

SOE 9: Urban Systems - Dynamics and Complexity of Cities (Invited Talk Luis Bettencourt)

Time: Tuesday 9:30–10:15

Location: MA 001

Invited Talk

SOE 9.1 Tue 9:30 MA 001

The Universality of Cities as Complex Network Systems —

•LUIS BETTENCOURT — Santa Fe Institute, Santa Fe NM, USA

Cities are perhaps among the most complex systems on the planet. For an increasing majority of people on the planet they are the dominant physical and socioeconomic environment affecting their lives. The development and growth of urban environments is also intimately connected to processes of economic growth, human development and challenges of environmental sustainability.

In this talk I will discuss some of the universal quantitative properties of cities and urban systems in terms of interacting social and

infrastructural networks embedded in space and subject to energetic and cognitive constraints. I will show how new theory describes the metrics of thousands of cities worldwide, both past and present. I will also describe how this new knowledge is both revealing of large scale human sociality and is useful for policy.

Finally, I will also show how to establish a formal connection between what is particular and what is general to people, neighborhoods and cities and how to bridge scales in terms of theory, from strong variations at the local an individual level to universality at the urban level. In this way I will attempt to unify description of cities across scientific disciplines, from physics to the social sciences.