

August 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. A New Executive Committee (EC) for NS

The NS Focus Group recently entered its second term of existence (effective July 1). The members of the Executive Committee for this term are:

[1] Lee Slater, Chair ([lslater@andromeda.rutgers.edu](mailto:lslater@andromeda.rutgers.edu)) [2] Louise Pellerin, Vice-Chair & Liaison to Society of Exploration Geophysics (SEG) ([pellerin@ak.net](mailto:pellerin@ak.net)) [3] George Tsoflias, Secretary & Newsletter Editor ([tsoflias@ku.edu](mailto:tsoflias@ku.edu)) [4] Rhett Herman, Webmaster ([rherman@radford.edu](mailto:rherman@radford.edu)) [5] Sarah Kruse, Fall Meeting Program Representative ([skruse@cas.usf.edu](mailto:skruse@cas.usf.edu)) (to be replaced '09) [6] Chester Weiss, Spring Meeting Program Representative ([cjweiss@vt.edu](mailto:cjweiss@vt.edu)) (to be replaced '09 with Rosemary Knight) [7] Niklas Linde, European Representative and Liaison to European Groups (European Association of Geoscientists & Engineers (EAGE), European Geosciences Union (EGU)) as well as AGU Hydrogeophysics ([linde@aug.ig.erdw.ethz.ch](mailto:linde@aug.ig.erdw.ethz.ch)) [8] Sue McGeary, Liaison to Geological Society of America (GSA), Environmental and Engineering Geophysical Society (EEGS) and other AGU groups ([smcgeary@UDel.edu](mailto:smcgeary@UDel.edu))

Each member of the new EC has a well-defined role to serve and you can expect to hear their voices in monthly newsletters etc. Please feel free to contact members of the EC about any issues related to the Focus Group.

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## 2. A Student Representative for NS - [from the NS Executive Committee]

Elliot Grunewald (Stanford University) has agreed to serve as 'NS Focus Group Student Representative', a new appointment for the second term of focus group activities. Elliott's duties include reporting to the EC on ongoing student activities in near surface geophysics, emerging student opportunities in near surface geophysics, organizing social events for annual meetings, brainstorming on how the NS Focus Group can best represent/serve its student members, and brainstorming on how to help NS increase its student membership. Most importantly, Elliot provides a voice for students of near surface geophysics within the focus group. Students are strongly encouraged to contact Elliot to share their ideas and concerns about the focus group at any time ([elliottg@stanford.edu](mailto:elliottg@stanford.edu)). Welcome Elliot, and many thanks for your willingness to serve as the first student representative of the focus group!

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## 3. AGU Chapman Conference on Biogeophysics - Travel Funds for Early Scientists - [from Estella Atekwana]

The AGU Chapman Conference on Biogeophysics, October 13-16, promises to be a unique, workshop-environment meeting of microbiologists and geophysicists to discuss opportunities within this emerging interdisciplinary field. The meeting will include over ~40 presentations, including plenary talks by three highly distinguished biogeochemists, and evening poster sessions spread over 3.5 days. Full details of the plenary talks and invited speakers for the four topical oral sessions can be found at the website <http://www.agu.org/meetings/chapman/2008/fcall/>. As a result of a generous grant from the National Science Foundation, limited travel funds are still available for early career scientists (within 7 yrs of phd) and students. Although it is not possible to accommodate further oral contributions, applicants for this remaining travel support are encouraged to present a poster if interested. An application for travel support is available on the website and must be sent to Estella Atekwana ([atekwana@umr.edu](mailto:atekwana@umr.edu)) on/before August 6.

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## 4. 2008 Fall AGU Meeting, 15-19 December, San Francisco, CA - [from Sarah Cruse and Mitch Craig]

Abstract Submission Deadline: 10 September 2359 UT Housing and Pre-registration Deadline: 14 November 2008 For complete information see [www.agu.org/meetings/fm08/](http://www.agu.org/meetings/fm08/)

### 4.1 Near Surface Sessions

#### NS01 Near Surface Geophysics: General Contributions

Cosponsors: Hydrology, Seismology

This session provides the opportunity for contributions that fall within the broad spectrum of Near Surface Geophysics, including those utilizing seismic, acoustic, radar, electrical, magnetic, and other methods. Studies may include land, marine, and airborne studies. Methods may

involve data acquisition, processing, analysis, modeling, or interpretation. Case histories showing application of near-surface geophysical methods to other fields are welcome, including but not limited to groundwater, geologic hazard assessment, archeology, and polar studies.

