

# School of Earth, Atmospheric and Environmental Sciences PhD Projects 2010

The School is offering a range of research topics leading to the degree of PhD starting in September 2010. A number of Research Council Studentships are available as well as industry funding. Proposed projects are:

## Atmospheric Science

1. **Predicting chemical weather - regional scale atmospheric modelling** - Professors G McFiggans and M Bane
2. **Greenhouse Gas Emissions from the UK** - Professors M Gallagher, G McFiggans and Dr C Percival
3. **Measurement of Dust Flux Source Functions by Eddy Correlation in Natural Micro-scale Dust Re-suspension Phenomena** - Professor M Gallagher
4. **Stratospheric Intrusions and deep convection** - Prof G Vaughan and Dr D Schultz
5. **Application of Real-Time Flow Cytometry for Measurements of Climatically Relevant Biological Aerosols** - Professor M Gallagher, Dr P Connolly and M Flynn
6. **Gas-phase atmospheric kinetics and branching ratios of formation of alkyl nitrates** - Dr C Percival
7. **Laboratory studies of atmospheric aerosol chemistry and reactivity** - Drs C Percival and A Horn
8. **The impact of aerosol on ice clouds; implications for climate change** - Professors T Chouartoun, M Gallagher and Drs P Connolly and K Bower
9. **Field, laboratory and numerical modelling studies of the persistence of super-cooled cloud layers** - Dr P Connolly
10. **Scattering ice clouds** - Drs A Webb and P Connolly
11. **Photochemical chamber studies - simplifying the complex atmosphere** - Professor G. McFiggans
12. **Physical/chemical properties of aerosol components** - Professor G McFiggans and D Topping
13. **Directional radiation exposure in the built environment** - Dr A Webb
14. **Development and use of a time of flight aerosol mass spectrometer** - Professor H Coe and Dr J Allen
15. **Atmospheric airborne aerosol measurements** - Professors H Coe and M Gallagher
16. **Aerosol - cloud interactions** - Professors H Coe and G McFiggans
17. **Testing aerosol processes in regional models using field measurements** - Professors H Coe and G McFiggans
18. **Novel application of laser optical particle and 2D imaging spectrometer probes for direct measurement of size segregated dust fluxes** - Prof M Gallagher
19. **Aerosol and chemical transport in deep convection** - Professor G Vaughan
20. **Remote sensing measurements of the atmospheric boundary layer** - Professor G Vaughan
21. **Inertia-gravity waves and layering in the lower stratosphere** - Professor G Vaughan

## Basin Studies and Petroleum Geoscience

22. **Evolution of the Great Australian Bight: from continental rift to open ocean** - Drs M Huuse and N Mitchell
23. **Basin-scale sediment mobilisation and fluid flow in the Northern North Sea** - Dr M Huuse, Professor R Gawthorpe, C Jackson (Imperial College)
24. **Evolution of the giant Southern North Sea Delta** - Drs D Irving, M Huuse, P Gibbard (Cambridge)
25. **Shallow hazards and CO2 storage opportunities in the North Sea** - Drs D Irving and M Huuse
26. **Accumulation of sediments in continental slope canyons during the recent high-stand sea-level conditions of the Holocene** - Drs N Mitchell and M Huuse
27. **Development of submarine canyons and channels** - Drs N Mitchell, D Long, D Tappin M Hicks and M Huuse
28. **Reconstruction of burial diagenetic processes in a post-rift regime** - Dr C Hollis, Prof C Ballentine, Dr F Whitaker, Dr G Jones
29. **The role of stylolites in controlling fluid flow and diagenesis in carbonate** - Dr C Hollis, Professor R Gawthorpe, Dr A Barnett, Professor P Wright, BG
30. **Reactive transport modelling as a tool for modelling burial** - Dr C Hollis and Professor C Ballentine (No longer available)
31. **Sedimentary response to structural evolution of continental slopes with mobile substrates** - Drs M Huuse, D Irving and Professor R Gawthorpe
32. **Glacial landscape evolution - numerical approaches constrained by field analogues** - Drs S Brocklehurst, E Finch and K MacGregor (USA)
33. **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
34. **UK Quaternary glaciations seen through the 3D seismic camera** - Drs D Irving, S Brocklehurst and M Huuse
35. **Glaciation of the North Sea Basin** - Drs M Huuse, D Irving and J Moreau

## Contact

School of Earth, Atmospheric and Environmental Sciences  
The University of Manchester  
Manchester  
M13 9PL

tel +44 (0)161 275 0776  
fax +44 (0)161 306 9361  
email [pg-earthsci@manchester.ac.uk](mailto:pg-earthsci@manchester.ac.uk)  
[www.manchester.ac.uk/seaes](http://www.manchester.ac.uk/seaes)

36. **Evolution of Late Triassic extensional basin fill along the Atlantic margin: a comparative study of the Fundy Basin, Nova Scotia (Canada), High Atlas Basin (Morocco) and Lusitania Basin (Portugal)** - Professor J Redfern, Dr D Hodgetts and B Williams
37. **Constraining the evolution of Permo Carboniferous ice sheets across Gondwana: integrated regional sedimentological analysis and zircon dating using laser ablation ICPMS and analysis of U Pb, Hf isotopes** - Professors J Redfern and B Williams  
(Please also see projects under Structural and Petrological Geoscience)

