American Geophysical Union

Near-Surface Geophysics Focus Group (NSFG)
Newsletter: June 2015

In Brief:

Recent announcements of interest to the NS community (conferences, academic positions, graduate student opportunities, etc.) can be found at the AGU Near Surface Geophysics Focus Group website.

Early Career Scientists: Check out the NSFG Early Career website.

Follow NSFG on Facebook and Twitter @NS_AGU!

1. Journal Special Issue Call for Papers

1.1 *Geophysics* Special Issue: Nuclear magnetic resonance for near-surface applications

Deadline for manuscript submission: 1 September 2015

Following the 2015 International Workshop on Magnetic Resonance of the Subsurface (MRS), the Society of Exploration Geophysicists (SEG) Near Surface is soliciting manuscripts for a special section in *Geophysics* focused on nuclear magnetic resonance characterization of near-surface materials.

Nuclear magnetic resonance (NMR) is a promising method for investigating the properties of Earth materials, providing direct sensitivity to hydrogen-bearing fluids and their interactions with the pore space. In near-surface geophysics, NMR is most commonly used to determine water content and to estimate hydrogeologic properties such as pore size and hydraulic conductivity.

The special section will highlight the recent advances in the NMR method as applied to the characterization of the near surface. We seek papers that address the state of NMR as a geophysical measurement for near-surface applications in the field (using surface, borehole, or direct-push NMR) and in the laboratory, as well as papers that address integrating NMR data sets into hydrogeological models. We welcome the submission of papers that present novel applications and case studies of NMR, technical advances in the instrumentation, new data interpretation, advancements in data acquisition and signal processing, and new forward modeling and inversion approaches. Authors who did not present at the 2015 MRS workshop but whose research fits the theme of this call are also encouraged to submit papers.

Authors should first register their interest and prospective title with the special section editors by sending an email to MRS2015@au.dk with "Special Issue: <paper title>" in the subject. Please also indicate when the manuscript will be submitted. The deadline for submitting manuscripts to the special issue is 1 September 2015. All submissions will be made using the *Geophysics* online submission system. Please indicate that the manuscript is intended for the MRS special section in the online submission system and in a cover letter to the editor. Manuscripts that are submitted to this special section will undergo the standard *Geophysics* review process. Authors will also be asked to contribute to the review process.

The submissions will be processed according to the following timeline:
Submission deadline: 1 September 2015
Peer review complete: 15 March 2016
All files submitted for production: 1 May 2016
Publication of issue: July–August 2016
Special section editors: Kristina Keating, Lin Jun, Mike Müller-Petke, Ahmad Behroozmand, Jean-Francois Girard.

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2. Tech-Transfer Courses & Training

2.1 Multichannel Analysis of Surface Waves (MASW) Workshop

Dates: 25–26 June 2015 and 27–28 August 2015 [two workshops]
Registration cost: free
Location: Kansas Geological Survey, Lawrence, Kansas
Website

This free two-day MASW workshop will provide opportunity for geoprofessionals, geoscientists, and graduate students to gain knowledge about acquisition, analysis, and interpretation of the seismic Rayleigh surface waves. The learning process will be facilitated by the use of SurfSeis software. The workshop is designed to address the current approaches for analyzing seismic data from both active and passive sources for obtaining shear-wave velocity (V_s) estimates for the near surface.

On day 1 a theoretical overview of the MASW method (active and passive) will be presented, participants will be familiarized with the SurfSeis software package, and field data acquisition from both active and passive sources is scheduled to take place (weather permitting).

Day 2 will continue with the theoretical MASW overview covering surface wave inversion, multimode interpretation and inversion, inversion sensitivity, use of a priori information and quality of inversion results, latest advancements for dispersion curve imaging such as the high-resolution linear Radon transform (HRLRT), challenging dispersion curve patterns, and more. Seismic data acquired on day 1 will be analyzed. Participants are encouraged to bring samples of their own data for discussion as time permits.

Attendees are expected to bring their own laptops.