Conveners: Sarah Kruse, University of South Florida, USA, [skruse@cas.usf.edu](mailto:skruse@cas.usf.edu), and Mitchell Craig, California State University East Bay, USA, [mitchell.craig@csueastbay.edu](mailto:mitchell.craig@csueastbay.edu)

#### NS02 Geoscientific Data for the Revitalization of Afghanistan

Cosponsors: Hydrology, Earth and Space Science Informatics This session will provide a multi-disciplinary forum for presentation of the results from recently completed geological, geophysical, and hydrologic studies in Afghanistan. Data from these studies will aid in resource and hazards assessments and are expected to play a major role in establishing the long term social and economic security of the Afghan people. Research from the private and public sectors in the areas of geophysics, hydrology, and tectonophysics, as well as field and laboratory investigations are welcome.

Conveners: Trude V. V. King, U.S. Geological Survey, Denver, CO USA, [tking@usgs.gov](mailto:tking@usgs.gov), and Raymond F. Kokaly, U.S. Geological Survey, Denver, CO USA, [raymond@usgs.gov](mailto:raymond@usgs.gov), and Ingrid Verstraeten, U.S. Geological Survey, Reston, VA USA, [imverstr@usgs.gov](mailto:imverstr@usgs.gov)

#### NS03 Geophysical Characterization of Flow in Dual Porosity Media: From fractures to karst and glaciers

Cosponsors: Mineral and Rock Physics, Hydrology, Cryosphere Predicting flow and transport in dual porosity media is a challenging problem. Fractured and karstic geologic media, as well as glaciers, exhibit heterogeneous hydraulic properties that are difficult to characterize using conventional hydraulic testing methods. Geophysical imaging offers the potential to monitor subsurface processes remotely and over a period of time. The purpose of this session is to present the latest scientific developments in the remote characterization of dual porosity using surface and borehole methods. We encourage theoretical and experimental contributions, at laboratory and field scales, for characterization of flow and contaminant transport through fractures, karst, and glaciers, and characterization of flow conduit properties (e.g. aperture, interconnectivity, roughness) using geophysical and remote sensing methods.

Conveners: Georgios Tsoflias, The University of Kansas, [tsoflias@ku.edu](mailto:tsoflias@ku.edu), and Matthew Becker, University at Buffalo, State University of New York, [mwbecker@geology.buffalo.edu](mailto:mwbecker@geology.buffalo.edu)

#### NS04 Stratigraphic Applications of Near Surface Geophysics

Cosponsors: Hydrology, Seismology

This session will focus on applications of ground-penetrating radar, seismic reflection, marine acoustic, borehole, and other near surface geophysical methods for stratigraphic imaging and interpretation. The detailed stratigraphic record in near-surface sediments provides a valuable indicator of global sea-level fluctuations and environmental changes during the Holocene and Pleistocene. It is also important in paleoseismology studies. Improved data acquisition systems and methods have led to larger surveys with higher temporal and spatial resolution. New techniques for processing and visualization of large data volumes have enabled more sophisticated stratigraphic interpretation. Case studies involving geophysically-enhanced stratigraphic analyses, from any discipline, are welcomed.

Conveners: Mitchell Craig, California State University, East Bay, [mitchell.craig@csueastbay.edu](mailto:mitchell.craig@csueastbay.edu), and Michael O'Neal, Loyola College in Maryland, [moneal@loyola.edu](mailto:moneal@loyola.edu), and Christopher Juhlin, Uppsala University, [christopher.juhlin@geo.uu.se](mailto:christopher.juhlin@geo.uu.se)

#### NS05 Application of Joint Inverse Methods for Improved Characterization and Assessment of Ground-Water, Mineral, and Petroleum Resources

