

Marta Morandini

AIX-MARSEILLE UNIVERSITÉ - INSTITUT DE NEUROSCIENCES DE LA TIMONE

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Passionate about interdisciplinary science, yet rooted in mathematics and physics. Currently, I'm applying network theory and modeling to functional MRI to delve into the aging process. Apart from my scientific pursuits, I am deeply committed to promoting inclusivity within and outside the community.

Research

WRITING

- 2025 **Behind the paper**, Higher-order Laplacian Renormalization *Research Comm*
- 2025 **Higher-order Laplacian Renormalization**, M. Nurişso, M. Morandini, M. Lucas, F. Vaccarino, T. Gili, G. Petri *Nat. Phys.*
- 2024 **Disentangling individual-level from location-based income uncovers socioeconomic preferential mobility and impacts segregation estimates**, M. Duran-Sala, A. Koikkalethu Balachandran, M. Morandini, T. Naushirvanov, A. Prabhakaran, A. Renninger, M. Mazzoli *ArXiv*

TALKS

- 2025 **CCS - CoBrain**, The role of directional interactions in typical aging *Siena, Italy*
- 2025 **PhD days of the INT**, The role of directional interactions in typical aging *Marseille, France*
- 2025 **BrainNets Day**, Surre-AI-lism *Marseille, France*
- 2023 **NetSci - Network Neuroscience**, Higher-order brain time series improve subject and age fingerprinting *Vienna, Austria*
- 2023 **NetSci - TopoNets**, Higher-order brain time series improve subject and age fingerprinting *Vienna, Austria*

POSTERS

- 2025 **CCS**, The role of directional brain interactions in cognitive performance in typical aging *Siena, Italy*
- 2025 **NeuroFrance**, Directional functional interactions in brain networks in typical aging *Montpellier, France*
- 2024 **BrainModes**, Directional functional interactions in brain networks in healthy aging *Bilbao, Spain*
- 2024 **15th scientific day of the IRM-INT centre**, Growing Older: exploring directional connectivity through fMRI *Marseille, France*
- 2024 **PhD days of INT**, Growing Older: exploring directional connectivity through fMRI *Marseille, France*

CONTRIBUTIONS

- 2025 **Higher-order Laplacian Renormalization**, GitHub repository
- 2024 **NetSciX**, Higher-order Laplacian Renormalization - talk by M. Nurişso *Venice, Italy*

SCHOOLS

- 2024 **EITN Fall School in Computational Neuroscience**, by EBRAINS *Marseille, France*
- 2024 **Complexity72h Workshop**, 5th edition by A. Antonioni, M.A. Gonz  les Casado, G. Pullano, E. Valdano *Madrid, Spain*

HONORS AND GRANTS

- 2024 **Best Poster Award**, BrainModes 2024 *Bilbao, Spain*
- 2023 **Scholarships for Events on Complex Systems (SECS)**, by yrCSS

MEMBERSHIPS AND SERVICES

- 2025 **"La complessit     semplice?" in collab with La Scienza Coatta**, organization and participation *Siena, Italy*
- 2025 - **Pint of Science**, event manager *Marseille, France*
- 2024 - **Network Science Society**, member
- 2023 - **Complex Systems Society**, member
- 2023 - **Comit   de Diversit  , d'  quit   et de Lutte contre les Discriminations (DELD)**, member *INT, Marseille*

Education

INT (Institut de Neurosciences de la Timone) - AMU (Aix-Marseille Universit  )

Marseille, France

PHD IN COMPUTATIONAL NEUROSCIENCE

2023 - present

- Thesis: *Analysis and modelling of directional interactions in the human brain*. Supervisors: Andrea Brovelli, Matthieu Gilson.

UniTo (University of Turin)

Turin, Italy

MASTER'S AND BACHELOR'S DEGREE IN MATHEMATICS

- Master's Thesis: *Topological fingerprints of brain individuality and age*. Supervisors: Federica Galluzzi, Giovanni Petri.
- Bachelor's Thesis: *Elliptic curves and cryptography*. Supervisor: Alberto Albano.

Skills

Programming Python, Matlab, R, LaTeX

Languages Italian (mother tongue), English (fluent), French (intermediate), Spanish (intermediate)

Experience

CENTAI Institute

Turin, Italy

INTERNSHIP

2022 - 2023

- Topological Data Analysis, Complex Systems, fMRI data in Giovanni Petri's team (NPL research).

UniTo

Turin, Italy

TUTOR

2018 - 2021

- *Scuola dei compiti*: maths and physics tutoring for high school students. (2018-2019)
- *Matematica e scienza: sostantivi femminili*: workshops about women in maths and economics for high school students. (2021)

Cooperativa Animazione Valdocco

Biella, Italy

WOOD SCHOOL-COMMUNITY

2019 - 2020

- Workshops in STEM disciplines for summer school (middle school students).

Additional

COURSES

- 2025 **Statistics with Python**, by Royce Anders
- 2025 **Mastering (neuro)scientific presentations**, by Liubov Ardasheva
- 2024 **Oral communication of scientific content course**, by Emma Rodero
- 2024 **Machine learning course**, by Matthieu Gilson, Laurent Perrinet and Etienne Thoret
- 2024 **Scientific writing in english**, by University of Aix-Marseille
- 2023 **Research ethics**, by Neuroschool and University of Aix-Marseille
- 2023 **Awareness to open science**, by Neuroschool and University of Aix-Marseille
- 2023 **Research integrity in scientific professions**, by Neuroschool and University of Aix-Marseille
- 2023 **English course for research**, by Adrian Wallwork

ATTENDANCES

- 2025 **Ecology and Neuroscience Workshop**, by Manuel Mercier and Marie Jacqué Marseille, France
- 2024 **INT Conference**, by Institut de Neurosciences de la Timone Marseille, France
- 2024 **NeuroMarseille Day**, by Neuroschool and University of Aix-Marseille Marseille, France
- 2023 **BrainHack Marseille**, project by A. Brovelli and E. Combrisson on higher-order interactions Marseille, France
- 2023 **NeuroDays: The Brain Chronicles**, by NeuroSchool and University of Aix-Marseille Marseille, France
- 2023 **Navigating the Research Frontier of AI and Complexity**, by CENTAI Turin, Italy