

Department of Earth Sciences

MSc by Research (MScR) projects for 2021 - 2022

MSc by research at Durham offers you the opportunity to pursue an independent research project while benefitting from expert supervision; developing an understanding of research study; linking your research to your future career; and obtaining a taste of what a PhD might entail.

MSc in Earth Sciences

- The permeability of beds of polydisperse particles: Implications for fluid flow through soils, sediments, magmas and rocks. ([Dr Fabian Wadsworth](#), Prof. Andrew Aplin)
- Concentrate, Life is Hard: the role of minerals in protiomolecule formation ([Prof Chris Greenwell](#))
- Nitrogen pollution recorded in macroalgae. ([Dr Darren Gröcke](#), Prof Chris Greenwell)
- Sulphur isotopes in modern and archaeological deer. ([Dr Darren Gröcke](#), Dr Kurt Gron)
- Tracking past sea level changes via novel isotope geochemistry. ([Prof David Selby](#), Dr Jerry Lloyd)
- Granite-Related Critical Element mineralization in central Sweden. ([Prof David Selby](#), Dr Edward Lynch)
- What have we learnt? Meta-analysis of greenhouse gas fluxes from peatlands. ([Prof Fred Worrall](#), Prof Martin Evans, Dr Julia Knapp)
- After the sheep have gone – a future for the uplands without sheep ([Prof Fred Worrall](#), Dr Julia Knapp)
- Finding hotspots and cold spots - mitigating climate change through land use. ([Prof Fred Worrall](#), Dr Julia Knapp)
- Cold humid Islands: peatlands as tools for cooling the climate. ([Prof Fred Worrall](#), Dr Julia Knapp)
- The effect of forest cutting on water and nutrient availability. ([Dr Julia Knapp](#), Prof Fred Worrall)
- Testing diachronous deformation models from syn-tectonic mineralization in ancient accretionary prisms. ([Bob Holdsworth](#), Catriona Menzies, Nick Roberts (BGS Keyworth))
- Near Surface fissure fills and fluid flow associated with emplacement of the Cenozoic Cleveland mega-dyke, N Yorkshire ([Bob Holdsworth](#), Rich Brown)

MSc in Computational Geosciences

- Computing evolutionary history from palaeontological data? ([Dr Martin Smith](#))
- Numerical modelling of the influence of volcanic eruptions on past climates ([Prof James Baldini](#), Prof Jeroen van Hunen)
- Banana-doughnut kernels for modelling waves in the Earth. ([Prof Stefan Nielsen](#), Dr Stefano Giani)
- Machine learning for laboratory earthquakes: detecting events in highly noisy time sequences. ([Prof Stefan Nielsen](#), Dr Stefano Giani)
- The dynamics of granite-greenstone belts. ([Prof Jeroen van Hunen](#), Prof. Mark Allen, Dr Nick Gardiner)

- Lithosphere-scale inheritance in the continents ([Prof Ken McCaffrey](#), Prof Jeroen van Hunen)
- Modelling martian flows ([Prof. Jim McElwaine](#), Prof Jeroen van Hunen)
- Enhancing and analysing geospatial data using machine learning. ([Dr Andrew Valentine](#), Dr Lara Kalnins, Dr Richard Walters)
- Time-series analysis in Cambrian stratigraphy. ([Dr Martin Smith](#), Dr Matthias Sinnesael)
- New techniques for measuring Earth's free oscillation spectrum. ([Dr Andrew Valentine](#), Dr Jennifer Jenkins)
- Time-series analysis in Cambrian stratigraphy. ([Dr Martin Smith](#), Dr Matthias Sinnesael)
- Stochastic modelling of Lower Carboniferous fluvial systems: the Fell Sandstone Northumberland ([Dr Stuart Jones](#), Prof Jeroen van Hunen)

