RAS Specialist Discussion Meeting
UK participation in Aurora

14 January 2011
10:30–15:30 in the Geological Society Lecture Theatre, Burlington House, Piccadilly, London W1

Organisers: Dr John Bridges (Space Research Centre, University of Leicester, j.bridges@le.ac.uk)
Dr Axel Hagermann (PSSRI, Open University)

Summary: High resolution imaging and near infrared mapping of the martian surface, together with detailed studies of martian meteorites and analogue research are revealing more about how climate and surface processes have changed on Mars. New missions such as the Mars Science Laboratory and the Trace Gas Orbiter will also answer more questions about the evolution of Mars. Mars research is acting as a spur for the development of analytical techniques such as XRD, Raman and the Life Marker Chip.
Following presentations from ESA and UKSA about current Mars exploration plans, there will be an open discussion about UK priorities for the Aurora mission after ExoMars.

10:00 Registration, Posters & Coffee

MORNING SESSION
Chair: Dr John Bridges (University of Leicester)

10:30 F. Taylor (University of Oxford):
The Scientific Exploration of Mars

10:50 M. Golombek (Jet Propulsion Laboratory):
Mars Science Laboratory and Landing Site Selection within the Context of Mars Exploration

11:15 N. Thomas (University of Bern):
High Resolution Imaging of the Surface of Mars – HiRISE and HiSCI

Constraints on the Origin and Evolution of Iani Chaos

11:50 M. Balme and C. Gallagher (Open University, University College Dublin)
Sorted clastic stripes, lobes and associated gullies in high-latitude craters on Mars: implications for recent climate, or evidence for phase changes in hydrated salts?

12:05 P. Grindrod (UCL)
Aqueous Mineralogy Recorded in a Sedimentary Basin in Coprates Catena, Mars

12:20 C. Gallagher and M. Balme (University College, Dublin, Open University)
Effluent crater breaches and channels on Mars: processes, morphological relationships and implications for understanding hydrology

12:35 C. Cockell (Open University)
Life in Earth’s Volcanic Environments and the Search for Life on Mars
12:50  Lunch & Posters
A hot meal will be available for purchase in the Council Room of the RAS.

AFTERNOON SESSION
Chair: Dr Axel Hagermann (Open University)

13:40  J. Parnell et al. (University of Aberdeen)
Identification of methane-rich rocks and their potential to support life, on Earth and Mars

13:55  Dr P. Irwin et al. (University of Oxford)
Probing Mars’ Atmosphere with ExoMars Mars Climate Sounder

14:10  Dr M. Patel et al. (Open University)
NOMAD and the UVIS channel – a spectrometer suite for Nadir and Solar Occultation observations on the ExoMars Trace Gas Orbiter

14:25  M. Sims, Dr I. Hutchinson et al. (Space Research Centre, University of Leicester)
Progress towards a Life Marker Chip Instrument and a Raman Instrument for ExoMars

14:40  C. Cousins et al. (Birkbeck)
Selection of the Geological Filters on the ExoMars PanCam instrument

14:55  S. Horne (UK Space Agency)
The UK Aurora Programme

15:05  A. Chicarro, J. Vago & D. Southwood (ESA)
The ESA-NASA Mars Exploration Programme

15:15  Discussion (all) Chair Dr John Bridges:
What are the UK priorities for an Aurora Programme mission after ExoMars?

*See over for posters*

15:30  Tea will be available in the Lower Library of the Geological Society for those attending the Open (Monthly A&G) Meeting of the Royal Astronomical Society

16:00  Open (Monthly A&G) Meeting

Admission fees:
Admission to Specialist Discussion Meetings is free to RAS members, £15 to non-members (£5 to students) for all or part of the day cash or cheque only, collected at the door. Admission to the subsequent Open (Monthly A&G) Meeting of the Royal Astronomical Society is open to all, at no charge.

For more information see
www.ras.org.uk
Posters

Martian Surface and Meteorites

_Sediment fan evolution and hydrologic activity in Mojave Crater, Mars_  
M. Balme and C. Gallagher (Open University)

_Oxidation of the Nakhlite Martian Meteorites During an Impact Hydrothermal Event_  
J.C. Bridges, L. Hicks and H.G. Changela (Space Research Centre, University of Leicester)

_Comparison of CRISM Analysis Techniques to understand Interior Layered Deposit Formation on Mars_  
K.S. Hill, J.C. Bridges, K.B. Smith, D.G. Tragheim, R.M. Ambrosi and S.J. Davies (Space Research Centre, University of Leicester, British Geological Survey)

_Martian atmospheric data analysis: Interpreting observations from Mars Global Surveyor, Mars Reconnaissance Orbiter and Mars Trace Gas Orbiter_  
S. R. Lewis, P. L. Read, L. Montabone, T. Ruan and L. Steele (Open University, Oxford University)

Instruments and Technology

_Robotic system for handling samples for the MSR (Mars Sample Return) mission_  
E. Allouis, A. Jorden and N. Patel (Astrium Ltd.)

_Scientific Objectives of the ExoMars Panoramic Camera (PanCam)_  

_Back-Reflection X-Ray Diffraction: A Novel Diffraction Technique with Almost Complete Insensitivity to Sample Morphology_  
G.M. Hansford (Space Research Centre, University of Leicester)

_The Mars-XRD Instrument for ExoMars: Combined X-ray Diffraction and Fluorescence Measurements_  
K.S. Hill, G.M. Hansford, D.Vernon, D.L. Talboys, L. Hicks, R.M. Ambrosi, J.C. Bridges and I.B. Hutchinson (Space Research Centre, University of Leicester)

_The ExoMars Panoramic Camera (PanCam) Instrument_  
C. E. Leff, A. D. Griffiths, B. K. Hancock, A. J. Coates, and the PanCam Team (Mullard Space Science Laboratory)

_Fluorescence mapping of PAH Organics and micro-organisms for Mars exploration within the EU-FP7 PRoViScout project_  
J-P. Muller, L. Dartnell, Andrew Griffiths, David Walton and PRoViScout team (MSSL, UCL)

_Surface roughness mapping from multi-resolution DTMs for landing site selection_  
J-P. Muller, W. Poole and P. Grindrod (MSSL, UCL)
Open source software tools for joint ESA-NASA Mars exploration developed in the EU-FP7 PRoViSG project
D. Shin, J.-P. Muller, W. Poole and the PRoViSG team (MSSL, UCL)

An overview of a proposed detailed design, operation and technology development required for a Mars Sample Receiving Facility (MSRF)
J.B. Vrublevskis et al. (SEA.)

Using technology and techniques from outside the space industry for Planetary Protection and ultra-clean flight hardware
J.B. Vrublevskis and M. Guest (SEA.)

Mission Ideas

Mars Reconnaissance Lander
H. R. Williams, R. M. Ambrosi, N. P. Bannister and J. C. Bridges (Space Research Centre, University of Leicester)

Analogue Studies

Redox couples and the search for life on Mars
S. L. Nixon, C. S. Cockell and M. Trantner (Open University)

Fe\(^{III}\)-oxidising microorganisms: a model for studying potential life on early Mars
K. Olsson-Francis and C. S. Cockell (Open University)

Effect of Water-Rock Ratios on Microbial Weathering: A Strategy for Site Selection on Mars?
A. E. Simpson, C. S. Cockell, K. Olsson-Francis and M. M. Grady (Open University)