



# Mineralogical Society of Great Britain and Ireland

[www.minersoc.org](http://www.minersoc.org)

## FROM THE PRESIDENT

### 100 Most Important Questions in Mineralogy



Richard Patrick

You will probably have seen the initiative to determine the 100 most important questions in mineralogy. I encourage you all to embrace this enterprise. Very heartening support has been received from many national societies, and I thank you for that. It is no gimmick – it is a serious attempt to demonstrate the importance and pervasive role mineralogical research will play in many of the academic and applied challenges facing the world. The perception of ‘mineralogy’ to much of the public may be limited to the pretty specimens that decorate rock shops. Even colleagues in academia can be sadly ignorant of the range and complexity of the science and engineering on which our research impacts and of the variety of investigative techniques we use. Other disciplines are fast defining their future roles – here is a chance for *our* global community to reveal its importance, define its future role and produce a document for the coordinated lobbying of decision makers. The fact you are reading *Elements* means you have a serious interest in activities related to mineralogy. So please visit [www.100-questions.org](http://www.100-questions.org) and place your question.

The conference began with a musical icebreaker reception. Heavy rain outside threatened to dampen enthusiasm, but the Côr cymysg o Aberystwyth a Bro Ceredigion (local choir) and a glass or two of wine soon lifted delegates’ spirits. The reception was held in the rarified surroundings of the National Library of Wales, and the singing was most uplifting.



### Mark Welch Stands Down as Principal Editor of Mineralogical Magazine

I must add my thanks to Mark Welch for his six-year tenure as Principal Editor of *Mineralogical Magazine*. During this period, the time from submission to publication fell dramatically (to as little as 17 days in one case) and quality improved measurably. I think it is a testament to Mark’s work that we have been able to recruit editors of the calibre of Peter Williams and Roger Mitchell to succeed him. Many thanks to Mark and good luck to Pete and Roger.

**Richard Patrick**  
President, Mineralogical Society

## FRONTIERS IN ENVIRONMENTAL GEOSCIENCE

### Report of Annual Conference

This year’s Annual Conference of the Mineralogical Society was held in the pleasant surroundings of the University of Aberystwyth on the Welsh coast. Many delegates joked about the challenge of making it to Aberystwyth. It is a three-hour train ride from Birmingham International Airport! Erika Greisshaber drove from Zurich to Aberystwyth to attend the meeting and chair her session. She returned afterwards to complete a beamtime session at the Swiss light source. Dedication to the cause! Surely the science and the friendly welcome made it all worthwhile for everyone though.



The convenors of Frontiers 2011, Karen Hudson-Edwards of Birkbeck University of London, Nick Pearce of Aberystwyth University and Ruth Warrender of SRK, Cardiff

The science began in earnest on Tuesday, June 21, with a session entitled ‘Applied Mineralogy of the Critical Zone: Metal Reactions at Mineral Surfaces,’ convened by John Bowles, Caroline Peacock, Hazel Prichard and Pascal Reiller. After a brief introduction by the session chair, John Bowles, the session began with a keynote talk by Dave Sherman titled ‘Metal Complexation by Minerals Surfaces: From Molecular Insights to Thermodynamic Models’. The session also contained an invited talk by Dmitri Vlassopoulos: ‘Approaches to In Situ Remediation of Mercury and Arsenic Contaminated Soils and Sediments Using Mineral Amendments’.

Session 2, ‘Reactivity and Toxicity of Nano- and Micro-Particles in Natural and Contaminated Environments’, was convened by Karen Hudson-Edwards and Kevin Taylor. The keynote talk was delivered by Eva Valsami-Jones and had the title ‘Reactivity and Toxicity of Engineered Nanoparticles: Linking Physicochemical Properties to Behaviour’.

The first afternoon session (3) was entitled ‘Shining Synchrotron Light on the Natural Environment: Metals, Microbes and Minerals’ and was convened by Sam Shaw and Caroline Peacock. The keynote talk was by the Society president, Richard Patrick, and had the title ‘Investigating Mineral Systems Using Synchrotron Soft X-rays’. The session also had an invited talk by Gareth Law entitled ‘The Environmental Biogeochemistry of Neptunium – An XAS Study’.



Jill Banfield receiving her Hallimond Lecturer certificate from Richard Patrick

The final session of the day (4) was 'Biological Mineralization: Palaeo-archives, Natural Functional Materials and Bacterial Mineralization Processes', convened by Erika Griesshaber and Wolfgang Schmahl. The keynote talk, 'From Confinement to Composites: A Biological Perspective', was delivered by F. Meldrum. The first day concluded with a poster session accompanied by locally brewed beer.

Day two consisted of a half-day plenary session (session 5) comprising three invited lectures. The first was the Hallimond Lecture, the Society's foremost invited lecture. It was delivered by Jill Banfield and had the title 'Subsurface Microbial Diversity and Microbe–Mineral Interactions'. This talk, as befits a multidisciplinary meeting like this one, had a strong bio-focus. Dr Banfield spoke passionately about the need to remove barriers between areas of science. She will produce a short paper highlighting this and other themes from her talk for publication in *Mineralogical Magazine*.



Georges Calas, Schlumberger Award winner for 2011

The second talk was by Georges Calas, this year's winner of the Mineralogical Society's Schlumberger Award. His talk had the title 'Impurities and Defects in Minerals: Witnesses of Environmental Processes'. Georges has used synchrotron radiation in his research since the technique was invented and has been one of those responsible for opening the door to this analytical tool to mineralogists.



Andy Rankin (left) receiving the Mineralogical Society's Collins Medal from Richard Patrick

The third talk, 'The Application of Fluid Inclusion Studies to Some Major Issues in the Environmental Geosciences', was by the Mineralogical Society's 2011 Collins Medal winner, Andy Rankin. He began his talk by speaking about his background in the science and how he moved to fluid inclusion research.

