



**American Geophysical Union  
Near-Surface Geophysics Focus Group (NSFG)  
Newsletter: March 2016**

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Recent announcements of interest to the near-surface community (conferences, academic positions, graduate student opportunities, etc.) can be found on 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. AGU Updates

### 1.1 Call for Session Proposals for 2016 Fall Meeting

The session proposal site for the 49th annual AGU Fall Meeting in 2016 is [now open](#). The deadline for submission is 20 April 2016, 11:59 p.m. Eastern Daylight Time.

Before submitting a session proposal, remember to read the guidelines to ensure that you have not missed important information that may hinder your submission and make sure that your 2016 AGU [membership dues](#) are up to date. You can also [search and view](#) session proposals submitted by your colleagues. Letters of notification will be distributed in June 2016. Additional information on submission policies and guidelines can be found [online](#).

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### 1.2 AGU Elections: Call for NSFG President-Elect and Secretary Nominations

Later this year, AGU will elect its next set of officers for the 2017–2018 term, and the nomination process is now underway. We are looking for possible candidates for Near-Surface Focus Group president-elect and secretary. If you are interested in being considered or would like to nominate another member, please send an email to [George Tsoflias](#). As you consider those opportunities, it will be helpful to review [AGU's Strategic Plan](#) and the leadership criteria and [job description](#) for Council members (focus group president and president-elect serve on the AGU Council). The email should include some information about the possible candidate: name, job title, employer, AGU section/focus group affiliation(s), email and phone number, and link to website/CV, if possible. It would also be helpful to know why you are nominating yourself or the other member—what strengths do you think the nominee brings to the table?

Nominations should be submitted by 15 March.

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### 1.3 Geophysical Survey Systems Inc. (GSSI) Student Research Grant Applications

The Geophysical Survey Systems Inc. (GSSI) Student Research Grant awards up to \$2000 to AGU student members to support field geophysical research using ground-penetrating radar and electromagnetic methods. For more information visit the AGU research [grants and awards page](#) or the [GSSI online application information](#) or contact [George Tsoflias](#).

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### 1.4 AGU Honors Program Nominations

The AGU Honors Program recognizes individuals who have made outstanding contributions to the advancement of the geophysical sciences, to the service to the community, and to the public's understanding. Visit the [AGU Honors Program online](#) for opportunities to recognize deserving colleagues. Contact [George Tsoflias](#), NSFG nominations committee chair, for more information.

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## 1.5 AGU Thriving Earth Exchange



AGU's [Thriving Earth Exchange](#) is seeking volunteer climate scientists and climate adaptation experts to participate in facilitated online dialogues with local community leaders— dialogues that will help those leaders confidently and knowledgably lead resilience and adaptation planning efforts in their communities. This innovative pilot project, [Resilience Dialogues](#), will take place in February through a customized online platform, giving Earth scientists a unique opportunity to lend their knowledge and expertise to civic leaders across the United States to aid in climate resilience efforts. Are you or someone in your professional network a good candidate for this volunteer effort?

[Read more here!](#)

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## 1.6 Student Spotlights and Research Highlights

Interested in being highlighted, or know a student who should be? Please email [Sarah Morton](#) for more information about the Student Spotlight. Take a look at this month's Student Spotlight on Emily Voytek at the end of the newsletter.

We are also seeking research highlights that showcase use of near-surface geophysics in other [AGU sections and focus groups](#). If you are interested in writing a short one-page highlight, please contact [Burke Minsley](#).

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## 2. Journal Information and Special Issue Call for Papers

### 2.1 *The Leading Edge* Special Section: Hydrogeophysics

**Deadline for manuscript submission: 15 May 2016**

*The Leading Edge* (TLE) has announced the call for papers for a special section on hydrogeophysics scheduled for publication in September 2016. The special section will showcase applications of hydrogeophysics to quantitatively assess and monitor subsurface properties and processes. Contributions utilizing borehole, cross-hole, surface, and airborne methods to support the development and calibration of groundwater and contaminant transport models, monitor ecosystems, and sustainably manage groundwater resources are encouraged.

The paper submission deadline is 15 May 2016. Papers should be submitted directly to the guest editors below. Submissions guidelines for TLE [are available online](#).

