

Federico Ghimenti

Postdoctoral Fellow, Department of Applied Physics
Stanford University

✉ ghimenti@stanford.edu
📄 [Webpage](#)

Research Activity

- 2024–2027 **SITP Postdoctoral fellow**, *Stanford Institute of theoretical Physics*, Independent postdoctoral fellowship.
- 2021–2024 **PhD**, *Université Paris Cité*, Laboratoire Matière et Systèmes Complexes.
Supervisor: [Frédéric van Wijland](#) **Title**: *Irreversible sampling of glassy systems*

Education

- 2019–2021 **M. Sc.**, *ENS ICFP*.
Theoretical Physics, **Final Grade**: 17.2/20
- 2016–2019 **B. Sc.**, *Sapienza University of Rome*.
Physics, **Final grade**: 110/110 cum laude
- 2011–2016 **Diploma**, *Liceo Scientifico Talete*, Rome.
High School education, **Final grade**: 100/100

Internships

- 2021 **M2 Internship**, *Laboratoire Matière et Systèmes Complexes, Université de Paris Cité*, **Supervision**: Frédéric Van Wijland. **Project**: *Accelerating Brownian Dynamics*.
- 2020 **M1 Internship**, *LPENS, Paris*.
Supervision: Giulio Biroli, Gilles Tarjus, Misaki Ozawa. **Project**: *Plastic flow of two-dimensional solids*

Teaching

- 2024 *Teaching assistant*, Logical Electronics (Bachelor, 1st year) IUT Université Paris Cité
- 2023 *Teaching assistant*, Electromagnetism (Bachelor, 2nd year) IUT Université Paris Cité
- 2023 *Teaching assistant*, Logical Electronics (Bachelor, 1st year), IUT Université Paris Cité
- 2022 *Teaching assistant*, Optics (Bachelor, 1st year) IUT Université Paris Cité
- 2022 *Teaching assistant*, Logical Electronics (Bachelor, 1st year), IUT Université Paris Cité

Publications

15. **FG**, L. Berthier, J. Kurchan, and F. van Wijland. “[Clever algorithms for glasses work by time reparameterization](#)”. *Proceedings of the National Academy of Sciences* 123 (2026).
14. T. Leleu, S. Gunathilaka, **FG**, and S. Ganguli. “[Contrastive Concept-Tree Search for LLM-Assisted Algorithm Discovery](#)”. *Preprint arXiv:2602.03132* (2026).
13. M. Del Gaudio, **FG**, and S. Ganguli. “[Short-term plasticity recalls forgotten memories through a trampoline mechanism](#)”. *Preprint arXiv:2511.22848* (2025).
12. **FG**, A. Sriram, A. Yamamura, H. Mabuchi, and S. Ganguli. “[The geometry and dynamics of annealed optimization in the coherent Ising machine with hidden and planted solutions](#)”. *Preprint arXiv:2510.21109* (2025).

11. C. Hargus, **FG**, J. Tailleur, and F. Van Wijland. "[Passive objects in a chiral active bath: From microscopic to macroscopic](#)". *Physical Review E* 112 (2025).
10. C. Hargus, **FG**, J. Tailleur, and F. van Wijland. "[Odd dynamics of passive objects in a chiral active bath](#)". *Physical Review Letters* 135 (2025).
9. Y. Nishikawa, **FG**, L. Berthier, and F. van Wijland. "[Irreversible swap algorithms for soft sphere glasses](#)". *Physical Review E* 111 (2025).
8. H. Pan, J. V. Roggeveen, E. Berg, J. Carrasquilla, D. Chowdhury, S. Ganguli, **FG**, J. Hasik, H. Hunt, H.-C. Jiang, et al. "[CMT-Benchmark: A Benchmark for Condensed Matter Theory Built by Expert Researchers](#)". *preprint arXiv:2510.05228* (2025).
7. L. Berthier, **FG**, and F. van Wijland. "[Monte Carlo simulations of glass-forming liquids beyond Metropolis](#)". *The Journal of Chemical Physics* 161 (2024).
6. **FG**, L. Berthier, G. Szamel, and F. van Wijland. "[Transverse forces and glassy liquids in infinite dimensions](#)". *Physical Review E* 109 (2024).
5. **FG**, L. Berthier, G. Szamel, and F. van Wijland. "[Irreversible Boltzmann samplers in dense liquids: Weak-coupling approximation and mode-coupling theory](#)". *Physical Review E (Editors' Suggestion)* 110 (2024).
4. **FG**, L. Berthier, and F. van Wijland. "[Irreversible Monte Carlo algorithms for hard disk glasses: From event-chain to collective swaps](#)". *Physical Review Letters (Editors' Suggestion)* 133 (2024).
3. **FG**, M. Ozawa, G. Biroli, and G. Tarjus. "[Shear-induced phase behavior and topological defects in two-dimensional crystals](#)". *Physical Review B* 109 (2024).
2. **FG**, L. Berthier, G. Szamel, and F. van Wijland. "[Sampling efficiency of transverse forces in dense liquids](#)". *Physical Review Letters (Editors' Suggestion)* 131 (2023).
1. **FG** and F. van Wijland. "[Accelerating, to some extent, the \$p\$ -spin dynamics](#)". *Phys. Rev. E* 105 (2022).

Awards and fellowships

- 2024–2027 **SITP postdoctoral fellowship**, 247500 \$
- 2021–2024 **PhD fellowship** from Ecole Doctorale Paris Ile de France (EDPIF), 57600 €
- 2019–2021 **ICFP scholarship** for International students, 32000 €
- 2016–2019 **Excellent Student** at *Sapienza University of Rome*.

Talks and Posters

- Jan 2026 Contributed poster, [Berkeley Statistical Mechanics Meeting](#), Berkeley, California
- Jul 2025 Contributed Talk, [StatPhys29](#), Florence, Italy
- Jul 2025 Poster, [Youth in high dimensions](#), ICTP Trieste, Italy
- Jan 2025 Research seminar in the Theoretical Chemistry Department, UC Berkeley, California
- Apr 2024 Interview Talk at [Stanford Institute of Theoretical Physics](#), Stanford, California
- Jan 2024 Short talk, [Journé de Physique Statistique](#), Paris, France
- Sep 2023 Talk, [Probabilistic sampling for physics](#), Paris, France
- Jun 2023 Seminar, [M. Michel's group](#), Université Clermont - Auvergne, France
- May 2023 Poster, [Cecam workshop on Mesoscale modelling of driven disordered materials: from glasses to active matter](#), Lausanne, Switzerland

Mar 2023 Seminar, [K. Miyazaki's group](#), Nagoya, Japan
Mar 2023 Seminar, A. Ikeda and H. Ikeda group, Tokyo, Japan
Mar 2023 Seminar, [H. Yoshino Lab](#), Osaka, Japan
Feb 2023 Seminar, [Yukawa Institute for Theoretical Physics](#), Kyoto, Japan
Apr 2022 Poster, [Cecam workshop on Numerical techniques for nonequilibrium steady states](#), Mainz, Germany
Jun 2022 Poster, [The Beg Rohu Summer School, poster](#), Saint Pierre Quiberon, France

Academic service

2025– **Organizer** – Stanford's Theoretical Biophysics Journal Club
2024– **Reviewer** – Physical Review Letters, Physical Review E

Computer Skills

Languages C, Python, HTML, Latex, Mathematica
Softwares Ovito, Excel, PowerPoint

Other

Languages **Italian** (mothertongue), **English** (fluent), **French** (fluent)
Interests Piano, hiking, climbing, music