

Cognitive Neuroscience Seminars

Thursday, 23 April 2026, at 2pm
Sala riunioni 1, 5° floor, CLA building
Via Venezia 16, Padova



Network Neuroscience Approaches to Brain–Behavior Associations and Personalized Brain Stimulation

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Abstract

The study of the brain as a complex network has gained increasing interest over the past decade, driven by interdisciplinary collaborations bridging neuroscience, mathematics, and computational modeling. Within this framework, graph theory provides a powerful approach for modeling the brain as a network of nodes and edges, enabling the characterization of topological properties that support efficient information processing. In parallel, functional connectivity gradient analysis has emerged as a complementary framework for capturing continuous, low-dimensional axes of brain organization, revealing transitions from unimodal to transmodal systems and offering a more nuanced view of large-scale cortical architecture. Together, these approaches provide complementary insights into how individual differences in brain organization relate to cognitive and behavioral variability. Importantly, they also hold promise for the personalization of brain stimulation protocols by identifying subject-specific network targets and optimal stimulation sites, thereby enhancing precision and therapeutic efficacy.



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