

Welcome & Update from the Chairs

Welcome to the third edition of the Distributed Sensing Technical Committee (DS TC) Newsletter!

The countdown to AGU25 is on! We hope that you will be as excited as we are about all of the great activities that will be going on this year during the meeting. We are inspired by the 5 MacGyver Sessions spanning multiple AGU Sections and their plan to “take over” AGU with a DIY virtual session open to any poster presenter! Our Committee is also partnering with AGU Open Science to host an innovative new pilot program for “scientific expeditions” of the Exhibit Hall — this is a great chance for all of you intrepid science explorers to volunteer to lead your own tour. Don’t forget to attend our Committee’s Science Exchange Session, which will take the place of our regular Technical Committee meeting this year. We are particularly excited about priming our community discussions with a panel of luminaries, including Shelley Stall (AGU VP of Open Science), Shah Selbe (engineer, conservation technologist, and National Geographic Explorer who has founded Conserify and FieldKit), and John Selker (Professor at OSU, Past President of AGU Hydrology, and maker extraordinaire!), who just had his and Nick van de Giesen’s work on the Trans-African Hydro-Meteorological Observatory (TAHMO) featured in EOS — [check it out](#)! And all of this is just the tip of the iceberg, so check out the additional sessions, Town Halls, and social events below (pro tip: Stephen likes fruity drinks!). Beyond AGU, make sure to check out the invitation to collaborate in Taking the Pulse of the Watershed in Rosemary Knight’s featured contribution. We are grateful to groups willing to make space for these community-focused opportunities for research in their projects! Let us know if you would like to share more test beds, platforms, or experiences that you would like to share with the community!

Wonderful things are happening in our community! Yet at the same time, many scientists are facing challenges supporting both their work and families. We particularly want to acknowledge the struggles faced by our friends and colleagues impacted by the US



Prefer to listen?
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Newsletter
Podcast!](#)



government shutdown. As you prepare for AGU, please consider how you might be able to help out those in our community who can't make it. Perhaps it would be possible to put up a poster for someone who will no longer be able to attend or simply check in on how one of your colleagues is doing. When challenges arise, the support of a strong community can make a huge difference, no matter how small the action may seem.

Stephen Moysey (Chair) & Emily Elhacham (Co-Chair)

AGU Distributed Sensing Technical Committee (DS TC)

The mission of the Distributed Sensing Technical Committee is to advance the understanding, development, and application of cutting-edge distributed sensing technologies across AGU Sections. As a cross-cutting initiative hosted by the Hydrology Section, the Technical Committee aims to coordinate activities across all AGU Sections to support sharing of knowledge, best practices, and emerging technologies for distributed sensing in all disciplines, inclusive of sensor networks, fiber optic (distributed) sensing, geophysics and remote sensing



Featured Field Photos: In these July 2025 photos, Evan King is measuring infiltration rates using an infiltrometer across soils derived from varying lithologies in the outdoor East River watershed, Crested Butte, Colorado. Photo Credit: Evan King.

Project Highlight: Taking the Pulse of the Watershed

Contributed by Rosemary Knight (Dept of Geophysics, Stanford University)

rknight@stanford.edu

Over the past two years, we have started a new research and teaching initiative at Stanford: [Taking the Pulse of the Planet](#). As stated on our website, our vision: A global network of sensors — satellite, airborne, land/water-based — to support the adaptive management of planetary health and human activities. The short-term objectives include galvanizing the Stanford research and teaching community, and galvanizing an international open-science community that shares data, workflows, and educational materials; and inspires and supports new forms of collaboration. This last objective is the primary reason for this newsletter article — to let you know what we are doing and invite you to join us.

