

December 2007 Newsletter of the AGU Near-Surface Focus Group

1. Fall AGU Meeting Near-Surface Geophysics Focus Group Events
2. Fall AGU Meeting Student Paper Judges needed
3. Student Fellowships for the Computational Methods in Water Resources Conference
4. Conference Session Announcements
 - 4.1 68th Annual Meeting of the German Geophysical Society
 - 4.2 EGU: Realistic modeling and inversion of high-frequency seismic and electromagnetic wave phenomena in the shallow subsurface
 - 4.3 EGU: The Transport Properties of Geomaterials: Theory, Modeling, Measurement, Application and Integration
5. Geophysics Summer Field Course: Tennessee Intensive Near Surface Geophysics Study (TINGS) 2008
6. Academic Position Announcements
 - 6.1 Faculty: Near Surface Geophysics, Rutgers University, USA
 - 6.2 Faculty: Computational Geoscientist, Stanford University, USA
 - 6.3 Post Doctoral: Thompson Postdoctoral Fellowship, Stanford University, USA
7. Special Issue of JEEG on The Geophysics of Glacial and Frozen Materials
8. Fall AGU Meeting Near-Surface Geophysics and Hydrogeophysics Sessions (repeat from November newsletter)

Membership update: As of the end of August, Near Surface had 1404 total affiliates, of these 380 listed Near Surface as their primary affiliation.

=====
1. Fall AGU Meeting Near-Surface Geophysics Focus Group Events

1.1 Near-Surface Geophysics Focus Group lunch, Tuesday Dec. 11:

For all NS members and any others who are interested in attending.
Please join us at the first Near-Surface Geophysics Focus Group AGU lunch. Sign up for this event (\$30) when registering for the Fall meeting. This is a great opportunity for our community to meet and discuss plans for future AGU meetings and other conferences/workshops. We will also talk about the development of the CUAHSI Hydrologic Measurement Facility for Geophysics, and discuss new opportunities for introducing near-surface geophysics to other scientific communities.

1.2 Joint Near-Surface Geophysics and Hydrogeophysics Social Gathering:

Monday Dec. 10, 6:00 pm, Hotel Utah, 500 4th Street at Bryant.

2. If you will be attending NS sessions and are interested in helping to evaluate student presentations for AGU Student Paper Awards, we can use your help. Please contact NS meeting coordinator Sarah Kruse, <mailto:skruse@cas.usf.edu>.

3. Student Fellowships for the Computational Methods in Water Resources Conference

CUAHSI (Consortium of Universities for Advancement of Hydrologic Science) has announced an opportunity for graduate students to apply for a registration fee waiver at the upcoming Computational Methods in Water Resources Conference, to be held in San Francisco July 6-10, 2008. The deadline for applying for the CUAHSI-CMWR Student Fellow Awards is December 14th, 2007. The link to the application form is given at http://esd.lbl.gov/CMWR08/stud_fellow.html

Susan Hubbard

4. Conference Announcements

4.1 68th Annual Meeting of the Deutsche Geophysikalische Gesellschaft

The 68th Annual Meeting of the Deutsche Geophysikalische Gesellschaft will take place in Freiberg (Saxony), Germany, from March 3rd to 6th, 2008. One of the four main topics of this meeting is Near Surface Geophysics. Deadline for abstract submission is December 15th, 2007. Further information is available at <http://www.geophysik.tu-freiberg.de/dgg2008>

4.2 EGU: Realistic modeling and inversion of high-frequency seismic and electromagnetic wave phenomena in the shallow subsurface

Dear Colleague,

We would like to draw to your attention the following session at the European Geosciences Union (EGU) General Assembly, to be held in Vienna, Austria from April 13-18, 2008: "Realistic modeling and inversion of high-frequency seismic and electromagnetic wave phenomena in the shallow subsurface". A description of the session is included below. The deadline for abstract submissions is January 14, 2008, and the conference website can be found at:

<http://meetings.copernicus.org/egu2008/>

Hope to see you there!

