Hybrid Conference

04 – 05 June 2026

AI in the Geosciences

CONFERENCE PROGRAMME

The Geological Society

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Thursday 4 June		
0930 - 1000	Registration opens, tea & coffee	
1000 - 1010	Welcome Address	
1010 - 1100	**Keynote:** At the Axis: Orienting AI in the Geosciences Toward the Public Good	David Leslie, *Turing Institute & Queen Mary, University of London*
Session One: Machine Learning		
1100 - 1115	Beyond the Perceptron: Why Kolmogorov-Arnold Networks (KAN) Represent the Future of Lithofacies Classification	Ardiansyah Koeshidayatullah, *King Fahd University of Petroleum and Minerals*
1115 - 1130	Physics-Informed Fourier Neural Operators for Variably Saturated Flow in Unsaturated Subsurface Systems	Amin Nadimy, *Queen Mary, University of London*
1130 - 1145	Neural emulation of gravity-driven geohazard runout across diverse real-world landscapes	Lorenzo Nava, *King's College London*
1145 - 1200	Deep Learning for Sediment Core Analysis: An Explainable AI Framework for Facies Segmentation	Andrea Di Martino, *University of Bologna*
1200 - 1230	Tea & coffee break	
Session Two: Machine Learning		
1230 - 1245	Evaluating Single and Dual-Domain Loss Functions in ML-Based Ring Artefact Suppression in High-Resolution X-Ray Microtomography Imaging	Syadhisy Dhanapal, *University of Oslo*
1245 - 1300	A multi-modal semi-supervised model for ocean sediment lithology	John Aiken, *University of Oslo*
1300 - 1315	Enriched clustering methodology with relaxation labeling for automated electrofacies interpretation from wireline data	Francesco Saverio Patacchini, *IFP Energies nouvelles*
1315 - 1330	From Source to Runout: A Scalable Machine Learning Framework for Regional Landslide Risk Assessment in New Zealand	Alex Stokes, *Tetra Tech (Virtual)*
1330 - 1430	Lunch	
Session Three: Analytical applications		
1430 - 1445	Assessment of formation integrity and rock strength to improve wellbore stability in overpressured sequences by using AI (Central North Sea)	Peter Evans, *NEO NEXT*
1445 - 1500	Beyond classified geological maps: the case for AI-enabled mapping of geological properties	Charlie Kirkwood, *University of Exeter*

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Session Three: Analytical applications *continued*...		
1500 - 1515	Agent-Based Reinforcement Learning for Geochemical Control in Geothermal Energy Systems	Füsun Tut-Haklidir, *Istanbul Bilgi University (Virtual)*
1515 - 1530	Integrating Geochemistry and Geodynamics into Machine Learning–Based Mineral Prospectivity along the Andean Margin	Juan Bello, *GeoInnova*
1530 - 1545	Mapping essential ocean variables with machine learning: Needs, challenges and opportunities	Arianna Olivelli, *Flanders Marine Institute*
1545 – 1600	Tea & coffee break	
Session Four: Panel Discussion		
1615 - 1700	**Panel discussion** **AI in the Geosciences: Ethical, social, and educational considerations**	Speakers TBC
Virtual Poster Session		
1700 - 1730	Titles TBC	Speakers TBC
1730 - 1900	Poster session & Drinks Reception	

