PhD Projects List 2023

Funding	Supervisor(s)	Project Title	Topic(s)
EPSRC	**Dr Rossella Arcucci**	Breathe In, Breathe Out, combining machine learning with data analysis, fusion and data assimilation for incomplete, noisy air pollution data	Data Science, Climate & Environment
EPSRC	**Dr Rossella Arcucci**	Modelling Extreme Weather Events using Data Science, Machine Learning, and Social Sentiments	Data Science, Climate & Environment
EPSRC	**Dr Rossella Arcucci**, Dr Simone Cenci, *Imperial College Business School*	Towards net-zero: Machine Learning and Data Science for the analysis of corporate environmental impact	Data Science, Climate & Environment
	Dr Ian Bastow, Dr Derek Keir (School of Ocean and Earth Science, University of Southampton)	Monitoring seismicity at volcanoes with geothermal prospects in Ethiopia	Geohazards & Tectonics, Energy & Resources
SSCP	**Dr Rebecca Bell**, Dr Ian Bastow	Investigating subduction plate boundary earthquake hazards using controlled-source seismic data	Geohazards & Tectonics, Data Science
EPSRC	**Dr Branko Bijeljic**	Pore-scale Modelling and Analysis of Reactive Transport in Carbon Storage and Oil Recovery	Energy & Resources
EPSRC	**Professor Martin Blunt**; Dr Branko Bijeljic, Professor Jerry Heng, *Department of Chemical Engineering*	Minimal surfaces in porous materials: wettability design for optimal flow performance	Energy & Resources
EPSRC	**Professor Martin Blunt**	Pore-Scale Imaging, Analysis, and Data-Driven Pore-Scale Modelling	Energy & Resources, Computational Modelling
EPSRC	**Professor Martin Blunt**	Topology, wettability and fluid flow in porous materials	Energy & Resources, Computational Modelling
SSCP; EPSRC	**Dr Pablo Brito-Parada**, Dr Stephanie Muller (BRGM/French Geological Survey), Jacques Villeneuve (BRGM/French Geological Survey)	Coupling Life Cycle Assessment and modelling tools to inform sustainable mineral resource management	Energy & Resources, Computational Modelling
EPSRC	**Dr Pablo Brito-Parada**, Professor Stephen Neethling	Modelling and predicting flotation froth stability	Energy & Resources, Computational Modelling
	Professor Jenny Collier, Dr Gareth Roberts, Dr Lidia Lonergan	Magmatism and Continental Breakup in the South Atlantic	Geohazards & Tectonics
	Professor Jenny Collier, Professor Tim Henstock *(Southampton)*	Structure and tsunamigenic potential of the Lesser Antilles accretionary prism	Geohazards & Tectonics
	Professor Jenny Collier, Professor Tim Henstock *(Southampton)*	Tectonics of the North America/South America plate boundary	Geohazards & Tectonics
STFC	**Professor Gareth Collins**, Dr Navjot Kukreja *(Department of Computer Science, University of Liverpool)* , Associate Professor Nicholas Warner *(Department of Geological Sciences, SUNY Geneseo, USA)*	Automated Crater Detection and Classification with Machine Learning	Planetary Science, Data Science
STFC	**Professor Gareth Collins**	Decoding inner solar system bombardment from impact crater populations	Planetary Science, Computational Modelling
STFC	**Professor Gareth Collins,** Mark Wieczorek *(IPGP)*	Impact Processing of Planetary Crust	Planetary Science, Computational Modelling
STFC	**Professor Gareth Collins**	Meteoroid fragmentation in planetary atmospheres and the formation of crater clusters on Earth and Mars	Planetary Science, Computational Modelling
STFC	**Professor Gareth Collins**	Modelling the Giant South Pole-Aitken basin	Planetary Science, Computational Modelling
STFC	**Professor Gareth Collins**, Dr Tom Davison, Professor Phil Bland *(Curtin)*	Multiscale modeling of compaction of primitive solar system materials	Planetary Science, Computational Modelling
EPSRC	**Professor Gareth Collins**, Professor Matthew Piggott, Professor Sue Dawson (Dundee)	Simulating submarine slide tsunami inundation of the Shetland Islands	Geohazards & Tectonics, Computational Modelling

