



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

**In brief:**

**1. AGU Updates**

- 1.1 Outstanding Student Paper Award (OSPA) Winners for the Near-Surface Geophysics Focus Group at the 2015 Fall Meeting
- 1.2 Geophysical Survey Systems Inc. (GSSI) Student Research Grant Applications Open 15 January 2016
- 1.3 AGU Honors Program: Nominations Open 15 January 2016
- 1.4 Student Spotlights

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

- 2.1 *Journal of Environmental and Engineering Geophysics* Special Issue: Airborne Geophysics
- 2.2 *The Leading Edge* Special Section: Hydrogeophysics

**3. Tech-Transfer Courses and Training**

- 3.1 Short Courses Offered at SAGEEP 2016
- 3.2 Multichannel Analysis of Surface Waves (MASW) Workshop

**4. Upcoming Conferences and Workshops**

- 4.1 Meetings Overview
- 4.2 European Geosciences Union (EGU) Session: Earth's Interior Insights from Electromagnetic Induction Studies
- 4.3 Near Surface Investigation and Modeling for Groundwater Resources Assessment at the Asia Oceania Geosciences Society (AOGS) 13th Annual Meeting

**5. Position Announcements**

- 5.1 Lecturer in Geophysics at the University of Exeter
- 5.2 Associate Professor in Hydrogeophysics—Electric and Electromagnetic Methods at Aarhus University, Denmark
- 5.3 Postdoctoral Position at the U.S. Geological Survey, Storrs, Conn.
- 5.4 Ph.D. Position: Geophysical Characterization of Soil Structural Dynamics Following Compaction at the University of Lausanne

**6. Student Spotlight: Christine Downs, University of South Florida**

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 Outstanding Student Paper Award (OSPA) Winners for the Near-Surface Geophysics Focus Group at the 2015 Fall Meeting

Many excellent student presentations were given this year at the AGU Fall Meeting in San Francisco. Congratulations to all NSFG student participants for a strong showing. Five presenters were selected to receive an Outstanding Student Presentation Award (listed in alphabetic order):

- Nils Gueting, Forschungszentrum Jülich, “High resolution imaging of aquifer properties using full-waveform GPR tomography”
- Seogi Kang, University of British Columbia, “Revisiting the time domain induced polarization technique, from linearization to inversion”
- Megan Miller, Arizona State University, “Spatiotemporal distribution of strain field and hydraulic conductivity at the Phoenix valley basins, constrained using INSAR time series and time-dependent models”
- Henry Schreiner, University of Texas at Austin, “Measurement over large solid angle of low energy cosmic ray muon flux”
- Emily Voytek, Colorado School of Mines, “Identifying hydrologic flowpaths on Arctic hillslopes using electrical resistivity and self potential”

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### 1.2 Geophysical Survey Systems Inc. (GSSI) Student Research Grant Applications Open 15 January 2016

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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### 1.3 AGU Honors Program: Nominations Open 15 January 2016

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. The nomination period opens 16 January 2016. 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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### 1.4 Student Spotlights

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 Christine Downs at the end of the newsletter.

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

### 2.1 *Journal of Environmental and Engineering Geophysics* Special Issue: Airborne Geophysics

#### **Deadline for manuscript submission: 28 February 2016**

The *Journal of Environmental and Engineering Geophysics* (JEEG) has announced a call for papers for a special issue on airborne geophysics. This issue is scheduled for publication in March 2017. The special issue coeditors are Antonio Menghini, Aarhus Geophysics, Denmark, and Les Beard, Zonge International, Arizona. Sponsorship of this issue is still open.

Suggested themes are

- New developments in equipment
- Novel airborne geophysical systems, including unmanned systems
- Data acquisition, modeling, and inversion
- Case histories, including
  - Hydrogeology, including soil salinity
  - Engineering
  - Ordnance detection
  - Environment
  - Mining
  - Exploration

International contributions are encouraged. The special issue will accommodate six to eight papers, but all accepted papers will be considered for publication in other JEEG issues.

Papers may be submitted through the [JEEG submission site](#). Indicate in the cover letter that the paper is for consideration in the Airborne Geophysics special issue. The deadline for submissions is 28 February 2016.

