

## SOE 1: Young Scientist Award for Socio-and Econophysics

Time: Wednesday 15:00–16:30

Location: YSA

**Prize Talk**

SOE 1.1 Wed 15:00 YSA

**Quantifying science and art** — ●ROBERTA SINATRA — NERDS, IT University of Copenhagen, Copenhagen, Denmark — SODAS, University of Copenhagen, Copenhagen, Denmark — Complexity Science Hub, Vienna, Austria

Performance, representing the objectively measurable achievements in a certain domain of activity, like the publication record of a scientist or the winning record of an athlete, captures the actions of an individual entity. In contrast, success, captured by impact or visibility, is a collective phenomenon, representing a community's reaction and acceptance of an individual entity's performance. We are often driven by the belief that the detection of extraordinary performance is sufficient to predict exceptional success. However, the link between these two measures, while often taken for granted, is actually far from being understood. Nevertheless, differently from performance, success is quantifiable and predictable: given its collective nature, its signatures can be uncovered from the many pieces of data around us using the tools of statistical physics, complex systems, network science, and data science. In this talk, I will focus on success in science and art as a way to test our ability to model and predict the collective phenomenon of success. I will discuss the role of luck in achieving success, and will address the relation between performance and success in a variety of settings, highlighting the challenges of gauging performance through

success.

**Prize Talk**

SOE 1.2 Wed 15:45 YSA

**Multilayer modeling and analysis of complex socio-economic systems** — ●MANLIO DE DOMENICO — Complex Multilayer Networks Lab, Fondazione Bruno Kessler, Trento (Italy)

Complex systems are characterized by constituents – from neurons in the brain to individuals in a social network – which exhibit special structural organization and nonlinear dynamics. As a consequence, a complex system can not be understood by studying its units separately because their interactions lead to unexpected emerging phenomena, from collective behavior to phase transitions. Recently, we have discovered that a new level of complexity characterizes a variety of natural and artificial systems, where units interact, simultaneously, in distinct ways. For instance, this is the case of multimodal transportation systems (e.g., metro, bus and train networks) or of social networks, whose interactions might be of different type (e.g. trust, trade, virtual, etc.). The unprecedented newfound wealth of socio-economic data allows to categorize system's interdependency by defining distinct "layers", each one encoding a different network representation of the system. The result is a multilayer network model. In this talk we will discuss the most salient features of multilayer systems, with special attention to socio-ecological and socio-technical ones.