

Gianmarco Spera

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webpage

Professional summary

I am a postdoctoral research assistant in active matter / theoretical biophysics at the Rudolf Peierls Centre for Theoretical Physics in the group of Julia Yeomans. Previously, I was a Ph.D. student in the Theory of Complex Systems group at the Laboratoire Matière et Systèmes Complexes in Paris. There, I worked under the supervision of Marc Durand, François Graner, and Julien Tailleur. I am interested in addressing biological questions from a statistical physics perspective. My research focuses on modeling cellular systems using continuum and agent-based theories.

Positions held

Postdoctoral Research Assistant <i>University of Oxford, Rudolf Peierls Centre for Theoretical Physics</i> Group of Julia Yeomans funded by the ERC Advanced Grant ActBio.	Oct. 2024 - now
Non-stipendiary lecturer <i>St. Hilda's college, Oxford</i>	Oct. 2025 - now

Education

Ph.D. in Physics <i>Université Paris Cité, Laboratoire Matière et Systèmes Complexes</i> Thesis: Are biological cells just another type of active particles? Supervisors: Marc Durand and Julien Tailleur.	Nov. 2020 - May 2024
Master Degree in Physics <i>University of Rome La Sapienza, Grade: 110/110 cum laude</i> Thesis title: Statistical analysis and theoretical modeling of swarming behavior in mosquitoes. Thesis advisor: Irene Giardina.	Oct. 2020
Bachelor Degree in Physics <i>University of Rome La Sapienza, Grade: 110/110 cum laude</i> Thesis title: Critical phenomena and Ising model. Thesis advisor: Mauro Lucio Papinutto.	Oct. 2018

Visits

Massachusetts Institute of Technology (MIT) <i>Hosted by Prof. Julien Tailleur.</i>	Oct-Nov 2023
Yukawa Institute for Theoretical Physics (YITP) <i>Hosted by Prof. Hisao Hayakawa.</i>	July 2023

Teaching activity

Non-stipendiary lecturer <i>St. Hilda's college</i> Duties: Thermal physics (thermodynamics, kinetic theory, and statistical mechanics) and undergraduate college admission.	2025-now
MMPHys project assessor <i>University of Oxford, Duties: marking.</i>	2025
Teaching assistant, Mechanics <i>IUT Paris Pajol (ex Diderot), Duties: laboratory supervision, marking, and invigilation.</i>	2021-2023
Teaching assistant, Real Analysis <i>University of Rome La Sapienza, Duties: exercise design, tutoring, and invigilation.</i>	2019-2020

Outreach

Theoretical Physics Postdoc Representative <i>University of Oxford, Duties: liaison for theory postdoctoral researchers.</i>	Oct 2025-now
Access and engagement, casual ambassador <i>University of Oxford, Duties: engagement activity in high-school.</i>	Jan 2025-now
Student support and academic advising office of the physics department <i>University of Rome La Sapienza, Duties: academic support for students and university open days.</i>	2018-2020

Awards

Excellence award program in physics <i>Classes: real analysis, potential theory, classical gravity, and critical phenomena.</i>	2017
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Skills

Languages: Italian: Native language. English: Advanced. French: Advanced

Programming: C, C++, Python, Matlab, awk, bash, and Mathematica.

Publications

- [1] Gianmarco Spera, Julia M Yeomans, and Sumesh P Thampi. Low-pass filtering of active turbulent flows to liquid substrates. *arXiv preprint arXiv:2511.22701*, 2025.
- [2] Quan Manh Nguyen, Alberto Dinelli, Gianmarco Spera, and Julien Tailleur. Contact forces in motility-regulated active matter. *arXiv preprint arXiv:2507.08964*, 2025.
- [3] Gianmarco Spera. From active particles to cells : a journey beyond simple active matter. *PhD Thesis*, 2024.
- [4] David Martin, Gianmarco Spera, Hugues Chaté, Charlie Duclut, Cesare Nardini, Julien Tailleur, and Frédéric van Wijland. Fluctuation-induced first order transition to collective motion. *Journal of Statistical Mechanics: Theory and Experiment*, 2024(8):084003, 2024.
- [5] Gianmarco Spera, Charlie Duclut, Marc Durand, and Julien Tailleur. Nematic torques in scalar active matter: when fluctuations favor polar order and persistence. *Physical Review Letters*, 132(7):078301, 2024.

Conferences organization

Interdisciplinary challenges in the physics of complexity and life <i>EMBL. Heidelberg (Germany)</i>	2025
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Talks, Conferences, and Summer Schools

Physics of Cancer. Leipzig (Germany). Contributed talk. StatPhys29. Florence (Italy). Poster. Oxford center for soft and biological matter. Oxford (UK). Contributed talk. Physics of collective cell dynamics. Oxford (UK). Contributed talk and poster. Physics of life. Harrogate (UK). Poster presentation.	2025
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University of Greifswald, Thomas Ihle group.. Online. Seminar.

IntCha24. Dresden (Germany). Invited Talk.

Società italiana di fisica statistica Young Seminars. Online. Seminar.

Journées de physique statistique. Paris (France). Contributed talk.

Greater boston area statistical mechanics meeting. Cambridge (USA). Table talk.

2024

2023

Harvard University, David Nelson group. Cambridge (USA). Seminar.
Boston University, Pankaj Mehta and Kirill Korolev groups. Boston (USA). Seminar.
Brandeis University, Michael Hagan group. Waltham (USA). Seminar.
Physics of living systems, MIT. Cambridge (USA). Seminar.
Statphys28. Tokyo (Japan). Contributed talk.
Perspectives on non-equilibrium statistical mechanics. Kyoto (Japan). Poster presentation.
Frontiers in nonequilibrium physics. Kyoto (Japan). Poster presentation.
Yukawa Institute for Theoretical Physics. Kyoto (Japan). Seminar.
AMSCE. Dresden (Germany). Poster presentation.
Laboratoire matière et systèmes complexes. Paris (France). Seminar.
Journées de physique statistique. Paris (France). Contributed talk.

2022

Active matter: the next 25 years. Leiden (Netherlands). Poster presentation.
EDPIF. Paris (France). Contributed talk.
MSC non-permanents. Paris (France). Contributed talk.
New frontiers in liquid matter. Paris (France). Poster presentation.
Disorder in complex systems. Paris (France). Summer school.
APS March meeting. Chicago (USA). Contributed talk.

2021

Multiscale integration in biological systems. Paris (France) . Flash talk.
News from disordered elastic systems. Spetses (Greece). Conference.
Fundamental problems in statistical physics. Brunico (Italy). Summer school.
Glassy systems and inter-disciplinary applications. Cargèse (France). Summer school.

Academic referees

Prof. Julia Yeomans OBE FRS
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