Friday 5 June		
0900 - 0930	Registration opens, tea & coffee	
0930 - 1020	**Keynote:** Can AI discover a new oil field? Practical applications of AI for subsurface evaluation	Karen Heyburn, *Halliburton*
1020 - 1100	**Panel discussion** **The Three Frontiers in AI for the Geosciences**	Speakers TBC
1100 - 1130	Tea & coffee break	
Session Five: Ethical considerations and use cases		
1130 - 1145	The Intelligent Geoscientist: Harnessing AI for Discovery, Decision-Making, and the Next Generation	Keith Richard Holdway, *Society of Petroleum Engineering & Society of Exploration Geophysicists (Virtual)*
1145 - 1200	Who Builds the Ground Model? Ethics and Fostering Engineering Judgement in AI-Enabled Ground Engineering Practice	Thomas Perriment, *Mott MacDonald*
1200 - 1215	Ethical impacts of AI upon the science of a national geological survey	Andrew Kingdon, *British Geological Survey*
1215 - 1230	Fair and Responsible AI for Earth Science: Benchmarking Deep Learning and Generative Methods for Rare Class Detection in Geological and Environmental Data	Masoud Rostami, *University of Texas at Arlington (Virtual)*
1230 - 1245	Architecting Synergy: Reframing AI as a Traceable Digital Junior to Drive Positive Disruption in the Geosciences	Bernique de Kock, *Terra Mineral Solutions (pty) Ltd*
1245 - 1300	The relation of students with AI in geosciences	Mario Sarasa Navarro, *Universidad de Barcelona*
1300 - 1400	Lunch	
Session Six: LLM		
1400 – 1415	Promises and challenges in geoscience information retrieval with Large Language Models: examples with technical reports and basin simulation results	Antione Bouziat, *IFP Energies Nouvelles*
1415 - 1430	Guiding Generative AI With Subsurface Reasoning for Scalable Play Innovation in Oil and Gas Exploration	Nicholas Holgate, *Shell*
1430 - 1445	AI for mineral exploration: What are areas of promise and challenges of AI-assisted subsurface imaging of ore deposits?	Thomas Samuel Hudson, *Fleet Space Technologies Ltd & ETF Zurich*

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Session Six: LLM *continued…*		
1445 - 1500	Knowledge Graph–Augmented Reasoning for Accurate and Transparent Geological Inference with Small Language Models	Maryam Alakkas, *Halliburton (virtual)*
1500 - 1515	Geoscience and AI: A Collaborative Approach to Trustworthy Literature Synthesis	Jesse Lord, *GeoScienceWorld*
1515 - 1545	Tea & coffee break	
Session Seven: Implementation for datasets		
1545 - 1600	GebPy, a Python-based open source tool for the synthetic generation of geophysical and compositional data of minerals, rocks and whole rock sequences	Maximilian Alexander Beeskow, *RWTH Aachen University*
1600 - 1615	Unlocking Geological Archives with AI: Multimodal Retrieval and UI Design applied to Critical Mineral Intelligence	Rachel Heaven, *UKRI & British Geological Survey*
1615 - 1630	Optimizing Deep Learning Workflows for Seismic Catalog Building	Rossella Fonzetti, *Istituto Nazionale di Geofisica e Vulcanologia*
1630 - 1645	AI-Powered Understanding of Geological Uncertainty in Fractured Caprocks	Sarah Perez, *Heriot-Watt University*
1645 - 1700	*TBC*	*Speaker TBC*
1700 - 1715	Transformer-Based Geotechnical Classification of Borehole Logs with Benchmarking of Uncertainty Quantification Methods: an Italian case study.	Roberto Cilli, *GeoResources Universitè de Lorraine*
1715 - 1730	Looking forward, Publication opportunities and closing words	

Continued on the next page….

