

Francesco Ferraro - CV

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Experience

University of Padova and National Biodiversity Future Center , Italy PhD in theoretical physics and ecology Supervisors: Sandro Azaele, Amos Maritan, Samir Suweis	2023/02 – present
University of Chicago , USA Visiting researcher Supervisor: Stefano Allesina	2025/10
Harvard University , USA Visiting researcher Supervisor: Michael P. Brenner	2024/03
École normale supérieure , Paris, France Researcher in applied mathematics and computational biology Supervisor: David Holcman	2022/06 – 2022/08
Femtorays Technologies , Trento, Italy Silicon photonics engineer	2021/04 – 2022/04

Teaching

University of Padova , Italy Teaching assistant, Models of theoretical physics	2024 – 2025
University of Padova , Italy Teaching assistant, Electromagnetism	2023 – 2025

Education

SISSA and University of Trento , Italy MSc in theoretical physics Grade: 110/110 cum laude	2018 – 2021
University of Padova , Italy BSc in physics Grade: 110/110	2015 – 2018

Schools

Spring school on mathematical theory in community ecology Institut Natura e Teoria en Pirenèus, France	2025/05
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Publications

- **Generalized Lotka-Volterra systems with quenched random interactions and saturating functional response**
Marco Zenari, [FE](#), Sandro Azaele, Amos Maritan, Samir Suweis
[arxiv:2506.04056](#) (2025)
- **Synchronization and chaos in complex ecological communities with delayed interactions**
[FE](#), Christian Grilletta, Emanuele Pigani, Samir Suweis, Sandro Azaele, Amos Maritan
[arxiv:2503.21551](#) (2025)
- **Exact solution of dynamical mean-field theory for a linear system with annealed disorder**
[FE](#), Christian Grilletta, Amos Maritan, Samir Suweis, Sandro Azaele
[Journal of Statistical Mechanics](#), 023301 (2025)
- **Generalized Lotka-Volterra Systems with Time Correlated Stochastic Interactions**
Samir Suweis, [FE](#), Christian Grilletta, Sandro Azaele, Amos Maritan
[Physical Review Letters](#) 133, 167101 (2024)
- **Optoelectronic device for the detection of substances dispersed in a fluid**
Carlo Guardiani, Lorenzo Pavesi, [FE](#), Niccolò Ardoino, Mattia Mancinelli
[US Patent App. 18/719,365](#) (2023)
- **Nonequilibrium relaxation of a trapped particle in a near-critical Gaussian field**
Davide Venturelli, [FE](#), Andrea Gambassi
[Physical Review E](#) 105, 054125 (2022)

Talks

- **Time delays induce synchronization and chaos in complex ecological communities**
Biodiversity PhD Day, Padova, Italy (2025)
- **Generating functional approach to dynamical systems with colored-noise interactions**
University of Mining and Technology, Xuzhou, China (2024)
- **Advances in the modeling of ecological communities: a theoretical physics approach**
Biodiversity PhD Day, Padova, Italy (2024)
- **Extensions of Dynamical Mean-Field Theory and applications**
Stochastic Models and Experiments in Ecology and Biology, L'Aquila, Italy (2024)
- **Advances in the modeling of ecological communities**
Harvard University, USA (2024)
- **Generalized Lotka-Volterra equations with annealed disorder**
Conference on Complex Systems, Napoli, Italy (2023)
- **Dynamical behaviour of Brownian particles coupled to a critical field**
LIPh Winter Workshop, Asiago, Italy (2023)

Funding and awards

- **Travel grant**, Young Researchers of the Complex Systems Society, 500 EUR (2025)
- **Travel grant**, Alma Dal Co Foundation, 1'500 EUR (2024)
- **PhD scholarship**, University of Padova (2023)
- **PhD scholarship**, École normale supérieure (2022, declined)
- **PhD scholarship**, University of Trento (2022, declined)
- **PhD scholarship**, Human Technopole (2022, declined)
- **PhD scholarship**, SISSA (2020, declined)
- **Diploma in physics**, SISSA, completion of extra 15 ECTS in PhD-level courses (2020)
- **MSc scholarship**, University of Trento, 15'000 EUR (2018)

References

Sandro Azaele, Associate professor, University of Padova, [contact hidden]
Amos Maritan, Full professor, University of Padova, [contact hidden]
Samir Suweis, Associate professor, University of Padova, [contact hidden]
Andrea Gambassi, Full professor, SISSA, [contact hidden]
Carlo Guardiani, CEO, Femtorays Technologies, [contact hidden]