JÉRÔME GARNIER-BRUN

jerome.garnier@unibocconi.it ◇ jeromegb.github.io ◇ Google Scholar
French citizen, born March 1998.

EXPERIENCE

Università Bocconi, Milan *June 2025 – current*
Marie Skłodowska-Curie research fellow
Marie Skłodowska-Curie Action funding for project SPIRAL (Structured Physics-Inspired Representations and dAta models for efficient Learning), carried out under the guidance of Prof. M. Mézard.

Università Bocconi, Milan *Jan. 2024 – June 2025*
Postdoctoral research fellow
Grant holder in the Theoretical Physics of Matter sector, working with Prof. M. Mézard (Dept. of Computing Sciences) on the role of the structure of data in learning and Prof. C. Tebaldi (Dept. of Finance) on networks of firms.

Kyoto University, Kyoto *July 2022 – Oct. 2022*
Visiting PhD student
JSPS fellowship for research on accelerating slow dynamics using nonequilibrium driving with Prof. S.-i. Sasa.

ENSAE and École polytechnique, Paris *Oct. 2020 – June 2022*
Teaching assistant
Supervision of tutorials in socio/econophysics and simulations in Python (84h total, 100% positive student ratings).

Imperial College, London *March 2019 – Aug. 2019*
Undergraduate researcher
Final year project on mathematical modelling for diffusion MRI under the supervision of Prof. D. J. Doorly.

EDUCATION

École polytechnique, Paris *Oct. 2020 – Dec. 2023*
PhD, Theoretical Physics
Thesis on the out-of-equilibrium statistical physics of complex and disordered systems, with a focus on socioeconomic-inspired models [link]. Supervised by Profs. J.-P. Bouchaud and M. Benzaquen at the EconophysiX lab.

Sorbonne Université, Paris *Sept. 2019 – June 2020*
Master of Physics, Physics of Complex Systems **High honours**

Imperial College, London *Oct. 2015 – July 2019*
Master of Engineering, Aeronautical Engineering **Highest honours**

PUBLICATIONS

10. Ariosto S., **G.-B. J.**, Straziota D. & Saglietti L. (2025). "Replication and Information Extraction in a Minimal Agent-Environment Model." *arXiv preprint*, arXiv:2509.23212 [arXiv]
9. **G.-B. J.**, Zakine R. & Benzaquen M. (2025). "Hydrodynamics of Cooperation and Self-Interest in a Two-Population Occupation Model." *Phys. Rev. Lett.* **135**, 107402 (Editors' Suggestion), [journal, arXiv], also featured in an École polytechnique press release [link]
8. **G.-B. J.**, Biggio L., Mézard M. & Saglietti L. (2025). "Early-stopping Too Late? Traces of Memorization Before Overfitting in Generative Diffusion." *The Impact of Memorization on Trustworthy Foundation Models: ICML 2025 Workshop* [OpenReview]

7. **G.-B. J.**, Mézard M., Moscato E. & Saglietti L. (2025). "How Transformers Learn Structured Data: Insights From Hierarchical Filtering." *Proceedings of the 42nd International Conference on Machine Learning (ICML 2025)*, PMLR **267** [OpenReview]
6. **G.-B. J.**, Benzaquen M. & Bouchaud J.-P. (2024). "Unlearnable Games and 'Satisficing' Decisions: a Simple Model for a Complex World." *Phys. Rev. X* **14**, 021039 [OA journal], also featured in the popular science magazine *New Scientist* [link]
5. Zakine R., **G.-B. J.**, Becharat A.-C. & Benzaquen M. (2024). "Socioeconomic agents as active matter in nonequilibrium Sakoda-Schelling models." *Phys. Rev. E* **109**, 044310 [journal, arXiv]
4. Dechant A., **G.-B. J.** & Sasa S.-I. (2023). "Thermodynamic Bounds on Correlation Times." *Phys. Rev. Lett.* **131**, 167101 (Editors' Suggestion) [journal, arXiv]
3. **G.-B. J.**, Bouchaud J.-P. & Benzaquen M. (2023). "Bounded rationality and animal spirits: a fluctuation-response approach to Slutsky matrices." *J. Phys. Complex.* **4**, 015004 [OA journal]
2. Alemany I., Rose J. N., **G.-B. J.**, Scott A. D. & Doorly D. J. (2022). "Random walk diffusion simulations in semi-permeable layered media with varying diffusivity." *Sci. Rep.* **12**, 10759 [OA journal]
1. **G.-B. J.**, Benzaquen M., Ciliberti S. & Bouchaud J.-P. (2021). "A new spin on optimal portfolios and ecological equilibria." *J. Stat. Mech.* **2021**, 093408 (featured in Highlights) [OA journal]