On October 1st we launched the first major research project under the Pulse initiative — a subset of the pulse of the planet: [Taking the Pulse of the Watershed](#). This is a very ambitious project focused on supporting the sustainable management of freshwater through the development of a sensor-informed analytical framework that will allow us to accurately quantify connected changes in human-ecological-hydrologic systems across scales and varying climatic, topographic, geologic, and landcover settings. Over the next 5 years, we will use California's San Joaquin Valley Watershed as the geographic location for building our framework and will use the Kaweah Subbasin in the valley as the location where we test and develop new sensors, new forms of measurement, and new data pipelines. We are taking a modular approach that allows us to identify and focus effort on the “weak links” where we believe we can make rapid advancements in a data-driven system for freshwater management, focusing on both water quantity and water quality. The successful completion of this project will lead to the next stage — the development of a water budget dashboard that can serve as a decision-support tool for water allocation, balancing the needs of people and nature.

The project is described under four objectives, each of which contains numerous Tasks:

Objective 1. Development of the “digital twin” of the watershed.

Objective 2. Monitoring changes in groundwater storage (through various sensor types).

Objective 3. Advancing the mapping and monitoring of connections between surface water and groundwater.

Objective 4. Avoiding groundwater quality degradation using automated sensor networks.

For each objective, we are very fortunate to have partners in state and local water agencies, NGOs, and consulting firms, whose support and involvement are essential in ensuring that our project will advance the ability to sustainably manage freshwater.

As a key part of the project — due to our commitment to broad collaboration — we have Zach Chandler (Director, Open Scholarship Strategy, Center for Open and Reproducible Science) working with us one day/week, to put in place best practices for Open Science, and support the high level of sharing of data and workflows that we are committed to. And we are keen to now initiate collaboration with any of you who are interested in joining us. [Please use this form to indicate how/if you would like to be involved.](#)

We have started a weekly seminar at Stanford — available on Zoom — Wednesday 11 to 11:50AM Pacific Time. The schedule, Zoom information, and recordings of past seminars [are available online.](#)

I am thrilled to be at the start of this 5-year project, intended to develop and demonstrate how sensors can revolutionize the approach to sustainable freshwater management. There are likely many areas of overlap and opportunities for collaboration with those of you who are members of AGU's Distributed Sensing Technical Committee.

Feel free to contact me at rknight@stanford.edu with questions/comments. I look forward to seeing many of you at AGU.



What's Happening at AGU25?

Call for Volunteers: Lead your own scientific expedition to the AGU Exhibit Hall!

We are excited to partner with AGU's Open Science Team to pilot a new initiative that will expand opportunities for discovery and collaboration through volunteer-led tours of the AGU Exhibit Hall this December! Volunteer tour guides are scientists (i.e., YOU!) who are willing to design and lead small groups on scientific expeditions of the exhibit hall throughout the week of AGU. Each guide will select exhibitors that fit within a scientific theme and engage their group in a discussion at each stop.



As a guide, you will:

- Identify a scientific theme that is of interest to you and others.
- Curate 3 to 5 vendors relevant to your theme from the [AGU25 Exhibitor Directory](#).
- Prepare a brief brochure summarizing your tour theme, vendor highlights, and key scientific takeaways for participants.
- Lead a 30-60min tour at AGU25.

[Please sign-up by November 6th](#) so that we can add your tour to the AGU25 program!

DS TC Science Exchange Session

This Science Exchange Session will be in lieu of our regular Technical Committee meeting at AGU25. Please join us for lively discussion and planning for our future!

SE23B: Advancing Community Collaboration Across AGU Sections to Support the Advancement of Distributed Sensing Instrument, Data, and Software Standards and Practices in the Earth and Space Sciences

Tuesday, December 16, 2:15-3:45PM, New Orleans Convention Center 343

How can AGU facilitate collaborations across Sections to help you get the data you need? Collecting data with sensors is important in all domains of Earth and Space Sciences. Yet

many challenges in sensing are shared across domains — from building electronics and integrating sensors into communication networks to managing, interpreting, and sharing large-scale data streams. Approaches for addressing these problems are emerging through all areas of AGU, creating an opportunity to share and learn about the needs, approaches, and solutions developed by your colleagues from all disciplines.