Cosponsors: Hydrology, Earth and Space Science Informatics In geophysical imaging and ground-water or petroleum reservoir model calibration, inverse methods typically use a single type of data sensitive to a single physical property. Combining several types of data collected over the same region can potentially reduce ambiguity and enhance inversion results. We welcome contributions demonstrating the application of joint inversions using data sets 1) sensitive to the same physical property, 2) responsive to different physical properties between which there is an analytic relationship, and 3) disparate data sets where there is no analytic relationship between the properties. This session encourages contributions that describe regularization strategies, challenges regarding parameterization, potential inconsistencies between the data sets, worth of combined data, relative weighting issues, and the introduction of an estimation bias due to increased systematic errors, and uncertainty.

Conveners: Michael J. Friedel, U.S. Geological Survey, USA, [mfriedel@usgs.gov](mailto:mfriedel@usgs.gov), and Burke Minsley, U.S. Geological Survey, USA, [bminsley@usgs.gov](mailto:bminsley@usgs.gov), and Alyssa Dausman, U.S. Geological Survey, USA, [adausman@usgs.gov](mailto:adausman@usgs.gov)

NS06 Monitoring Techniques and Interpretation Methods for Coupled Thermo-Hydro-Mechanical Processes in the Earth Crust Couplings of fluid flow with thermal and rock mechanical effects in seismically active faults, volcanoes, slope stability, reservoir dynamics and CO<sub>2</sub> sequestration, deep underground mining and nuclear waste storage are key research topics in which Thermo-Hydro-Mechanical-Chemical (THMC) processes are involved. Major challenges include imaging and monitoring these coupled processes in-situ and in the laboratory, and developing the coupling relations between them. It is commonly recognized that there is a lack of in-situ data that could help understand the processes at the mesoscale (which is the tenth of meters scale of large fractures and fault zones). The main reason is that such data are difficult to obtain at depths exceeding 300 m due to technological difficulties and cost. Although laboratory experiments that have been conducted are bigger in number than field experiments, there are also many technological challenges especially when studying changes in elastic parameters while monitoring chemical reactions at high temperatures and pressures. This session will be an opportunity to present and discuss various industrial and fundamental researches that focus on THMC processes in the earth crust. Interpretation methods applied to the results from innovative monitoring systems for the understanding of these coupled processes will be presented. This session is at the interface between high technology industrial research and leading-edge scientific research on THMC processes in the earth crust. The session will emphasize on testing the feasibility and principles of a new generation of smart-material-based sensor systems for in-situ and laboratory monitoring and imaging of THMC processes. Smart materials like optical fiber, piezo-electric ceramics, electro-rheological fluids, magnetostrictive materials and shape memory alloys can alter their properties in response to specific stimulus inputs. They offer miniaturized, non-invasive multi-sensing units that allow highly reliable coupled pressure-deformation-waves-temperature-chemical measurements which are necessary

to understand the complex processes linking rock rheology, fluids and deformations over a broad band of frequencies.

Conveners: Yves Guglielmi, University of Provence Aix-Marseille 1, [yguglielmi@free.fr](mailto:yguglielmi@free.fr), and Tiziana Vanorio, Stanford Rock Physics and Borehole Laboratory, [tvanorio@stanford.edu](mailto:tvanorio@stanford.edu), and Jonny Rutqvist, Lawrence Berkeley National Laboratory, [JRutqvist@lbl.gov](mailto:JRutqvist@lbl.gov)

