Math & Brain seminars

Matematica e Cervello

Thursday 14/03/24 - 17:00
Room 1A150

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Multimodal Brain Connectivity: an integrative view

Multimodal brain connectivity is a burgeoning field within neuroscience that delves into the intricate interplay between different brain regions and networks through various imaging modalities. This approach offers a comprehensive understanding of the brain's functional, metabolic, molecular and structural organization, shedding light on its complex dynamics and providing valuable insights into both healthy and pathological states. Traditional methods such as functional magnetic resonance imaging (fMRI) and electroencephalography (EEG) have been instrumental in mapping functional connectivity, revealing synchronized activity patterns among spatially distinct brain areas. However, these modalities only offer a partial view of the brain's intricate wiring. To overcome this limitation, researchers have turned to multimodal approaches, which integrate data from multiple imaging techniques, EEG, diffusion magnetic imaging, positron emission tomography (PET), and magnetoencephalography (MEG). By combining complementary information from these modalities, scientists can construct a more comprehensive picture of brain connectivity, capturing both functional and structural aspects across different spatial and temporal scales. However, multimodal brain connectivity analysis poses mathematical challenges in integrating diverse data types and developing robust computational models to unravel the brain's complex network dynamics accurately.

Organizers

S. De Marchi, W. Erb, M. Formentin, V. Franceschi, F. Marchetti, R. Monti, F. Rinaldi