

AT HOME – A MISCELLANY

THURSDAY 5 July 2012

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This meeting has been organised by George Freeman

## Programme

Chairman Mike Quinton

10:30 Registration and coffee

11:00 Introduction and notices

11:10 Michael Callaghan *More tales from the cockpit*

11:50 Peter Mercer *A personal history of computing*

12:30 John Belling *Temperamental music* †

13:10 Lunch

14:30 Tony Watts *Mountains in the Sea*  
(Earth Sciences, Oxford)

15:30 Stephen Hall *Autonomous underwater vehicles*  
(National Oceanography Centre, Southampton)

16:30 Tea

Institute of Physics, 76 Portland Place, W1B 1NT. Nearest underground stations are Oxford Circus and Regents Park.

This meeting is open to visitors. Please contact John Belling, [john.a.belling.secrems@gmail.com](mailto:john.a.belling.secrems@gmail.com), 07986 379935, 42 Cunningham Park, Harrow, Middx, HA1 4QJ, if you wish to attend.

Costs are £31.00 or £6 without lunch. The lunch choice (as chosen by members in a vote) is:

Meat dish: Braised new seasons lamb with minted ebley risotto  
Fish dish: Devonshire crab & smoked haddock fishcakes with a lemon aioli  
Vegetarian dish: Mediterranean vegetable lasagne  
Pudding: Peach & vanilla crumble with cream

There will be no reimbursement for cancellations after 1 July 2012.

† *It is planned to have two harpsichords present to illustrate the talk. Thanks go to William Mitchell for supplying the instruments. They will be played by William, and Ian Shaw, organist at St Clement's Eastcheap, St Mary Abchurch, and St John's Greenhill Harrow. There will also a short demonstration during the lunch period.*

## **Mountains in the Sea**

### **Abstract**

One of the mysteries of the sea are the large number of seamounts that rise up on the seabed and, in a few cases, break surface to form oceanic islands. Volcanic in origin, seamounts are widely scattered throughout the world's ocean basins, especially in the Pacific. Recent estimates suggest that there may be as many as 200,000 seamounts with heights that range from 0.1 to 6.7 km above the surrounding seafloor. Seamounts are generally circular in shape, have pointed, star-shaped, curved, or flat tops, and are often capped by a coral reef. They are of geological interest because they record the motions of Earth's tectonic plates and the magmatic 'pulse' of its deep interior. They are also significant as ocean 'stirring rods', biodiversity 'hotspots', and hazards for megathrust earthquakes, submarine landslides, and navigation. Statistical studies suggest that there are as many as 24,000 seamounts higher than 1 km still to be discovered. The charting of these seamounts and the determination of their morphology, structure, and evolution is one of the many challenges facing marine geologists in the future.

### **Brief CV**

Tony Watts is Professor of Marine Geology and Geophysics in the Department of Earth Sciences at the University of Oxford. He received his BSc. in Geology and Physics from University College, London and his Ph.D in Marine Geophysics from the University of Durham. After graduating, he joined the Bedford Institute of Oceanography, Dartmouth, Canada and then the Lamont-Doherty Geological Observatory of Columbia University, New York, USA. He has participated in some 20 cruises of scientific research ships to each of the world's ocean basins and has been involved in all aspects of the acquisition, reduction, and interpretation of marine geological and geophysical data. His current research is focused on the structure and evolution of the Brazilian continental margin, the Canary and Cape Verde Islands, and the Tonga-Kermadec deep-sea trench island arc system. He is a Fellow of the American Geophysical Union, the European Geophysical Union and the Geological Society of America.

## **Autonomous underwater vehicles**

### **Abstract**

The ocean is cold, dark and inhospitable for humans beyond 100 metres depth without expensive equipment and extensive support facilities. Manned underwater vehicles offer access to deeper water, but are extremely expensive to own and operate and there is little prospect of rescue for the crew in deep open-ocean situations. Unmanned underwater vehicles, either remote-controlled or fully autonomous, are enabling engineers, scientists and military operators to explore the oceans with little risk to human life. They can service sea-bed oil and gas facilities, inspect pipelines, explore the mid-ocean ridges, and map enemy mine-fields. One day, they may be able to explore the mysteries of the ocean that may exist under the ice of Jupiter's moon Europa.

This talk will look at the history, use and latest developments in underwater robot vehicles.

### **Brief CV**

Stephen Hall graduated from Cardiff University in 1985 and initially worked in the engineering and survey industry before joining HM Customs and Excise where he specialised in oil refineries, pipelines and hydrocarbon excise duty. In 1990 he transferred to the Natural Environment Research Council, undertaking tracer chemistry experiments in the Southern Ocean on board the Royal Research Ship Discovery, and duties relating to the 7-year 'World Ocean Circulation Experiment'. Between 1998 and 2002 Steve managed the NERC 'Autosub Science Missions' programme, the first attempt to use an autonomous underwater vehicle to explore a variety of locations in the world's oceans, including the first civilian under-ice missions in the Antarctic.

After 2002 Steve worked for the Climate Variability Programme, then worked on risk-management for deployment of deep scientific moorings, before moving into marine science policy work in 2006. He currently writes position papers for the National Oceanography Centre and NERC on a variety of marine and maritime subjects, advises senior civil servants for the Government's Marine Science Coordination Committee, is part of the UK delegation to the Intergovernmental Oceanographic Commission and serves on several marine science committees in the UK and Europe.

Steve is a Chartered Marine Scientist and Fellow of the Institute of Marine Engineering, Science and Technology, and is Chairman of the Society for Underwater Technology.