Marius Schneider

Postdoc · UC Santa Barbara

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Google Scholar Profile | ORCID Profile

Computational neuroscientist studying how the brain processes and integrates sensory input to support perception and behavior, using large-scale neural recordings and computational modeling. My PhD introduced a theoretical model of inter-areal coherence that challenges prevailing interpretations of neural oscillations and functional connectivity.

Education

Ph.D. in Neurophysics — *Nijmegen (NL)*

Donders Centre for Neuroscience, Radboud University — *02/2020 - 05/2024*

Title: Mechanisms of inter-areal neuronal communication
Advisor: Prof. Dr. Martin Vinck.
Committee: Prof. Dr. Marie Carlen, Prof. Dr. Gaute Einevoll, Prof. Dr. Dr. h.c. mult. Wolf Singer.
Graduated with highest honors (top 5 %).

M.Sc. in Physics — *Frankfurt (DE)*

Goethe University — *10/2016 – 04/2019*

Title: Biological complexity facilitates tuning of the neuronal parameter space
Advisor: Dr. Hermann Cuntz, Prof. Dr. Peter Jedlicka.
German Grade - 1.1, American GPA - 3.9.

B.Sc. in Physics — *Frankfurt (DE)*

Goethe University — *10/2012 – 10/2016*

Advisor: Prof. Dr. Reinhard Dörner.
German Grade - 1.7, American GPA - 3.3.

Professional Experience

2024-2026 **Postdoc**, UC Santa Barbara, California, USA
- Leading several highly collaborative projects
- Mentoring graduate students on deep reinforcement learning and digital twin models of mouse vision
- Large-scale data analysis of electrophysiological recordings from visual cortex and behavior in freely moving mice

2019-2024 **PhD student**, Ernst Strüngmann Institute for Neuroscience in Cooperation with Max Planck Society
- Led several highly collaborative projects resulting in high-impact publications
- Large-scale data analysis of neural recordings in different species
- Developed biophysical and abstract models of neural circuits and LFP signals
- Mathematical analysis

2018-2019 **Research Assistant**, Justus Liebig University, Gießen
- Developed biophysical models of degeneracy in the hippocampus

2017-2018 **Research Assistant**, Frankfurt Institute for Advanced Studies
- Biophysical modeling of hippocampal granule cells
- Teaching and supervision of undergraduate students

2017-2018 **Accelerator Operator**, Goethe University, Frankfurt
- Operate a linear particle accelerator to carry out ion beam analyses

2016-2018 **Research Assistant**, Max Planck Institute for Empirical Aesthetics
- Performed & preprocessed MEG recordings
- Project management and recruitment of subjects

Publications

Published

Onorato I, Tzanou A, **Schneider M**, Uran C, Broggini AC, Vinck M. 2025. Distinct roles of PV and Sst interneurons in visually-induced gamma oscillations. Cell Reports, 44 (3), 115385.

Spyropoulos G*, **Schneider M***, van Kempen J, Gieselmann MA, Thiele A, Vinck M. 2024. Distinct feedforward and feedback pathways for cell-type specific attention effects. Neuron, 112 (14): 2423-2434.e7.

Schneider M, Tzanou A, Uran C, Vinck M. 2023. Cell-type-specific propagation of visual flicker. Cell Reports, 42(5): e1011212.

Schneider M, Bird AD, Gidon A, Triesch J, Jedlicka P, Cuntz H. 2023. Biological complexity facilitates tuning of the neuronal parameter space. PLOS Computational Biology, 19(7): e1011212.

Vinck M, Uran C, Spyropoulos G, Onorato I, Broggini AC, **Schneider M**, Johnson AC. 2023. Principles of large-scale neural interactions. Neuron, 111(7): 987-1002.

JR Dowdall, **Schneider M**, M Vinck. 2023. Attentional modulation of inter-areal coherence explained by frequency shifts. NeuroImage, 277: 120256.

