

## SOE 8: Award Ceremony: Young Scientist Award for Socio- and Econophysics

Time: Monday 17:00–18:30

Location: HSZ 02

**Invited Talk** SOE 8.1 Mon 17:00 HSZ 02

**Dragon-kings versus black swans: diagnostics and forecasts for the on-going world financial crisis** — ●DIDIER SORNETTE — ETH Zurich, Department of Management, Technology and Economics, Kreuzplatz 5, 8032 Zurich, Switzerland

Extreme fluctuations or events are often associated with power law statistics. Indeed, it is a popular belief that “wild randomness” is deeply associated with distributions with power law tails characterized by small exponents. Here, we document in many different systems that there is life beyond power law tails: power laws can be superseded by “dragon-kings”, monster events that occur beyond the power law tail. Dragon-kings reveal hidden mechanisms that are only transiently active and that amplify the normal power law fluctuations. Evidence of the dragon-king phenomenon is found in the statistics of financial losses, economic geography, hydrodynamic turbulence, material rupture, avalanches in random directed polymers, earthquakes, epileptic seizures, and cyber risks. The special status of dragon-kings open a new research program on their predictability, based on the hypothesis that they belong to a different class of their own and express specific mechanisms amplifying the normal dynamics via positive feedbacks. The dragon-king approach allows us to understand the present World financial crisis as underpinned by two decades of successive financial and economic bubbles. We will demonstrate how market risk management can be enlarged by combining strategic, tactical and time-varying risk analysis (see [www.er.ethz.ch/fco](http://www.er.ethz.ch/fco))

**Presentation of the Young Scientist Award for Socio- and Econophysics to Dr. Santo Fortunato, Institute for**

**Scientific Interchange, Torino, Italy**

**Prize Talk** SOE 8.2 Mon 18:00 HSZ 02

**Community structure in networks and statistical physics of social dynamics** — ●SANTO FORTUNATO — ISI Foundation, Torino, Italy

This seminar is a brief excursion across some problems I have been investigating over the last few years. Networks are the simplest representations of complex systems and their investigation may shed light on the structure and function of many systems. Here I will discuss the problem of graph clustering, i.e. of finding subgraphs with a high density of internal edges, whereas the density of edges between subgraphs is comparatively low. I will focus on the issues of resolution of global optimization methods and of testing methods against each other. Next, I will enter the realm of sociophysics, i.e. of how statistical physics can help to uncover the collective dynamics of large-scale social systems. The main weakness of this field is the absence of a quantitative phenomenology, as little attention is paid to the relationship between models and real systems and models are usually studied for their own sake. Here I have mainly tried to search for empirical regularities in social data, like scaling and universality, that could somehow inspire and validate a statistical physics modeling of social dynamics. I will introduce recent results on election and citation behavior

**After the awardee’s talk, there will be a social gathering with beer and pretzels in front of the lecture hall HSZ 02.**