SEMINARS, SCHOOLS & CONFERENCES

- *Conference on Inference and AI* (Rockin'AI), Roccella Ionica, 02/09/2025 — contributed talk
- *Forty-Second International Conference on Machine Learning*, Vancouver, 13-19/07/2025 — poster
- *Learning with Machines, Physics and Minds summer school*, Beg Rohu, 02-13/06/2025
- *Towards a theory for typical-case algorithmic hardness winter school*, Les Houches, 27/01-07/02/2025
- *Young Seminar*, Società Italiana di Fisica Statistica (SIFS), 14/11/2024 — seminar
- *Conference on Inference and AI* (Rockin'AI), Roccella Ionica, 03/09/2024 — contributed talk
- *Glassy and Complex Systems summer school*, Cargèse, 08-19/07/2024 — poster
- *From Ecology to Economics and back workshop*, CFM & ENS, 13-14/05/2024 — **co-organizer**
- *Ergodicity Economics 2024*, Santa Fe Institute (remote), 19/02/2024 — contributed talk
- *Statistical Physics of Complex Systems summer school*, Beg Rohu, 05-16/06/2023 — poster
- *Recent advances in understanding artificial and biological neural networks winter school*, Les Houches, 20-24/02/2023 — poster
- *Yoshino lab.*, Osaka University, 06/10/2022 — seminar
- *Sasa lab.*, Kyoto University, 01/08/2022 — seminar
- *Laboratoire Gulliver theory group*, ESPCI Paris, 21/04/2022 — seminar
- *Nonequilibrium physics of living matter research group*, RIKEN Kobe (remote), 15/12/2021 — seminar
- *Conference on Complex Systems – Econophysics satellite*, Lyon, 27-28/10/2021 — poster
- *Fundamental Problems in Statistical Physics XV summer school*, Brunico, 12-24/07/2021
- *Glassy Systems and Inter-Disciplinary Applications summer school*, Cargèse, 28/06-08/07/2021 — poster

GRANTS & PRIZES

- Marie Skłodowska-Curie Action *Postdoctoral fellowship*, Sept. 2025 – Sept. 2027
- French Complex Systems Society *Best thesis prize* – finalist, Oct. 2024 [link]
- G-Research *Grant for PhD students*, Feb. 2023 [link]

- Japanese Society for the Promotion of Science (JSPS) *Summer fellowship*, Jul. – Oct. 2022 [link]
- Imperial College Faculty of Engineering *Dean's list*, June 2018 & June 2019

REFERENCES

- Marc Mézard (Università Bocconi & Académie des Sciences): marc.mezard@unibocconi.it
- Jean-Philippe Bouchaud (CFM & Académie des Sciences): jean-philippe.bouchaud@cfm.com
- Michael Benzaquen (CNRS & École polytechnique): michael.benzaquen@polytechnique.edu

SUPERVISION

- Luca Alberto Polverino (Università Bocconi): Bachelor thesis "On the Statistics of Bitcoin Returns: Power-Law Tails, Volatility Dynamics, and Fractality" (2024), co-supervised with M. Mézard, no Master student at Università Bocconi—presented at the *Complexity in Economics and Finance* StatPhys29 satellite
- Sayah El Hajji (ENS): Master thesis "Dynamics in low dimensional complex non-potential force" (2021), co-supervised with J.-P. Bouchaud & M. Benzaquen
- Noé Beserman (ENS): Master thesis "A generalization of the Schelling model: abolishing frontiers" (2021), co-supervised with J.-P. Bouchaud & M. Benzaquen