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3. Upcoming Conferences and Workshops

3.1 6th International Workshop on Magnetic Resonance

Submission Deadline: ***closed***
Meeting Dates: 8–10 June 2015
Meeting Location: Aarhus, Denmark
Visit the Workshop Website

We are glad to invite the community to this event in Denmark hosted by the HydroGeophysics Group, Aarhus University.

We would like to invite newcomers to the world of magnetic resonance sounding (MRS), and therefore, we offer a short course on MRS on 6–7 June. Here we will cover all aspects of MRS, including examples of how these data can be used in hydrological modeling. We have lined up prominent experts from all over the world to give the lectures.

The workshop will focus on the recent advances in nuclear magnetic resonance (NMR) measurements for near-surface characterization. The most important findings will be presented in the areas of

- MRS/surface NMR
- Borehole NMR
- Laboratory NMR
- Integration of NMR with hydrologic modeling
- Instrumentation
- Case studies

We look forward to seeing geophysicists, geologists, and hydrologists in Aarhus in June!

3.2 MARELEC 2015

Submission Deadline: ***closed***
Meeting Dates: 16-19 June 2015
Meeting Location: Philadelphia, Pennsylvania
Visit the Conference Website

The conference technical committee invited paper and poster proposals in the broad areas of marine electromagnetics concerned with theoretical development and modeling, measurement, and analysis, together with case studies where appropriate.

The topics of interest are electromagnetic surveillance and communication systems, vessel electromagnetic signature prediction and control, seafloor and sub-bottom electromagnetic exploration, and oceanographic electromagnetics.

Marelec 2015, the ninth international conference on marine electromagnetics, will be held at the Bossone Research Enterprise Center, Philadelphia, PA., from 16 to 19 June 2015.

3.3 Near-Surface Asia Pacific Conference

Submission Deadline: ***closed***
Meeting Dates: 7–10 July 2015
Meeting Location: Waikoloa, Hawaii
Visit the Conference Website

The 2015 Near-Surface Asia Pacific Conference will focus on near-surface issues within the entire pan-Pacific region and will provide a world-class forum for new technical advances, developments, and applications in near-surface geophysics.

Submitted papers cover theoretical developments and case histories in the broad topic of near-surface geophysics, including

- Shallow seismology
- Engineering geophysics
- Borehole geophysics
- Rock and soil properties
- Ground-penetrating radar
- Hydrogeophysics
- Modeling and inversion
- Remote sensing and lidar applications
- Electric, EM, and NMR methods
- Mining and geothermal exploration
- Geophysical instruments

As a new component to this year's conference, we invite proposals for additional special sessions and one-day post-conference workshops. In your proposal, please include the workshop or session organizers, potential invited speakers, and a brief description of the topic and its relevance to the conference.

In addition, given that this year's venue is located on the Hawaiian volcanic chain, we will highlight geophysical applications to natural hazards focusing on volcanoes. Special sessions are planned for volcano characterization; monitoring, imaging, and stratigraphy of pyroclastic flows; geophysical applications to tsunamis; and passive/microseismic methods for near-surface applications.

3.4 AGU-SEG Workshop: Potential-Field and Electromagnetic Methods Applied to Basin Studies

Submission Deadline: ***closed***
Meeting Dates: 25–27 August 2015
Meeting Location: Keystone, Colorado
Visit the Conference Website

This workshop will provide a platform for an exchange of concepts and ideas on the development and integrated application of potential-field and electromagnetic methods to define the structure and tectonics, natural resources, and hazards associated with active and relic basins.

3.5 Near Surface Geoscience 2015

Submission Deadline: ***closed***
Meeting Dates: 6–10 September 2015
Meeting Location: Turin, Italy
Visit the Conference Website

Near Surface Geoscience 2015 is actually three conferences in one! Participants can attend the 21st European Meeting of Environmental and Engineering Geophysics, the 1st Conference on Proximal Sensing Supporting Precision Agriculture, or the 1st European Airborne Electromagnetics Conference. In addition, there will be several workshops available on 6 September.

