



NETWORK NEUROSCIENCE: GOING FROM NODES TO EDGES

A TALK BY

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28
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**SEMINARIO
IN MODALITA'
TELEMATICA**

Connectivity and dynamics are two key pillars of network neuroscience – an emerging field dedicated to understanding network structure and function of neural systems across scales, from neurons to circuits to the whole brain. In this presentation I will review current themes and future directions by focusing on structure/function relationships in animal models, neuronal circuits, and the human brain. I will review some key concepts of connectomics, highlight the issue of network modularity and rich club organization and mention the use of computational models to map information flow and communication dynamics. Finally, I will introduce a novel edge-centric approach to functional connectivity based on edge time series and network bipartitions. Overall, I will argue that network neuroscience represents a promising theoretical framework for understanding the complex structure and function of nervous systems.



After receiving an undergraduate degree in biochemistry,

OLAF SPORNS earned a PhD in Neuroscience at Rockefeller University and conducted postdoctoral work at The Neurosciences Institute in New York and San Diego. Currently he is the Robert H. Shaffer Chair, a Distinguished Professor, and a Provost Professor in the Department of Psychological and Brain Sciences at Indiana University in Bloomington. Sporns holds adjunct appointments in the School of Informatics, Computing and Engineering, and in the School of Medicine. His main research area is theoretical and computational neuroscience, with a focus on complex brain networks. In addition to over 250 peer-reviewed publications he has written two books, "Networks of the Brain" and "Discovering the Human Connectome". He is the Founding Editor of "Network Neuroscience", a journal published by MIT Press. Sporns received a John Simon Guggenheim Memorial Fellowship in 2011, and the Patrick Suppes Prize in Psychology/Neuroscience, awarded by the American Philosophical Society, in 2017. He is a Fellow of the American Association for the Advancement of Science and the Society of Experimental Psychologists and of the Society of Experimental Psychologists.



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