysical Monitoring for CO<sub>2</sub> Storage
- (c) Near Real-time UXO Discrimination

### (4) Technical Luncheons:

(a) NSG Section Luncheon and 15th Anniversary Celebration: We will have two special presentations at our Luncheon: (i) Don Steeples on "How did we get here and where are we going?", and (ii) Sheldon Breiner on "Geophysics Uncovers the Past". The first 20 students to arrive at the luncheon are eligible to have their event ticket cost reimbursed. This year's reception will be different from those in the past, namely the business meeting will be held later in the day on Tuesday.

(b) Mining and Geothermal Luncheon: Speaker and Topic: Clyde Harrison, "Raw Materials Bull Market - A Bubble or a Beginning"

(c) Gravity and Magnetics Luncheon: Speaker and Topic: Richard Ernst; "Large Igneous Provinces and Continental Breakup: New Tools for Paleogeographic Reconstruction and Hydrocarbon / Mineral Exploration"

### (5) "Near-Surface Seismology" continuing education course:

This pre-meeting workshop will explore practical aspects (acquisition, processing, interpretation) of near-surface seismic reflection, refraction, and surface wave methods. This is open to anyone interested in learning more about near-surface seismic techniques. Final day for registration is October 22nd. For more information, go to <http://www.seg.org> and look under "Education".

(6) Workshops:

- (a) Induced Polarization: Research and Recent Advances in Near Surface Applications
- (b) Mentoring Geophysicists in the Mining Industry
- (c) Gravity in Motion

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6. EAGE Passive Seismic Workshop: case studies and applications for field development and exploration, 22-25 March 2009, Limassol, Cyprus

Passive seismic is an exciting, developing technology in the petroleum industry. The workshop will address advances in acquisition, processing, and interpretation for field development and exploration that have occurred since the first EAGE Workshop on Passive Seismic in 2006.

Topics will include, but are not limited to:

- Hydraulic fracturing
- Reservoir monitoring
- Geomechanical interpretation
- Low frequency spectroscopy
- CO2 sequestration
- Enhanced geothermal systems

Emphasis will be on case studies presented by oil and gas companies. Presentation of work in progress is encouraged.

The Workshop format will be extended oral presentations consisting of a 20 minute oral presentation followed by 10 or 15 minutes for discussion. About half of the workshop program time will be allotted for discussion. There will be no poster sessions.

Further information: <http://www.eage.org/events/index.php?eventid=94&Opendivs=s2>

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7. European Geosciences Union, General Assembly 2009, 19-24 April, Vienna, Austria

A provisional session program for the EGU General Assembly 2009 can be found at: [http://www.cosis.net/members/meetings/skeleton/view.php?m\\_id=58&p\\_id=372](http://www.cosis.net/members/meetings/skeleton/view.php?m_id=58&p_id=372).

The deadline for abstracts is 19 January, 2009. Proposed sessions of interest include:

Hydrogeophysics in subsurface hydrology

Convener: Vereecken, H.

Co-Convener: Ferre, T.; Yaramanci, U.

Imaging the shallow subsurface with seismic and GPR methods

Convener: Nielsen, L.

Co-Convener: Holliger, K.

Seismic inversion and imaging: New theoretical developments and applications Convener:  
Buske, S.

Co-Conveners: Sallarès, V.; Operto, S.

Seismic tomography - state of the art: algorithms and results  
convener: Ivan Koulakov  
co-conveners: Kissling, E.; Morelli, A.

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## 8. Positions:

### 8.1 Postdoctoral: USGS Mendenhall Postdoctoral Research Fellowship Program

Title: Development of Joint Inverse Methods for Improved Characterization and Assessment of  
Ground-Water, Mineral, and Petroleum Resources

<http://geology.usgs.gov/postdoc/2010/opp/opp21.html>

Primary Contact: Michael J. Friedel, U.S. Geological Survey, Denver Federal Center, MS 964,  
Denver, CO; 303-236-7790; [mfriedel@usgs.gov](mailto:mfriedel@usgs.gov)

**DESCRIPTION:** The USGS is interested in developing joint inverse strategies for improved characterization and assessment of ground-water, mineral, and petroleum resources. This research opportunity will promote development through the integration of geologic, geophysical, and hydrogeologic information as measurement constraints during the simultaneous solution of multiple numerical models. Because the focus of this project is on the development of integrated joint inverse methods rather than a specific application, the scale and direction of research can be determined by the postdoctoral fellow. One example would be the joint inversion of gravity and magnetic responses over a draped surface to estimate the 3-dimensional geology using a Markov Monte Carlo approach.

