

## New Geomicrobiology Network for the UK formed

The first meeting of the UK's Geomicrobiology Network took place on 19-20 April 2012 at the Manchester Interdisciplinary Centre. The venue was apposite, given the multi-disciplinary nature of the work on display.

The meeting (and now the new network) was born out of a suggestion by Jon Lloyd (University of Manchester), Geoff Gadd (Dundee) and Joanne Santini (University College London) that a meeting be held to provide a forum for the growing number of those working in the geomicrobiology area.

This first event was supported financially by the Geological Society, the Society for General Microbiology, the British Mycological Society and by the Mineralogical Society (including strong scientific and financial support from the Environmental Mineralogy Group), with the latter taking on the administrative duties for the event.

Eighty five people attended the meeting held over two days, with 19 oral and 31 poster presentations.



The list of presentations is given in the Abstracts volume which is available in its entirety. The ground covered ranged from the deep subsurface to exoplanetary geobiology. What was striking was the number of presenters with industrial funding, indicative of the broad range of applications for this slice of science.

Derek Lovely opened by presenting a typical *tour de force* that spanned microbial mineral reduction and bioenergy production. The novel extracellular protein-based electron transfer processes described are also implicated in a broad-range of syntrophic interactions of environmental importance. Microbial electron flow was a theme in several of the talks that followed, and is, of course, key to our understanding of how these microorganisms interact with many mineral types in the biosphere. For example, Tom Clark gave a very clear talk on the elegant structural biology work that he has been doing on the precise mechanism of electron flow via heme-containing cytochromes localised to the surface of the metal-reducing bacterium *Shewanella*. Several authors spoke of the impact of microbial processes in waste-containment (CO<sub>2</sub>, radionuclides) systems. There are trillions of dollars-worth of radioactive waste in need of safe storage sites. Cindy Lockwood's paper on biogeochemistry in the release of oxyanions in soil-water systems affected by bauxite residue prompted significant discussion. Barrie Johnson's presentation, as well as focusing on remediation of acid mine drainage, spoke of projects in which metals retrieved from wastewater are being harvested for use.

There was also much interest in the role of microbes in geological processes at km depths in the subsurface (covered by speakers including John Parkes and Ian Head), and in other extreme environments including other planets (Charles Cockell)



Several of the speakers are leaders of sizeable research groups and spoke of the large range of research being conducted at the microbe-mineral interface. Jon Lloyd's group, for example, is carrying out a large array of work, including remediation of As-tainted water, with a focus on SE Asia, but which is quickly becoming a worldwide problem. In addition, the Manchester team is working on the bioremediation and safe geodisposal of radioactive waste, and the controlled microbial synthesis of functional biominerals for use in catalysis, medical applications and other high technology areas. Lynne Macaskie also developed several of these themes, with a focus on capturing radionuclides in carefully controlled phosphate biomineral lattices. Tellingly, one key point of her presentation came at the end when she described the likely more serious effects of radioactivity on the bones of children than on adults; this was stark, coming as it did, just before her brief tour of the current status of Fukushima site and its surroundings. Although there was a focus on bacterial systems Geoff Gadd and Eric Verrecchia gave excellent overviews the role of fungi in mineral cycles, emphasizing the importance of studies that encompass both prokaryotes (bacteria and archaee) and eukaryotes (such as fungi and plants).



At the end of the second day's presentations, a discussion took place to decide on future gatherings and collaborations of this vibrant group of researchers. Agreement was made to form A 'Network' of Geomicrobiologists. Support for the Network will be sought from the Societies which supported this original meeting, with possible additional support from the Royal Society of Chemistry. It was agreed that administrative support would continue to be provided by the Mineralogical Society. Meetings of the type held here, will take place every two years or so, but in the meantime, the group may opt to support events held by some of the supporting Societies, including the Research in Progress meetings of the Environmental Mineralogy Group of the Mineralogical

Society. A likely target for the new network will be to support the “bio” theme of the Mineralogical and Geological Societies June 2013 meeting being held in Edinburgh.



The Mineralogical Society will arrange for webspace (as part of its own website) for the Network as required, and will host the archive for the group.

Photos taken at the meeting:

