YANN-EDWIN KETA

Associate professor of physics

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Campus P. & M. Curie (Jussieu)
7 quai Saint-Bernard, Paris 5e

November 1995

Education

2020-2023
PhD in Physics
Université de Montpellier
Under the joint supervision of Ludovic Berthier and Robert L. Jack.

2016-2018
MSc in Physics
École normale supérieure de Lyon
Specialisation in computational physics, soft matter, and statistical physics.

2015-2016
BSc in Physics
École normale supérieure de Lyon

2013-2015
Classes préparatoires aux grandes écoles (PCSI/PC*)
Lycée Lakanal, Sceaux

2018-2019 (Gap year)
MA in Social sciences *1st year*
École normale supérieure de Lyon

Skills

Programming

Python, C/C++, GNU/Linux, Git, symbolic computation (SageMath), Julia, HTML/JS/CSS, LaTeX.

Molecular dynamics, parallelisation on CPU and GPU (OpenMP, HOOMD), biased path ensemble algorithms.

Languages

Français (French) – Native speaker
English – Fluent
Nederlands (Dutch) – Beginner

Interests

* Extreme music.
* Free software, open knowledge.
* Environment protection.
* French and non-French literature.

Research

Sep 2025 - Present **Associate professor (Maître de conférences)**
UFR de Physique, Faculté des Sciences et Ingénierie,
Sorbonne Université
Laboratoire de Physique et Mécanique des Milieux Hétérogènes (PMMH), UMR 7636 CNRS, ESPCI Paris – PSL, Sorbonne Université, Université Paris-Cité

Oct 2023 - Aug 2025 **Postdoc: "Physical models of cell sheets"**
Instituut-Lorentz for Theoretical Physics,
Universiteit Leiden

Supervisor: Silke Henkes

Sep 2020 - Sep 2023 **PhD: "Emergence of disordered collective motion in dense systems of isotropic self-propelled particles"**
Laboratoire Charles Coulomb (L2C), UMR 5221 CNRS,
Université de Montpellier
Simons collaboration on *Cracking the Glass Problem*

Supervisors: Ludovic Berthier (Montpellier), Robert L. Jack (Cambridge)

ENS-funded internships

Oct 2019 - July 2020 **"Large deviations of active particles"**
Department of Applied Mathematics and Theoretical Physics,
University of Cambridge
Laboratoire Matière et Systèmes Complexes (MSC),
UMR 7057 CNRS, Université Paris-Cité

Supervisors: Robert L. Jack, Michael E. Cates (Cambridge), Frédéric van Wijland (Paris)

Jan 2018 - Jul 2018 **"Glassy behaviour in phase-separating active matter"**
Stewart Blusson Quantum Matter Institute,
University of British Columbia

Supervisor: Jörg Rottler

May 2017 - Jul 2017 **"Jamming criticality of spheroids"**
Institutionen för fysik, Umeå universitet

Supervisor: Peter Olsson

Publications

S. C. Kammeraat, Y.-E. Keta, P. Appleton, I. P. Newton, T. B. Liverpool, R. Sknepnek, I. Näthke, and S. Henkes, "Correlated cell movements drive epithelial finger formation", *arXiv* (2025) [DOI:10.48550/arXiv.2508.01046]. arXiv:2508.01046

Y.-E. Keta and S. Henkes, "Long-range order in two-dimensional systems with fluctuating active stresses", *Soft Matter* **21**, 5710–5719 (2025) [DOI:10.1039/D5SM00208G]. arXiv:2410.14840

S. Naik, Y.-E. Keta, K. Pranjic-Ferscha, E. Hannezo, S. Henkes, and C.-P. Heisenberg, "Keratins coordinate tissue spreading by balancing spreading forces with tissue material properties", *bioRxiv* (2025) [DOI:10.1101/2025.02.14.638262]. bioRxiv:10.1101/2025.02.14.638262

Y.-E. Keta*, J. U. Klamser*, R. L. Jack, and L. Berthier, "Emerging Mesoscale Flows and Chaotic Advection in Dense Active Matter", *Physical Review Letters* **132**, 218301 (2024) [DOI:10.1103/PhysRevLett.132.218301]. arXiv:2306.07172

Y.-E. Keta, R. Mandal, P. Sollich, R. L. Jack, and L. Berthier, "Intermittent relaxation and avalanches in extremely persistent active matter", *Soft Matter* **19**, 3871–3883 (2023) [DOI:10.1039/D3SM00034F]. arXiv:2212.09836

Y.-E. Keta, R. L. Jack, and L. Berthier, "Disordered collective motion in dense assemblies of persistent particles", *Physical Review Letters* **129**, 048002 (2022) [DOI:10.1103/PhysRevLett.129.048002]. arXiv:2201.04902

Y.-E. Keta, É. Fodor, F. van Wijland, M. E. Cates, and R. L. Jack, "Collective motion in large deviations of active particles", *Physical Review E* **103**, 022603 (2021) [DOI:10.1103/PhysRevE.103.022603]. 🔓 arXiv:2009.07112

Y.-E. Keta and P. Olsson, "Translational and rotational velocities in shear-driven jamming of ellipsoidal particles", *Physical Review E* **102**, 052905 (2020) [DOI:10.1103/PhysRevE.102.052905]. 🔓 arXiv:2006.05305

T. Marschall, Y.-E. Keta, P. Olsson, and S. Teitel, "Orientational Ordering in Athermally Sheared, Aspherical, Frictionless Particles", *Physical Review Letters* **122**, 188002 (2019) [DOI:10.1103/PhysRevLett.122.188002]. 🔓 arXiv:1806.01739

Y.-E. Keta and J. Rottler, "Cooperative motion and shear strain correlations in dense 2D systems of self-propelled soft disks", *EPL* **125**, 58004 (2019) [DOI:10.1209/0295-5075/125/58004].

Refereeing

Communications Physics, Nature Communications, Nature Physics, Physical Review E, Scientific Reports, SciPost, Soft Matter.

Responsibilities

2025 - 2026 **Co-organisation of the IntCha26 conference**
Institut d'Études Scientifiques de Cargèse 🇫🇷

The conference "Interdisciplinary Challenges in Non-Equilibrium Physics" aims to connect young researchers from diverse backgrounds at the interface between the physics of complex systems and biology.

2023 - 2025 **Co-organisation of the "Smart, Living, and Active Matter" seminar**
Universiteit Leiden 🇳🇱

Hosts international speakers between 1 and 4 times a month.

Teaching

2025 **"Mathematics", "Physics of continuous media" (Bachelor)**
"Granular materials" (Master)
Sorbonne Université 🇫🇷

Teaching assistant.

2025 **"Active Matter" (Advanced Topics Masters Course)**
Universiteit Leiden 🇳🇱

Lecturer. Part of the course "Advanced Topics in Theoretical Physics" from the Dutch Research School of Theoretical Physics.

2024 **"Statistical Physics" (Masters)**
Universiteit Leiden 🇳🇱

Teaching assistant.

2022 **"Physics for life sciences", "Python for sciences" (Bachelor)**
Université de Montpellier 🇫🇷

Teaching assistant.

2018-2019 2016-2017 **Oral interrogator (Physics, Chemistry, Mathematics)**
Lycée du Parc, Institution des Chartreux, Lycée La Martinière Diderot (Lyon) 🇫🇷

2015 - 2017 **Volunteer tutor (Physics, Chemistry, Mathematics)**
ENSeigner association, École normale supérieure de Lyon 🇫🇷