A second example would be the joint inversion of airborne and ground-based electromagnetic responses together with borehole geophysical and hydrogeologic mass and energy measurements to define a coastal fresh-salt water interface using a Levenberg-Marquardt approach.

A third example would be the joint inversion of surface and borehole dc resistivity and spontaneous potential response together with subsurface variably saturated zone measurements to estimate ground-water recharge using a combination of genetic algorithm and Levenberg-Marquardt approaches. In these cases, special attention will be on the development and evaluation of an appropriate regularization strategy, as well as the estimation of uncertainty in model parameters and prediction of dependent variables. Regularization strategies could involve one or more analytical, petrophysical, and structural constraints applied as direct or soft prior information. Understanding the worth of combined information on reducing model and predictive uncertainty is an expected outcome of this research.

## 8.2 Graduate Research Assistantships in Near-Surface Geophysics at the University of Tennessee.

Funding is currently available for several graduate research assistantships through the Environmental Geophysics Research (EGR) Lab at the University of Tennessee. The first project (sponsored by the DOD and ORNL) involves utilizing time-lapse electrical resistivity tomography with a large-array system (224 electrodes) for assessing natural recharge and contaminant remediation processes through time (days, weeks, months). The second project (sponsored by NSF) involves promoting diversity in the geosciences by providing unique opportunities to underrepresented student populations through the East Tennessee Geosciences Program (ETGP; [www.etgp.tennessee.edu](http://www.etgp.tennessee.edu)). The third project is a multi-university collaborative project involving near-surface seismic reflection, refraction tomography, and GPR for examining shallow fault structures in the Centennial Valley to assess stress field switching associated with the interaction between the Yellowstone Hotspot and Basin and Range extension. The fourth project involves the development of high-resolution near-surface three-component (3C) seismic reflection methods (144 channels available for 48 3C stations) and azimuthal seismic refraction tomography (ASRT) for analyzing bedrock anisotropy and associated hydrologic controls.

Applicants interested in either Ph.D. or M.S. degrees are encouraged to apply, though Ph.D. candidates will be given preference. Funding is available now for students planning to begin pursuit of their graduate degree at the University of Tennessee as early as January 2009. Funding is available for applicants to travel to Knoxville for a site visit. Additionally, the EGR Director will be attending GSA and AGU, so interested candidates may contact him directly to arrange an informal on-site interview. Evaluation of candidates for assistantship positions will begin November 7th and continue until the positions are filled.

For additional information contact:

Dr. Gregory Baker, Director, Environmental Geophysics Research Lab, Department of Earth & Planetary Sciences

Email: [gbaker@tennessee.edu](mailto:gbaker@tennessee.edu); Phone: 865.974.6003

For more info, go to <http://www.geophysics.tennessee.edu>

## 8.3 PhD position, Polluted Sites Assessment and Mapping, Université Catholique de Louvain

The Department of Environmental Sciences and Land Use Planning of the Université Catholique de Louvain (Belgium) is opening a position for a PhD student in the field of spatial mapping and statistical analysis techniques applied to soil polluted sites assessment, in the framework of the EU FP7 research project MODELPROBE (“Model driven Soil Probing, Site Assessment and Evaluation”).

The PhD student will contribute to the development and application of spatial mapping techniques and statistical analysis techniques with the aim of (i) assessing the performances of various existing in-situ measurement method (geophysics, biology, tree monitoring, etc.), and (ii) applying data fusion techniques for the spatial mapping and delineation of a contaminated area. The appointment will be for a period of three years, starting November 1, 2008. The candidate should have a MSc Degree in Civil or Agricultural and Environmental Engineering, Statistics,

Mathematics, Physics, or closely related disciplines. Good knowledge of the Matlab programming language is welcome.

To apply, please email your CV along with the names of two referees to Professor Patrick Bogaert ([patrick.bogaert@uclouvain.be](mailto:patrick.bogaert@uclouvain.be)), Faculty of bioengineering. Deadline for receipt of applications is November 1, 2008.

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To contribute material to the NS-letter e-mail to:

George Tsoflias [tsoflias@ku.edu](mailto:tsoflias@ku.edu)

DEADLINE: Material must be received 2 full business days prior to the first of each month.

GUIDELINES FOR SUBMISSIONS: All members are welcome to submit content of interest to the NS community. Please keep messages brief and provide contact information and (if available) a hyperlink for additional information. AGU requests formatting of e-mail messages to be as simple as possible (no bold characters (use ALL CAPS instead), no color font, or other special formatting of text and paragraphs). Do not submit e-mail attachments for distribution.