

# School of Earth, Atmospheric & Environmental Sciences PhD Projects for 2008/2009

The School is offering a range of research topics leading to the degree of PhD starting in September 2009. A number of Research Council Studentships are available as well as industry funding. Proposed projects are:

## Isotope Geochemistry & Planetary Science

1. Investigating the solar system with noble gases - Drs J. Gilmour, R. Burgess, G. Holland, S. Crowther, I. Strashnov and Professor C. Ballentine
2. Metamorphism on asteroids in the early solar system - Drs M. Schonbachler, J. Gilmour and R. Burgess
3. A study of platinum group mineral origins and mobility in the Earth's crust using osmium isotope systematics - Drs I.C. Lyon, M. Schonbachler and Professor D.J. Vaughan
4. The cooling history of the first asteroids - Drs M. Schonbachler, M. Rehkemper (Imperial College), G. Benedix (Natural History Museum) and J. Gilmour
5. Understanding phase behaviour in the geological storage of carbon dioxide - Professor C. Ballentine and Dr A. Masters (SCEAS)
6. Reconstructing the tectonic evolution of Mars using automatic mapping software - Drs M. Jones, J. Gilmour and N. Thacker
7. Backarc systems and seawater subduction - Professor C. Ballentine Drs R. Burgess, and G. Droop
8. The provenance and geochemical history of gold - Drs M. Schonbachler, R. Hough (CSIRO) and Professor R. Patrick

## Minerals and Fluids

9. Microbe-metal interactions in the environment (CASE study with Geological Survey of Northern Ireland) - Dr G. Earls and Professors J. Lloyd and R. Patrick
10. Microbially-derived extracellular proteins in nanoparticle formation - Drs C. Pearce, J. Moreau and Professors J. Lloyd and R. Patrick - NO LONGER AVAILABLE
11. Microorganisms and the formation of ferromanganese concretions: their role in biomineralisation and their potential as palaeo-climate indicators - Dr B. van Dongen and Professors R. Patrick and J. Lloyd
12. Remediation of organics using novel bionanominerals - B van Dongen and Professors R. Patrick and J. Lloyd
13. Exploring the metal-microbe interface using advanced mass spectrometry techniques - Drs I. Lyon and Professors D. Vaughan & J. Lloyd

## Structural and Petrological Geoscience

14. Documenting the collapse of a mountain belt: a comparison of P-T-time paths from zoned garnets - Drs G. Droop and R. Burgess
15. Experimental studies of the compositions and stabilities of phyllosilicates in subduction zones - Drs A. Pawley and G. Droop
16. Norwegian orthopyroxene eclogites: petrogenesis and implications for metasomatism and crust mantle interactions during subduction continental crust - Drs G. Droop, R. Burgess, S. Cuthbert (Paisley) and Professor C. Ballentine
17. Study of fault activation under various stress conditions - Professor E. Rutter and Dr. K Brodie

## Basin Studies, Sedimentology and Stratigraphy

18. Geomorphology of Antarctic submarine slopes - Drs R. Larter, D. Shoosmith (BAS) and N. Mitchell
19. Reactive transport modelling as a tool for modelling burial diagenesis within a carbonate system - Professor C. Ballentine and Dr C. Hollis
20. Tectono-sedimentary evolution of continental slopes with mobile substrates - Professor R. Gawthorpe
21. Gradients of submarine canyon walls and implications for the development of large-scale morphology - Drs N. Mitchell and M. Hicks
22. Sedimentary response to structural evolution of continental slopes with mobile substrates - Drs M. Huuse, D. Irving and Professor R. Gawthorpe
23. Source-to-sink analysis of rift basin tectonics and sedimentation in the basin and range, USA - Dr S. Brocklehurst and Professor R. Gawthorpe
24. Glacial landscape evolution - numerical approaches constrained by field analogues - Drs S. Brocklehurst, E. Finch and K. MacGregor (USA)
25. Establishing a high-resolution chronology of late Quaternary climate change on South Island, New Zealand using tephra horizons - Drs M. Jones, S. Covey-Crump and P. Almond
26. Tunnel valleys: seismic imaging, genetic models and analogues for hydrocarbon reservoirs in North Africa and groundwater reservoirs in Northern Europe - Drs M. Huuse, D. Irving and J. Moreau
27. UK Quaternary glaciations seen through the 3D seismic camera - Drs D. Irving, M. Huuse, and S. Brocklehurst

