EAGE

EUROPEAN ASSOCIATION OF GEOSCIENTISTS & ENGINEERS

10th ANNIVERSARY

Eighth High Performance Computing Workshop

- **Final Announcement**

PLATINUM SPONSOR

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TECHNICAL COMITTEE

Saber Feki (Local Chair)	KAUST
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Diego Klahr	TotalEnergies
Gaël Youinou	Viridien
Elizabeth L'Heureux	BP
Lorenzo Casasanta	Shearwater
Essam Morsi	AMD

WORKSHOP OVERVIEW

Experience the driving force of high-performance computing shaping our energy future. As we navigate the energy transition, it empowers us to unravel new complexities and conquer large-scale computational challenges in our industry.

For over a decade, this workshop has grown into a premier platform for sharing insights and fostering innovation in high-performance computing technologies tailored for our sector.

Marking its 10th anniversary, the workshop comes to KAUST in the Middle East. Immerse yourself in the Core Visualization Lab, explore the cutting-edge of HPC & AI at KAUST, and engage in dynamic poster sessions—all integral parts of this year's celebration.

Join us at this pivotal event on the HPC calendar for the oil and gas industry. Discover how high-performance computing is redefining possibilities in energy.

TOPICS

Emerging HPC Technologies
- High-Performance Data Analytics, Machine Learning and Deep Learning
- Convergence and Overlapping of HPC and Data Analytics
- Quantum Computing
- Next Generation Programming Models and Languages
- High-Performance Cloud Computing (HPCC)
- System Architectures for Exascale Computing
- High-Performance IoT-based solutions
- Neuromorphic Computing
- Software Stacks
- Software Engineering for HPC
- HPC DevOps

Geosciences & HPC
- Seismic Imaging, Modeling & Inversion
- Reservoir Modeling and Simulation
- Joint Inversion of Geophysical and Engineering Data
- Designing Upstream Applications for Exascale Computing
- Upstream Data Visualization (Distributed and Remote Visualization)
- Digital Rock Physics
- Seismic Processing
- Electromagnetic Modeling and Inversion
- Combining Geosciences with AI

Performance Analysis and Optimization
- HPC Case Histories and Field Studies
- Mixed Precision Computing
- Energy Efficient Computing
- Numerical Methods and Solvers
- Data Intensive Computing (High Performance I/O and File Systems)
- Fabrics for Upstream HPC

HPC for the Energy Transition
- Weather and Climate Modelling
- Fusion Simulation
- Green Hydrogen
- Carbon Capture and Storage
- Solar Power Plant, Wind Farm, Geothermal & Hydroelectric Energy
- Electrical Power Grid & Grid Energy Storage

TECHNICAL PROGRAMME

Sunday 15, September 2025

19:00	IceBreaker Reception - Sponsored by Shell

Oral Presentations | Monday, 16 October 2024

HALL 1, BUILDING 19

08:00	Registration and Welcome Coffee
08:30	HSSE & Opening Remarks by event Co-chairs : Amik St-Cyr (Shell) , Nicola Bienati (ENI) & Saber Feki (KAUST)
08:40	Opening Address: Robust and Energy Efficient Computing for Upstream - David Keyes (KAUST)

SESSION 1 - AI for Geosciences
Session Chairs: Amik St-Cyr & Saber Feki

09:25	Keynote 1 - Combining physics with Neural Networks: some use cases and practical considerations - Matteo Ravasi (KAUST)
10:10	Comparative Analysis of Super Resolution Techniques in Micro-CT Imaging - M. Awadalla[1]*, Y. Ghazal[1], D. Barradas[2], A. Ayyad[1], A. Nasr[1], S. Ghani[2] [1]Brightskies; [2]KAUST
10:35	Super resolution for Digital Rock Physics with ESRGAN and Diffusion Models Leveraging MONAI - F. Miled[1]*, H. Hmida[1], R. Karray[2] , Issam Said[3]* [1]ReDX Technologies; [2]Khawarizmy; [3]Nvidia
11:00	AM Coffee Break
11:30	HPC expertise for extreme Generative AI tuning - A. HINCELIN*, P. Demichel [1]Viridien; [1]Viridien
11:55	AI for Geosciences Speaker Q & A
12:25	Lunch Break

SESSION 2 - HPC for Geosciences: Part I
Session Chairs: Gerard Gorman & Lorenzo Casasanta