## Structural and Petrological Geoscience

38. **Documenting the collapse of a mountain belt: a comparison of P-T-time paths from zoned garnets** - Drs G Droop and R Burgess
39. **Experimental studies of the compositions and stabilities of phyllosilicates in subduction zones** - Drs A Pawley and G Droop
40. **Grain growth in polymineralic rocks** - Dr S Covey-Cump
41. **Improving the descriptions of the plastic flow properties of geological materials** - Dr S Covey-Cump
42. **A Comparative study of texture development in marbles deformed under different loading geometries** - Drs S Covey-Crump, J Mecklenburgh, E Mariani, G Molli
43. **Experimental Study of Deformation-Metamorphism Relationships** - Professor E Rutter and Dr K Brodie  
(Please also see projects under Basin Studies and Petroleum Geoscience)

## Environmental Geochemistry and Geomicrobiology

44. **Plant litter decomposition in soils: is it really a fungal world? Simultaneous fungal and bacterial community characterisation in soils** - Dr C Robinson and Professor J Lloyd
45. **Microbial degradation of organic matter and arsenic mobilisation in the Pannonian Basin** - Dr Bart E van Dongen, Professors D Poly and J Lloyd
46. **The geomicrobiology of alkaline and cementitious nuclear waste** - Professors J Lloyd, K Morris and F Livens
47. **Sustainable groundwater development in South-East Asia** - Professors D Poly, J Pan (Mathematics), Dr. Johannes Sauer (Economics)
48. **Critical role of organic matter in the natural attenuation of acid mine drainage** - Professors J Lloyd, D Vaughan and Dr B van Dongen
49. **Spatial and temporal variation in physical and chemical character of natural organic matter in natural waters** - Drs S Boulton and B van Dongen
50. **Understanding the effects of a warming climate on the release of terrestrial carbon in the Arctic region** - Drs S Boulton and B van Dongen
51. **Genomic and post-genomic analysis of a marine metal-reducing bacteria** - Professor J Lloyd and Drs M Upton and J Cavet
52. **The enzymology and molecular ecology of microbial arsenic mobilization** - Professors J Lloyd, D Vaughan, D Poly and Dr R Wogelius
53. **Climate change and groundwater in the Amu Darya Basin, Uzbekistan: impacts on quality and inputs to the Aral Sea** - Professors D Poly, C Ballentine, Mr P Lythgoe and R Kulmatov
54. **Geogenic arsenic attributable health risks in UK and European Union** - Professor D Poly, Drs M J Watts (British Geological Survey), P Haris (De Montfort University) and Professor J Pan (Mathematics)  
(Please also see projects under Mineral Sciences)

## Mineral Sciences

55. **Microbial response to soil chemistry defined by the Tellus dataset, Northern Ireland** - Professors R Patrick, J Lloyd; GSNI: M Young PNNL: C Pearce
56. **Selenium in the natural environment: source to sink and biotechnological potential** - Professors R Patrick and J Lloyd and Drs B Van Dongen and C Pearce
57. **Engineering novel bionanominerals for bioremediation** - Professors J Lloyd, D Vaughan and R Patrick
58. **Microorganisms and the formation of ferromanganese concretions: their role in bio-mineralisation and their potential as palaeo-climate indicators** - Dr B van Dongen and Professors R Patrick and J Lloyd
59. **Exploring the metal-microbe interface using advanced mass spectrometry techniques** - Dr I Lyon and Professors D Vaughan and J Lloyd  
(Please also see projects under Environmental Geochemistry and Geomicrobiology)

## Isotope Geochemistry and Cosmochemistry

60. **Early solar system volcanism on asteroids as recorded in meteoritic glasses** - Drs H Busemann, J D Gilmour, N Vogel and R Wieler (both ETH Zurich)
61. **Tracing Mantle Structure and Chemical Evolution Using Noble Gas Isotopes** - Prof C Ballentine; Drs G Holland, R Burgess J D Gilmour
62. **CO2 Capture and Energy Resources: Tracking the Crustal Carbon Cycle Using Noble Gas Isotopes** - Professor C Ballentine, Dr Z Zheng and Professor B S Lollar
63. **Probing the interstellar medium from laboratory samples** - Drs I C Lyon and J D Gilmour
64. **The extraction and study of interstellar grains** - Drs I C Lyon and J D Gilmour
65. **Halogens in volcanic systems and their fluxes to the ocean and atmosphere** - Dr R Burgess and Professor C Ballentine
66. **Chronology of the mare basalts and chemical evolution of the lunar mantle** - Drs R Burgess, I Crawford (Birkbeck, University of London) and Katherine Joy (Lunar and Planetary Institute/Johnson Space Centre, USA)
67. **The search for carbonate and other fragile stardust in our solar system** - Drs M Schonbachler, H Busemann, C Kemper (Jodrell Bank Centre for Astrophysics) and I C Lyon
68. **Tracing the origin of the Earth's building blocks using nucleosynthetic anomalies** - Drs M Schonbachler and I C Lyon
69. **Metamorphism on asteroids in the early solar system** - Drs M Schonbachler, J D Gilmour and R Burgess
70. **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 Vaughan
71. **The cooling history of the first asteroids** - Drs M Schonbachler, M Rehkemper (Imperial College), G Benedix (Natural History Museum) and J D Gilmour
72. **Backarc systems and seawater subduction** - Professor C Ballentine, Drs R Burgess and G Droop
73. **The provenance and geochemical history of gold** - Drs M Schonbachler, R Hough (CSIRO) and Professor R Patrick
74. **An in-depth study of meteorite matrix** - Dr I C Lyon and Dr P Bland (Imperial College London)

## Palaentology

75. **Comparison of skeletal form and function between extant and extinct vertebrates** - Drs P Manning, B Sellers and I Margrett