Session 6, 'Mine Drainage – Mineralogy, Geochemistry, Remediation', was convened by Nick Pearce and Bill Perkins. The keynote was delivered by Phil Verplanck and had the title 'Determining

the Origin of Portal Discharge by Underground Sampling, the Standard Mine, Crested Butte, Colorado, USA'.

In Session 7, 'Geochemical and Biogeochemical Behaviour of Radionuclides and Toxic Elements in the Environment', convened by Ian Burke, Sam Shaw and Gareth Law, the keynote was delivered by Dave Polya and had the title 'Biogeochemical and Hydrogeological Controls on Arsenic Mobilization in Aquifers – Implications for Secular Changes in Groundwater Arsenic Hazard and Concomitant Health Risks in Southern Asia'.

Afternoon Session 8, 'Ash and Aerosol Emissions from Active Volcanoes: Characterizations, Processes and Impacts', was convened by Tamsin Mather and Rob Martin. The keynote by Pierre Delmelle was entitled 'Understanding the Reactivity of Volcanic Ash in the Environment'.

Session 9 was 'Geologic Carbon Capture and Storage: Observations and Models of Mineral–Fluid–Microbe Interactions and CO<sub>2</sub> Transport'. The keynote talk, 'Natural Analogues for Geological CO<sub>2</sub> Storage: A Reality Check for Computer Simulation?', was given by Mark Wilkinson. An invited talk delivered by Dominique Tobler had the title 'Plugging of Porous Media Using Ureolysis-Driven Calcite Precipitation and Its Potential for Sealing Leaks at CO<sub>2</sub> Storage Sites'.

In total, there were three plenary lectures, 42 other oral presentations and 22 posters, which were attended by 90 delegates from 16 countries. A longer version of this report, with more photographs, is available in the archive section of the Mineralogical Society website. A full copy of

the programme and the abstracts volume is also available at [www.minersoc.org/pages/meetings/frontiers-2011-archive/frontiers-2011-report.html](http://www.minersoc.org/pages/meetings/frontiers-2011-archive/frontiers-2011-report.html). A special issue arising from the meeting is planned for early 2012. More news of this will be provided as it becomes available. Many thanks to Karen, Nick and Ruth, to the Mineralogical Society staff, to departmental colleagues in Aberystwyth, and to the staff at the university for helping to make this meeting a success.

### New Focus for Environmental Mineralogy Group



The bio-focus of this meeting was a fitting lead-in to a new departure for the Environmental Mineralogy Group. In 2012 a joint meeting with the Society for General Microbiology will hopefully be the first in a series of joint events between the two groups, catering for the growing number of people interested in the interface between minerals and microbes.

Kevin Murphy, Executive Director

### THEMATIC SET OF PAPERS FOR MINERALOGICAL MAGAZINE

A set of papers arising from the September 2010 Annual Conference was published in the August 2011 issue of *Mineralogical Magazine*. This set includes the following papers:

- ACTINIDES AND RADIATION EFFECTS: IMPACT ON THE BACK-END OF THE NUCLEAR FUEL CYCLE, R.C. Ewing
- INTERFACIAL REACTIVITY OF RADIONUCLIDES: EMERGING PARADIGMS FROM MOLECULAR-LEVEL OBSERVATIONS, A.R. Felmy, E.S. Ilton, K.M. Rosso and J.M. Zachara
- A REVIEW OF ANALOGUES OF ALKALINE ALTERATION WITH REGARD TO LONG-TERM BARRIER PERFORMANCE, D. Savage
- RECRYSTALLIZATION OF METAMICT ALLANITE, T. Beirau, C. Paulmann and U. Bismayer
- MICROBIOLOGICAL INFLUENCES ON FRACTURE SURFACES OF INTACT MUDSTONE AND THE IMPLICATIONS FOR GEOLOGICAL DISPOSAL OF RADIOACTIVE WASTE, H. Harrison, D. Wagner, H. Yoshikawa, J.M. West, A.E. Milodowski, Y. Sasaki, G. Turner, A. Lacinska, S. Holyoake, J. Harrington, D. Noy, P. Coombs, K. Bateman and K. Aoki
- SORPTION OF Tc(IV) TO SOME GEOLOGIC MATERIALS WITH REFERENCE TO RADIOACTIVE WASTE DISPOSAL, R.J. Hallam, N.D.M. Evans and S.L. Jain
- RESEARCH AND DEVELOPMENT FOR GEOLOGICAL DISPOSAL OF HIGHER ACTIVITY WASTES: THE ROLE AND EXPECTATIONS OF THE ENVIRONMENT AGENCY, C.R. Cailles, I. Barraclough, R.E. Smith and G. Thomson
- REDOX INTERACTIONS OF TECHNETIUM WITH IRON-BEARING MINERALS, J.M. McBeth, J.R. Lloyd, G.T.W. Law, F.R. Livens, I.T. Burke and K. Morris

### EMU NOTES IN MINERALOGY VOLUME 11 PUBLISHED



The eleventh book in the EMU Notes in Mineralogy series, *Layered Mineral Structures and Their Application in Advanced Technologies* (M.F. Brigatti and A. Mottana, editors), from the European Mineralogical Union and the Mineralogical Society, has been published.

This volume aims to provide an in-depth knowledge of the complex field of layered materials and addresses diverse and fundamental aspects, including crystal chemistry and structure, layer packing disorder, surface properties and the description of the most advanced experimental techniques for the characterization of layered materials.

The book is now available from the Mineralogical Society bookshop (£25.50 for individuals, £40 for libraries and other institutions). Follow the link to the online bookshop from [www.minersoc.org](http://www.minersoc.org).