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ASSOCIATION OF  
GEOSCIENTISTS &  
ENGINEERS



# Eighth EAGE Workshop on Passive Seismic

6-7 DECEMBER 2020 • AMSTERDAM, THE NETHERLANDS

- **Workshop Brochure - Programme**

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## TECHNICAL COMMITTEE

Saif Alazri	PDO
Nidhal Belayouni	Baker Hughes
Kit Chambers	Motion Signal Technologies
Zuzana Jechumtalova	Seismik
Grzegorz Kwiatek	GFZ German Research Centre for Geosciences
Pierre-Francois Roux	Baker Hughes
Ted Urbancic	Meta Innovation Technologies
Václav Vavryčuk	Geophysical Institute of the Academy of Sciences of the Czech Republic
Will Wills	Avalon Sciences
Andreas Wuestefeld*	NORSAR

\*Chair

## ABOUT THE WORKSHOP

The value of passive seismic data is measured by its capacity to impact business critical decisions. Although passive seismic data have been used extensively for these purposes, often the decision makers receive mixed messages on the validity and accuracy of their results. This workshop covers topics and solutions that have a direct impact on the cost-effectiveness and value-added of passive seismicity, and how novel approaches and technology progress can help to improve the value of the interpretation.

We invite presentations on a broad range of topics, covering novel methods (both, processing and instrumentation), as well as applications to satisfy regulatory needs. Processing standards and comparability of results across the industry is currently seen by many as an obstacle to progress in the use of passive seismic monitoring technologies and their application. We therefore invite contributions to stimulate discussion on how to achieve processing and reporting standards across different industries (geothermal, hydraulic fracture stimulations, reservoir monitoring, and mining to name a few applications).

## AIMS OF THIS WORKSHOP

This highly interactive workshop brings together some of the leading experts in the fields of planning, acquisition, processing and interpretation of passive seismicity and allows the participants to identify specific solutions for current problems in the application of passive seismic data. Interactive poster-sessions and round-table discussion groups will provide a unique opportunity to network and discuss how to advance the technology.