3.6 South African Geophysical Association 14th Biennial Conference and Exhibition

Submission Deadline: ***closed***
Meeting Dates: 6–9 September 2015
Meeting Location: Drakensberg, South Africa
Visit the Conference Website

The conference's organizing committee takes pleasure in extending an invitation to attend the South African Geophysical Association's 14th Biennial Conference and Exhibition, to be hosted at the Champagne Sports Resort in the majestic Drakensburg Mountains, South Africa.

For any queries regarding registration, please contact Kathy.

3.7 Society of Exploration Geophysicists 85th Annual Meeting

Submission Deadline: ***closed***
Meeting Dates: 18–23 October 2015
Meeting Location: New Orleans, Louisiana
Visit the Conference Website

The SEG International Exposition and 85th Annual Meeting is one of the year's most anticipated events, bringing together more than 8,500 attendees from 70 countries, representing the fields of global oil, gas and mineral exploration to new areas of civil engineering, environmental regulation and archaeology.

Located in the New Orleans Arts District, the state-of-the-art Morial Convention Center is situated in the middle of dozens of art galleries and museums and within walking distance of hundreds of restaurants, shops, bars and jazz clubs in the French Quarter.

SEG looks forward to returning to New Orleans for an exciting week of premier educational, networking and business development opportunities.

3.8 3rd International Conference on Engineering Geophysics

Submission Deadline: ***closed***
Meeting Dates: 15–18 November 2015
Meeting Location: Al Ain, United Arab Emirates
Visit the Conference Website

The United Arab Emirates University (UAEU) and Al Ain City Municipality (AAM) in partnership with the Society of Exploration Geophysicists (SEG) are proud to announce the third edition of the International Conference on Engineering Geophysics (ICEG). This third edition will take place 15–18 November 2015 on the grounds of the UAEU in the Conference Auditorium of the Crescent Building.

The success of the first and second ICEGs is reflected by the number of participants and the great interest shown by and feedback from both local authorities and the international geocommunity working with geophysical methods applied to engineering, environmental, archaeological, geotechnical, and forensic problems. Overwhelming encouragement from this community has led to the third in the series and a decision to extend the fields of interest to a wider range of near-surface-related specialties, including groundwater, time-lapse, security, seismicity, and geothermal to name a few options. Beyond this 2015 event, this world-class series will be broadened to allow sharing of the event with other regional partners with equivalent enthusiasm for the application of geophysics to near-surface problems.

In addition to the regular conference program, Oz Yilmaz, the 2015 SEG Distinguished Instructor Short Course (DISC), will deliver a full day course on "Engineering Seismology: With Applications to Geotechnical Engineering" on 14 November 2015. **Learn more about the DISC at ICEG 2015**.

3.9 3rd International Workshop on Geoelectrical Monitoring (GELMON 2015)

Submission Deadline: 20 September 2015
Meeting Dates: 24–26 November 2015
Meeting Location: Vienna, Austria
Visit the Workshop Website

To foster scientific discussion and to support cooperation among the scientific groups, the Geological Survey of Austria invites you to the Third International Workshop on Geoelectrical Monitoring. The scope of this workshop will not only be the presentation of state-of-the-art results; significant time will also be reserved for the discussion of special topics of data acquisition, processing, inversion, and interpretation. Special topics include

- Monitoring case studies in general (CO_2, landslides, embankments, permafrost, etc.)
- Inversion and modeling
- Data quality assessment

- Infrastructure monitoring
- New fields of application
- Other topics are welcome

We would also kindly ask you to forward this invitation to any other colleague who might be interested in this event.

To facilitate an unobstructed organization of the event, we ask you to state your intention to participate in the GELMON 2015 workshop in a short email to Stefanie Gruber. Please inform us if you are also planning to give an oral/poster presentation and specify the topic (full title is not necessary).

For companies and institutes there will be the opportunity to present their products and research in the form of a company booth (€400), which will be on display during the conference in a special room adjacent to the main conference room. Sponsorship of a certain conference event (icebreaker party, conference dinner) is also welcome. For further information, please contact Stefanie Gruber. Registration by bank transfer will be open from 22 June 2015 to 16 November 2015.