MSc in Palaeoecosystems

- Do clades exhibit an early burst of disparity?. ([Dr Martin Smith](#))
- Why do Cambrian organisms lack mineralisation? ([Dr Martin Smith](#))
- Using $\delta^{13}\text{C}_{\text{org}}$ to improve the timeline of the Cambrian explosion ([Dr Martin Smith](#))
- An improved Bayesian framework for global stratigraphy correlation ([Dr Martin Smith](#), [Dr Matthias Sinnesael](#))
- Cambrian cyclostratigraphy ([Dr Martin Smith](#))
- All the better to see you with controls on visual acuity in Cambrian communities ([Dr Martin Smith](#))
- How does morphology evolve? ([Dr Martin Smith](#))
- Reliability of phylogenetic results ([Dr Martin Smith](#))
- Preservation of Permian fishes from the Marl Slate of County Durham ([Dr Martin Smith](#), [Dr Stuart James](#))

MSc in Geoenergy

- Controls on faulted geothermal systems. ([Prof. Ken McCaffrey](#), Dr Charlotte Adams, Prof. Jon Gluyas)
- Fissure fills in fractured basin material ([Prof. Bob Holdsworth](#), [Prof. Ken McCaffrey](#))
- Geothermal potential of gas fields. ([Prof. Jon Gluyas](#), Dr Charlotte Adams, Dr Stuart Jones)
- Hydrocarbon potential in the Solway Firth: an onshore and offshore investigation. ([Dr Stuart Jones](#), Prof Jon Gluyas)
- Appraising the geothermal potential of the Lower Carboniferous Fell Sandstone, Northumberland. ([Dr Stuart Jones](#), Prof Jon Gluyas, Dr Charlotte Adams)

- Understanding shale swelling for well-bore stability. ([Prof Chris Greenwell](#))
- Assessing the effect of organic matter on shale swelling. ([Prof Chris Greenwell](#))
- The heat beneath our feet: modelling geothermal energy from abandoned mines. ([Prof Jeroen van Hunen](#), Dr Charlotte Adams)
- The geology of fissure fills in fractured crystalline reservoirs. ([Bob Holdsworth](#), Ken McCaffrey, Richard Jones (GRL))

MSc in Volcanology

- Volcanic debris avalanche deposits: a micro-textural study of a volcanic slip surface ([Dr Rich Brown](#), Dr Katie Preece)
- Volcanic ash aggregates I: pyroclastic density currents ([Dr Rich Brown](#), Dr Fabian Wadsworth)
- Volcanic ash aggregates II: fall deposits ([Dr Rich Brown](#), Dr Fabian Wadsworth)
- Welding and coalescence of hot volcanic ash ([Dr Fabian Wadsworth](#), Prof Ed Llewellyn, Dr Madeleine Humphreys)
- Tuffites as textural and geochemical records of volcanic valve mechanics ([Dr Fabian Wadsworth](#), Prof Ed Llewellyn)
- Bubble motion in hot magma: A collaboration between artists and scientists Welding and coalescence of hot volcanic ash ([Dr Fabian Wadsworth](#), Prof Ed Llewellyn, Colin Rennie)
- Welding of volcanic ash and pyroclasts: The effect of magma composition ([Dr Fabian Wadsworth](#), Prof Ed Llewellyn, Dr Madeleine Humphreys)
- Distribution of Pacific Ocean island volcanism ([Prof Colin Macpherson](#), Prof Ken McCaffrey)
- Volcano distribution in northern and central American arcs ([Prof Colin Macpherson](#), Prof Ken McCaffrey)
- Formation of lava tubes and magma conduits: shear-thinning induced localisation in bubbly lava and magma ([Prof Ed Llewellyn](#), Dr Antonio Capponi)
- Volcanic influences on atmospheric chemistry and dynamics ([Prof James Baldini](#), Dr Rich Brown)
- The compressibility of bubbly magma: numerical modelling to describe an essential magma property ([Prof Ed Llewellyn](#), Dr Jason Coumans, Dr Fabian Wadsworth)
- Plugging a volcanic conduit: a numerical investigation of convection in an open volcanic conduit ([Prof Ed Llewellyn](#), Dr Antonio Capponi)
- Multiphase lattice-Boltzmann simulation of sintering of volcanic ash ([Prof Ed Llewellyn](#), Dr Halim Kususmaatmaja)

Further information and how to apply for a MSc by Research degrees: contact:
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