

Plenary talks (PV)

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**Plenary Talk** PV X Thu 8:30 H1  
**Complex Networks: From Statistical Physics to the Cell**  
— •ALBERT-LASZLO BARABASI — Northeastern University/Harvard Medical School

Highly interconnected networks with amazingly complex structure describe systems as diverse as the World Wide Web, our cells, social systems or the economy. In the past decade we learned that most of these networks are the result of self-organizing processes governed by simple but generic laws, resulting in architectural features that makes them much more similar to each other than one would have expected

by chance. I will discuss the statistical mechanics of our interconnected world and its implications to network robustness and spreading processes. Much of these advances were inspired by maps of real networks, informing the modeling and analytical efforts. Yet, in the past few years the richness of data has improved considerably, allowing us to look deeper into the role of the nodes and links that shape the network topology and function. My goal is to move beyond the topology and to potentially review a few recent results, from the role of distance in shaping our social networks to controllability in biological and technological networks.