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Mr Michael Riley

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Biography

Michael Riley has a BA in Philosophy, a BSc in Mathematics and an MSc in Engineering Hydrology. He was engaged as a Research Associate in the Department of Civil Engineering at the University of Newcastle upon Tyne in 1990 to work on groundwater pollution modelling, and was appointed to the post of Lecturer in Groundwater Engineering in 1995. In 1999 he moved from Newcastle to his present position at Birmingham.

Postgraduate supervision

Research Students since 2001

Anna Jeffcoat: Exploring the hydraulic properties of discontinuity geometry in the UK Triassic Sandstones

Ben Furlong: Regional scale solute transport in the permo-triassic sandstone aquifer of the Lower Mersey basin, North West England

Philipp Blum: Upscaling of hydro-mechanical processes in fractured rock

Abdulrahman al Ghamdi: Groundwater salinity in Bahrain

Salah Sidahmed: Desert irrigation from groundwater

Research

Research groups

Water Sciences (file:///C:/research/clusters/water/index.shtml)

Hydrogeology (file:///C:/research/clusters/water/hydrogeology.shtml)

Research interests

- Flow and contaminant transport in fractured and porous media
- Mathematical and numerical modelling in Earth Sciences

Current / recent research

Manufactured nanoparticle migration in groundwater

Funding: NERC

SWITCH – Subsurface virus migration

Funding: EU FP6

Collaborators: Robens Centre, Surrey University, U.K.; 32 partners led by UNESCO IHE, Delft

Migration of Enteric Viruses in Deep Aquifers: Intergranular Transport Processes, Sorption and Survival

Funding: NERC

Partners: Robens Centre for Public and Environmental Health (RCPEH), University of Surrey, UK; Public Health Laboratory, Royal Berkshire Hospital, Reading, UK

Advanced Logging Investigations of Aquifers in Coastal Environments (ALIANCE)

Funding: EU

Partners: CNRS, Institut des Sciences de la Terre, de l'Eau et de l'Espace (ISTEEM), Montpellier, France; Swiss Federal Institute of Technology (ETH), Department of Earth Sciences, Zürich, Switzerland; Universidad de Oviedo, Department of Geology, Oviedo, Spain; CNRS, Laboratoire de Mécanique et d'Acoustique (LMA), Marseille, France; Advanced Logic Technology, Redange-sur-Attert, Luxembourg; Geo Energy S.A., Le Vaudreuil, France

Where rivers meet: landscape, ritual, settlement and the archaeology of river gravels

Funding: English Heritage

Sediment filled fractures in Triassic Sandstones - pathways or barriers to contaminant transport?

Funding: EPSRC

Partners: British Geological Survey; University of Sheffield

The Impact of Upscaling Thermo-Hydro-Mechanical (THM) Processes on Deep Waste Disposal Performance Assessment

Funding: UK NIREX Ltd

Statistical modelling of rock fracture and statistical analysis of rock fracture data

Mathematical modelling of protein degradation and amino acid racemisation

Partners: University of Newcastle upon Tyne, UK; University of Sheffield, UK; University of Oxford, UK; University of Derby, UK; University of Glasgow, UK;University of Oregon, USA; University of Leiden, The Netherlands; Delft University of Technology, The Netherlands; The Natural History Museum, London, UK

Other activities

Administrative Responsibilities

Head of Academic Programme (Earth Sciences)

Publications

Greswell, R. B., **Riley, M. S**., Fernandes Alves, P, Tellam, J. H. (2009) A heat perturbation flow meter for application in soft sediments. *Journal of Hydrology.* doi: 10.1016/j.jhydrol.2009.02.054

Blum, P., Mackay, R., **Riley, M. S.** (2009) Stochastic simulations of regional scale advective transport in fractured rock masses using block upscaled hydro-mechanical rock property data. *Journal of Hydrology.* doi:10.1016/j.jhydrol.2009.02.009.

Haacke, R. R., Westbrook, G. K. and **Riley, M. S**. (2008) Controls on the formation and stability of gas hydrate-related bottom-simulating reflectors (BSRs): A case study from the west Svalbard continental slope. *Journal of Geophysical Research*, 113, B05104, doi: 10.1029/2007JB005200.

