

**Collective Behaviour in the Big Data Era  
Speakers / Titles / Abstracts**

**April- 14<sup>th</sup> – Day 1**

**Suzy MOAT**

*Sensing human behavior with Internet data*

Our everyday usage of the Internet generates huge amounts of data on how humans collect and exchange information worldwide. In this talk, I will outline recent work in which we investigate whether data from sources such as Google, Wikipedia and Flickr can be used to gain new insight into real world human behavior. I will provide case studies from a range of domains, including disease detection, crowd size estimation, and evaluating whether the beauty of the environment we live in might affect our health.

**Mehdi Moussaïd**

*Mechanisms of judgment propagation in experimental diffusion chains*

How do people form and revise judgments under the influence of others? Existing studies addressing this question often rely on simple “advice-taking” experimental paradigms that do not reflect the rich complexity of our social environment.

In this talk, I will present the results of a dense research project that studies the role of various components of social influence such as social learning, reputation effects, and biased communication.

**Marc Barthelemy**

*Statistical patterns of commuting*

The recent availability of new data sources of triggered new studies on the mobility in urban systems. I will discuss some of these results here, both from an empirical and theoretical point of view. In particular, I will show that in order to understand the relation between income and commuting, we have to drastically modify the traditional job-search models and to propose the idea that workers evaluate potential jobs based on a quality aspect and that workers search for job sequentially across space. This new model predicts a distribution of commuting distance in excellent agreement with data and represents an alternative model for modeling urban phenomena.

**Javier Borge**

*Unconventional approaches to human collective behavior*

Underlying the rich tradition of sociophysics we find a daring assumption: that individuals, however complex and differentiated they may be, may act as (relatively) simple particles when collective behavior arises. Indeed, fairly abstract idealizations, inspired in Statistical Physics, pointed in that direction (to the despair of many schools in Humanities), rendering powerful insights that are now classics: Schelling’s model of segregation, the seminal works by Serge Galam or Axelrod’s model for the dissemination of culture. However, these (and many other) examples remained dubious at the time, because simplicity and qualitative intuitions still lacked the strength of empirical confirmation.

The rise of the digital age (and particularly the appearance of the Web 2.0 and 3.0) have come to fill such gap, flooding scholars with unprecedented amounts of data—including structure (who interacts with whom), dynamics (when), contents (text, imagery), and geography (where). With this at hand, we can now provide new (complex systems) answers to old (sociological) questions; or raise new (sociological) questions exploiting (old, and not-so-old) complex systems perspectives.

With this in mind, I will introduce unconventional approaches to human collective behavior, where 'unconventional' refers to their lack of prevalence in social network science research. These include time series analysis (case study 1: political mobilizations), and the modelling of spatial and information human ecosystems, which display intriguing parallelisms with some biological systems (case studies 2 & 3).