## 4.2 Hydrogeophysics Sessions

### H15: Recent Innovations in Environmental Sensing, Cyberinfrastructure and Observatories

Cosponsors: Earth and Space Science Informatics, Near Surface Geophysics

Multiscale/multiprocess coupling combined with the establishment of environmental terrestrial observations and the development of novel sensor and hydrogeophysical methods is important for improved predictability of the terrestrial water cycle, identifying pathways, and closing water, energy and solute budgets. With the advancement of wireless communication, high performance scientific computing, data management approaches, the efficient integration of existing and novel sensors technologies, simulation and analysis tools present new areas of research. Distributed "intelligent" sensor networks collect long term data from remote locations at scales and resolutions that were previously attainable through numerical simulations only. High resolution, large scale simulations to analyze and understand land-subsurface-atmosphere interactions will further require efficient numerical methods and novel data assimilation. In this session we invite studies from the fields of hydrology, remote sensing, geophysics and land surface atmosphere interactions that deal with a) the development of low-cost, energy-efficient and adaptive sensor networks and novel observation technologies (e.g. remote sensing platforms and hydrogeophysics) that can provide a multi-scale view of ecohydrologic states, b) design of data-models and inverse modelling approaches that tightly couple high resolution spatial and temporal systems, numerical models, and processing and visualization tools (GIS), c) implementation of large scale numerical-modeling and data-management tools using super-computers, d) "new" scientific predictions evolving from integrated modeling or measurements and e) experimental network design for test beds and environmental observatories

Conveners: Barbara S. Minsker, [minsker@illinois.edu](mailto:minsker@illinois.edu), Jeff Dozier [dozier@bren.ucsb.edu](mailto:dozier@bren.ucsb.edu), Harry Vereecken [h.vereecken@fz-juelich.de](mailto:h.vereecken@fz-juelich.de), Karsten Høgh Jensen [khj@gol.ku.dk](mailto:khj@gol.ku.dk)

### H19 Hydrogeophysics: Methods, Models, and Applications

Cosponsor: Near Surface Geophysics

There is growing recognition of the value of hydrogeophysical measurement methods for subsurface hydrogeologic characterization and monitoring. These geophysical methods offer improved spatial coverage and resolution, often at lower cost than traditional direct sampling. However, as the use of geophysics in hydrologic science increases, we are placing increased demands on geophysical methods. Some of these demands seek to expand the hydrologic states and parameters that can be measured, others aim at providing measurements at new spatial and temporal scales or at greater sensitivity to the hydrological states, and others seek to improve the interpretation of instrument responses for hydrologic analyses or the way in which hydrogeophysical datasets are used. We invite contributions that discuss: (i) new observations and interpretations of hydrological-geophysical property relationships; (ii) new measurement techniques; (iii) new applications of existing techniques; (iv) new methods of interpreting the responses of geophysical measurements for hydrologic applications. We anticipate that

applications will range from laboratory, to plot, to basin scale and will include theoretical and applied studies. Topical examples include, but are not limited to: monitoring recharge, quantifying groundwater/surface-water interaction, mapping aquifer contamination, or characterizing root zone processes. Method examples include, but are not limited to: microgravity, magnetic resonance imaging, electrical resistivity, electromagnetic induction. Conveners: Ty P. A. Ferre [ty@hwr.arizona.edu](mailto:ty@hwr.arizona.edu), Roger Beckie [rbeckie@eos.ubc.ca](mailto:rbeckie@eos.ubc.ca), Dale Rucker [drucker@hgiworld.com](mailto:drucker@hgiworld.com), Sander Huisman [s.huisman@fz-juelich.de](mailto:s.huisman@fz-juelich.de)

### H28 Joint Inversion Methods in Hydrogeophysics

Cosponsor: Near Surface Geophysics

Hydrogeophysical methods for characterizing the spatiotemporal dynamics of water and chemicals in the subsurface are essential tools to address a wide range of societal issues, including the management of water and land resources, monitoring of vulnerable ecosystems, risk assessment, and remediation of contaminated soils and groundwater. Recent studies have shown that joint interpretation of geophysical and hydrological information can make inverse problems better posed, thereby leading to improved estimates of both geophysical and hydrological quantities. The theme of this session is the latest advances in integrated inversion methods and applications for geophysical and hydrological data and process knowledge fusion. We encourage contributions (but not limited to) on coupled models, Bayesian approaches, data assimilation using Kalman filtering, geostatistical regularization techniques, and multi-sensor fusion (electric resistivity tomography, ground penetrating radar, electromagnetic induction, near-surface seismic, radar remote sensing, etc.). We particularly welcome applications dealing with time-lapse analyzes for non-invasively monitoring subsurface conditions such as water content, water chemistry (e.g., salinity and redox potential), microbial activity, preferential flow pathways, and root water uptake, and for estimating the governing soil hydraulic and transport properties.

