



# MODULAR ORGANIZATION OF BRAIN FUNCTIONAL CONNECTIVITY IN NEUROPSYCHIATRIC DISORDERS

**A TALK BY  
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**ISTITUTO ITALIANO DI  
TECNOLOGIA ROVERETO**

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FONDAZIONE RICERCA  
BIOMEDICA AVANZATA  
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Abnormal brain resting-state functional connectivity, as measured by functional MRI and other neuroimaging techniques, has been consistently observed in patients affected by various neuropsychiatric disorders. Graph theoretical methods provide a framework to investigate these defective functional interactions and their effects on the organization of brain connectivity networks. Leveraging recent developments in complex network theory, I will present research from our laboratory that has examined the modular structure of functional connectivity in schizophrenia patients and alcoholics, and in models of these conditions. I will show that schizophrenia involves profound disruption of functional connectivity in primary sensory cortices, in keeping with theories that posit that cognitive dysfunction in this devastating disease may arise from deficits occurring already at early stages of sensory processing. In alcoholics, we observed reorganization of functional connectivity involving specifically the anterior insula, thus suggesting that alcohol abuse may be related with an abnormal role of this region in the integration of interoception, decision-making and emotional processing.



**Angelo Bifone**, PhD, is a Senior Scientist of the Istituto Italiano di Tecnologia, responsible for the Magnetic Resonance Imaging Research Line. While at IIT, he has been the director of the Center for Neuroscience and Cognitive systems, in Rovereto, and of the Center for Nanotechnology Innovation, in Pisa. Previously, he has headed the Neuroimaging Department of the Research Center of Glaxo-Smith Kline in Verona.



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