Questions may be directed to

Special issue coeditors: [Antonio Menghini](#) and [Les Beard](#)

JEEG editor: [Janet Simms](#)

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### 2.2 *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 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, Tetrattech; Phil Sirls, 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 explain 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:** 3–4 March 2016

**Registration cost:** free

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

**Website**

This free 2-day [MASW](#) workshop will provide an opportunity for geoprofessionals, 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="#">2nd SEG/DGS Workshop: Near-Surface Modeling and Imaging</a>	Manama, Bahrain	6–7 March 2016	<i>Closed</i>	Early registration ends: 4 February 2016
<a href="#">SAGEEP 2016</a>	Denver, Colorado	20–24 March 2016	<i>Closed</i>	<i>TBA</i>
<a href="#">EGU General Assembly</a>	Vienna, Austria	17–22 April 2016	13 January 2016	Early registration ends: 17 March 2016
<a href="#">4th International Workshop on Induced Polarization</a>	Aarhus, Denmark	6–8 June 2016	15 February 2016	Early registration ends: 1 April 2016
<a href="#">Asia Oceania Geosciences Society 13th Annual Meeting</a>	Beijing, China	31 July to 5 August 2016	19 February 2016	Early registration ends: 18 May 2016
<a href="#">ASEG 25th International Geophysical Conference and Exhibition</a>	Adelaide, Australia	21–24 August 2016	1 March 2016	Early registration ends: 31 March 2016
<a href="#">EAGE Near Surface Geoscience 2016</a>	Barcelona, Spain	4–8 September 2016	15 April 2016	Early registration ends: 15 July 2016

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### 4.2 European Geosciences Union (EGU) Session: Earth's Interior Insights from Electromagnetic Induction Studies

We invite you to [submit abstracts](#) to the session "EMRP2.5/GD8.9 Earth's interior insights from electromagnetic induction studies," which will be held during the EGU General Assembly in Vienna, 17–22 April 2016.

We welcome contributions on all aspects of the topic, including recent advances in theory, forward and inverse numerical modeling, data acquisition and processing, multidisciplinary investigations, and geological or geodynamic interpretations.

We are planning to have two invited speakers (the topics are tentative): Niklas Linde, University of Lausanne, will talk about time-lapse and probabilistic inversion, model reduction, and parameterization strategies in the context of electromagnetic studies. Max Moorkamp, University of Leicester, will talk about practicalities of three-dimensional magnetotelluric inversion of distorted data.

The submission of abstracts closes on 13 January 2016.

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#### **4.3 Near Surface Investigation and Modeling for Groundwater Resources Assessment at the Asia Oceania Geosciences Society (AOGS) 13th Annual Meeting**

Groundwater resources serve as a vital source of regional water supply. The lack of proper management of the available groundwater resources can lead to serious environmental issues such as land subsidence or seawater intrusion. Before sustainable management of groundwater resources can be established, it is required to have an accurate assessment of the groundwater system. This proposed session focuses on the assessment of groundwater resources with a focus on issues of near-surface investigation and modeling. This session welcomes studies related to numerical modeling and field investigation. Traditional hydrogeological approaches, geophysical approaches, and geochemical approaches are welcome. We especially encourage interdisciplinary studies that apply state-of-the-art hydrogeological and/or modeling approaches.

**Conveners:** [Dr. Ping-Yu Chang](#) (National Central University, Taiwan), [Prof. Liang-Cheng Chang](#) (National Chiao Tung University, Taiwan), [Prof. Cheinway Hwang](#) (National Chiao Tung University, Taiwan), [Dr. Jui-Pin Tsai](#) (University of Arizona, United States), [Prof. Hwa-Lung Yu](#) (National Taiwan University, Taiwan).

**Invited Speaker:** Yu-Feng Forrest Lin, hydrogeologist and assistant section head, Hydrogeology and Geophysics Section, Illinois State Geological Survey/Prairie Research Institute, University of Illinois at Urbana-Champaign

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### **5. Position Announcements**

#### **5.1 Lecturer in Geophysics at the University of Exeter**

The post is based at Camborne School of Mines on the Exeter University campus in Cornwall. We have a new 4-year integrated master's in geology and energetic and research-focused academic staff to support it. The university overall has a very strong group working on diverse aspects of Earth system science.

The closing date is 31 January 2016. Details can be found [online](#).

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#### **5.2 Associate Professor in Hydrogeophysics—Electric and Electromagnetic Methods at Aarhus University, Denmark**

The Department of Geoscience, Aarhus University, invites applications for a permanent position in hydrogeophysics within electric and electromagnetic methods. The position is at the associate professor level.

