



SFB 1315

Mechanisms and Disturbances in Memory Consolidation:
From synapses to systems

Tuesday

JUN 10, 2025
4:00 pm

BCCN Lecture Hall
Philippstraße 13/Haus 6
10115 Berlin
Meeting-ID: 775 491 0236
sfb1315.ifb@hu-berlin.de

SFB 1315 LECTURE SERIES 2025

DENDRITIC BALANCE, PREDICTIVE PROCESSING AND SYNAPTIC LEARNING

VIOLA PRIESEMANN

Research Group Leader, Neural Systems Theory
Max Planck Institute for Dynamics and Self-Organization
Professor, Department of Physics
Georg-August-Universität Göttingen
Göttingen, Germany

Viola Priesemann. Photo: Host Ziegenfusz



Funded by



Deutsche
Forschungsgemeinschaft
German Research Foundation



SFB 1315

Mechanisms and Disturbances in Memory Consolidation:
From synapses to systems

Tuesday

JUN 10, 2025
4:00 pm

BCCN Lecture Hall
Philippstraße 13/Haus 6
10115 Berlin
Meeting-ID: 775 491 0236

DENDRITIC BALANCE, PREDICTIVE PROCESSING AND SYNAPTIC LEARNING

Our brains can learn a model about the world by continuously making predictions, and comparing the prediction from this inner model with the outcome from the world. In case of a mismatch, the error can be used to update the model in principle. These conceptual ideas date back to Helmholtz. But how is such learning realized on the neuronal level?

We propose that dendritic branches play a central role in representing the encoding error - implementing "dendritic error computation", where the encoding error is represented as a deviation from resting potential. This concept arises from analytical derivation of optimal synaptic learning rules for efficient coding. In the second part of the talk we discuss how, on the network level, homeostatic regulation implements a fine balance between excitation and inhibition, enabling for rapid and flexible changes of computational properties.

Overall, spanning the arch from analytical principles of neural computation to physiological implementation on the synaptic and neural level, we contribute to a fundamental understanding of learning in living neural networks.

About the speaker

Viola Priesemann is Professor in the department of physics, Göttingen, and group leader at the MPI for Dynamics and Self-Organization. She studies living and artificial neural networks, carving out their basic mechanisms of self-organization, learning, and efficient coding.

Viola studied physics at the TU Darmstadt and the U.N. Lisbon. For her PhD, she combined theoretical work at the ENS Paris with experimental neuroscience at Caltech, Pasadena, and graduated 2013 at the MPI for Brain Research and University Frankfurt. In 2015, she was awarded a Max Planck Research group, which she heads at the MPI for Dynamics and Self-Organization, and since 2022 she is also professor of physics at the University of Göttingen.

Social

www.viola-priesemann.de
viola.priesemann@ds.mpg.de
Mastodon: @ViolaPriesemann@Mastodon.Social
Twitter: @ViolaPriesemann, @PriesemannLab
BlueSky: @violapriesemann.bsky.social

This invited talk is hosted by SFB1315 Speaker and PI Matthew Larkum (Ao4, A10, Z)

Certificate of attendance

Please contact team assistant
[serenella.brinati.1\(at\)hu-berlin.de](mailto:serenella.brinati.1(at)hu-berlin.de)



Funded by



Deutsche
Forschungsgemeinschaft
German Research Foundation