## TECHNICAL PROGRAMME

Oral Presentations | Tuesday 24 March 2020

<b>ROOM: TBC</b>	
<b>08:00</b>	<b>Welcome Coffee and Registration</b>
<b>08:50</b>	<b>Opening and Welcome Address</b>
<b>Data Analysis Challenges I</b> Z. Jechumtalova (Seismik s.r.o.), G. Kwiatek (GFZ German Research Centre for Geosciences)	
<b>09:00</b>	<b>TuPSW01 - Effective Monitoring of Hydraulic Fracture Stimulations Using Microseismicity: Part 1, Source Scaling Behavior and Stress Release</b> - T. Urbancic <sup>1*</sup> , E. Ardakani <sup>1</sup> <sup>1</sup> Meta Innovation Technologies
<b>09:30</b>	<b>TuPSW02 - Effective Monitoring of Hydraulic Fracture Stimulations Using Microseismicity: Part 2, Tapered Gutenberg – Richter Relationship</b> - T. Urbancic <sup>1*</sup> <sup>1</sup> Meta Innovation Technologies
<b>10:00</b>	<b>TuPSW03 - Controlling Induced Seismicity Associated with Hydraulic Stimulation of a 6 Km Deep EGS in Finland</b> - G. Kwiatek <sup>1*</sup> , M. Leonhardt <sup>1</sup> , T. Saarno <sup>2</sup> , P. Martinez-Garzon <sup>1</sup> , P. Malin <sup>3</sup> , T. Ader <sup>4</sup> , P. Heikkinen <sup>5</sup> , M. Bohnhoff <sup>1</sup> , G. Dresen <sup>1</sup> <sup>1</sup> GFZ German Research Centre for Geosciences; <sup>2</sup> St1 Deep Heat Oy; <sup>3</sup> ASIR Advanced Seismic Instrumentation and Research; <sup>4</sup> ARUP; <sup>5</sup> University of Helsinki
<b>10:30</b>	<b>Coffee Break</b>
<b>Data Analysis Challenges II</b> Z. Jechumtalova (Seismik s.r.o.), G. Kwiatek (GFZ German Research Centre for Geosciences)	
<b>11:00</b>	<b>TuPSW04 - Identification of Tectonic Structures Based On Tremors in Bobrek Coal Mine Using A Collapsing Method</b> - E. Sledz <sup>1*</sup> , A. Lesniak <sup>1</sup> , K. Mirek <sup>1</sup> <sup>1</sup> AGH University of Science and Technology
<b>11:30</b>	<b>TuPSW05 - Using Microseismicity to Manage Induced Seismicity During Hydraulic Fracturing at the Preston New Road PNR1 Well</b> - J. Verdon <sup>1</sup> , T. Kettley <sup>1*</sup> , A. Baird <sup>1</sup> , M. Kendall <sup>1</sup> <sup>1</sup> University of Bristol
<b>12:00</b>	<b>Panel Discussion</b>
<b>12:30</b>	<b>Lunch Break</b>
<b>Quantification of Errors I</b> N.B. Belayouni (Baker Hughes), V. Vavryčuk (Academy of Sciences of the Czech Republic)	
<b>13:30</b>	<b>TuPSW06 - Developing Approaches for Background Seismicity Monitoring of Potential CO2 Storage Sites in Horda Area Offshore Norway</b> - R. Dehghan-Niri <sup>1*</sup> , V. Oye <sup>2</sup> , A. Wuestefeld <sup>2</sup> , R. Bakke <sup>1</sup> , M. Wilks <sup>2</sup> , A. Furre <sup>1</sup> , P. Ringrose <sup>1</sup> <sup>1</sup> Equinor ASA; <sup>2</sup> NORSAR
<b>14:00</b>	<b>TuPSW07 - Systematic Recovery of Instrumental Timing Errors Using Interferometric Surface Waves Retrieved from Large N Seismic Arrays</b> - C. Weemstra <sup>1*</sup> , J. De Laat <sup>2</sup> , A. Verdel <sup>3</sup> <sup>1</sup> Delft University of Technology; <sup>2</sup> Dublin Institute for Advanced Studies; <sup>3</sup> Netherlands Organization for Applied Scientific Research (TNO)
<b>14:30</b>	<b>TuPSW08 - A Metric for Evaluating Difference between Seismograms</b> - A. Arefina <sup>1*</sup> , R. Khudorozhkov <sup>1</sup> , A. Kuvaev <sup>1</sup> <sup>1</sup> Gazprom Neft
<b>15:00</b>	<b>Coffee Break</b>
<b>Quantification of Errors II</b> N.B. Belayouni (Baker Hughes), V. Vavryčuk (Academy of Sciences of the Czech Republic)	
<b>15:30</b>	<b>TuPSW09 - A New Seismic Hazard Assessment for Injection Seismicity</b> - N. Cao <sup>1*</sup> , L. Eisner <sup>1</sup> , Z. Jechumtalova <sup>1</sup> <sup>1</sup> Seismik s.r.o.
<b>16:00</b>	<b>TuPSW10 - Dynamic Ray Tracing with Adaptive Step Size Control in Inhomogeneous Anisotropic Media</b> - A. Roeser <sup>1*</sup> , S.A. Shapiro <sup>1</sup> <sup>1</sup> Freie Universität Berlin
<b>16:30</b>	<b>Panel Discussion</b>
<b>17:00</b>	<b>End of Day 1</b>