Klaus Holliger, University of Lausanne

James Irving, University of Lausanne
Alan Levander, Rice University

High-resolution seismic and georadar methods have great potential for resolving the highly complex structure of the shallow subsurface. Moreover, these methods are critically sensitive to some of the most interesting and pertinent petrophysical parameters for environmental and engineering applications. Whereas the velocities of seismic and georadar waves are sensitive to porosity and water content, the attenuation of seismic waves may be indicative of changes in permeability or rock quality and the attenuation of georadar waves is often linked to clay content. During the last two decades, acquisition technologies as well as modeling and inversion algorithms for high-resolution seismic and georadar data have seen immense progress. Although the innovations in data acquisition have been readily embraced by the community, the adoption of corresponding innovations in modeling and inversion methods has moved more slowly.

Clearly, this is problematic as it means that the immense improvements in the potential resolution of seismic and georadar data are not yet fully realized. Indeed, it can be argued that the use of modern modeling and inversion technologies holds the promise of improving the resolution of seismic and georadar data by roughly one order-of-magnitude, thus pushing it into a realm that is directly compatible with borehole logging data. Moreover, modern inexpensive computing platforms make massive modeling and inversion feasible to a broad community. The purpose of this session is to explore the possibilities and limitations of modern modeling and inversion algorithms for high-resolution seismic and georadar data under real-world conditions, and to promote their use by the broader community of practitioners in these domains.

4.3 EGU: The Transport Properties of Geomaterials: Theory, Modeling, Measurement, Application and Integration

Dear Colleague,

I would like to draw to your attention the session MPRG7 "The Transport Properties of Geomaterials: Theory, Modeling, Measurement, Application and Integration" at the European Geosciences Union General Assembly, to be held in Vienna, Austria from April 13 to April 18, 2008 (<http://meetings.copernicus.org/egu2008/>)

This session aims to provide a platform for the study of novel and integrated geoscientific techniques in order to examine the transport properties of geomaterials.

Contributions will be accepted on the subjects of:

- (i) fluid flow, permeability, fluid conductivity at all frequencies and scales,
- (ii) electrical properties, conductivity, resistivity and permittivity in both real and complex domains and at all frequencies and scales,
- (iii) heat flow, geothermal states, thermal conductivity and diffusivity

(iv) transport of energy by elastic waves, velocities and dispersion of pressure shear and other types of elastic wave,

(v) rheological mass flow

(vi) diffusion of atomic species within solid crystals.

The primary aims of the session are:

(a) To provide an opportunity for scientists interested in the transport properties of geomaterials to share advances in the development of laboratory and field-based geoscientific techniques.

(b) To examine the physical relationships between physical properties that have often been considered separate. For example, electro-kinetic links between electrical and flow properties or seismo-kinetic links between flow and seismic properties.

(c) To examine the effect of rock microstructure and anisotropy upon the transport properties of rocks, including methods to characterize the anisotropy experimentally, and its links with the rock structure.

(d) To examine the effect of pressure and temperature upon the transport properties of rocks directly or via a change in the rock microstructure.

(e) To examine how integrated field and laboratory studies and/or integrated techniques can provide a better approach to geophysical problem solving.

Presentations and posters that cover: (i) the development of theory, (ii) numerical or (iii) digital modeling, (iv) the design of experimental apparatus and the subsequent experimental results, (v) information discovered from field studies, and (vi) the application of geotransport data to the solution of geological and geophysical problems are all welcome.

Studies that integrate two or more of these approaches are particularly welcome. We also strongly encourage contributions which apply novel or established technical methods in new ways or in order to answer new questions.

The deadline for abstract submissions is January 14, 2008, and December 7, 2007, for support applications.

On behalf of P. Glover (convener) and H. Hase (co-convener), A. Maineult
(co-convener)

5. Geophysics Summer Field Course: Tennessee Intensive Near Surface Geophysics Study (TINGS) 2008

Applications are now being accepted for TINGS 2008. For details visit [<http://www.geophysics.tennessee.edu/tings.htm>]. The TINGS Program is a near-surface geophysics field course for geophysicists and non-geophysicists alike, providing participants exposure to a unique array of industry and academic instructors covering a wide variety of techniques. The course is open to students, faculty, and government/industry professionals, and will be capped this year at 26 participants on a first-come/first-serve basis. Unique characteristics of the TINGS program are: (1) specifically geared toward near surface geophysical techniques; (2) guides participants all the way through pitfalls associated with survey design, data acquisition, processing, and analysis of each technique; and (3) focuses on techniques, not problems, so participants can include geologists/geophysicists, engineers, archaeologists, agricultural scientists, etc., and participants will not be required to have any specific background.