SSCP	**Dr Fangxin Fang**, Professor Christopher Pain, Dr Paul Wilkinson *(British Geological Survey)* , Dr Oliver Kuras *(British Geological Survey)* , Dr Jorg Herwanger *(MP Geomechanics)*	Anisotropic geoelectrical imaging - can Artificial Intelligence (AI) replace conventional resistivity inversion approaches?	Energy & Resources, Computational Modelling
EPSRC	**Dr Fangxin Fang**, Professor Christopher Pain	New generation data assimilation and rapid response models for urban flooding	Computational Modelling, Geohazards & Tectonics
EPSRC	**Dr Fangxin Fang**, Professor Christopher Pain	Optimisation of sensor locations for observation of air flows/pollutions	Computational Modelling, Climate & Evironment
EPSRC	**Dr Fangxin Fang**, Professor Christopher Pain	Rapid Response Modelling for Assessment of Pollution and Toxic Releases in Complex Urban Environments	Computational Modelling, Climate & Evironment
STFC	**Dr Matthew Genge**	Microspherules in the geological record	Planetary Science
SSCP	**Professor Saskia Goes**, Dr Ian Bastow	Mapping thermal and compositional structure of cratons	Geohazards & Tectonics, Data Science
SSCP	**Professor Saskia Goes**, Professor Jenny Collier	Seismotectonics of the Lesser Antilles Arc	Geohazards & Tectonics, Data Science, Computational Modelling
	Professor Saskia Goes, Dr Gareth Roberts	Structure and Evolution of the African Plate from Geophysical Observations	Geohazards & Tectonics, Data Science
	Professor Saskia Goes, Dr Gareth Roberts	Understanding how subduction has shaped Circum-Pacific tectonics using 3D numerical models	Geohazards & Tectonics, Computational Modelling
EPSRC	**Dr Gerard Gorman**, Professor Paul Kelly *(Department of Computing),* Dr Fabio Luporini	Redundancy, retiming and data flow in compiling finite-difference applications for many core architectures	Computational Modelling
SSCP	**Professor Gary Hampson**, Dr Alex Whittaker, Dr Rebecca Bell, Dr Sam Krevor	Sediment routing controls on CO2 mineralisation potential	Climate & Environment, Energy & Resources
EPSRC	**Dr Claire Heaney**, Professor Christopher Pain	Applying Dimensionality Reduction to Solutions on Finite Element Meshes with Autoencoders	Numerical Modelling
EPSRC	**Dr Claire Heaney**, Professor Christopher Pain	Large Scale AI Modelling for Environmental Flows	Climate & Environment, Numerical Modelling
EPSRC	**Dr Claire Heaney**, Dr Pablo Salinas, Professor Matthew Jackson and Professor Christopher Pain	Simulation of geo-thermal wells with reduced order modelling and data assimilation	Enery & Resources, Numerical Modelling
SSCP	**Professor Matthew Jackson**, Professor Gary Hampson, Marko Aunedi, *Electrical and Electronic Engineering*	Developing the world's largest geobattery: ultra-hightemperature underground thermal energy storage for large-scale electricity storage in the UK	Energy & Resources, Numerical Modelling
SSCP	**Professor Matthew Jackson**, Professor Gary Hampson	Efficient numerical modelling of subsurface hydrogen storage for low carbon energy	Energy & Resources, Numerical Modelling
SSCP	**Professor Matthew Jackson**, Dr Pablo Brito-Parada, Professor Stephen Neethling	Electrokinetic enhanced in-situ resource utilisation (EK-ISRU) for green copper production	Energy & Resources, Numerical Modelling
	Professor Matthew Jackson, Dr Pablo Salinas, Dr Haiyang Hu and Professor Jon Blundy *(University of Oxford)*	Fluid dynamics of magma reservoirs	Computational Modelling; Geohazards & Tectonics
	Professor Matthew Jackson, Professor Chris Pain, Dr Claire Heaney	Rapid modelling of reactive flow using machine learning and dynamic mesh optimisation	Energy & Resources, Numerical Modelling
	Professor Matthew Jackson, Professor Gary Hampson, Professor Alexandra Porter *(Department of Materials*), Dr Geoff Fowler *(Department of Civil and Environmental Engineering*)	Storage and transport of microplastics in groundwater	Computational Modelling, Climate & Evironment