Guest editors: [Rosemary Knight](#) and [Burke Minsley](#)

Coordinating editor: [John Lane](#)

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## 3. Tech-Transfer Courses and Training

### 3.1 Short Courses Offered at Symposium on the Application of Geophysics to Engineering and Environmental Problems (SAGEEP) 2016

The Environmental and Engineering Geophysical Society announces four full-day short courses being offered at the [SAGEEP 2016 conference](#) at the Downtown Denver Marriott Hotel in Denver, Colo.

**Sunday, 20 March 2016**

**SC1: geoDRONEology—A Short Course on Integrating Drones into the Geoscientific and Engineering Workflow**

**Presenters:** Ronald S. Bell, senior geophysicist and president, Aerobotic Geophysical Systems, LLC; Rene A. Perez, senior hydrogeological consultant, Earth Forensics, Inc.

Multicopter and fixed-wing autonomous robotic aircraft, commonly known as “drones,” are the latest technical innovation being applied to the acquisition of geospatial and geoscientific data for asset management, geological investigations, and environmental monitoring. This short course will provide you with up-to-date information on how to begin using small unmanned aircraft systems (sUAS) equipped with visible light and infrared cameras for surface investigations and magnetometers for subsurface site characterization. A strong emphasis is placed on the practical implementation of drones for photogrammetry, infrared and spectral imaging, and magnetometry through the use of numerous case histories. Recent changes in the rapidly evolving regulatory framework governing sUAS including the recommended best practices for legally operating drones for profit will be reviewed. There will be a “wrap-up discussion” on the several issues of concern including but not limited to (a) the implementation of detect and avoid technologies, (b) beyond line of site operations, (c) nighttime flights, and (d) drone swarms.

**SC2: Ground Penetrating Radar—Principals, Practices and Processing**

**Presenter:** Greg Johnston, Sensors & Software, Inc.

Ground penetrating radar (GPR) is a noninvasive subsurface exploration technique that has found widespread application in areas including near-surface geology (<100 meters), geotechnical and environmental surveys, mine safety, forensics, archaeology, utility location, concrete inspection, snow thickness measurements, and glaciology. This 1-day course will introduce the principles of GPR and GPR instrumentation, discuss survey design, provide hands-on data acquisition with a GPR system, and explore data interpretation (including common pitfalls), data processing, and data visualization in two and three dimensions. The course also includes case studies of common and not-so-common applications of the technology. No prerequisites required. Students will receive printed course notes and a memory stick with a PDF copy of a GPR textbook written by Dr. Peter Annan, the CEO and founder of Sensors & Software. Attendees need to come prepared to work for 2–3 hours outside and, if interested, to bring a PC-based laptop for the data processing portion of the course. The laptop should have GoogleEarth installed, if possible.

**Thursday, 24 March 2016**

**SC3: Summit on Dams and Levees**

**Presenters:** William Doll, Tetratech; Phil Sirles, Olson Engineering

It is now widely recognized that the infrastructure in the United States is in poor condition, and this is but one example of a larger global problem for public safety. Dams and levees, often constructed in an era of less stringent design and construction requirements, are among the infrastructure elements that are of great concern, particularly as populations increase and relocate in proximity to formerly remote dam and/or levee structures. Geophysics offers many tools that can be used for large-scale assessment and internal imaging, as well as more localized subsurface material characterization of problem areas. Many geophysical and advanced monitoring methods have been developed and deployed and in countries throughout the world.

This forum on dams and levees is designed to bring together geophysicists from many countries to a common venue to share knowledge and experience, as well as discuss the future needs that our industry can provide for addressing this critical problem. The forum includes speakers from leaders in industry, government, and commercial application of state-of-the-practice methods and advancements to state of the art for imaging and monitoring small and large structures with remote/satellite, heliborne, driven, and handheld instruments, which can be deployed once or installed for monitoring these structures.

#### **SC4: Satellite InSAR Data: Surface Deformation Monitoring from Space**

**Presenter:** Alessandro Ferretti (special EAGE-sponsored EET course)

Satellite radar data for surface deformation monitoring are gaining increasing attention and not only within the oil and gas community. They provide a powerful tool for remotely measuring extremely small surface displacements over large areas and long periods of time, without requiring the installation of in situ equipment. However, apart from remote sensing and radar specialists, only a relatively small number of geoscientists and engineers understand how a radar sensor orbiting the Earth at about 7 km/s from 700 km above the Earth's surface can actually measure ground displacements of a fraction of a centimeter.

