

Gianmarco Spera

118 Pinnocks Way – OX2 9DH – United Kingdom

* 20 February 1996 • ☎ +33 7 49 45 39 59 • ✉ gianmarco.spera@physics.ox.ac.uk
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

Oct. 2024 - now

University of Oxford, Rudolf Peierls Centre for Theoretical Physics
Group of Julia Yeomans funded by the ERC Advanced Grant ActBio.

Non-stipendiary lecturer

Oct. 2025 - now

St. Hilda's college, Oxford

Education

Ph.D. in Physics

Nov. 2020 - May 2024

Université Paris Cité, Laboratoire Matière et Systèmes Complexes

Thesis: Are biological cells just another type of active particles? Supervisors: Marc Durand and Julien Tailleur.

Master Degree in Physics

Oct. 2020

University of Rome La Sapienza, Grade: 110/110 cum laude

Thesis title: Statistical analysis and theoretical modeling of swarming behavior in mosquitoes. Thesis advisor: Irene Giardina.

Bachelor Degree in Physics

Oct. 2018

University of Rome La Sapienza, Grade: 110/110 cum laude

Thesis title: Critical phenomena and Ising model. Thesis advisor: Mauro Lucio Papinutto.

Visits

Massachusetts Institute of Technology (MIT)

Oct-Nov 2023

Hosted by Prof. Julien Tailleur.

Yukawa Institute for Theoretical Physics (YITP)

July 2023

Hosted by Prof. Hisao Hayakawa.

Teaching activity

Non-stipendiary lecturer

2025-now

St. Hilda's college

Duties: Thermal physics (thermodynamics, kinetic theory, and statistical mechanics) and undergraduate college admission.

MMPhys project assessor

2025

University of Oxford, Duties: marking.

Teaching assistant, Mechanics

2021-2023

IUT Paris Pajol (ex Diderot), Duties: laboratory supervision, marking, and invigilation.

Teaching assistant, Real Analysis

2019-2020

University of Rome La Sapienza, Duties: exercise design, tutoring, and invigilation.

Outreach

Theoretical Physics Postdoc Representative

Oct 2025-now

University of Oxford, Duties: liaison for theory postdoctoral researchers.

Access and engagement, casual ambassador

Jan 2025-now

University of Oxford, Duties: engagement activity in high-school.

Student support and academic advising office of the physics department

2018-2020

University of Rome La Sapienza, Duties: accademic support for students and university open days.

Awards

Excellence award program in physics

2017

Classes: real analysis, potential theory, classical gravity, and critical phenomena.

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

2025

EMBL. Heidelberg (Germany)

Talks, Conferences, and Summer Schools

2025

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.

2024

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.

2023

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

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

University of Oxford
 Rudolf Peierls Centre for Theoretical Physics
 Parks Road, Oxford OX1 3PU
 julia.yeomans@physics.ox.ac.uk

Prof. Alexander Mietke

University of Oxford
 Rudolf Peierls Centre for Theoretical Physics
 Parks Road, Oxford OX1 3PU
 alexander.mietke@physics.ox.ac.uk

Prof. Julien Tailleur

MIT department of physics
 77 Massachusetts Avenue
 Cambridge, MA 02139
 jgt@mit.edu

Prof. Marc Durand

Laboratoire MSC
 10 Rue Alice Domon et Léonie Duquet
 75205 Paris Cedex 13, France
 marc.durand@univ-paris-diderot.fr