



## SEMINAR SERIES / TRINITY 2009

Convenors: Felix Reed-Tsochas, *Institute for Science, Innovation and Society, Saïd Business School*  
Eduardo López, *Saïd Business School*

Tuesday 2<sup>nd</sup> June

12.30 – 2.00pm

James Martin Seminar Room, Saïd Business School

**Dr. Colm Connaughton**

**Mathematics Institute & Warwick Centre for Complexity  
Science**

**University of Warwick**

**“Runaway Growth in the Coagulation Equation Revisited”**

### ABSTRACT

The Smoluchowski coagulation equation, or variations of it, arise in many applications and models ranging from colloid physics to river networks to growth of networks. The scaling theory of this equation reveals a rich set of behaviours depending on how the coalescence kernel behaves as a function of cluster size. In this talk I will concentrate on "pathological" kernels which are believed to exhibit an extreme form of singular behaviour known as "instantaneous gelation" in which the dynamics leads to the formation of infinite clusters in zero time. I will discuss how this behaviour can be understood by considering the behaviour of a regularised Smoluchowski equation as the regularisation is removed.

This approach gives some insight into what, at first sight, is a rather difficult phenomenon to analyse and seems to lead to some novel new phenomena.

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/>).

Sandwiches and  
drinks will be  
provided

For further information  
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