This course provides a step-by-step introduction to satellite radar sensors, synthetic aperture radar (SAR) imagery, SAR interferometry, and advanced interferometric synthetic aperture radar (InSAR) techniques. Rather than a tutorial for remote sensing specialists, the course starts from very basic concepts and explains in plain language the most important ideas related to SAR data processing and why geoscientists and engineers should take a vested interest in this new information source.

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### **3.2 Multichannel Analysis of Surface Waves (MASW) Workshop**

**Dates:** 19–20 May 2016 (tentative)

**Registration cost:** free

**Location:** [Kansas Geological Survey](#), Lawrence, Kan.

**Website**

SurfSeis 5 will be released shortly (we are expecting within a week or so). What's new? Passive-data and single-record processing is now available with the high-resolution linear radon transform (HRLRT). Also available are varying topography, Scholte-wave inversion, and more.

This free 2-day [MASW](#) workshop will provide an opportunity for geoprosessionals, geoscientists, and graduate students to gain knowledge about data 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 to obtain 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, the quality of inversion results, and the latest advancements for dispersion curve imaging, such as the high-resolution linear radon transform, 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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## 4. Upcoming Conferences and Workshops

### 4.1 Meetings Overview

Meeting (click to go to website)	Location	Meeting Dates	Submission	Registration
<a href="#">SAGEEP 2016</a>	Denver, Colorado	20–24 March 2016	<i>Closed</i>	Onsite registration opens: 20 March 2016
<a href="#">EGU General Assembly</a>	Vienna, Austria	17–22 April 2016	<i>Closed</i>	Early registration ends: 17 March 2016
<a href="#">Japan Geoscience Union Meeting 2016</a>	Chiba, Japan	22–26 May, 2016	<i>Closed</i>	Early registration ends: 10 May 2016
<a href="#">4th International Workshop on Induced Polarization</a>	Aarhus, Denmark	6–8 June 2016	<i>Closed</i>	Early registration ends: 1 April 2016
<a href="#">Asia Oceania Geosciences Society 13th Annual Meeting</a>	Beijing, China	31 July to 5 August 2016	<i>Closed</i>	Early registration ends: 18 May 2016
<a href="#">ASEG 25th International Geophysical Conference and Exhibition</a>	Adelaide, Australia	21–24 August 2016	<i>Closed</i>	Early registration ends: 31 March 2016
<a href="#">35th International Geological Congress (IGC)</a>	Cape Town, South Africa	27 August to 4 September 2016	<i>Closed</i>	Early Registration ends: 31 May 2016
<a href="#">EAGE Near Surface Geoscience 2016</a>	Barcelona, Spain	4–8 September 2016	15 April 2016	Early registration ends: 15 July 2016
<a href="#">SEG International Exposition and 86th Annual Meeting</a>	Dallas, Texas	16–21 October 2016	1 April 2016	Registration opens May 2016

### 4.2 Abstract Submission for Near-Surface Geophysics at the Society for Exploration Geophysicists (SEG) Annual Meeting

The SEG Near Surface Technical Section is soliciting abstracts for the SEG Annual Meeting. Technical sessions on electromagnetics, ground-penetrating radar, gravity and magnetics, statics, karst, cavity and void detection, seismic methods, and imaging and modeling, as well as others, are welcome!

Additionally, the Near Surface Technical Section is recruiting abstracts for the following special sessions:

**SEG-AGU Hydrogeophysics:** The Hydrogeophysics special session will highlight papers on the application of near-surface geophysics to hydrologic problems. The session will include papers that report new methods for analysis and interpretation of hydrogeophysical data, development of cutting-edge instruments, and presentation of novel case studies.

**Engineering Geophysics:** The Engineering Geophysics special session will highlight the application of near-surface geophysics to engineering and geologic problems associated with civil and geotechnical investigations. This session is intended to include presentations regarding cutting-edge development of

and use of new instrumentation, unique case studies in difficult urban settings, and new approaches to visualize geophysical data in engineering formats.

**Surface Waves:** The Surface Wave special session will highlight most recent developments for shear-wave velocity ( $V_s$ ) profiling and case histories for uses and applications.

**GWB—Humanitarian Geophysics:** The SEG Foundation's Geoscientists Without Borders program has provided funding for humanitarian projects around the globe. The program has helped to raise awareness of humanitarian issues and the role geophysics can play in solving problems that lead to humanitarian need. This special session will highlight case studies where humanitarian problems are approached from a geophysics perspective and how various geophysical methods can be utilized to address humanitarian need.

Submit abstracts [online](#) by 1 April 2016.