EPSRC	**Dr Cédric M. John**	A Machine Learning Approach to Represent Carbonate Heterogeneities in Forward Stratigraphic Models	Climate & Environment, Data Science
	Dr Cédric M. John	Environmental reconstruction using clumped isotopes: testing the effects and signs of recrystallization in carbonates	Climate & Environment

EPSRC	**Dr Cédric M. John**	Extending the carbonate clumped isotopes paleothermometer to new mineral systems: a computer modelling approach	Climate & Environment, Numerical Modelling
	Dr Cédric M. John	Modelling modern carbonates (Bahamas, Great Barrier Reef) using numerical approaches	Climate & Environment, Numerical Modelling
EPSRC	**Dr Sam Krevor**	Global CO2 storage capacity: Modeling limitations of geography and injectivity	Climate & Environment, Numerical Modelling
	Dr Sam Krevor	Pore-to-core linkages and upscaling for CO2 Storage	Climate & Environment, Energy & Resources
SSCP	Dr Andrew Hughes *(British Geological Survey)* , **Professor Anna Korre**, Dr Evi Petavratzi *(British Geological Survey)*	Assessing the sustainability of lithium brine extraction in high Andean salars	Energy & Resources, Climate & Environment
EPSRC	**Dr John-Paul Latham**, Dr Jiansheng Xiang and Professor Martin Blunt	Modelling the physics of granular rock compaction for characterisation of flow in reservoirs	Energy & Resources
SSCP	**Dr Philippa Mason**, James Lawrence *(Civil Engineering, IC)* , Richard Ghail *(Earth Sciences, Royal Holloway UK)* & Cedric John	Developing time-series InSAR for understanding changes to the ground surface, subsurface, biosphere and environment	Climate & Environment, Data Science
STFC	**Dr Philippa Mason**, Professor Richard Ghail *(Royal Holloway, University of London)* , Dr Gareth Roberts	Understanding surface processes on Venus: in support of the EnVision mission	Planetary Science, Data Science
SSCP	**Professor Mike Mayall**, Dr Alex Whittaker, Professor Gary Hampson, Dr Lidia Lonergan	Submarine channels, deformation, and routing of sediment and plastics to the deep ocean	Climate & Environment
	Professor Susan Hughes *(University of Surrey)*, **Professor Ann Muggeridge**, Dr Emma Hellawell *(LEAP Environmental)*, Dr Sam Krevor	Mitigating greenhouse gas releases from contaminated urban re-development sites	Energy & Resources, Climate & Environment
	Professor Adrian Muxworthy, Dr David Green *(School of Public Health, Imperial)*	Biomagnetic Monitoring as an Urban Air Quality Assessment	Climate & Environment, Life & Health
EPSRC	**Professor Stephen Neethling**	Simulation of charge-slurry interactions in tumbling and stirred mills	Energy & Resources, Computational Modelling
EPSRC	**Professor Stephen Neethling**	The impact of mineral texture on the relationship between particle size, surface exposure and mineral liberation: A key to coarse particle flotation	Energy & Resources, Computational Modelling
SSCP	**Professor Christopher Pain**, Dr Claire Heaney	AI modelling of underground water for heating buildings	Energy & Resources, Computational Modelling
EPSRC	**Dr Adriana Paluszny**, including interaction with Professor Robert Zimmerman	PhD studentship in Next-Generation Fracture Modelling	Computational Modelling; Energy & Resources
	Dr Michele Paulatto, Professor Joanna Morgan	High resolution 3D imaging of an oceanic core complex: interaction of magma, water and faults on the mid-Atlantic ridge	Geohazards & Tectonics, Data Science
	Dr Michele Paulatto, Professor Joanna Morgan	Multi-parameter geophysical imaging of Santorini Volcano	Geohazards & Tectonics, Data Science
EPSRC	**Dr Michele Paulatto**, Dr Sam Krevor, Dr Carl Jacquemyn, Professor Matthew Jackson	Multi-scale characterization of water flow in submarine hydrothermal systems	Geohazards & Tectonics, Computational Modelling