A priority at this Science Exchange will be initiating an AGU-wide agenda for identifying and advancing community standards and practices in distributed sensing. The goals are to identify shared needs across the disciplines, document existing resources, and propose new opportunities where the AGU community can advance the capacity for distributed sensing across all fields of Earth and Space Sciences. You will help set the agenda for how AGU's newly formed Distributed Sensing Technical Committee can best serve all Sections. The Committee is coordinating member-driven activities for all sensing skill levels — from novices to experts — to collaborate across disciplines and applications, inclusive of research, education, and community outreach. We welcome all participants!

Session Description

2:15–2:20PM	Welcome and Introduction to the Distributed Sensing Technical Committee
2:20–2:30	Breaking the Ice Across Sections (interactive — with prizes!)
2:30–3:10	Panel & Discussion: Challenges and Opportunities for Distributed Sensing Panelists: Shah Selbe, FieldKit John Selker, Oregon State University Shelley Stall, AGU Open Science
3:10–3:30	Identifying Needs (small group discussions and reports)
3:30–3:45	Setting Priorities and Next Steps (full group)

Reminder: AGU25 Hardship Waivers

If you have recently lost a job or significant funding, you can [apply for a discounted](#) AGU25 Annual Meeting registration fee. Contact AGU member services at service@agu.org for more information.

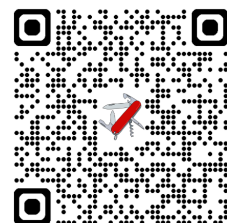
The MacGyver Sessions

As you make plans for New Orleans, be sure to come by and visit any or all of the five **MacGyver Sessions** that occur throughout the week. These four poster sessions and one oral session showcase the myriad ways in which scientists have hacked together instruments, sensors, and methods to further their work. The “MacGyver Sessions” are the place for all who both are and appreciate invention in all forms. Don’t miss this chance to see how your fellow scientists are applying novel solutions to problems in their — and your! — fields.

Here is a quick list of the MacGyver Sessions:

- Monday
 - [SA11A The MacGyver Session: The Place for Novel, Exciting, Self-Made, Hacked, or Improved Sensors and Software Solutions to Understand **Space Weather** I \(Oral\)](#)
 - [SA13F The MacGyver Session: The Place for Novel, Exciting, Self-Made, Hacked, or Improved Sensors and Software Solutions to Understand **Space Weather** II \(Poster\)](#)
- Tuesday
 - [H21V The MacGyver Session: Novel, Exciting, Self-Made, Hacked, and/or Improvised Sensors, Data Acquisition, and Data Transmission Solutions to Understand the **Geosphere** \(Poster\)](#) This is an inter-sectional session combining Hydrology and Near Surface.
- Wednesday
 - [SY31D The MacGyver Session: The Place for Novel, Exciting, Self-Made, Hacked, or Improved Sensors and Software Solutions to Contribute to **Participatory, Citizen, and Community Science** \(Poster\)](#)
- Friday
 - [OS51H The MacGyver Session: The Place for Novel, Exciting, Self-Made, Hacked, or Improved Sensors and Software Solutions to Understand **Ocean Environments** \(Poster\)](#)

Do you want to be a MacGyver? It is never too late! Everyone with a poster at AGU can join the MacGyver Sessions no matter what session you are in! Scan the QR code and [upload your poster](#) to join a cross-AGU virtual MacGyver Session! Everyone who signs up will get a special sticker for your poster from the organizers to show that you are a MacGyver too!



“With a little bit of imagination, anything is possible.” – A. MacGyver

Even More Sessions at AGU!