## Oral Presentations | Wednesday 25 March 2020

ROOM: TBC	
<b>Alternative Uses of Microseismic I</b> K. Chambers (Motion Signal Technologies), T.I. Urbancic (Meta Innovation Technologies)	
08:30	<b>WePSW01 - Case Study: Indication of A Precursor to A Screenout Interpreted by Microseismic Waveform-Similarity Clustering</b> - S. Ishikawa <sup>1*</sup> , N. Shimoda <sup>2</sup> , H. Tokunaga <sup>1</sup> <sup>1</sup> INPEX Corporation; <sup>2</sup> Japan Oil, Gas and Metals National Corporation
09:00	<b>WePSW02 - Background Seismicity Monitoring Using Conventional Offshore Geophones: An Input to the Carbon Capture and Storage Project</b> - Z. Zarifi <sup>1*</sup> , A. Furre <sup>1</sup> , P. Ringrose <sup>1</sup> , L. Ottemoller <sup>2</sup> , R. Thorsen <sup>1</sup> <sup>1</sup> Equinor ASA; <sup>2</sup> Department of Earth Sciences, University of Bergen
09:30	<b>WePSW03 - Microseismic Event Localization Using Surface and Borehole Data</b> - I. Abakumov <sup>1*</sup> , S. Gutjahr <sup>1</sup> , S.A. Shapiro <sup>1</sup> <sup>1</sup> Freie Universität Berlin
10:00	Coffee Break
<b>Alternative Uses of Microseismic II</b> K. Chambers (Motion Signal Technologies), T.I. Urbancic (Meta Innovation Technologies)	
10:30	<b>WePSW04 - Virtual Seismic Gather Generation: A Case Study from Passive Experiment in Dehdasht Area Southwest Iran</b> - F.S. Tayeb Hosseini <sup>1*</sup> , Z.H. Shomali <sup>1</sup> , J. Jamali <sup>2</sup> <sup>1</sup> Institute of Geophysics, University of Tehran; <sup>2</sup> Amirkabir University of Technology
11:00	Discussion Round Table
12:30	Lunch Break
<b>Machine Learning in Microseismic</b> W. Wills (Avalon Sciences Ltd), A. Wuestefeld (NORSAR)	
13:30	<b>WePSW05 - Picking Automatization by Pattern Matching: A New Methodology Using EAT Events</b> - L. Duboeuf <sup>1*</sup> , V. Oye <sup>1</sup> , I. Berre <sup>2</sup> <sup>1</sup> Norsar; <sup>2</sup> Universitetet i Bergen
14:00	<b>WePSW06 - Offline Processing Workflow for Large-N Passive Seismic Networks</b> - A. Villasenor <sup>1*</sup> , L. Fernandez-Prieto <sup>1</sup> , V. Sallarès <sup>1</sup> , A. Ugalde <sup>1</sup> , C.R. Ranero <sup>1</sup> <sup>1</sup> Institute of Marine Sciences - CSIC
14:30	<b>WePSW07 - Towards Synthetically Trained Convolutional Neural Networks for Induced Earthquake Detection and Localization</b> - N. Vinard <sup>1*</sup> , G.G. Drijkoningen <sup>1</sup> , D.J. Verschuur <sup>1</sup> <sup>1</sup> Delft University of Technology
15:00	Coffee Break
<b>Fibre Optic Sensing</b> K. Chambers (Motion Signal Technologies), S. Alazri (PDO)	
15:30	<b>WePSW08 - Corkscrew Well Paths for Improved Microseismic Event Locations with DAS Recordings</b> - A. Wuestefeld <sup>1*</sup> <sup>1</sup> NORSAR
16:00	<b>WePSW09 - Microseismic Source Mechanism Inversion from Distributed Acoustic Sensing (DAS) Data</b> - D. Diller <sup>1*</sup> , R. Gibson <sup>1</sup> <sup>1</sup> NanoSeis, LLC
16:30	Closing Remarks / Panel Discussion
17:00	End of Day 2

## REGISTRATION FEES

REGISTERED AND PAID	UNTIL 15/09/2020	FROM 16/09/2020 - 01/11/2020	FROM 02/11/2020
EAGE Green Member <sup>1,5</sup>	€845	€945	€1,045
EAGE Bronze/Silver/Gold Member <sup>1,5</sup>	€695	€795	€895
EAGE Platinum Member <sup>1,5</sup>	€695	€695	€695
Non-member <sup>3</sup>	€895	€995	€1,095
EAGE Student Green Member <sup>1,2,5</sup>	€350	€400	€450
EAGE Student Bronze/Silver/Gold Member <sup>1,2,5</sup>	€325	€375	€425
Student Non-member <sup>2,3,4</sup>	€375	€425	€475

- Members please note: To qualify for the member registration fee, your EAGE membership dues for 2020 must have been paid and confirmed. The processing time for membership applications or renewals is 10 working days.
- To qualify for the reduced student registration fee:
  - Students must be enrolled in a full-time study programme at a recognized university or institute.
  - The registration must be accompanied by a copy of a student ID card and/or official proof of enrolment.
- The non-member fee includes EAGE membership for the remainder of 2020.
- Student non-members cannot be older than 34 years of age (when registering).
- Green membership status gives you a €50 discount (€25 for students) on each EAGE event registration; starting from the Bronze status, you can benefit from an even greater reduced EAGE member registration fee.

All fees are in Euros (€). One Euro of your total registration fee is donated to the EAGE Green Fund. Please note: The deadlines are following the Local Time in the Netherlands. EAGE reserves the right to cancel the workshop due to low participation.

## IMPORTANT DATES

### Call for Posters is Open!

Call for Abstracts Deadline (Posters only)	15 August 2020
Early Registration Deadline	15 September 2020
Regular Registration Deadline	1 November 2020
Passive Seismic Workshop	6-7 December 2020

## SPONSORING

The Eighth EAGE Workshop on Passive Seismic offers excellent sponsoring opportunities to create high visibility for your brand. A company display, lanyards and catering package are a few examples of the available sponsored items. For more information about sponsoring, please refer to the 'Sponsor Guide' that is available on the event website (via [events.eage.org](https://events.eage.org)) or contact us via [eage.events@eage.org](mailto:eage.events@eage.org).

## CONTACT

For further up-to-date information, please visit the event website via [events.eage.org](https://events.eage.org) or contact the EAGE Europe Office via [eage.events@eage.org](mailto:eage.events@eage.org) or +31 88 9955055.



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