Le Borgne, T., Bour, O, **Riley, M. S**., Gouze, P., Belgouhl, A., Lods, G., Le Provost, R., Greswell, R. B., Ellis, P. A., Isakov, E, Last, B. J. and Pezard, P. (2007) Comparison of alternative methodologies for identifying and characterizing preferential flow paths in heterogeneous aquifers. *Journal of Hydrology*, 345(3-4), 134 – 148

Hitchmough, A. M., **Riley, M. S**., Herbert, A. W. and Tellam, J. H. (2007) Estimating the hydraulic properties of the fracture network in a sandstone aquifer. *Journal of Contaminant Hydrology*, 93, 38 – 57.

Blum, P., Mackay, R., **Riley, M. S**. and Knight, J. L. (2007) Hydraulische Modellierung und die Ermittlung des repräsentativen Elementarvolumens (REV) im Kluftgestein. *Grundwasser,* 12, 48 – 65.

Blum, P., Mackay, R. and **Riley, M. S**. (2007) Coupled Hydro-Mechanical Modelling of Flow in Fractured Rock. In: Sharp, J. M. and Krasny, J. (Eds.), *IAH Selected Papers on Hydrogeology, Groundwater in Fractured Rocks*, 567 – 574.

Riley, M. S. (2005) Fracture trace length and number distributions from fracture mapping, *Journal of Geophysical Research*, 110, B08414.

Blum, P., Mackay, R. **Riley, M. S**. and Knight, J. L. (2005) Performance assessment of a nuclear waste repository: Upscaling coupled hydro-mechanical properties for far-field transport analysis. *International Journal of Rock Mechanics and Mining Sciences*, 42, 781-792.

Riley, M. S. (2005), Fracture trace length and number distributions from fracture mapping, Journal of Geophysical Research, 110, B08414, doi: 10.1029/2004JB003164.

Riley, M. S. (2004) An algorithm for generating rock fracture patterns: mathematical analysis. *Mathematical Geology*, 36(6), 683-702

Blum, P., Mackay, R. and **Riley, M. S.** (2004) Development of a methodology to quantify the importance of hydro-mechanical processes in radionuclide migration assessments. In: Stephansson, O., Hudson, J. A. and Jing, L. (Eds.), *Coupled Thermal-Hydro-Mechanical-Chemical Processes in Geo-Systems*, 231-237. Elsevier.

Blum, P., Mackay, R. and **Riley, M. S**. (2004) Understanding the impact of hydro-mechanical coupling on performance assessment of deep waste disposal. In: Stephansson, O., Hudson, J. A. and Jing, L. (Eds.), *Coupled Thermal-Hydro-Mechanical-Chemical Processes in Geo-Systems,* 238-243. Elsevier.

Smith, C., Chamberlain, A. T., **Riley, M. S**., Stringer, C. B. and Collins, M. (2003) The thermal history of human fossils and the likelihood of successful DNA amplification. *Journal of Human Evolution*, 45, 203 – 217.

Collins, M. J., Walton, D., Curry, G. B., **Riley, M. S**., Von Wallmenich, T. N., Savage, N. M., Muyzer, G. and Woestbroek, P. (2003) Long-term trends in the survival of immunological epies entombed in fossil brachiopod skeletons. *Organic Geochemistry*, 34, 89 - 96.

Collins, M. J. and **Riley M. S**. (2001) Amino acid racemization in biominerals: the impact of protein degradation and loss. In, *Perspectives in Amino Acid and Protein Geochemistry* (Eds. Goodfriend G. A., Collins M. J., Fogel. M. L., Macko S. A. & Wehmiller, J. F.). pp 120 - 142. Oxford University Press, NY.

Riley, M. S., Ward, R. S. and Greswell, R. B. (2001) Converging flow tracer tests in fissured limestone. *Quarterly Journal of Engineering Geology and Hydrogeology*, 34, 283 - 297.

Mackay, R., **Riley, M. S.** and Williams, G. M. (2001) Simulating groundwater contaminant migration at Villa Farm lagoons. *Quarterly Journal of Engineering Geology and Hydrogeology*, 34, 215 – 224.

Smith, C. I., Chamberlain, A. T., **Riley, M. S**., Cooper, A., Stringer, C. B. and Collins, M. J. (2001) Neanderthal DNA; Not just old but old and cold? *Nature,* 410, 771 - 772.

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