Also mark your itinerary for these other exciting sessions related to distributed sensing:

- Tuesday
 - [H145: Understanding Distributed Sensing Instruments for Scientific Discovery: A Guided Tour through the Tools of Earth Science \(Poster\)](#)
 - [H163: Wireless Data Networking for Distributed Sensing in the Earth Sciences: Connecting the Sciences](#)
- Wednesday
 - [B34D: Surface-Atmosphere Interactions: Multisensor Integration for Real-World Impact II \(Oral\)](#)
 - [B31H: Surface-Atmosphere Interactions: Multisensor Integration for Real-World Impact I \(Poster\)](#)
 - [NS004: Advances in Fiber-Optic Sensing for Near-Surface Imaging and Geohazard Assessment I \(Oral\)](#)
- Thursday
 - [NS004: Advances in Fiber-Optic Sensing for Near-Surface Imaging and Geohazard Assessment II \(Poster\)](#)

Workshops around AGU25

- [AGU-Adjacent OPEnS Lab Sensors Workshop](#)
Sunday December 14, 8:00AM - 5:00PM (at LSU)
- [Large-Scale Geospatial Data Analysis and Visualization in R](#)
Tuesday, December 16, 08:30AM - 5:00PM
- [CTEMPs AGU One-Day Fiber Optic Sensing Training](#)
Wednesday, December 17, 08:30AM - 5:00PM



Town Halls

There are two great Town Halls of direct relevance to our community that you have been invited to attend by the organizers.

GeoFAIR: Connecting and strengthening the data and digital object needs of researchers with the tools and infrastructure that can make a difference (TH15J)

Monday, December 15, 6:00–7:00PM, New Orleans Convention Center 272-273

Challenged with where to find data (or other digital objects); where to share your data; or how to ensure you are aligned with what your community recommends? We invite you to learn about a new initiative led by AGU, Woods Hole Oceanographic Institute, and the University of Arizona to better connect researchers across the globe with the supporting digital object infrastructure for the purpose of easing the burden of finding, evaluating, and using data and/or other digital objects. We are initially focused on the digital objects used in Ocean, Seismology, and Hydrology research — but all are welcome to learn more.

Increasing Scientific Impact in Geophysics from National Science Foundation Earth Science Facilities (TH35B)

Wednesday, December 17, 6:00–7:00PM, New Orleans Convention Center Theater C

Technologically-driven innovation can facilitate new observations and increased insight into geophysics and Earth processes, but often require funding and expertise beyond the capacity of many potential users. National Science Foundation (NSF) Facilities offer geophysical resources to researchers to shortcut the costs and training necessary to use cutting-edge technologies, which is particularly important during times of reduced science funding and support. Additionally, such facilities help communicate best-practices for data synthesis and support FAIR data repositories associated with particular geophysical sub-disciplines. This townhall will attempt to

1. Raise awareness of current facilities, tools, and training programs,
2. Deliver updates on new initiatives for facilities,
3. Create a roundtable to strategize emerging user needs, better application of existing technologies, new technologies, and new facility needs.

Need space for a meeting or networking?

This year, there are several AGU25 options to schedule space to interact with colleagues and fellow attendees outside of the open networking spaces and scientific sessions.

- [Lounges](#): Reserve a lounge for a larger informal gathering.
- [Meeting Rooms](#): Reserve a small, private meeting space.
- [Pods](#): Reserve small, open, and casual meeting space.

Get Social @ AGU25

- **Joint DS TC social mixer with the Near Surface Geophysics section:**

Wednesday, December 17, 7-9PM at [The Rusty Nail](#). Everyone is welcome. Stay tuned for details! Please [RSVP with this form](#) as soon as possible so that we can provide an approximate headcount to the venue.

- **Science Connects Us All: AGU-wide section receptions:**

For AGU25, all section receptions have been combined on the evening of Tuesday December 16. See the AGU25 program for details.



Featured Field Photos: Fieldwork throwback photos from a few years ago! Scientists from Bahir Dar University conducted multiple hydrogeophysics surveys, including short and normal long resistivity logging in Eastern Ethiopia and vertical electrical sounding in Northwestern Ethiopia. Credit: Bahir Dar University.

Weather Instrument Survey

Your input is needed! Pete Marchetto is doing research for FieldKit on preferences in weather sensor clusters. If this relates to your work, [please take a couple minutes to respond to their survey](#). Pete will be summarizing the anonymized responses and sending them out before the AGU Fall Meeting. For questions or more information, reach out to Pete at pete@fieldkit.org.