We are eager to find the right person with drive and energy to further develop the research we are doing within electromagnetic geophysics. Applications cover the upper few hundred meters of the Earth and span from large-scale airborne electromagnetic mappings to small-scale permanent DC and IP monitoring of freezing and thaw process. Our projects are worldwide.

[Click here](#) for more information on our research.

The full advertisement is [here](#).

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### **5.3 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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### **5.4 Ph.D. Position: Geophysical Characterization of Soil Structural Dynamics Following Compaction at the University of Lausanne**

The Applied and Environmental Geophysics Group at the University of Lausanne has an opening for a doctoral student who will work in close collaboration with Prof. Dani Or at ETH Zürich and Dr. Thomas Keller at Agroscope. Soil compaction modifies the soil structure and adversely impacts various important hydrological and ecological soil functions, including water infiltration and runoff, soil aeration, mechanical impedance, and other properties important for plant root growth and food production. A novel Soil Structure Observatory ([SSO](#)) has been established with extensive monitoring of hydrological and mechanical processes in a field that has been compacted in different patterns and with different plant covers (including bare soil). The primary objective of this project is to combine geophysics with other observables to quantify rates of soil structure restoration and the recovery of hydrological and ecological functions.

The position is funded for 3 years (an extension of 1 year is likely), and the starting date is 1 March 2016 or a later date to be decided upon. The successful candidate should hold a M.Sc. degree in the natural sciences or engineering and have knowledge of vadose zone hydrology (e.g., soil physics, numerical modeling of coupled processes) or near-surface geophysics (theory, acquisition, processing, inversion). We seek a highly motivated candidate to perform quantitative and cross-disciplinary research that combines laboratory and field-based observations with advanced numerical modeling and analysis to address critical environmental science questions. The Applied and Environmental Geophysics Group offers a vibrant academic environment with well-equipped facilities located on the shores of Lake Geneva, a region close to the Alps with outstanding beauty, active and cosmopolitan atmosphere, and high quality of life.

To apply, please send a cover letter clarifying your overall motivation for entering a Ph.D. program together with your curriculum vitae, copy of your university degree, and the names, telephone numbers, and email addresses of two referees to Prof. Niklas Linde, Institute of Earth Sciences, Géopolis 3779, University of Lausanne, 1015 Lausanne, Switzerland, or by email to [niklas.linde@unil.ch](mailto:niklas.linde@unil.ch). The application deadline is 31 January 2016.

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## 6. Student Spotlight: Christine Downs, University of South Florida

Christine Downs is a fourth-year doctoral student at the University of South Florida focusing on electrical and radar methods for monitoring hydrogeological investigations. She has made a personal effort to combine multiple near-surface techniques throughout her studies to build a well-rounded foundation and increase her ability to work with research scientists from various backgrounds. One step toward this includes her latest work in west central Florida, which she presented as a poster at the 2015 AGU Fall Meeting titled “Investigating Hydrogeologic Controls on Sandhill Wetlands in Covered Karst with 2D Resistivity and Ground Penetrating Radar” (H21C-1395). Here she successfully imaged karst-driven landforms, such as sand-filled basins, using electrical resistivity and ground penetrating radar to better understand their hydrologic regime. This project appealed to several disciplines within AGU, allowing her the opportunity to converse with hydrogeologists, wetland scientists, and geophysicists alike. The near-surface geophysics community is constantly expanding, and Christine has found that her work supports investigations outside her usual network, reaffirming her motivation to incorporate different field applications into her research projects. Her work is supported by the Geological Society of America’s Southeast Section Student Research Grant and Sigma Xi Grants-in-Aid.



Thinking about attending the AGU Fall Meeting for the first time in 2016? Christine recommends you plan your days conservatively to minimize the potential for becoming too overwhelmed. If you are feeling adventurous, plan to attend sessions that focus on research you know nothing about but still find fascinating. This year she stumbled upon an interesting oral session on volcanic lightning. Outside of the sessions, she likes to attend the focus group luncheon or early career and student workshops as they provide great networking opportunities in addition to other planned social events. Finally, ask questions. A large portion of AGU presentations are in poster format to help break down barriers between presenters and other attendees; be sure to take advantage of the research in front of you. Christine’s next project will be investigating mangrove forests (hypersaline conditions) using resistivity time series data sets (multiple surveys over 24-hour periods). If you are working in a similar research area and would like to discuss, feel free to contact [Christine Downs](#).

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**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!