



Cambridge Society for the Application of Research

Churchill College  
Storeys Way  
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# **Flying 300 Underwater Planes and other Oil Industry Innovations**

**Dr Simon Bittleston**

Vice President of Research for Schlumberger

7.30pm, Monday 2<sup>nd</sup> March 2015

Wolfson Hall Lecture Theatre, Churchill College, Storey's Way, Cambridge

## **The Lecture:**

### **Simon Bittleston writes:**

Exploring for oil and gas reserves begins with seismic exploration in which a picture of the subsurface is obtained using acoustic imaging. For marine seismic exploration this involves a boat towing sources and receivers. The acoustic signal from the sources propagates through the water, and then into the earth, where it is reflected at boundaries between rock types. The reflected signals are recorded on hydrophones within long cables, towed at about 10m below the sea surface. These cables can be extremely long, 12km or more, and 10 to 20 cables are often simultaneously towed behind the boat, approximately 50 m apart. A typical arrangement will contain 40,000 to 100,000 hydrophones, which are all simultaneously recording the reflected signals.

Keeping all these cables in the correct position is a major challenge and is achieved by small underwater planes (called birds) placed periodically along the cables. In all, there are several hundred underwater birds distributed amongst all the cables. Each bird can force the cable to locally change depth or horizontal position. However, to achieve the correct physical geometry, required to ensure accurate acoustic data is gathered, all the birds must be instructed in concert.

This talk describes the remarkable simultaneous flying of these hundreds of birds; and how they are coordinated to respond to changes in sea currents, the trajectory of the boat, and other factors. It will also explain the multi-level control system, how the system is designed to cope with critical events and how an accurate estimate of the position of the equipment being towed is achieved.

Dr. Simon Bittleston invented these underwater birds, and the complete dynamic control system, which allow this massive acoustic array to be placed accurately whilst being towed.

## About the Speaker:

**Dr Simon Bittleston** is currently Vice President of Research for Schlumberger, a position he assumed in 2012. He is responsible for research centers in Boston, Cambridge (UK), Moscow, Rio, Stavanger, Edmonton, Houston and Dhahran, covering all aspects of oil-field activities.

He joined Schlumberger in 1985 and worked at Schlumberger Cambridge Research, becoming a Research Programme Manager.

He moved to Norway in 1993 and became domain manager for the development of Marine Seismic Systems where he was responsible for the development of Q-Marine.

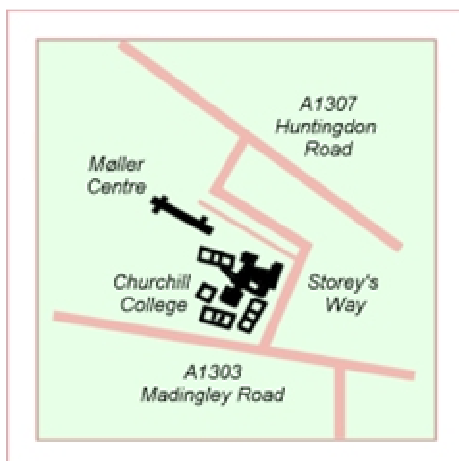
In 1999 he returned to the UK as a Research Director, and then in 2001 moved to Houston as VP Product Development which included all Product Development and Manufacturing for Schlumberger.

In 2005 he moved to Paris and became VP of Mergers and Acquisitions – the team completed more than 40 investments culminating in the Smith acquisition.

Simon Bittleston holds a Bachelor's degree in mathematics from Imperial College London, and a Ph.D. in fluid mechanics from the University of Bristol, UK.

He is also a By-Fellow of Churchill College Cambridge and Fellow of Darwin College Cambridge.

## Practical Matters



Those attending the CSAR lecture may park in the Senior Car Park on Churchill Road, which is off Storey's Way. More parking is available further along Churchill Road, and in the Möller Centre at the far end.

CSAR lectures are open to all; CSAR members are admitted free. Pupils and students may register for free membership at the lecture reception desk.

Non-members are asked to make a nominal contribution of £3.00.

Coffee and biscuits are available in the Wolfson Foyer from around 7pm. For further directions, see: [www.chu.cam.ac.uk/about/visitors/directions.php](http://www.chu.cam.ac.uk/about/visitors/directions.php)