13:25	Effect of Nanomaterials In Reducing Drilling Fluid Loss And Clay Swelling Using Molecular Dynamics Simulations - J. Avila[1]*, C. Barrios[1], Z. Calderon[1], A. Lopez[1], A. Leon[1] [1]Universidad Industrial de Santander
13:50	Frequency-dependent adaptive reciprocal low-rank factorization for multidimensional deconvolution - F. Chen[1]*, M. Ravasi[1], D. Keyes[1] [1]King Abdullah University of Science & Technology
14:15	Exploiting Tensor Cores for Stencil-based PDE Solvers - V. LE FEVRE[1]*, H. Ltaief[2,1] [1]Algodoers; [2]Extreme Computing Research Center Computer, Electrical and Mathematical Sciences & Engineering Division King Abdullah University of Science and Technology
14:40	PM Coffee Break
15:10	Neutral atoms quantum computing in a High Performance Computing environment - Current trends and applications - Krisztian Benyo[1] [1]Pasqal
15:35	Discussion Session

SESSION 3 - Emerging HPC Technologies - Part I
Session Chairs: Issam Said

15:55	Optimizing GAN Training for 3D Seismic Microstructure Generation - Y. Ghazal[1], M. Awadalla[1]*, D. Barradas[2], A. Ayyad[1], A. Nasr[1], S. Ghani[2] [1]Brightskies; [2]KAUST
16:20	Optimizing SRME: exploiting the power of GPUs and high-core count CPUsBEI - L. Casasanta[1]* [1]Shearwater Geoservices
16:45	A clang based transpiler of OKL in the Open Concurrent Compute Architecture (OKL) - I. Kobein[2]*, V. Yastrebov[2], Y. Pankevych[2], K. Chaba[2], A. St-Cyr[1], P. Hilei* [1]Shell Integrated Gas & Upstream; [2]SoftServe
17:10	Discussion Session
17:30	Closing Remarks / Close of Day 1

Oral Presentations | Tuesday, 17 October 2024

HALL 1, BUILDING 19

08:00	Registration and Welcome Coffee
08:30	Welcome by Co-Chairs: Review of Day 1 & Welcome to Day 2

SESSION 4 - HPC & AI @ KAUST: A Comprehensive Overview

08:40	Supercomputing Presentation - Jysoo Lee (KAUST)
09:40	Visualization Core Lab tour - Group 1
09:40	AM Coffee Break & Poster Session - Group 2
10:40	Visualization Core Lab tour - Group 2
10:40	AM Coffee Break & Poster Session - Group 1

SESSION 5 - Performance Analysis & Optimisation
Session Chairs: Essam Morsi & Hatem Ltaief

11:40	Keynote 2 - Automated Mathematics to Supercomputers, Leveraging Abstractions - Fabio Luporini (Devito Codes)
12:25	Full Wave Imaging beyond GPU memory limits - N. Bienati[1]*, L. Bortot[1], J. Panizzardi[1] [1]Eni Natural Resources
12:50	Lunch Break
13:50	Leveraging the High Bandwidth of Last-Level Cache for the first-order reverse time migration - P. Plotnitskii[1]* [1]KAUST
14:15	Performance tuning of seismic processing software with integrated profiling toolsbei - N. Wilson[1], M. Nauta[1], L. Casasanta[1]* [1]Shearwater Geoservices
14:40	Discussion Session
15:00	PM Coffee Break

SESSION 6 - Emerging HPC Technologies - Part II
Session Chairs: Nicola Bienati & Fabio Luporini

15:30	Full injection of Devito generated code into Shell's Wave Equation Library - J. Van der Holst[2], D. Datta[3], A. St-Cyr[1]* [1]Shell Integrated Gas & Upstream; [2]Enter; [3]Shell Integrated Gas & Upstream
15:55	Efficient Multidimensional Deconvolution with an H2-like parametrization - D. Sushnikova[1]* [1]KAUST
16:20	Energy Tuning: Methodology and Exploration - F. Pautre[1]*, A. Hincelin[1], N. Moller[1] [1]Viridien
16:45	Discussion Session
17:05	Closing Remarks / Close of Day 2
19:00	Gala Dinner