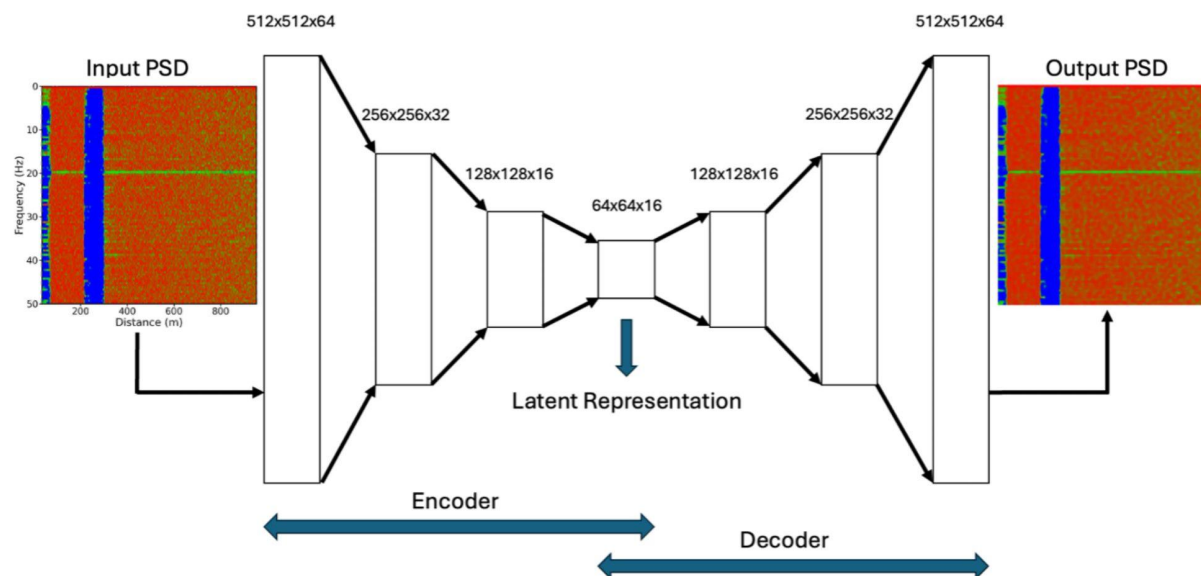
Distributed Sensing Researcher Profile: Ahmad Tourei

Enhancing Large-Scale Distributed Acoustic Sensing (DAS) Data Management with Unsupervised Anomaly Detection

Distributed acoustic sensing (DAS) systems can generate massive datasets due to their high spatial and temporal resolution, creating significant challenges for data management and interpretation. Using this technology, a fiber-optic cable is turned into thousands of seismic or strain sensors. Ahmad Tourei, a Ph.D. candidate at Colorado School of Mines, is working under the supervision of Dr. Eileen Martin to address this challenge through the development of das-anomaly, an open-source Python toolkit that applies deep learning to streamline large-scale DAS data processing.

As illustrated in the figure, the das-anomaly framework utilizes autoencoder-based unsupervised learning to detect and classify anomalous signals from power spectral density (PSD) representations. By compressing DAS data into a low-dimensional latent space and applying a probabilistic metric for anomaly detection, the model distinguishes anomalies from typical background noise. Transient or impulsive events such as microseismic and cryoseismic activity, traffic signals, and interrogator noise can be detected without prior need for labeled data. This enables researchers to focus computational and human resources on segments of interest while significantly reducing overall data volume.

