**Trinity Term 2008**

# CABDyN SEMINAR SERIES
## Saïd Business School, University of Oxford

**Convenors:**
Felix Reed-Tsochas, *James Martin Institute*, *Saïd Business School*
Jukka-Pekka Onnela, *Physics Department & Saïd Business School*

Our meetings intend to provide a forum for rigorous research (in a broad range of disciplines) focusing on complex adaptive systems, using methods and techniques such as agent-based modelling and complex network analysis. Since potential areas of application for such approaches can be located across the social, natural and engineering sciences, our aim is to involve participants from a wide range of departments in Oxford. We welcome talks which focus on particular areas of application and associated technical issues, but also encourage contributions which address more fundamental conceptual or mathematical problems. The CABDyN Seminar Series is one of the activities of the CABDyN Research Cluster (http://sbs-xnet.sbs.ox.ac.uk/complexity/).

## Tuesday 20th May, 12.30 – 2.00 pm

## Seminar Room B, Saïd Business School

# Professor Julian Hunt
## Department of Earth Sciences
## University College London

## Systems modelling approaches for making and exploring decisions

### ABSTRACT

Increasingly all large organisations including governments and large industries are using systems modelling to analyse complex and multifarious activities, to make predictions and then make decisions for their present and future operations. These may well be iterative processes and continually adjusted as events unfold. For political organisations (which means most organisations today) such systems-based decisions have to be explained and justified, especially when the decisions have to change quite rapidly. Previous systems based analyses/predictions and decisions are reviewed, such as conflict, environmental pollution, disease, and organisational changes/issues. The mathematical methods involved are discussed (deterministic coupled equations, dynamical systems analysis, statistical/probabilistic modelling), as well as the new challenges of climate change, risks, changing physical and societal systems (e.g. megacities), and resource issues. Some of the big questions for systems modellers working with decision makers are first how to focus on key issues of optimal combination of micro and macro modelling (e.g. using data from discrete bottom up, simulation/computational methods to support or critique top-down, macro analyses of critical aspects – which are much easier to communicate and use for decision making). Second, how systems have metastable states with sometimes rapid transitions between them - which should be explained in public decisions (highly relevant in modelling disaster /planning scenarios). Third, how publication of predictions and future plans resulting from modelling can cause society to change its actions, and possibly invalidate the predictions! Does this imply that public targets/policies may have to be deliberately in error to obtain the desired outcome? If so, this may require a new approach to error analysis of such systems.

**Sandwiches and drinks will be provided**

For further information contact info.cabdyn@sbs.ox.ac.uk
Seminar webpage: http://sbs-xnet.sbs.ox.ac.uk/complexity/complexity_seminars.asp