Conveners: Sebastien Lambot [sebastien.lambot@uclouvain.be](mailto:sebastien.lambot@uclouvain.be), Jasper A. Vrugt [vrugt@lanl.gov](mailto:vrugt@lanl.gov), Jim Yeh [yeh@hwr.arizona.edu](mailto:yeh@hwr.arizona.edu), Jinsong Chen [JChen@lbl.gov](mailto:JChen@lbl.gov)

### H30 Innovative Methods for Integrating Hydrological, Geophysical, and Biochemical Methods for Subsurface Characterization and Remediation

Cosponsor: Near Surface Geophysics

In recent decades, it has become clear that standard methods of aquifer or vadose zone characterization do not provide sufficient information to fully understand the subsurface aqueous environment. Similarly, many single-discipline characterization and remedial techniques have not been successful. Integrating techniques for characterization and remediation across disciplines is necessary to make advances in subsurface characterization and remediation. For example, accurate representation of reactive mass transport is required for predicting contaminant migration, monitoring remediation progress, calibrating flow and reactive transport models, among other applications. Geochemical variations in space or time, either natural or as a consequence of the introduction of chemicals or tracers, can cause contrasts in subsurface petrophysical properties that are detectable with geophysical methods. Geophysical responses are non-unique and correct interpretation of data requires an understanding of the geophysical properties of both the system under investigation and the target. Combining detailed hydrologic and geophysical models has the potential to improve characterization through better understanding of the geophysical response. We invite papers that examine the integration of two

or more techniques to improve subsurface characterization and remediation. Topics of interest include but are not limited to approaches for integrating geophysical measurements with hydrogeochemical data, optimal combinations of geochemical and geophysical measurements, auxiliary monitoring and measurement requirements, appropriate geophysical measurements, spatial and temporal resolution of geophysical results, issues of integrating measurements of different sample support, scale and uncertainty, reduction of nonuniqueness in geophysical interpretations with chemical measurements and models, reduction of the uncertainty in geochemical interpretations using geophysical methods, implementation of petrophysical models and linking geophysical modeling with chemical and transport models.

Conveners: John H. Bradford [johnb@cgiss.boisestate.edu](mailto:johnb@cgiss.boisestate.edu), Lawrence Bentley [lbentley@ucalgary.ca](mailto:lbentley@ucalgary.ca), Megan M. Smith [megsmith@mines.edu](mailto:megsmith@mines.edu)

#### 4.3 NS co-sponsored sessions

IN08 Provenance Management for Large Scale Scientific Datasets

IN23 Uncertainty in Geophysical Data Interpretation: Implications and Developments P10 The Dynamic Lunar Environment

S05 Advances in the Theory, Modeling, and Observation of Anelastic Seismic Wave Propagation - Recent Anelastic Models of the Earth

S16 Crust and Upper Mantle Structural Models Beneath the Central US

S19 Active-Source Seismic Imaging - Characterizing the Subsurface

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#### 5. Third East Bay Earthquake Hazards Conference, Abstracts due Aug. 15

You are cordially invited to participate in the Third Conference on Earthquake Hazards in the Eastern San Francisco Bay Area: Science, Hazard, Engineering, and Risk, October 22 to 24, 2008, at California State University East Bay, Hayward Campus. Four related field trips will be conducted Saturday and Sunday, October 25 to 26.

The conference is sponsored by the California Geological Survey, U.S. Geological Survey, California State University East Bay, and others. Information is available at:

<http://www.conservation.ca.gov/cgs/News/Pages/eastbayconference.aspx>

Abstracts are due August 15, and should be submitted online at:

<http://www.seismosoc.org/meetings/2008/3ebconf/>

This conference is meant to help commemorate the 140th anniversary of the 1868 Hayward earthquake on October 21st. The meeting is an opportunity to make public and to synthesize the exciting results of earthquake-related studies conducted since the most recent of these conferences in 1992. It will also include a public forum, field trips, and tutorials for educators. A proceedings volume will be published in the months following the conference.