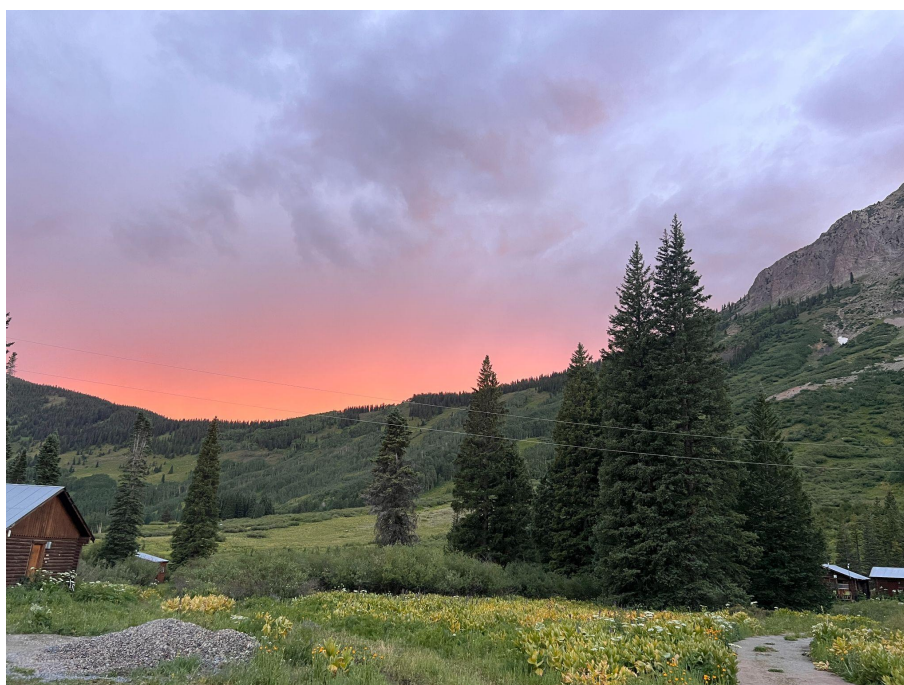
Tourei's work establishes a scalable foundation for distributed sensing big data, which can facilitate near-real-time DAS data analysis for a range of applications. The das-anomaly toolkit is freely available on GitHub at <https://github.com/ahmadtourei/das-anomaly>, promoting open and reproducible research in distributed sensing.



For more information, connect with Ahmad Tourei directly at tourei@mines.edu or <https://www.linkedin.com/in/ahmad-tourei/>.

Attention ECR & Students!

Want to suggest a researcher profile or have a new publication you'd like us to feature? Reach out to the [Student and Early Career Subcommittee](#) via Evan King (e_king@mit.edu).



Get involved!

Everyone in the distributed sensing research community and across all AGU sections is invited to get involved in the Technical Committee!

Join the Email Group

Join the Technical Committee email group to get updates, participate in planning discussions, share resources, and receive meeting announcements. All members can post. The list is currently very low-volume. To join, send an email to DS TC Secretary, Aleksei Nelaev (nelaevaleksei@gmail.com).

Be a Section Liaison!

Are you on the executive committee of another AGU Technical Committee or Section? Can you help with communication between our groups, to share opportunities and coordinate collaborations?

Submit to Future Newsletters!

Help us build this newsletter into a community resource!

- Know of events or opportunities of interest to the community?
- Want to share photos?
- Have other announcements to share?

[Submit suggestions through the DS TC suggestion form anytime!](#)

Join a Subcommittee!

Learn more about [DS TC subcommittees](#) and volunteer!

Community Calendar

Upcoming events and deadlines that may be of interest to the Distributed Sensing research community:

[AWRA 2025 Annual Water Resources Conference](#)

Dates: 10-12 November 2025

[3rd Indian Near Surface Geophysics Conference & Exhibition](#)

Dates: 12-14 November 2025

[UAVs and Drones in the Geosciences](#)

Dates: 1-4 December 2025

[AGU25](#)

Early Bird Registration Deadline: 6 November 2025

Dates: 15-19 December 2025

For the full calendar:

- [View the calendar online](#)
- [Subscribe to the calendar](#)
- [Submit events and deadlines for the calendar](#)

Connect on Bluesky

We are one of more than 20 AGU section, committee, and publication [accounts on Bluesky](#). Connect with us there, and help spread the word to colleagues. Let us know what you would like to see from us and if there are resources or events we can help boost.

Want to browse a list of publications we recently highlighted on BlueSky? The list is available as [a Zotero group](#).