Oral Presentations
Wednesday, 18 October 2024

HALL 1, BUILDING 19	
08:00	Welcome Coffee
Opening Remarks for Day 3 by Co-Chairs	
08:40	**PANEL SESSION : TOPIC: HPC Challenges: Hardware, Software, and Human Resources Moderator: David Keyes (KAUST); Panelists Representation: AMD, NVIDIA; Devito Codes, Aramco**
09:25	**Discussion and Q&A**
SESSION 7 - HPC for Geosciences ; Part II Session Chairs: Lorenzo Casasanta & Matteo Ravasi	
09:40	**Keynote 3- From High Performance Computing to High Performance AI, or not? - Nicola Bienati (ENI)**
10:25	**GPU-accelerated Full-Waveform Inversion using Hamiltonian Monte Carlo Method -** D. Urozayev[1]*, B. Boddupalli[1], P. Eliasson[1] [1]SINTEF AS
10:50	**AM Coffee Break**
11:20	**Accelerating 2-D Full Wavefield Forward Modeling via Frequency Interpolation with a Tiny Attention U-Net Based Model -** J. Zhao[1]*, N. Akram[1], N. Savva[1,2], E. Verschuur[3] [1]The Cyprus Institute; [2]University of Cyprus; [3]Delft University of Technology
11:45	**GPU Acceleration of Graph Algorithms for Seismic Data Interpretation -** Dr N.Keskes[1]* [1]NKDeep
12:10	**Discussion Session**
12:30	**Closing Remarks - Co-Chairs / End of Workshop**
12:45	**Lunch Break**

VENUE

Building 19, Floor 3, Conference Halls 1 & 2
KAUST, University Campus.

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SPONSORS

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CONTACT

For more information please contact EAGE Middle East at middle_east@eage.org or +971 4 369 3897.

REGISTRATION FEE

(All registration rates are in USD)

REGISTERED AND PAID	Early Registration 16/02/24 - 16/07/24	Regular Registration 17/07/24 - 17/08/24	Late Registration 18/08/24 - 18/09/24
AGE Green Member[1,5]	$ 1300	$ 1400	$ 1500
EAGE Bronze/Silver/Gold Member[1,5]	$ 1150	$ 1250	$ 1350
EAGE Platinum Member[1,5]	$ 1150	$ 1150	$ 1150
Non-Member[3]	$ 1400	$ 1500	$ 1600
EAGE Green Student Member[1,2,5]	$ 650	$ 700	$ 750
EAGE Bronze/Silver/Gold Student Member[1,2,5]	$ 575	$ 625	$ 675
Student Non-Member[2,3,4]	$ 675	$ 725	$ 775

Members please note: To qualify for the member registration fee, your EAGE membership dues for 2023 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 2024 (31/12/2024). This membership will be activated shortly after the event.
Student Non-members cannot be older than 34 years of age (when registering).
Green membership status gives you a USD 100 discount (USD 25 for students) on the Non-member fee for each EAGE event registration; starting from the Bronze status, you can benefit from an even greater reduced EAGE member registration fee. Find here for more information on the recognition programme.
All fees are in USD. One US Dollar 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 short course(s), conference(s), workshop(s) or field trip(s) due to low participation. In this case, payment will be refunded in full.

Payment Methods
All payments must be made in US Dollars
By credit card (VISA, Master card, AMEX) through our secure web server
By bank transfer. Made out to:
Emirates NBD Bank, The Greens branch, P.O. Box 777, Dubai, UAEIBAN: AE420260001025427498303 Swift Code: EBILAEAD
Please indicate your name and/or invoice number clearly on bank transfers. Due to postal or bank delays, registration by post and/or bank transfer will not be accepted after 12 February 2024. Please allow at least two weeks for processing.

NOTES

UPCOMING
REGIONAL WORKSHOPS & CONFERENCES

FIFTH EAGE NATURALLY FRACTURED RESERVOIRS WORKSHOP
6-8 October 2024 • Muscat, Oman

DIGITALIZATION IN GEOSCIENCE SYMPOSIUM
21-24 October 2024 • Al Khobar, Saudi Arabia

INNOVATIVE TECHNOLOGY FOR RESERVOIR OPTIMIZATION: FIFTH EAGE WELL INJECTIVITY & PRODUCTIVITY IN CARBONATES (WIPIC) WORKSHOP
14-16 April 2025 • Doha, Qatar

FIRST EAGE ATLANTIC GEOSCIENCE RESOURCE EXPLORATION & DEVELOPMENT SYMPOSIUM
5-7 May 2025 • Marrakech, Morocco

THE MIDDLE EAST OIL, GAS AND GEOSCIENCES SHOW (MEOS GEO)
16-18 September 2025 • Manama, Bahrain

SIXTH EAGE BOREHOLE GEOLOGY WORKSHOP
22-24 September 2025 • Stavanger, Norway

SECOND AAPG/ EAGE MEDITERRANEAN AND NORTH AFRICAN CONFERENCE (MEDINA)
29 September - 1 October • Tunis, Tunisia

EIGHTH EAGE BOREHOLE GEOPHYSICS WORKSHOP
29 September - 1 October 2025 • Al Khobar, Saudi Arabia

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