

Advanced Applications of Noninvasive Brain Stimulation and EEG in Experimental Psychology

Saturday, September 13, 2025 9:00 AM (1h 30m)

The combination of Noninvasive Brain Stimulation (NIBS) and electroencephalography (EEG) provides a powerful and precise method to explore the dynamic neural processes underpinning human cognition. Here, we emphasize transcranial magnetic stimulation (TMS) as a leading NIBS modality integrated with EEG to offer direct causal insights into how cognitive functions emerge and evolve over time. Organized by early-career researchers, this symposium junior will highlight recent methodological innovations and compelling empirical findings achieved through advanced TMS-EEG techniques.

Speakers will showcase the versatility and precision of TMS-EEG across cognitive domains—including time perception, decision-making, learning, hemispheric specialization, and action observation—and will discuss a suite of tailored stimulation protocols (paired-pulse TMS, cortico-cortical paired associative stimulation, continuous theta-burst stimulation, rhythmic TMS). Each protocol will be highlighted for its ability to selectively modulate neural excitability, drive neuroplasticity, or entrain oscillatory activity within targeted frequency bands.

The integration of simultaneous EEG recordings with targeted brain stimulation further enables unprecedented opportunities for exploring neural excitability, oscillatory dynamics, functional connectivity, and causal interactions among brain regions with exceptional temporal resolution. These advanced methodological frameworks are critical for dissecting complex cognitive phenomena into precise neural mechanisms, facilitating detailed and mechanistic interpretations.

Designed specifically for researchers working at the crossroads of brain stimulation, electrophysiology, and experimental neuroscience, the symposium will present robust theoretical frameworks, innovative methods, and practical insights. The event aims to foster a dynamic, collaborative environment, stimulating discussion and inspiring future research directions in this rapidly evolving and exciting scientific field.

If you're submitting a symposium talk, what's the symposium title?

If you're submitting a symposium, or a talk that is part of a symposium, is this a junior symposium?

Yes

Primary author: TARASI, Luca (University of Bologna)

Presenter: TARASI, Luca (University of Bologna)

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