Additionally, data from multiple techniques are acquired at a primary geophysical test site and participants work through quantitative data integration/fusion utilizing industry standard software to understand important concepts related to temporal and spatial resolution as well as emphasizing the pros/cons of the individual techniques.

The TINGS 2008 program will be offered through the University of Tennessee during miniterm 2008 in and around Knoxville, TN. The course will start May 7th and run until May 28th, 2008, inclusive. Out-of-town participants should arrive May 6th and depart May 29th. A detailed preliminary schedule is available

[<http://www.geophysics.tennessee.edu/2008scheduleTINGS.pdf>]. For additional information see the web [<http://www.geophysics.tennessee.edu/tings.htm>] or contact Dr. Gregory S. Baker (Dept. of Earth & Planetary Sciences, University of Tennessee) at <mailto:gbaker@tennessee.edu>.

6. Academic Position Announcements

6.1 FACULTY: Near Surface Geophysics, Rutgers University, USA

Rutgers University-Newark seeks to fill a full-time, tenure-track position at the rank of Assistant Professor for fall 2008 in the area of Environmental/Near Surface Geophysics. We seek candidates with expertise in near surface geophysical methods for the study of environmental processes occurring in the upper ~100 m of the Earth. Desirable areas of specialty include (but are not limited to) hydrogeophysics, biogeophysics, near surface stratigraphy, coastal processes, abiotic-biotic interactions and climate change related research.

Candidates who wish to pursue interdisciplinary research, and could take advantage of unique opportunities resulting from our urban environmental setting on the doorstep of New York City, are particularly encouraged to apply. Excellent opportunities exist for collaboration with current faculty in near surface geophysics, soil geochemistry and ocean-atmosphere interactions. Establishing a vigorous, externally funded research program and advisement of MS/PhD students is essential.

Effective teaching is required with a maximum teaching load of 3 courses per year. Applicants must have a Ph.D., a record of scholarly productivity and demonstrate potential to develop a

funded program of research. Send a letter of application, a CV and names of three referees to Dr. Lee Slater, Search Chair, Dept. of Earth and Environmental Sciences, Rutgers University, 101 Warren St, Newark, NJ 07012 or <mailto:lslater@andromeda.rutgers.edu>.

Review of completed applications will begin December 1 and continue until the position is filled. Rutgers University is an equal opportunity/affirmative action employer.

6.2 FACULTY: Computational Geoscientist, Stanford University, USA

Stanford University's School of Earth Sciences invites applications for a senior tenure-track faculty appointment at either the Associate or Full Professor level in the area of computational geosciences. We welcome applicants with strong skills in computational theory and practice, as well as a working familiarity with numerical methods for large-scale problems, parallelization paradigms, and modern computer systems. The successful applicant will have research experience or interests in applications to Earth and environmental problems, including but not limited to one or more of the following areas: energy, water, other natural resources, atmospheres, oceans, fluid dynamics, geodynamics, geomechanics, hazards, seismology, electromagnetics, inversion, optimization, and imaging of the earth surface and interior.

Experience with large geoscience datasets is desirable.

Strong interest in or experience with research collaboration and teaching across earth and environmental science disciplines is highly desirable. We expect the successful applicant to lead development and growth of the Stanford Center for Computational Earth and Environmental Science. The Center, with its shared high productivity computing resources, seeks to expand research and educational opportunities in computational geosciences. This appointment will be with one (or jointly with two) of the four departments in the School of Earth Sciences: Energy Resources Engineering, Geological and Environmental Sciences, Geophysics, and Environmental Earth System Science (proposed). Further information about the School of Earth Sciences and this search can be found at <http://pangea.stanford.edu/>.