SSCP	**Dr Michele Paulatto**, Dr Lluis Guasch, Professor James Hammond *(Birkbeck University of London)*	Teleseismic full-waveform imaging of active volcanoes	Geohazards & Tectonics, Data Science
EPSRC	**Professor Matthew Piggott**, Dr R. Iestyn Woolway *(University of Reading)* , Professor Stephen Maberly *(UK CEH)*	Accelerating Scientific Discovery of Complex Scientific Applications with Process-Guided Deep Learning: Aquatic Eco-Dynamics in Lakes	Climate & Environment, Life & Health, Data Science
EPSRC	**Professor Matthew Piggott**	Understanding and minimising the potential environmental impacts of tidal range (lagoon) based renewable energy generation via advanced numerical modelling	Energy & Resources, Climate & Environment, Computational Modelling
SSCP	**Dr Yves Plancherel**, Professor Mark Rehkamper, Professor Tina van de Flierdt	Exploiting the GEOTRACES toolbox to characterize ocean biogeochemical processes: trace elements, isotopes and new quasi-conservative tracers	Climate & Environment, Data Science
	Dr Yves Plancherel	Modeling the global Pb cycle: from industrial emissions to the bottom of the ocean	Climate & Environment, Data Science

SSCP	**Dr Yves Plancherel**, Dr Pablo Brito-Parada, Dr Philippa Mason	Tracking Illegal Gold Mining Safely with Earth Observations and Machine Learning	Energy & Resources, Climate & Environment, Data Science
	Professor Mark Rehkämper, Laurence Maurice	Cadmium enrichment in cocoa beans – a stable isotope investigation of Cd sources and mitigation strategies	Life & Health
EPSRC	**Professor Mark Rehkämper,** Dr Claus Svendsen, *NERC Centre for Ecology & Hydrology (CEH)*	Environmental effects and fate of engineered nanomaterials	Climate & Environment
STFC	**Professor Mark Rehkämper**	Mixing and Volatile Depletion in the Early Solar System	Planetary Science
	Professor Mark Rehkämper	Novel applications of trace metal stable isotopes in medical research	Life & Health
STFC	**Professor Mark Rehkämper**	The origin of Earth's volatiles – new constraints from isotopic analyses of meteorites	Planetary Science
SSCP	**Dr Fred Richards**, Dr Gareth Roberts, Professor Saskia Goes, Dr Mark Hoggard *(Australian National University)* , Dr Karol Czarnota *(Geoscience Australia)*	Integrating Geochemistry and Geophysics to Make Critical Metal Treasure Maps	Geohazards & Tectonics, Energy & Resources, Computational Modelling
SSCP	**Dr Gareth Roberts** *(Imperial)* , Dr Conor O'Malley, Dr Philip Mannion *(UCL)* , Dr Mark Sutton *(Imperial)* , Dr Jan Hackel *(Royal Botanical Gardens, Kew)*	Biodiversity and the Evolving Earth: New Data, New Methods, New Insights	Life & Health, Data Science
	Dr Gareth Roberts, Professor Matthew Piggott	Continental Uplift and Erosion From Drainage Patterns: Predicting Sedimentary Flux to Passive Margins	Geohazards & Tectonics, Computational Modelling
SSCP	**Dr Gareth Roberts**, Dr Yves Plancherel, Dr Alex Whittaker, Earth Science Engineering; Charles Gowing *(British Geological Survey)* , Dr Alex Lipp *(University of Oxford, Earth Sciences)*	Hard Rock to Heavy Metal: Data and tools for geochemical baselines and chemical fluxes through landscapes	Geohazards & Tectonics, Climate & Environment, Energy & Resources, Data Science
	Dr Gareth Roberts, Dr Alex Whittaker, Dr Dylan Rood	Histories of mantle convection: Constraints from Arabia's landscape	Geohazards & Tectonics
SSCP	**Dr Gareth Roberts**, Dr Leon Barron *(School of Public Health),* Professor Guy Woodward *(Life Sciences)* , Dr Alex Lipp *(Earth Sciences, University of Oxford)*	Mapping pollutants and biodiversity throughout drainage basins	Climate & Environment, Data Science
	Dr Gareth Roberts, Professor Matthew Piggott, Professor Gareth Collins, Dr Alex Whittaker	Modeling landscape evolution through space and time	Geohazards & Tectonics, Climate & Environment, Computational Modelling
