

Matteo Guardamagna, PhD

Solberg Postdoctoral Fellow at *Kavli Institute for Systems Neuroscience* (NTNU)
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Education

- 2018-2022: **PhD in Neuroscience**, Radboud University (Donders Institute), Nijmegen (NL).
Thesis: Temporal Coding Dynamics in the CA1 region of the hippocampus
Cum Laude Distinction
- 2015-2017: **MSc in Cognitive Neuroscience**, University of Padua, Padua (IT).
Thesis: Functional characterization of spatially-modulated neurons in the dorsal subiculum of the mouse.
Graduated cum laude (110/110 cum laude)
- 2012-2015: **BSc in Psychological Sciences**, University of Milano-Bicocca, Milan (IT).
Thesis: Cross-modal influences on face perception: psychophysiological study
Graduated cum laude (110/110 cum laude)

Research Positions

- 2023-present: **Postdoctoral Fellow**
Kavli Institute for Systems Neuroscience (NTNU), Trondheim (NO)
Supervisors: Prof. Edvard Moser and Prof. May-Britt Moser
- 2018-2022: **PhD Candidate** (Marie-Curie Early-Stage Researcher)
Donders Institute (Radboud University), Nijmegen (NL).
Supervisors: Prof. Francesco Battaglia and Dr. Federico Stella
- 2020-2021: **Visiting PhD Student** (5 Months)
Kavli Institute for Systems Neuroscience (NTNU), Trondheim (NO)
Supervisors: Prof. Clifford Kentros
- 2016-2017: **Visiting Research Student** (MSc Thesis)
University College London (UCL), London (UK)
Supervisors: Prof. Francesca Cacucci and Prof Tom Wills
- 2014-2015: **Undergraduate Research Student** (BSc Thesis)
University of Milano-Bicocca, Milan (IT).
Supervisors: Prof. Alice Mado Proverbio

Grants and Awards

- 2025-present **Solberg** Postdoctoral Fellowships (Kavli Institute)
- 2023-2025: **EMBO** Postdoctoral Fellowships (ALTF 738-2022- total 148000€)
- 2018-2021: **Marie Skłodowska-Curie** Fellowship for Early Stage Researchers (total 374000€)
- 2016-2017: **MIUR** Scholarship for Excellent Traineeships (total 500€)
- 2016-2017: **Erasmus+** Traineeship Scholarship (total 3000€)
- 2022 **Cum Laude Distinction** from the PhD in Science at Radboud University.
- 2017 Graduated **cum laude** (110/110 cum laude) from the M.Sc.
- 2015 Graduated **cum laude** (110/110 cum laude) from the BSc.

Publications

- **Guardamagna, M.**, Hermansen, E., Carpenter, J., Lykken, C. M., Dunn, B. A., Moser, E. I., & Moser, M. (2026). Toroidal topology of grid-cell activity precedes spatial navigation during development. *bioRxiv* (Cold Spring Harbor Laboratory). <https://doi.org/10.64898/2026.03.10.710908>
- **Guardamagna, M.**, Chadney, O., Stella, F., Zhang, Q., Kentros, C., & Battaglia, F. P. (2025). Direct entorhinal control of CA1 temporal coding. *Nature Communications*, 16(1), 6430. <https://doi.org/10.1038/s41467-025-61453-2>
- Lykken, C. M., Kanter, B. R., Nagelhus, A., Carpenter, J., **Guardamagna, M.**, Moser, E. I., & Moser, M. (2025). Functional independence of entorhinal grid cell modules enables remapping in hippocampal place cells. *bioRxiv* (Cold Spring Harbor Laboratory). <https://doi.org/10.1101/2025.09.24.677985>
- Modi, B., **Guardamagna, M.**, Stella, F., Griguoli, M., Cherubini, E., Battaglia, FP (2023). State Dependent Coupling of Hippocampal Oscillations. *eLife*, <https://doi.org/10.7554/eLife.80263>.
- **Guardamagna, M.**, Stella, F., & Battaglia, F. P. (2023). Heterogeneity of network and coding states in mouse CA1 place cells. *Cell Reports*, 42(2), 112022. <https://doi.org/10.1016/j.celrep.2023.112022>
- **Guardamagna, M.**, Eichler, R., Pedrosa, R., Aarts, A., Meyer, A., & Battaglia, F. (2022). The Hybrid Drive: A Chronic Implant Device Combining Tetrode Arrays with Silicon Probes for Layer-Resolved Ensemble Electrophysiology in Freely Moving Mice. *J. Neural Eng.* 19 036030.
- Proverbio, C. A. A. M., Nasi, V. L., Arcari, L. A., De Benedetto, F., **Guardamagna, M.**, Gazzola, M., & Zani, A. (2015). The effect of background music on episodic memory and autonomic responses: Listening to emotionally touching music enhances facial memory capacity. *Scientific Reports*, 5. <https://doi.org/10.1038/srep15219>.
- Proverbio, A. M., Manfrin, L., Arcari, L. A., De Benedetto, F., Gazzola, M., **Guardamagna, M.**, ... Zani, A. (2015). Non-expert listeners show decreased heart rate and increased blood pressure (fear bradycardia) in response to atonal music. *Frontiers in Psychology*, 6(OCT). <https://doi.org/10.3389/fpsyg.2015.01646>

Invited Talks and Poster Presentations

- 07.10.2025 **Guardamagna, M.**, Ontogeny of Toroidal Manifolds in the entorhinal cortex.
Invited Talk: Columbia University (USA).
- 06.10.2025 **Guardamagna, M.**, Ontogeny of Toroidal Manifolds in the entorhinal cortex.
Invited Talk: Kavli NDI Series. Johns Hopkins University (USA).
- 24.05.2025 **Guardamagna, M.**, Ontogeny of the grid network
Invited Talk: Spring Hippocampal Conference (IT).
- 11.12.2023 **Guardamagna, M.**, Development of Toroidal Topology in the Grid Cells Network.
Invited Talk: Memory Development in Mammalian Species. Nijmegen (NL).
- 30.5.2023 **Guardamagna, M.**, Direct Entorhinal Control of CA1 Temporal Coding.
Invited Talk: Spring Hippocampal Research Conference. Verona (IT).
- 14.4.2023 **Guardamagna, M.**, Heterogeneity of Network and coding states in mouse CA1 place cells.
Invited Talk: Journal Club, Wills-Cacucci – UCL. London (UK). (Virtual)
- 28.4.2021 **Guardamagna, M.**, Medium gamma control of CA1 place cells' phase precession.
Invited Talk: Journal Club – Physionet Team. Marseille (FR). (Virtual)

Posters presentations:

SfN 2025; Ascona Lake Conference 2024; SfN 2024; FENS 2024; SfN 2023; FENS 2022; SfN 2021; Donders Session 2020

Mentoring and Teaching

2023-present: Supervising PhD student Jordan Carpenter (Moser Lab)
2020: Supervising MSc student and MSc Thesis of George Bardanikas (Battaglia Lab)
2019: Supervising MSc student and MSc Thesis of Kyras Wilmink (Battaglia Lab)

2025-2026: **Lecturer on** "Neural Dynamics" for the NEVR3003,
2024-2025: **Lecturer on** "Neural Dynamics" for the NEVR3003,
2023-2024: **Lecturer on** "Neural Dynamics" for the NEVR3003,
Behavioral and Cognitive Neuroscience Course.

2020: **Teaching assistant** for Coding with Matlab (BSc Course).
2020: **Teaching assistant** for Cognitive Neuroimaging (MSc Course).
2019: **Teaching assistant** for Behavioral Neuroscience (BSc Course).