

Hybrid Conference



04 – 05 June 2026

AI in the Geosciences
CONFERENCE PROGRAMME



The Geological Society

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| Thursday 4 June | | |
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| 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, <i>Turing Institute & Queen Mary, University of London</i> |
| Session One: Machine Learning | | |
| 1100 - 1115 | Beyond the Perceptron: Why Kolmogorov-Arnold Networks (KAN) Represent the Future of Lithofacies Classification | Ardiansyah Koeshidayatullah, <i>King Fahd University of Petroleum and Minerals</i> |
| 1115 - 1130 | Physics-Informed Fourier Neural Operators for Variably Saturated Flow in Unsaturated Subsurface Systems | Amin Nadimy, <i>Queen Mary, University of London</i> |
| 1130 - 1145 | Neural emulation of gravity-driven geohazard runout across diverse real-world landscapes | Lorenzo Nava, <i>King's College London</i> |
| 1145 - 1200 | Deep Learning for Sediment Core Analysis: An Explainable AI Framework for Facies Segmentation | Andrea Di Martino, <i>University of Bologna</i> |
| 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, <i>University of Oslo</i> |
| 1245 - 1300 | A multi-modal semi-supervised model for ocean sediment lithology | John Aiken, <i>University of Oslo</i> |
| 1300 - 1315 | Enriched clustering methodology with relaxation labeling for automated electrofacies interpretation from wireline data | Francesco Saverio Patacchini, <i>IFP Energies nouvelles</i> |
| 1315 - 1330 | From Source to Runout: A Scalable Machine Learning Framework for Regional Landslide Risk Assessment in New Zealand | Alex Stokes, <i>Tetra Tech (Virtual)</i> |
| 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, <i>NEO NEXT</i> |
| 1445 - 1500 | Beyond classified geological maps: the case for AI-enabled mapping of geological properties | Charlie Kirkwood, <i>University of Exeter</i> |

Continued on the next page....

| Session Three: Analytical applications <i>continued...</i> | | |
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| 1500 - 1515 | Agent-Based Reinforcement Learning for Geochemical Control in Geothermal Energy Systems | Fusum Tut-Haklidir, <i>Istanbul Bilgi University</i> |
| 1515 - 1530 | Integrating Geochemistry and Geodynamics into Machine Learning-Based Mineral Prospectivity along the Andean Margin | Juan Bello, <i>Geolnova</i> |
| 1530 - 1545 | Mapping essential ocean variables with machine learning: Needs, challenges and opportunities | Arianna Olivelli, <i>Flanders Marine Institute</i> |
| 1545 - 1600 | Tea & coffee break | |
| Session Four: Panel Discussion | | |
| 1615 - 1700 | Panel discussion Title TBC | Speakers TBC |
| Virtual Poster Session | | |
| 1700 - 1730 | Titles TBC | Speakers TBC |
| 1730 - 1900 | Poster session & Drinks Reception | |

| Friday 5 June | | |
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| 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, <i>Halliburton</i> |
| 1020 - 1100 | Panel discussion Title TBC | 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, <i>Society of Petroleum Engineering & Society of Exploration Geophysicists (Virtual)</i> |
| 1145 - 1200 | Who Builds the Ground Model? Ethics and Fostering Engineering Judgement in AI-Enabled Ground Engineering Practice | Thomas Perriment, <i>Mott MacDonald</i> |
| 1200 - 1215 | Ethical impacts of AI upon the science of a national geological survey | Andrew Kingdon, <i>British Geological Survey</i> |
| 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, <i>University of Texas at Arlington (Virtual)</i> |
| 1230 - 1245 | Architecting Synergy: Reframing AI as a Traceable Digital Junior to Drive Positive Disruption in the Geosciences | Bernique de Kock, <i>Terra Mineral Solutions (pty) Ltd</i> |
| 1245 - 1300 | The relation of students with AI in geosciences | Mario Sarasa Navarro, <i>Universidad de Barcelona</i> |
| 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, <i>IFP Energies Nouvelles</i> |
| 1415 - 1430 | Guiding Generative AI With Subsurface Reasoning for Scalable Play Innovation in Oil and Gas Exploration | Nicholas Holgate, <i>Shell</i> |
| 1430 - 1445 | AI for mineral exploration: What are areas of promise and challenges of AI-assisted subsurface imaging of ore deposits? | Thomas Samuel Hudson, <i>Fleet Space Technologies Ltd & ETF Zurich</i> |

| Session Six: LLM <i>continued...</i> | | |
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| 1445 - 1500 | Knowledge Graph–Augmented Reasoning for Accurate and Transparent Geological Inference with Small Language Models | Maryam Alakkas, <i>Halliburton</i> |
| 1500 - 1515 | Title TBC | Speaker TBC |
| 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, <i>RWTH Aachen University</i> |
| 1600 - 1615 | Unlocking Geological Archives with AI: Multimodal Retrieval and UI Design applied to Critical Mineral Intelligence | Rachel Heaven, <i>UKRI & British Geological Survey</i> |
| 1615 - 1630 | Optimizing Deep Learning Workflows for Seismic Catalog Building | Rossella Fonzetti, <i>Istituto Nazionale di Geofisica e Vulcanologia (INGV)</i> |
| 1630 - 1645 | AI-Powered Understanding of Geological Uncertainty in Fractured Caprocks | Sarah Perez, <i>Heriot-Watt University</i> |
| 1645 - 1700 | <i>TBC</i> | <i>Speaker TBC</i> |
| 1700 - 1715 | Transformer-Based Geotechnical Classification of Borehole Logs with Benchmarking of Uncertainty Quantification Methods: an Italian case study. | Roberto Cilli, <i>GeoResources Université de Lorraine</i> |
| 1715 - 1730 | Looking forward, Publication opportunities and closing words | |

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

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

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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