	Joanne Johnson *(British Antarctic Survey)* , **Dr Dylan Rood** *(Imperial College London)* , Associate Professor Brent Goehring *(Tulane University)* , and Dr Stephen Roberts *(British Antarctic Survey)*	Exploring terrestrial geological eividence for past glaciation and volcanism in the Thwaites Glacier catchment, Antarctica	Geohazards & Tectonics, Climate & Environment
	Dr Dylan Rood	Using Cosmogenic Surface Exposure Dating to Reconstruct Late-Holocene Glacier and Climate Stability to Determine Precedence for Recent Declines in Snowpack and Water Resources in the American Pacific Northwest	Climate & Environment,
	Dr Dylan Rood, Dr John-Paul Latham, Dr Peter Stafford	Validating Earthquake Hazard Models For Critical Engineered Structures Using Geologic Data And Cosmogenic Isotopes	Geohazards & Tectonics
	Dr Dylan Rood	Will climate change make coastal erosion rates faster?: Comparing historic and Holocene cliff retreat rates using cosmogenic isotopes with numerical models	Geohazards & Tectonics, Climate & Environment
STFC	**Professor Mark A. Sephton**, Dr Jonathan Watson, *with collaboration opportunities (Dr Christian Potiszil, Okayama University Japan)*	Astrobiology and meteorites from the early Solar System	Planetary Science, Life & Health
	Professor Mark A. Sephton, Professor Craig Smalley, Professor Al Fraser	Capture Carbon Dioxide on Shales	Climate & Environment
STFC	**Professor Mark A. Sephton**, Dr Jonathan Watson	Extracting Records of Life on Mars	Planetary Science, Life & Health
EPSRC	**Professor Mark A. Sephton**, Dr Simon Davis, David Bell *(Protium)*	Forensic Detection of Microplastics	Climate & Environment,

STFC	**Professor Mark A. Sephton**, Dr Jonathan Watson	Life Detection at Jupiter's Icy Moon Europa	Planetary Science, Life & Health
STFC	**Professor Mark A. Sephton**, Dr Jonathan Watson	Organic Preservation in Jezero Crater – Site of the Mars 2020 Perseverance Rover	Planetary Science, Life & Health
STFC	**Professor Mark A. Sephton**, Dr Simon Davis, David Bell *(Protium)*	Recognising Life in Samples Returned from Mars	Planetary Science, Life & Health
SSCP	**Dr Mark Sutton,** Dr Yves Plancherel, Dr Catherine Head, *ZSL*	Leveraging emerging numerical models from engineering to support coral reef conservation	Climate & Environment, Computational Modelling
	Professor Tina van de Flierdt, Dr Yves Plancherel, Professor Mark Rehkämper	Understanding Modern Biogeochemical Cycles in the context of the international GEOTRACES project – Lead, cadmium, neodymium	Climate & Environment
	Professor Dominik Weiss	Arsenic Contamination of Drinking Water	Life & Health
	Professor Dominik Weiss	Geochemistry of Non-Traditional Stable Isotopes	Climate & Environment, Life & Health
	Professor Dominik Weiss	Human and Natural Control on Global Atmospheric Trace Element Cycles	Climate & Environment
	Professor Dominik Weiss	Micronutrient cycling in submerged soils and uptake into rice	Climate & Environment, Life & Health
EPSRC	**Professor Dominik Weiss**	Nuclear Waste – How to deal with it safely	Climate & Environment, Energy & Resources
	Professor Dominik Weiss	The Aqueous Chemistry of Actinides and Metalloids	Climate & Environment
	Dr Alex Whittaker, Dr Sam Brooke *(Terrabotics - industry partner),* Dr Becky Bell, Dr Gary Hampson	Landscape sensitivity to past and future climate: Solving the intermittency puzzle	Climate & Environment
	Dr Alex Whittaker, Dr Rebecca Bell	Tectonics from topography in Central Greece: decoding the history of fault growth and landscape evolution in the Corinth Rift	Geohazards & Tectonics
SSCP	**Professor Jamie Wilkinson**, Pieter Vermeesch, *University College London*	Detrital mineral records of magmatism and fertility in porphyry copper districts	Energy & Resources
	Professor Jamie Wilkinson	Development of UV-fluorescence spectroscopy as a tool for mineral exploration	Energy & Resources
	Professor Jamie Wilkinson	Residence and mobility of metals in the alteration zones of porphyry ore systems	Energy & Resources