Poster Presentations	
Development of an Intelligent Chatbot DAISY for Natural Disaster Information Dissemination	Amanda He, *Valley Christian High School (Virtual)*
Creep bursts in landslides - Characterization and modeling of transient deformations	Andreas Aspaas, *Norwegian Resources and Energy Directorate*
More is Not Always Better: Lessons Learned from Finetuning LLMs for Geosciences Knowledge Extraction	Ardiansyah Koeshidayatullah, King Fahd University of Petroleum and Minerals
Using machine learning for seabed sediment mapping	Ben Marchant, *British Geological Survey*
RockGPT, a Researcher-Curated, Self-Hosted Large Language Models for Trusted Knowledge Management in the Geosciences	Daniele Bailo, *Istituto Nazionale di Geofisica e Vulcanologia - INGV*
Multimodal Log–Guided Generation of High-Fidelity Synthetic Core Images from FMS Data	Daqian Shi, *Queen Mary, University of London*
A Deep Learning-based Workflow for the Automated Focal Mechanism Determination in Italy	Flavia Tavani, *Istituto Nazionale di Geofisica e Vulcanologia - INGV*
Machine Learning-Assisted Real-Time Volcano Surveillance: A Mount Etna Case Study	Flavio Cannavo, *Istituto Nazionale di Geofisica e Vulcanologia - INGV*
Digitalization and computer vision applied to palynology – recent developments	Gil Machado, *Chronosurveys and GeoBioTec*
Integrating Multisource Geodata Using AI Tools for Enhanced Mineral Mapping in Algeria	Hamida Diab, *University chikh Larbi tebessi Tebessa Algeria*
Reconstructing historic coastal and mining landscapes with AI, digitised maps, and LiDAR	Iris Karmer, *Arch AI*
Distribution-agnostic graph transformers for landslide modelling	Itahisa Gonzalez Alvarez, *British Geological Survey*
iGeologist: The Connected Ecosystem of Rocks, Sensors, AI, and Geologists	James Cleverley, *IMDEX*
Ensemble Data Assimilation for Parameter Calibration of Stratigraphic Forward Models Using Well-Log–Derived Thickness Observations	Liang Wang, *Queen Mary University of London*
Spectro-Temporal Characterisation of Urban Traffic: A Deep Learning Approach to Estimating Vehicles from Seismic Data	Luke Potts, *Manchester Metropolitan University*
From limited scenarios to robust subsurface insights: A practical autonomous workflow for asset management	Mathieu Ducros, *Kognitus*
Groundwater model emulation with Recursive Neural Networks	Matthew Arran, *British Geological Survey*

Poster Presentations continued...	
Responsible resource ownership: Operationalising AI in ore movement	Michelle Keegan, *Augment Technologies*
Deep Learning for Geothermal Frontier Exploration: Identifying Hydrothermal Alteration in Puga Valley, Ladakh, Using PRISMA Hyperspectral Data and CNNs	Mohammad Taqi Daqiq, *Indian Institute of Technology Roorkee*
AI-Driven Optimization of Reservoir Management and Production Forecasting	Mohammed Abubakar, *Federal University of Lafia*
AI assisted drought monitoring with open CHIRPS rainfall data: a reproducible notebook workflow for geoscience education	Nimatallahi Masuud, *INFINION Technology*
Deep Learning for Seismic Facies Classification in the Sergipe-Alagoas Basin	Robson Wants, *Federal University of Paraná*
AI-Powered Extraction and Visualization of Historic Well Logs for CCUS Projects	Usman Ayobami, *CoreExtract (Virtual)*
GEOLAB+: An AI-Enhanced LINE Chatbot and Virtual Mineral–Rock Laboratory for Improving Geoscience Learning Performance	Vimoltop Singtuen, *Khon Kaen University (Virtual)*
Seamount detection using a convolutional neural network	*Zhenyu Wang, Institute of Earthquake Forecasting, China Earthquake Administration & University of Oxford*

Convenors:

- **Dr David Hodgetts** – Founder, VRGeoscience Ltd
- **Prof Paul Cleverly** – Founder, Infoscience Technologies Ltd; Visiting Professor of Information Science & Technology, Robert Gordon University, UK
- **Prof Cedric John** – Professor & Head of Data Science for the Environment and Sustainability, Digital Science Research Institute (DERI), Queen Mary University of London, UK
- **Dr Silvia Peppoloni** – Researcher, National Institute of Geophysics and Volcanology (INGV), Rome, Italy; Chair/Director, International Association for Promoting Geoethics (IAPG)
- **Dr Giuseppe di Capua** – Senior Technologist, National Institute of Geophysics and Volcanology (INGV), Rome, Italy; Secretary General, International Association for Promoting Geoethics (IAPG)

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+44 (0) 20 7434 9944
conference@geolsoc.org.uk

The Geological Society

The Geological Society of London
Burlington House, Piccadilly, London, W1J 0BG, UK
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