Stanford University is an equal opportunity employer and is committed to increasing the diversity of its faculty. It welcomes nominations of and applications from women and minority groups, as well as others who would bring additional dimensions to the university's research, teaching and service missions. Applications, including curriculum vitae, a statement outlining research and teaching experience and interests, and the names and addresses of four referees should be sent in electronic format (.pdf only) to cg-search@sesmail.stanford.edu, addressed to Computational Geosciences Search Committee. Applications received by January 31, 2008 will receive full consideration, though the position will remain open until the appropriate applicant is identified.

6.3 POST DOCTORAL: Thompson Postdoctoral Fellowship, Stanford University, USA

The Department of Geophysics, Stanford University, has established the Thompson Postdoctoral Fellowship to be awarded to a candidate preferably within two years of receipt of the Ph.D. The fellowship is open to applicants in any area of geophysics including new areas of research that

cross existing disciplinary boundaries, so that students and recent graduates in Earth science, physics, chemistry, biology, or computational sciences with interests in the geophysical sciences are also encouraged to apply. Our department is currently active in crustal geophysics, exploration and production geophysics, seismic imaging, rock physics, earthquake seismology, crustal deformation, stress and geomechanics, environmental geophysics, and atmospheric, ocean, and planetary sciences.

Appointments are for a one- to two-year term that can start any time in the academic year 2008/2009. The salary is \$50k to \$55k per year depending on experience, plus a \$5k research allowance for travel and miscellaneous expenses. Applications received by January 2, 2008, will receive fullest consideration. Applicants should submit a statement of research interests and proposed research, a curriculum vita, a list of publications and names of three potential referees, by email (as .pdf files, with the applicant name as part of the file name) to thompsonfellowship@sesmail.stanford.edu (see also <http://geo.stanford.edu/GP/research>)

Stanford University is an equal opportunity employer and is committed to increasing to the diversity among its students, staff, and faculty. It welcomes nominations of and applications from minority groups and women, as well as others who would bring additional dimensions to the university's research, teaching and service missions

7. Special Issue of JEEG on 'The Geophysics of Glacial and Frozen Materials' to foster communication between the near-surface geophysical and glaciological communities (Bernd Kulessa)

This Special Issue of the Journal of Environmental and Engineering Geophysics arises from a conference on Geophysics and Glacial Materials, hosted by the Environmental and Industrial Geophysics Group, The Geological Society, UK (<http://www.eigg.org/>). This conference was held at the School of Applied Sciences, Northumbria University, UK, in conjunction with the Annual Meeting of the British Branch of the International Glaciological Society from 14-16 September 2005. Joint hosting of the two events aimed to foster communication and future collaboration between the near-surface geophysical and glaciological communities. This recognises, in particular, that techniques of applied geophysics have led to many glaciological advances over recent decades, and promise to play a major and indeed growing role in glaciology in the foreseeable future. At present few near-surface geophysicists engage in glaciological research, although it is timely that concerted efforts are focused on adapting the stimulating methodological and technological advances made in near-surface geophysics in recent years to solving glaciological problems.

Bernd Kulessa and John Woodward

Introduction to this Special Issue of JEEG: The Geophysics of Glacial and Frozen Materials J ENVIRON ENG GEOPHYS 2007 12: 1-2.

Andrew M. Smith

Subglacial Bed Properties from Normal-Incidence Seismic Reflection Data J ENVIRON ENG GEOPHYS 2007 12: 3-13.

Edward C. King and Eric P. Jarvis

Use of Shear Waves to Measure Poisson's Ratio in Polar Firn J ENVIRON ENG GEOPHYS 2007 12: 15-21.

Bernd Kulesa

A Critical Review of the Low-frequency Electrical Properties of Ice Sheets and Glaciers J ENVIRON ENG GEOPHYS 2007 12: 23-36.

L. Jared West, David M. Rippin, Tavi Murray, Heidi M. Mader, and Bryn Hubbard Dielectric Permittivity Measurements on Ice Cores: Implications for Interpretation of Radar to Yield Glacial Unfrozen Water Content J ENVIRON ENG GEOPHYS 2007 12: 37-45.

Robert G. Bingham and Martin J. Siegert

Radio-Echo Sounding Over Polar Ice Masses J ENVIRON ENG GEOPHYS 2007 12: 47-62.