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#### 6. NSGS News [from Robert Jacob]

## 6.1 SEG 2008 Meeting Update: Las Vegas, NV, 10-14 November

Registration ([www.seg.org](http://www.seg.org)) is now open for the SEG Annual Meeting and Technical Program which contains a full Near Surface Geophysics (NSG) docket from Monday thru Friday, starting with the SEG Forum "Managing our Groundwater Resources for the Future", sponsored by the NSG Section on Monday morning. "Hydrogeophysics in Practice" occurs on Monday afternoon and is the first of six NSG sessions. The NSG Section luncheon celebrating the sections' 15th anniversary is sandwiched between the General NSG Poster session on Tuesday morning and GPR, EM, Electrical and Seismic for Water session in the afternoon. Wednesday is the home for Inversion and Engineering Applications in the morning and Near Surface Seismic session in the afternoon. The sixth NSG session "Near Real-Time UXO Discrimination" is Thursday morning. And the NSG docket concludes with the "Induced Polarization: Research and Recent Advances in Near Surface Applications" Post-Convention workshop on Friday. The workshop is jointly sponsored by the NSG Section of SEG and EEGS, and will include a historical/tutorial discussion of IP, recent research in IP data acquisition, recent IP laboratory studies and rock properties, inverse modeling and imaging of IP data, and concluding with near surface applications of IP.

## 6.2. Near Surface Geophysics Section of SEG Elections

NSGS Elections as well as the general SEG elections are underway. Please contact Robert Jacob ([Robert.Jacob@brown.edu](mailto:Robert.Jacob@brown.edu)) if you have any questions.

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## 7. EEGS News [from Jeff Paine]

### 7.1 SAGGEP 2009 conference call for abstracts

SAGEEP 2009 will be held in Fort Worth, Texas, March 29-April 2. Abstracts not to exceed 200 words are due September 19, 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.

### 7.2 July issue of FastTIMES available for download

The July issue of FastTIMES, news for the near-surface geophysical sciences is now available. Low- and high-resolution versions are available for download from the EEGS website at [www.eegs.org/fasttimes/latest\\_issue.cfm](http://www.eegs.org/fasttimes/latest_issue.cfm). It is best to download the document and view it outside of a web browser with Acrobat.

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## 8. Positions:

### 8.1 Postdoctoral

#### 8.1.a: Postdoctoral Position in APPLIED GEOPHYSICS / ENVIRONMENTAL GEOPHYSICS / HYDROGEOPHYSICS.

The Applied Geophysics Group at University of Bonn has an opening for a Postdoctoral scientist on the recently funded FP7 EU research project ModelPROBE (Model-driven soil probing, site assessment and evaluation), involving 19 partners from 9 European countries. The appointment will be for an initial period of two years, optionally for a third year depending on performance. The main research task is to develop 4D (3D+time/frequency) complex resistivity inversion, based on existing 2D and 3D codes, for the imaging, characterization, and monitoring of subsurface contamination. The ideal candidate has a strong expertise in finite-element modeling, inversion methods, and programming experience in FORTRAN. Good knowledge of English is essential, and a working understanding of German is welcome. Contributing to teaching courses in applied geophysics is possible, but not mandatory. Research will be conducted in close collaboration with project partners at Lancaster University and University of Padua. To apply please email your resume together with the names of two referees to Professor Andreas Kemna ([application@geo.uni-bonn.de](mailto:application@geo.uni-bonn.de)). Deadline for receipt of applications is August 31, 2008.

8.1.b: BRGM ([www.brgm.fr](http://www.brgm.fr)) associated with the University of Nancy (LIMOS laboratory, <http://www.limos.uhp-nancy.fr/research/>) propose a 18-month post doctoral position. The subject is: optimization of in situ biological decontamination processes by monitoring of reagent injection, microbial activity and residual contamination.

The objective is the development and optimization of biodegradation processes from laboratory to lysimeter scale. One specific aspect of the monitoring will be to use Spectral induced Polarization to estimate the microbial activity. It is recommended that the candidate has a degree in microbiology, but should also be interested in research in geophysics.