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4. Position Announcements

4.1 Research Geophysicist at British Geological Survey

The British Geological Survey (BGS) is one of the world's leading and forward thinking geological science institutes with a focus on both public good science for government and geoscientific research to understand earth and environmental processes. A vacancy has arisen for an enthusiastic Research Geophysicist to be based at our headquarters in Keyworth, Nottingham.

You will develop expertise in electrical geophysical techniques for subsurface imaging and time-lapse monitoring of complex Earth systems and processes and develop existing geophysical technology platforms (e.g., ALERT: Automated Time-Lapse Electrical Resistivity Tomography, CRI: Capacitive Resistivity Imaging) to automate 4D data capture, processing, and visualization for field observatories and laboratory programs. In addition, you will assist the development of new image optimization and reconstruction algorithms to improve the resolving capabilities of electrical imaging/monitoring.

With an M.Sc. degree in geophysics, physics, or a related subject, you should have the skills, knowledge, and ability to solve theoretical and practical physics-based problems, including the ability to measure, analyze and interpret data sets acquired from field surveys, laboratory experiments, or computer simulations and a willingness to undertake geophysical research activities. You must possess good communication skills, both oral and written. The post involves team working; therefore, you should be able to work effectively with others and have good time management skills.

Depending on qualifications and experience, full-time starting salary will be £22,224 to £24,112 per annum. Full-time working hours are 37 per week excluding lunch breaks. A generous benefits package is also offered, including a company pension scheme, childcare voucher scheme, 30 days annual leave plus 10.5 days public and privilege holidays.

This is advertised as a full-time post, but we will consider applications from those who require more flexible arrangements.

Applications are handled by the RCUK Shared Services Centre; to apply please visit our job board and submit your up-to-date CV and covering letter, which clearly outlines why you are applying for this post and how you meet the criteria described in this advertisement. Applicants who would like to receive this advert in an alternative format (e.g., large print, Braille, audio or hard copy) or who are unable to apply online should contact us by telephone on 01793 867003. Please quote reference number IRC192253.

Closing date for receipt of application forms is 12 June 2015.

The Natural Environment Research Council is an equal opportunities employer and welcomes applications from all sections of the community. People with disabilities and those from ethnic minorities are currently underrepresented, and their applications are particularly welcome. The British Geological Survey is an Investors in People organization. There is a guaranteed Interview Scheme for suitable candidates with disabilities.

4.2 Hydro-biogeophysical Ph.D. Position at Bordeaux INP, collaborative with Lawrence Berkeley National Laboratory

A highly qualified and motivated Ph.D. candidate is sought to develop and implement methodologies for characterizing the presence and mobility of metal contamination through terrestrial systems using geophysical (particularly electrical) methods. Lab/field experimental and numerical methods will be used to quantify copper contamination (present in industrial sites and vineyards), as well as controls on copper transport through soils and plants. The Ph.D. candidate will work with a multidisciplinary group of scientists at Bordeaux INP (The ENSEGID-Bordeaux INP–EA 4592 in Bordeaux, France) and in the Earth Sciences Division of Berkeley Lab (Berkeley, Calif.) to collect and integrate aboveground and belowground hydrological, geochemical, vegetation, and geophysical data sets, with a focus on (1) documenting the geophysical signature of relevant hydrogeochemical processes and (2) improving understanding of controls on copper mobility in managed ecosystems. The degree will be granted from Bordeaux INP, and the candidate is expected to spend approximately half time at each partner institution. Applications are required by 30 June 2015, with anticipated start date of 1 October 2015.

Essential for this position is a master's degree in geophysics or geosciences (French candidates must have scores above 14/20); a willingness to perform laboratory, field, and numerical research; an ability to travel/live in Bordeaux and Berkeley; and an interest in working with a multidisciplinary team to understand complex, near-surface processes. Knowledge in soil or environmental sciences, airborne imaging, geochemistry, or electrical methods is desired.

The partner institutions are located in stimulating environments recognized for offering a high quality of life, excellent culinary opportunities, and abundant natural and historical beauty. The EA 4592 "Géoressources and Environment"–thème 2 in Bordeaux has expertise in environmental issues and approaches, with a particular focus on processes and methods associated with contaminated sites and hydrogeology. More information is available here. The Berkeley Lab Environmental Geophysics Group has expertise in a variety of methods and approaches and works within a collaborative environment to tackle complex terrestrial system challenges that require coupling of geophysics, hydrology, geochemistry, and biology. More information is available on the Earth Science Division website.

