

Marius Schneider

POSTDOC · UC SANTA BARBARA

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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, Broggin 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, Broggin 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, Broggin AC, Dann B, Tzanou 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 biophysiological 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 Strüngmann Institute for Neuroscience*

Teaching & Mentoring

- 2025 **Graduate Course: Bionic Vision**, Guest lecture: Introduction to Computational Neuroscience, UC Santa Barbara
- 2024 **Jing Peng**, Master's Thesis supervision, UC Santa Barbara
- 2022 **Neuromatch Academy: Computational Neuroscience**, Teaching Assistant, Online
- 2019 **Aysin Yildirim**, Bachelor Thesis supervision, 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)

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

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