Martin J. Siegert and Gwendolyn J.-MC Leysinger Vieli Lake Glacial History of the Ross Sea Sector of the West Antarctic Ice

Sheet: Evidence from Englacial Layering at Talos Dome, East Antarctica J ENVIRON ENG GEOPHYS 2007 12: 63-67.

John Woodward and Matthew J. Burke

Applications of Ground-penetrating Radar to Glacial and Frozen Materials J ENVIRON ENG GEOPHYS 2007 12: 69-85.

Tavi Murray, Adam Booth, and David M. Rippin Water-content of Glacier-ice: Limitations on Estimates from Velocity Analysis of Surface Ground-penetrating Radar Surveys J ENVIRON ENG GEOPHYS 2007 12: 87-99.

Brian Edward Barrett, Tavi Murray, and Roger Clark Errors in Radar CMP Velocity Estimates Due to Survey Geometry, and Their Implication for Ice Water Content Estimation J ENVIRON ENG GEOPHYS 2007 12: 101-111.

Neil Ross, Peter J. Brabham, Charles Harris, and Hanne H. Christiansen Internal Structure of Open System Pingos, Adventdalen, Svalbard: The Use of Resistivity Tomography to Assess Ground-ice Conditions J ENVIRON ENG GEOPHYS 2007 12: 113-126.

Jonathan L. Carrivick, Jamie K. Pringle, Andrew J. Russell, and Nigel J. Cassidy

GPR-derived Sedimentary Architecture and Stratigraphy of Outburst Flood Sedimentation Within a Bedrock Valley System, Hraundalur, Iceland J ENVIRON ENG GEOPHYS 2007 12: 127-143.

Author Biographies

8. 2007 Fall AGU Near-Surface Geophysics and Hydrogeophysics Sessions (repeat from November newsletter)

Arrive early because there is lots of good stuff on Monday morning!

And stay late — the Thursday afternoon NS talks are scheduled between Hydrogeophysics sessions!

MONDAY MORNING (Dec 10)

Posters: Moscone South Exhibit Hall B

NS11A: Exploration of the Cryosphere Using Near-Surface Geophysical Techniques: Synergism in the International Polar Year, I Posters (joint with C, GP, S). Presiding: A L Endres, University of Waterloo; T Murray, Swansea University

NS11B: Biogeophysics, I Posters (joint with B, H). Presiding: K Keating, Stanford University; L Slater, Rutgers University

NS11C: Induced Polarization, Self-Potential, and Seismic-Electric Coupling for Near-Surface Applications, I Posters(joint with B, S). Presiding: D Ntarlagiannis, Queens University Belfast; B Minsley, Massachusetts Institute of Technology; B Kulesa, Swansea University

NS11D: Near-Surface Geophysics and Natural Hazards, I Posters (joint with PA, S, V). Presiding: M E Everett, Texas A&M University; J Louie, University of Nevada, Reno

NS11E: Fault Imaging and Seismic Hazard Assessment, I Posters (joint with PA, S, T). Presiding: M Craig, California State University, East Bay; S Kruse, University of South Florida

Talks:

08:00 Room: Moscone West 2022

H11G: Watershed Characterization and Modeling I: Applications (joint with NS). Presiding: T Ferre, University of Arizona; T Wagener, Pennsylvania State University; D Hyndman, Michigan State University; K Singha, Pennsylvania State University

10:20 Room: Moscone West 2022

H12E: Watershed Characterization and Modeling II: Physical Analyses (joint with NS). Presiding: T Ferre, University of Arizona; T Wagener, Pennsylvania State University; D Hyndman, Michigan State University; K Singha, Pennsylvania State University

MONDAY AFTERNOON (Dec 10)

Talks

13:40 Room: Moscone West 3005

NS13A: Induced Polarization, Self-Potential, and Seismic-Electric Coupling for Near-Surface Applications II (joint with B, S). Presiding:

D Ntarlagiannis, Queens University Belfast; B Minsley, Massachusetts Institute of Technology;
B Kulesa, Swansea University

