

Alberto Bassanoni

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Profile

Third-year PhD Candidate in Theoretical Physics at the University of Parma, specializing in statistical physics, stochastic processes, and complex systems. My research focuses on rare events, large deviation theory, and Big Jump phenomena in non-equilibrium systems, combining probability theory, stochastic calculus, statistical inference, and mathematical modeling. During my PhD, I established international research collaborations with Bar-Ilan University (Israel) and Université Paris-Saclay (France), where I was a Visiting Researcher at LPTMS. My current interests lie in high-dimensional complex systems, and stochastic modelling of artificial intelligence.

Employment History

- 2023 – ongoing
 - **Ph.D. Candidate in Physics**, University of Parma, XXXIX Cycle. Ph.D. project title: *Large deviations and big jump effects in stochastic processes*.
 - **Teaching assistant** for the courses of *Physics I* (mechanics) and of *Physics II* (electromagnetism, optics) for the B.Sc. in Chemistry, University of Parma.
- mar 2026 – jun 2026
 - **Visiting Ph.D. Researcher** at *Laboratoire de Physique Théorique et les Modèles Statistique* (LPTMS), Université Paris-Saclay, Orsay (Paris, France).

Education

- 2021 – 2023
 - **M.Sc., University of Parma (PR, Italy)** in Theoretical Physics.
Thesis title: *Large deviations and single big jump effects in Ornstein-Uhlenbeck processes*.
Final grade: 110/110 cum laude.
- 2018 – 2021
 - **B.Sc., University of Parma (PR, Italy)** in Physics.
Thesis title: *Magnetostatic analysis of materials subjected to mechanical cutting and laborations*.
Final grade: 110/110 cum laude.
- 2013 – 2018
 - **"L. Respighi" Scientific High School (PC, Italy)**, High School Diploma.
Final grade: 99/100.

Research Activities

Published Journal Articles

- 1 **A. Bassanoni** and O. Hamdi, "Beyond the big jump: A perturbative approach to stretched-exponential processes," *Journal of Statistical Mechanics: Theory and Experiment*, vol. 5, p. 053 202, 2026. [DOI: 10.1088/1742-5468/ae625d](#).
- 2 E. Ellettari, G. Nasuti, **A. Bassanoni**, A. Vezzani, and R. Burioni, "Rare events and redundancy in random walkers target search in a finite domain," *Chaos, Solitons & Fractals*, vol. 210, Part 1, p. 118 650, 2026. [DOI: 10.1016/j.chaos.2026.118650](#).
- 3 **A. Bassanoni**, A. Vezzani, E. Barkai, and R. Burioni, "Rare events and single big jump effects in ornstein-uhlenbeck processes," *Journal of Statistical Mechanics: Theory and Experiment*, vol. 34, p. 043 201, 2025. [DOI: 10.1088/1742-5468/adc093](#).
- 4 **A. Bassanoni**, A. Vezzani, and R. Burioni, "Rare events in extreme value statistics of jump processes with power tails," *Chaos: An Interdisciplinary Journal of Nonlinear Science*, vol. 34, no. 8, p. 083 144, 2024. [DOI: 10.1063/5.0216439](#).

Ongoing Research Projects

- 1 **A. Bassanoni**, M. Aliberti, L. Celada, L. Piovan, V. Zimbardo, and P. Rotondo, *Fisher information and its role in learning*, Work in preparation, 2026.
- 2 **A. Bassanoni** and G. de Mauro, *Big jump effects in run and tumble particles with stochastic resetting*, Work in preparation, 2026.
- 3 **A. Bassanoni** and V. Ros, *Constrained entropy and chaos in non-reciprocal p -spin model*, Work in preparation, 2026.

Some Attended Schools and Conferences

- 1 **DPG Spring Meeting Conference**, Participant and Talk Contribution, Dresden, Germany, Mar. 2026. [URL: https://www.dpg-verhandlungen.de/year/2026/conference/dresden/part/dy/session/7/contribution/2](https://www.dpg-verhandlungen.de/year/2026/conference/dresden/part/dy/session/7/contribution/2).
- 2 **LPTMC Seminars - Laboratoire de la Physique Théorique de la Matière Condensée**, Invited Talk Contribution, Paris, France, May 2026. [URL: https://www.lptmc.jussieu.fr/en/events/seminars2/alberto-bassanoni-parma](https://www.lptmc.jussieu.fr/en/events/seminars2/alberto-bassanoni-parma).
- 3 **Conference "Complex Spreading Phenomena: From Bacteria to Innovations"**, Participant and Poster Session Contribution, Bad Honnef, Germany, Jan. 2025. [URL: https://www.we-heraeus-stiftung.de/fileadmin/Redaktion/PDF/Seminare/2025/826_booklet.pdf](https://www.we-heraeus-stiftung.de/fileadmin/Redaktion/PDF/Seminare/2025/826_booklet.pdf).
- 4 **STATPHYS 29 - Florence 2025, the 29th International Conference on Statistical Physics**, Participant, Poster Contribution and Member of the Scientific Secretariat, Florence, Italy, Jul. 2025. [URL: https://statphys29.org](https://statphys29.org).
- 5 **Summer School "Fundamental Problems in Statistical Physics XVI"**, Participant and Poster Contribution, Biella, Italy, Jun. 2025. [URL: https://fjspxvi.sciencesconf.org/resource/page/id/14](https://fjspxvi.sciencesconf.org/resource/page/id/14).
- 6 **Les Houches Summer School in "Theory of Large Deviations and Applications"**, Participant, Les Houches, France, Jul. 2024. [URL: https://www.houches-school-physics.com/program/program-2024/theory-of-large-deviations-and-applications-1305507.kjsp](https://www.houches-school-physics.com/program/program-2024/theory-of-large-deviations-and-applications-1305507.kjsp).

Skills

Languages	Academic reading, writing and speaking competencies for English (B2 level) and Italian (mother tongue).
Coding	Matlab, Python, Excel, $\text{\LaTeX}$
Misc.	Academic research, teaching, training, consultation, $\text{\LaTeX}$ typesetting and publishing.

Miscellaneous Experience

Awards and Achievements

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| 2025 | Honorable Mention for Best Poster Contribution , FPSP XVI Summer School, Biella. Title: <i>Rare Events and Single Big Jump Effects in Ornstein-Uhlenbeck Processes</i> . |
| 2024 | Best Poster Contribution Award , IV SIFS Conference, Parma. Title: <i>Rare Events and Single Big Jump Effects in Ornstein-Uhlenbeck Processes</i> . |

Academic Service and Mentoring

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| 2025–Present | Scientific Reviewer . Referee for <i>Nature Communications</i> and <i>Journal of Statistical Mechanics: Theory and Experiment (JSTAT)</i> . |
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Miscellaneous Experience (continued)

- 2024–2026  **M.Sc. Thesis Co-Supervisor.** Co-supervisor of *Elisabetta Ellettari* and *Giacomo Nasuti* (University of Parma).
- 2024–2026  **Organizer of *Buzz Physics*,** a project of scientific dissemination with seminars and a journal produced by students in the Physics Department of the University of Parma.

Certifications and Licenses

- 2026  **BLSD Healthcare Executor Certification.** Issued by the Italian Red Cross of Piacenza.
- 2019  **Lifeguard Certification (P – Swimming Pool).** Issued by the Italian Swimming Federation (FIN).
- 2018  **Driving License B.**