Schneider M, Broggini AC, Dann B, Tzanoua A, Uran C, Sheshadri S, Scherberger H, Vinck M . 2021. A mechanism for inter-areal coherence through communication based on connectivity and oscillatory power. Neuron, 109(24): 4050-4067.

Cuntz H, Bird A, Beining M, **Schneider M**, Mediavilla L, Hoffmann F, Deller T, Jedlicka P. 2021. A general principle of dendritic constancy – a neuron's size and shape invariant excitability. Neuron, 109(22): 3647-3662.

In Review

Vinck M, Uran C, **Schneider M**. Aperiodic processes explaining rhythms in behavior: A matter of false detection or definition?

* These authors contributed equally

Awards, Fellowships, & Grants

2024	**EBBS young investigator award** European Brain and Behaviour Society
2019	**PhD research fellowship,** International Max Planck Research School for Neural Circuits
	Travel Grant for CNS conference, Organization for Computational Neurosciences
2018	**Travel Grant for Neural Dynamics Summer School,** University of Bristol
2016	**German National Student Scholarship**

Invited Talks & Selected Conference Presentations

2025	**Cosyne (Montreal, Canada),** Poster: Uncovering behavioral strategies: Training mice and AI on a shared foraging task.
2025	**Cosyne (Montreal, Canada),** Poster: A mechanism for selective attention in biophysically realistic Daleian spiking neural networks.
2025	**Cosyne (Montreal, Canada),** Poster: A deep learning framework for center-periphery visual processing in mouse visual cortex.
2024	**FENS Forum (Vienna, Austria),** Poster: Mechanisms of attention in biophysiologically realistic Daleian spiking neural networks
2022	**Bernstein Center of Computational Neurosciences (Berlin, Germany),** Invited Talk: Do neurons communicate through coherence?
2022	**SFN (San Diego, USA),** Poster: Cell-type specific entrainment during rhythmic visual flicker stimulation.

2022 **Bernstein (Berlin, Germany),** Poster: Cell-type specific entrainment during rhythmic visual flicker stimulation.

2021 **Neuromatch Conference (Online),** Selected Talk: A mechanism for inter-areal coherence through communication based on connectivity and oscillatory power.

2019 **CNS (Barcelona, Spain),** Poster: High dimensional ion channel composition enables robust and efficient targeting of realistic regions in the parameter landscape of neuron models.

2018 **3R Centre Kick-off symposium (Giessen, Germany),** Poster: Ion channel diversity enables robust and flexible targeting of realistic regions in the parameter landscape of dentate granule cell models.

Academic Contributions and Services

Peer Reviewer for *Nature Communications*

Peer Reviewer for *Journal of Neurophysiology*

Co-organizer of lecture series *ESI-talks, Ernst Struengmann Institute*

Teaching & Mentoring

2025 **UC Santa Barbara – Graduate Course: Bionic Vision,** Guest lecture: Introduction to Computational Neuroscience

2024 **Jing Peng** Master Thesis, UC Santa Barbara

2022 **Neuromatch Academy: Computational Neuroscience,** Teaching Assistant (Online)

2019 **Aysin Yildirim** Bachelor Thesis, Goethe University

2019 **7th Baltic-Nordic School on Neuroinformatics,** Teaching Assistant (Frankfurt Institute for Advanced Studies)

2018 **Computational Neurobiology Course,** Teaching Assistant (Goethe University, Frankfurt)

Further Qualifications

LANGUAGES : German (native speaker), English (fluent), French (basic)

METHODOLOGICAL EXPERTISE : Analysis of large-scale neural recordings, computational and biophysical modeling, machine learning

TECHNICAL SKILLS : Python, PyTorch, TensorFlow, MATLAB, C++, NEURON, FieldTrip, LaTeX, Adobe Illustrator

OTHER SKILLS : Mentoring, collaborative research, teaching, scientific communication, problem solving