The Ph.D. will be co-funded by IDEX–University of Bordeaux (18 months) and by Berkeley Lab (18 months).

To apply, please contact Myriam Schmutz.

4.3 Ph.D. student at Université de Liège: Unravel the electrical signature of roots

Duration: October 2015 to September 2019

Scientific context
Geophysical techniques, such as electrical resistivity tomography (ERT), are more and more used as a tool to assess spatiotemporal soil moisture dynamics of cropped soils. Yet the variability in space and time of the pedophysical relationship remains an important challenge, especially in the presence of growing roots. In most studies, an effect of root biomass on bulk EC is observed but not yet well understood, and thus, this effect is not compensated for the estimation of soil moisture content. It has been shown that bulk electrical resistivity from ERT is correlated with root density or root length density. However, the electrical properties of the individual root segments and how they contribute to the bulk electrical properties for the full root architecture have not been fully addressed.

Only very recently, it has been shown that roots give rise to induced electrical polarization processes, presumably originating from electrochemical polarization at the root-electrolyte interface. Both electrical impedance tomography (complex resistivity imaging) and electrical impedance spectroscopy (spectral induced polarization) might offer access to important root structural and functional parameters. The objective of this Ph.D. is to quantify the electrical signature of individual root segments and establish a model describing the polarization properties of roots. The Ph.D. candidate will perform a spectroscopic diagnosis of the electrical conduction and polarization properties of root segments and elucidate the role of various root properties.

Location
Université de Liège, Applied Science Faculty, Géo 3, Liège (Belgium). The Ph.D. is part of a larger research project in which three Ph.D. students will collaborate to understand and quantify the signature of plant roots in electrical, geophysical properties of soils under vegetation, with the long-term aim of improved soil moisture and root activity monitoring. Related research topics are investigated by partners at the University of Bonn and the Forschungszentrum Jülich in Germany in close cooperation. Stay abroad at the University of Bonn (Andreas Kemna) and/or Forschungszentrum Jülich (Sander Huisman) of at least 6 months has to be taken into account.

Profile & requested skills
The candidate must be graduated from a university with a master's degree whose training focuses primarily on (bio)physics, (bio/electrical) engineering, numerical mathematics. Aptitude for teamwork and good spoken and written English will be appreciated.

Allowance
Allocation of a Ph.D. grant from the Walloon scientific research fund FNRS.

Supervisors
Frederic Nguyen
Sarah Garré

Application Deadline
Candidates must send a detailed CV and a motivation letter to Sarah Garré before 1 July 2015.

4.4 Ph.D. student at Université catholique de Louvain: Establish a multi-scale model of the electrical signature of plant root architecture

Duration: February 2016 to January 2020

Scientific context
Geophysical techniques, such as electrical resistivity tomography (ERT), are more and more used as a tool to assess spatiotemporal soil moisture dynamics of cropped soils. Yet the variability in space and time of the pedophysical relationship remains an important challenge, especially in the presence of growing roots. In most studies, an effect of root biomass on bulk EC is observed but not yet well understood, and thus, this effect is not compensated for the estimation of soil moisture content. It has been shown that bulk electrical resistivity from ERT is correlated with root density or root length density. However, the electrical properties of root segments, the effect of the full root architecture, and the combination with heterogeneous porous media have not been fully addressed.

This Ph.D. aims at developing a multi-scale model to represent the electrical processes taking place in the soil-plant continuum under an external electric field. At the microscopic scale a novel model that considers polarization from soil over rhizosphere to root tissue, as well as the polarization processes along and around roots, needs to be developed. The effect of different root system characteristics on these properties will be addressed. Based on an electrical model for individual root segments, electrical parameterizations of complete, growing root architectures will be developed. Existing root growth and soil water models will have to be combined with the electrical models, allowing the prediction and study of effective soil-root electrical properties as well as the calibration of corresponding biopedophysical relationships. Besides the modeling efforts, the Ph.D. candidate will assist in the execution of experiments on root segments and individual plants with varying root architectures.