Questions: contact [ns@seg.org](mailto:ns@seg.org)

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## 5. Position Announcements

### 5.1 Tenure-Track Faculty Position in Exploration Geophysics at Instituto Potosino de Investigación Científica y Tecnológica (IPICYT)

The Division of Applied Geosciences at IPICYT (San Luis Potosi, Mexico) invites applications for an open tenure-track faculty position in exploration geophysics. Candidates interested in this position will find details and application information [online](#).

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### 5.2 Ph.D. Student Position in Applied Geophysics on Three-Dimensional Inverse Modeling of Electromagnetic Data at Uppsala University

The advertised Ph.D. student position is open at the Department of Earth Sciences, Geophysics. This research project will focus on the further development of a three-dimensional finite-element modeling algorithm for magnetotelluric (electromagnetic) data to inversion, including constraints from other geoscientific disciplines, collection of magnetotelluric field data in the Swedish Caledonides, and application of the modeling algorithm to the collected data.

**Project description:** The Swedish Caledonides offer exceptional opportunities for inter- and interdisciplinary approaches to model electromagnetic data. Large areas of this mountain belt have been extensively studied using geological mapping, seismic studies, and airborne geophysical measurements. In many areas, direct geological and geophysical evidence exists in the form of borehole logs (for instance, as part of the Collisional Orogeny in the Scandinavian Caledonides ([COSC](#)) project). However, the interpretation of electromagnetic data is often complicated because the effect of topography on the data is strong and upper crustal conductors often reduce the signature of deeper structures in the data. It is the aim of this project to overcome these problems by further developing an existing three-dimensional finite-element forward modeling code (that accounts for topography) to inversion. To reduce the ambiguity of the resulting electromagnetic models, model constraints from other geoscientific disciplines will be included in the inversion. The new inversion algorithm will permit direct assessment of the compatibility of the electromagnetic models to existing models and contribute to an improved geological interpretation. Collection of magnetotelluric field data in the Swedish Caledonides will be an important part of the project.



The successful candidate will be given ample opportunity and is expected to develop skills in electromagnetic field theory, numerical methods such as finite-element methods and gradient-based inversion techniques (e.g., nonlinear conjugate gradient methods or quasi-Newton methods), parallel programming, acquisition and processing of magnetotelluric data, and interpretation of magnetotelluric models.

**How to apply:** Applications should include a letter of motivation including contact details of two referees, a CV, a list of publications (if any), and university transcripts that include the M.Sc. certificate and a list of courses and grades.

The applicant must be eligible for Ph.D. studies. Priority is given to those who are deemed to show the greatest aptitude for a successful completion of graduate studies. Local guidelines at Uppsala University determine the salary levels. The university is striving for a more even balance between genders. A majority of Ph.D. students within the department are men. Women are thus especially invited to apply.

**For further information about the position please contact:**

Thomas Kalscheuer, tel.: +48-18-4713819; email: [thomas.kalscheuer@geo.uu.se](mailto:thomas.kalscheuer@geo.uu.se).

**You are welcome to submit your application no later than 1 April 2016.**

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### **5.3 Faculty Position in Geophysics at Stanford University**

We invite applications for a tenure-track faculty position in the [Department of Geophysics](#) in any field of observational, experimental, computational, or theoretical geophysics. Priority will be given to the overall originality and promise of the candidate's work over any specific area of specialization. The appointment will likely be at the junior level (assistant or untenured associate professor).

We seek exceptional individuals who can develop a world-class program of research and have a strong commitment to both graduate and undergraduate teaching. A doctorate is required at the time of appointment.

#### **How to Apply**

Applications should include a cover letter, curriculum vitae, a statement of research and teaching interests, three recent publications, and the names and email addresses of three individuals from whom the search committee can request letters of reference. Please [apply online](#). Review of applications will commence upon receipt, and the position will remain open until filled. Questions related to your submission may be directed to [csaplar@stanford.edu](mailto:csaplar@stanford.edu).

#### **Contact**

Csilla M. Csaplár  
(650) 498-6877  
[csaplar@stanford.edu](mailto:csaplar@stanford.edu)

*Stanford University has a strong institutional commitment to the principle of diversity. In that spirit, we particularly encourage applications from women, members of ethnic minorities, and individuals with disabilities.*

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#### 5.4 Postdoctoral Position at the U.S. Geological Survey, Storrs, Conn.

