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SEMINAR CYCLE

of the PhD in Neuroscience of Turin

3rd Appointment

Prof. Timo Stein

University of Amsterdam

**“Refining models of (un)conscious
information processing: Improving theories
of consciousness”**

16th April, 2025 h 5:00 PM

The lecture will last 1 hour and it will be followed by discussion

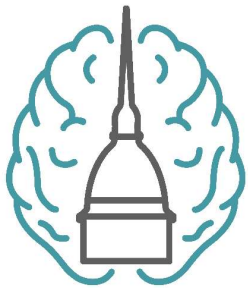
Host: Prof. Lorenzo Pia



Graduation Hall, Department of
Psychology, Via Verdi 10, Turin

Link: <http://bit.ly/3DGT7R7>

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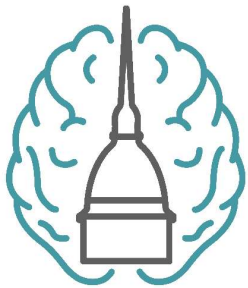


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PROF. TIMO STEIN

Prof. Stein is Assistant professor at the University of Amsterdam. Before joining the Brain and Cognition group at the Department of Psychology at the University of Amsterdam in 2016 he did a postdoc at University of Trento with Marius Peelen, and a PhD at Berlin School of Mind and Brain with Philipp Sterzer and John-Dylan Haynes. In ancient times he studied (neuro-cognitive) psychology in Mainz, Munich, and Princeton. He is am a member and Co-PI of the Conscious Brain Lab, working closely together with Simon van Gaal and Johannes Fahrenfort.

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ABSTRACT

In the dynamic field of consciousness science, recent years have witnessed a surge of interest, marked by competition among various theories of consciousness. Amidst these competing theories, a common thread has emerged—the idea that distinct stages of neural information processing exist, depending on the strength of sensory input and the availability of top-down attention. Although the resulting "four-stage model" is central to major theories of consciousness, empirical evidence for the hypothesized neural processes at all four stages has been lacking. Here, I demonstrate how time-resolved EEG decoding of different visual features can be used to concurrently characterize feedforward and recurrent processing at all stages of the model. Another key challenge in consciousness science relates to the “measurement problem”—disagreements about how to measure consciousness. I provide evidence that the hypothesized extent of conscious vs. unconscious processing is determined by the measurement approach, using data from visual detection paradigms and fMRI as examples. Different measurement approaches result in different estimates of the functional and neural correlates of consciousness, contributing to a lack of convergence on a single theoretical framework that explains conscious experience. These findings underscore the need for conceptual and methodological reform in consciousness science. By addressing these challenges, we can pave the way for a unified theory of consciousness.

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