13:40 Room: Moscone West 2022

H13M: Watershed Characterization and Modeling III: Concepts (joint with NS). Presiding: T Ferre, University of Arizona; T Wagener, Pennsylvania State University; D Hyndman, Michigan State University; K Singha, Pennsylvania State University

16:00 Room: Moscone West 3005

NS14A: Exploration of the Cryosphere Using Near-Surface Geophysical Techniques: Synergism in the International Polar Year II (joint with C, GP, S). Presiding: A L Endres, University of Waterloo; T Murray, Swansea University

TUESDAY MORNING (Dec 11)

Talks

8:00 Room: Moscone West 2005

NS21A: Near-Surface Geophysics and Natural Hazards II (joint with PA, S, V). Presiding: M E Everett, Texas A&M University; J Louie, University of Nevada, Reno

Posters: Moscone South Exhibit Hall B

H21A: Watershed Characterization and Modeling IV Posters (joint with NS). Presiding: T Ferre, University of Arizona

H21B: Cold Region Hydrogeophysics I Posters (joint with NS). Presiding: J H Bradford, Boise State University; L Bentley, University of Calgary

TUESDAY AFTERNOON (Dec 11)

Talks

13:40 Room: Moscone West 2005

NS23A: Fault Imaging and Seismic Hazard Assessment II (joint with PA, S, T). Presiding: M Craig, California State University, East Bay; S Kruse, University

16:00 Room: Moscone West 2005

NS24A: Fault Imaging and Seismic Hazard Assessment III (joint with PA, S, T). Presiding: M Craig, California State University, East Bay; S Kruse, University

13:40 Room: Moscone West 2020

H23H: Cold Region Hydrogeophysics II (joint with NS). Presiding: J H Bradford, Boise State University; H French, Soil and Environment Division, Bioforsk

Posters: Moscone South Exhibit Hall B

H23A: Hydrogeophysics: Linking Geophysical and Hydrological Data I Posters (joint with NS). Presiding: A Binley, Lancaster University

WEDNESDAY MORNING (Dec 12)

Posters; Moscone South Exhibit Hall B

NS31A: Development and Applications of Airborne Methods, I Posters (joint with GP, H, T, V). Presiding: L Pellerin, Green Engineering, Inc.

NS31B: Near-Surface Geophysics General Contributions, I Posters (joint with H, S). Presiding: S Kruse, University of South Florida; C J Weiss, Virginia Polytechnic Institute and State University

WEDNESDAY AFTERNOON (Dec 12)

Talks

13:40 Room: Moscone West 2005

NS33A: Near-Surface Geophysics General Contributions II (joint with H, S). Presiding: C J Weiss, Virginia Polytechnic Institute and State University; D I Doser, University of Texas at El Paso

16:00 Room: Moscone West 2005

NS34A: Development and Applications of Airborne Methods II (joint with GP, H, T, V). Presiding: C Finn, U.S. Geological Survey; S Okuma, Geological Survey of Japan, AIST

THURSDAY MORNING (Dec 12)

Talks

08:00 Room: Moscone West 2020

H41H: Hydrogeophysics: Linking Geophysical and Hydrological Data II (joint with NS). Presiding: G Cassiani, University of Padova; K Holliger, University of Lausanne

10:20 Room: Moscone West 2020

H42B: Hydrogeophysics: Linking Geophysical and Hydrological Data III (joint with NS). Presiding: K Holliger, University of Lausanne; A Bellin, University of Trento

THURSDAY AFTERNOON (Dec 12)

Talks

13:40 Room: Moscone West 2020

NS43A Improved Estimation and Prediction in Earth Science Through Integration of Multiple Data Sets and Model Types (joint with H, S).

Presiding: P A Bedrosian, U.S. Geological Survey; M J Friedel, U.S. Geological Survey; S S Haines, U.S. Geological Survey

16:00 Room: Moscone West 2020

H44A: Hydrogeophysics: Linking Geophysical and Hydrological Data IV (joint with NS).

Presiding: G Cassiani, University of Padova; A Bellin, University of Trento

=====

AGU NS-Focus Group Web Page: http://www.agu.org/focus_group/nsg/index.html

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. Failure to meet the deadline will likely result in missing the next issue.

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.