The candidate will be based in Nancy (east of France). This description is a summary of the post doctoral position. For more information contact Mr Saada at BRGM ([a.saada@brgm.fr](mailto:a.saada@brgm.fr)) or Mrs Corinne Leyval ([corinne.leyval@limos.uhp-nancy.fr](mailto:corinne.leyval@limos.uhp-nancy.fr))

### 8.2 Graduate opportunities

#### 8.2.a: HYDROGEOPHYSICS PHD STUDENTSHIP, Lancaster University, UK.

Applications are invited for a 3 year funded PhD studentship in Hydrogeophysics at Lancaster University. The studentship will contribute to a larger collaborative (US NSF funded) research project on "Hydrogeophysical quantification of hydraulic conductivity from electrical measurements of the effective properties of porous media" which is led by Lee Slater (Rutgers University) in collaboration with Warren Barrash (Boise State University) and André Revil (Colorado School of Mines).

There is growing interest in the potential use of measurements of electrical polarization for field-scale mapping of hydraulic conductivity (e.g. Kemna et al., 2004; Slater & Lesmes, 2002), particularly given recent empirical evidence of links between electrical spectra characteristics and hydraulic conductivity (Binley et al., 2005). This project is a multi-scale program of research directed towards the quantification of hydraulic conductivity from complex conductivity (?\*)

measurements on coarse alluvial deposits of the Boise Hydrogeophysical Research Site (BHRS). The proposal is motivated by our observation that  $\rho^*$  provides quantitative measures of: (a) the interconnected pore volume, and (b) the interconnected pore surface area, controlling fluid flow, that can be embedded into an Electrical-Kozeny Carman (K-C-E) type equation for K prediction. The project will employ a series of geophysical and hydraulic experimental studies at the laboratory and field scale. Laboratory scale experiments will provide petrophysical relationships linking electrical geophysical, physical and hydraulic properties on sediments extracted from the field site. Field scale measurements will include: single hole and cross borehole electrical geophysical surveys and multi-level slug tests.

The Lancaster PhD studentship will make use of existing complex conductivity inversion tools developed at Lancaster and focus on the development of numerical schemes for deriving the spatial distribution of hydraulic conductivity from the hydraulic and geophysical data available. Two strategies for inverting  $\rho^*$  datasets for tomographic estimates of K are: (1) direct conversion of  $\rho^*$  images to K images assuming a stationary K-C-E equation, and (2) a structural inversion whereby the K zonation is estimated without having to state a single K-C-E relationship. These strategies will be assessed via comparison with spatial K distribution at the BHRS estimated from kriging of borehole-based K measurements, as well as hydraulic tomography datasets available from a separate project.

Candidates should have a good honors degree in Geophysics, Earth Science, Environmental Science or a related discipline. Experience of inverse modeling or numerical modeling of electrical and/or hydraulic potential fields would be an advantage but are not necessary. Deadline for applications is the 31st August 2008. Interviews will be held in September 2008 and the studentship will start as soon as possible thereafter.

For informal enquiries with regard to the research, please contact Andrew Binley by e-mail ([a.binley@lancaster.ac.uk](mailto:a.binley@lancaster.ac.uk)). For further information on making an application, please contact Andy Harrod by email ([lec.pg@lancaster.ac.uk](mailto:lec.pg@lancaster.ac.uk)) or telephone (+44 (0)1524 593478).

#### 8.2.b: APPLIED GEOPHYSICS / HYDROGEOPHYSICS / SOIL SCIENCE.

The Applied Geophysics Group at University of Bonn has an opening for a Ph.D. student on the recently funded FP7 EU research project iSOIL (Interactions between soil related sciences-linking geophysics, soil science and digital soil mapping), involving 19 partners from 9 European countries. The appointment will be for a period of three years. The Ph.D. work will focus on the use of the spectral induced polarization (SIP) method for soil characterization at the field scale. The ideal candidate has a degree in applied geophysics, soil sciences, or related discipline. Previous experience with geoelectrical methods is preferred. Good knowledge of English is essential, and a working understanding of German is welcome. Research will be conducted in close collaboration with project partners at Helmholtz-Centre for Environmental Research (UFZ) and University of Padua.

To apply please email your resume together with the names of two referees to Professor Andreas Kemna ([application@geo.uni-bonn.de](mailto:application@geo.uni-bonn.de)). Deadline for receipt of applications is August 31, 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.