The U.S. Geological Survey (USGS), [Office of Groundwater, Branch of Geophysics](#), anticipates an opening for a postdoctoral researcher in the area of hydrogeophysics. The purpose of this notice is to seek prospective applicants for this opportunity. The anticipated start date for this position is mid- to late 2016, pending final approval and funding availability.

The Branch of Geophysics engages in applied geophysics research and technology transfer related to groundwater resources. Current research initiatives at the Branch include application of geophysical methods to (1) characterize aquifer systems and properties controlling fluid flow and transport, (2) monitor natural and engineered hydrologic processes, (3) understand groundwater/surface water interaction, and (4) evaluate potential hydroecologic impacts of climate change. It is anticipated that the postdoc will work on one or more projects related to these topics and engage in fieldwork, data analysis, and publication of results. We are looking for candidates with strong quantitative skills, experience with geophysical forward and inverse modeling, programming ability in two or more computer languages, and experience with field and/or laboratory experiments. Candidates should have experience or course work in electrical and electromagnetic geophysical methods and hydrology.

The Branch of Geophysics is located on the University of Connecticut campus, in Storrs, Conn. The office's location on the UConn campus and in Connecticut's rural "Quiet Corner" provides for cultural opportunities, outdoor recreation, and easy access to Hartford (~30 minutes), Boston (~1.5 hours), and New York City (~2.5 hours).

If you are interested in knowing more about this position, please contact [Fred Day-Lewis](#), [John Lane](#), or [Martin Briggs](#).

U.S. citizenship is required. The USGS is an Equal Opportunity Employer.

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## 6. Student Spotlight: Emily Voytek, Colorado School of Mines

Emily Voytek is a doctoral candidate in the Hydrologic Science and Engineering (HSE) program at the Colorado School of Mines. Her research primarily focuses on mapping groundwater flow patterns using electrical methods, or, more specifically, using self-potential (SP) measurements to analyze groundwater flow in arctic and alpine regions. After starting her Ph.D., she received the National Defense Science and Engineering Graduate (NDSEG) Fellowship, a highly competitive Department of Defense program that accepts only 10% of its applicants each year. With this 3-year fellowship, she has been given the scientific freedom to build and pursue her own research ideas without the restriction of fitting into existing projects.



Prior to her program in Colorado, Emily worked as a hydrologist at the USGS Office of Groundwater, Branch of Geophysics, in Connecticut. In this position Emily obtained valuable field and processing experience that enhanced her geophysical background and solidified her desire to continue in the field. For example, her projects often involved constructing or modifying existing field instruments. Not only was this a less expensive equipment alternative, but it also provided an opportunity to learn how the instruments operate, what causes failure, and how to appropriately resolve such challenges in the field while waist deep in a river. One notable product of her time at the USGS is the computer program 1DTempPro, which analyzes vertical one-dimensional temperature profiles of groundwater–surface water exchange.

At the 2015 AGU Fall Meeting Emily presented results from a project in Alaska as a poster titled “Identifying Hydrologic Flow Paths on Arctic Hillslopes Using Electrical Resistivity and Self Potential.” The poster received a 2015 Outstanding Student Paper Award from the focus group. In this work she differentiated between frozen permafrost and thawed materials using electrical resistivity in conjunction with self-potential measurements to identify flow patterns around water tracks, drainage features on arctic hillslopes. The results were also recently published in a special cryosphere section of *Geophysics*. The effectiveness of her presentation can be attributed to her great enthusiasm for her work as well as her dedication to creating a poster that allowed her figures to explain her concepts rather than paragraphs of text. She also found that concise bulleting facilitated the main points of the project while still leaving room to spark engaging conversation with the reader.

As a testament to the impact and promising success of her research, Emily received the 2015 Horton Research Grant, a competitive research grant awarded each year to three Ph.D. students in the AGU Hydrology section. With this funding she will continue investigating shallow groundwater flow using passive electrical techniques, including a project in Rocky Mountain National Park, and analyzing seasonal changes in groundwater flow patterns.

If you are interested in learning more about Emily’s work or receiving additional advice on effective poster presentations, please contact [Emily Voytek](#).

**To contribute material to the NSFG newsletter, send an email to [Burke Minsley](#).**

**Deadline:** Material must be received five full business days before the first of the month.

**Guidelines for submissions:** All members are welcome to submit content of interest to the near-surface community. Please keep messages brief and provide contact information and (if available) a Web address for additional information.

**Get your message out to NSFG members faster.**

You 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 who follow [@NS\\_AGU](#) will receive Twitter announcements, so make sure that you sign up!