Location
Université catholique de Louvain, Earth and Life Institute, Louvain-la-Neuve (Belgium). The Ph.D. is part of a larger research project in which three Ph.D. students will collaborate to understand and quantify the signature of plant roots in electrical, geophysical properties of soils under vegetation with the long-term aim of improved soil moisture and root activity monitoring. Related research topics are investigated by partners at the University of Bonn and the Forschungszentrum Jülich in Germany in close cooperation. Stay abroad at the University of Bonn (Andreas Kemna) and/or Forschungszentrum Jülich (Sander Huisman) of at least 6 months has to be taken into account.

Profile & requested skills
The candidate must be graduated from a university with a master's degree whose training focuses primarily on (soil/bio) physics, (bio/electrical) engineering, numerical mathematics. Aptitude for teamwork and good spoken and written English will be appreciated.

Allowance
Allocation of a Ph.D. grant from the Walloon scientific research fund FNRS.

Supervisors
Mathieu Javaux
Frederic Nguyen

Application Deadline
Candidates must send a detailed CV and a motivation letter to Sarah Garré before 1 July 2015.

4.5 Postdoctoral Fellow at Lawrence Berkeley National Laboratory

The Earth Sciences Division of Lawrence Berkeley National Laboratory is seeking applications for a postdoctoral fellow to develop and implement methodologies for monitoring and investigating complex near-surface and surface processes using remote sensing (primarily using unmanned aerial systems), hydrological and geophysical techniques, and point-scale energy and flux measurements.

The postdoctoral fellow will work with a multidisciplinary group of scientists to improve predictive understanding of coupled hydrological-geomechanical-biogeochemical processes that are manifested at the pore to the watershed scales and that are relevant to hydrological and biogeochemical functioning of terrestrial ecosystems. The position focuses on the development of advanced acquisition, processing, and change detection approaches for monitoring complex terrestrial environments in the Colorado River Basin (CO) and in the Arctic (AK).

Essential for this position is expertise in near-surface Earth or environmental sciences with a particular emphasis on at least one of the following domains: airborne-based multi/hyperspectral and/or geophysical data acquisition and processing, soil physics and hydrology at the field scale, and surface-subsurface water-heat-gas fluxes.

The position requires an outstanding record of original and high-quality research and demonstrated experience and enthusiasm for subsurface and surface processes characterization and monitoring. Essential for the position is a Ph.D. in Earth sciences, environmental sciences, or engineering and experience with field data integration and assimilation. Desired is a familiarity with hydrogeophysical techniques, soil physics, remote sensing approaches, statistical methods for data analyses, and an interest in working with a multidisciplinary team to understand complex near-surface processes.

The Earth Sciences Division in Lawrence Berkeley National Laboratory takes advantage of multidisciplinary research expertise to tackle many critical and challenging environmental questions, including quantification of terrestrial environments and their dynamics. Berkeley Lab is located in an environment recognized for offering a high quality of life, having both abundant natural beauty and exciting urban surrounds.

For more information about the LBNL Environmental Geophysics Group, please visit http://esd.lbl.gov/departments/geophysics/core_capabilities/environmental_geophysics.html. For more information about the relevant projects, please visit http://ngee.ornl.gov/ and http://esd.lbl.gov/research/projects/sustainable_systems/

To apply, please visit http://jobs.lbl.gov and reference Geological Postdoc Fellow posting #80701

TO CONTRIBUTE MATERIAL TO THE NSFG NEWSLETTER SEND AN EMAIL TO Burke Minsley

DEADLINE: Material must be received 5 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 Web address for additional information.

GET YOUR MESSAGE OUT TO NS MEMBERS FASTER:

You will no longer need to wait until the end of the month to share an important or time-sensitive contribution to the newsletter. Appropriate contributions to the newsletter will also be shared ASAP via Twitter. Please note that only NSFG members that follow @NS_AGU will receive Twitter announcements; so make sure that you sign up!