## Contact

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## Environmental Geoscience and Biogeochemistry

28. The role of decomposer fungi in carbon dynamics over a period of agricultural land use change - Drs C. Robinson and P. Murray (North Wyke Research)
29. Critical role of organic matter in the natural attenuation of acid mine drainage - Professors J. Lloyd, D. Vaughan and Dr B. van Dongen
30. Biogeochemistry of hydrogen-utilising bacteria in alkaline and cementitious environments of importance to the nuclear industry - Professors J. Lloyd and F. Livens
31. Spatial and temporal variation in physical and chemical character of natural organic matter in natural waters - Drs S. Boulton and B. van Dongen
32. Understanding the effects of a warming climate on the release of terrestrial carbon in the Arctic region - Drs S. Boulton and B. van Dongen
33. Genomic and post-genomic analysis of a marine metal-reducing bacteria - Professor J. Lloyd and Drs M. Upton and J. Cavet
34. The enzymology and molecular ecology of microbial arsenic mobilization - Professors J. Lloyd, D. Vaughan and Drs D. Polya and R. Wogelius
35. Climate change and groundwater in the Amu Darya Basin, Uzbekistan: impacts on quality and inputs to the Aral Sea - Dr D. Polya, Professor C. Ballentine, Mrs P. Lythgoe and R. Kulmatov
36. Modelling risks arising from arsenic hazard in shallow ground waters - Dr D. Polya, Mr P. Lythgoe and Dr B. Bounvilay

## Paleontology

37. Fossil biomarkers - understanding the preservations of biomolecules in fossilised tissues - Drs B. van Dongen, R. Wogelius and P. Manning

## Atmospheric Science

38. Gas-phase atmospheric kinetics and branching ratios of formation of alkyl nitrates - Dr C. Percival
39. Airborne chemical ionisation mass spectrometer studies of HNO<sub>3</sub> and NH<sub>3</sub> - Dr C. Percival
40. Laboratory studies of atmospheric aerosol chemistry and reactivity - Drs C. Percival and A. Horn
41. The impact of aerosol on ice clouds; implications for climate change - Professor T. Choulaton and Drs M. Gallagher, P. Connolly and K. Bower
42. Field, laboratory and numerical modelling studies of the persistence of super cooled cloud layers - Dr P. Connolly
43. Investigating the radiative properties of stratocumulus clouds using airborne hyperspectral imaging - Professors H. Coe and G. Vaughan
44. Scattering ice clouds - Drs A. Webb and P. Connolly
45. Predicting chemical weather - regional scale atmospheric modelling - Drs G. McFiggans and M. Bane
46. Photochemical chamber studies - simplifying the complex atmosphere - Dr G. McFiggans
47. Physical/chemical properties of aerosol components - Drs G. McFiggans and D. Topping
48. Atmospheric organic aerosol investigations - Professor H. Coe and Dr G. McFiggans
49. Directional radiation exposure in the built environment - Dr A. Webb
50. Development and use of a time of flight aerosol mass spectrometer - Professor H. Coe and Dr J. Allen
51. Atmospheric airborne aerosol measurements - Professor H. Coe and Dr M. Gallagher
52. Soot in the atmosphere - Professor H. Coe
53. Aerosol - cloud interactions - Professor H. Coe and Dr G. McFiggans
54. Testing aerosol processes in regional models using field measurements - Professor H. Coe and Dr G. McFiggans
55. Real time observations of primary biological aerosols using airborne instrumentation - Dr M. Gallagher
56. 3D ice crystal visualisation using airborne imaging instruments - Dr M. Gallagher
57. Novel application of laser optical particle and 2D imaging spectrometer probes for direct measurement of size segregated dust fluxes - Dr M. Gallagher
58. Aerosol and chemical transport in deep convection - Professor G. Vaughan
59. Remote sensing measurements of the atmospheric boundary layer - Professor G. Vaughan
60. Inertia-gravity waves and layering in the lower stratosphere - Professor G. Vaughan

