

# Grégoire Le Lay

PhD Candidate in physics

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## Education

- 2022-Today **PhD Candidate in physics**, under the supervision of Adrian Daerr  
*Nonlinear Meandering Dynamics of a Liquid Filament*  
Matière et Systèmes Complexes (MSC), Université Paris Cité / CNRS, Paris, France
- 2021-2022 **Admission to Agrégation de Physique**  
High-level competitive exam for future physics teachers (rank : 2/459)  
École Normale Supérieure and Sorbonne Université, Paris, France
- 2020-2021 **M2 Nonlinear and Out of Equilibrium Phenomena** in Physics & Mathematics  
Applied and Theoretical Mathematics (MATH) Master's degree  
École Normale Supérieure and Université Paris Dauphine, Paris, France
- 2019-2020 **M2 Lophiss** in History and Philosophy of Science  
Université Paris Diderot, Paris, France
- 2017-2022 **Scolarity at École Normale Supérieure**  
Elite academic institution accessed by competitive exam in Paris, France  
2017-2019 : Bachelor in Physics (L3 FIP) and Master 1 in Fundamental Physics (ICFP)

## Research Internships

- 2021  
(5 months) **Experimental study of the meandering of a liquid rivulet**, with Adrian Daerr —  
Laboratoire Matière et Systèmes Complexes, Université Paris Cité, Paris, France
- 2020  
(6 months) **Computational analysis of leukocytes migration dynamics in complex environments**, with  
Pablo Vargas and Matthieu Piel — MOTILE group, Institut Curie, Paris, France
- 2019  
(6 months) **Transition to disordered front propagation in a Hele-Shaw channel**, with Anne Juel —  
Manchester Center for Nonlinear Dynamics, University of Manchester, Manchester, UK
- 2018  
(1 month) **Assembly of a Total Internal Reflexion Fluorescence Microscope (TIRFM) to study the  
dynamics of polymers at nanometric scales**, with Joshua McGraw —  
Laboratoire Gulliver, ESPCI, Paris, France

## Expertise

- Experimental    Optical alignment protocols  
Chemistry lab techniques  
Computer Assisted Design, Laser cutting & 3D printing
- Softwares        LabView, ImageJ, Inkscape
- Programming    Python - Image analysis, Data treatment  
C, C++ - Software development, GTK & Qt framework  
Git - Distributed version control

## Publications

- 2025 **Grégoire Le Lay** and Adrian Daerr  
*Phase-locking parametric instability coupling longitudinal and transverse waves on rivulets in a Hele-Shaw cell*  
*Physical Review Letters* — [10.1103/PhysRevLett.134.014001](#)
- 2024 **Grégoire Le Lay**, Sarah Layani, Adrian Daerr, Michael Berhanu et al.  
*Magnetic levitation in the field of a rotating dipole*  
*Physical Review E* — **Editor's suggestion** — [10.1103/PhysRevE.110.045003](#)
- 2023 Tania Gajardo, Mathilde Bernard, Marie Lô, Elisa Turck, **et al.**,  
*Actin dynamics regulation by *TTC7A/PI4KIII $\alpha$*  limits DNA damage and cell death under confinement*  
*Journal of Allergy and Clinical Immunology* — [10.1016/j.jaci.2023.06.016](#)
- 2021 Antoine Gaillard, Jack S. Keeler, **Grégoire Le Lay**, Grégoire Lemoult et al.,  
*The life and fate of a bubble in a geometrically perturbed Hele-Shaw channel*  
*Journal of Fluid Mechanics* — [10.1017/jfm.2020.844](#)
- 2021 Sundry Sormendi, Mathieu Deygas, Anupam Sinha, Mathilde Bernard **et al.**,  
*HIF2 $\alpha$  is a direct regulator of neutrophil motility*  
*Blood* — [10.1182/blood.2020007505](#)

## Presentations

- 03/2025 **Rencontres du Non-Linéaire**, Paris (Fr), Long talk.
- 01/2025 **Journées de Physique Statistique**, Paris (Fr), Contributed talk.
- 12/2024 **MSC Internal Seminar**, Paris (Fr), Invited seminar.
- 10/2024 **Journées de la Matière Condensée**, Marseille (Fr), Contributed talk.
- 09/2024 **European Fluid Dynamics Conference**, Aachen (De), Contributed talk.
- 06/2024 **International meeting in the memory of Yves Couder**, Paris (Fr), Poster presentation.
- 03/2024 **Rencontres du Non-Linéaire**, Paris (Fr), Poster presentation.
- 03/2024 **Séminaire café**, PMMH (Fr), Invited seminar.
- 09/2023 **European Coating Symposium**, Paris (Fr), Contributed talk.
- 07/2023 **Congrès Général des 150 ans de la SFP**, Paris (Fr), Contributed talk.
- 06/2023 **Non-linear physics team**, LPENS (Fr), Invited seminar.
- 03/2023 **Rencontres du Non-Linéaire**, Paris (Fr), Poster presentation.

## Para-academic activities

- 2023-2025 **Laboratory concil**, MSC  
Elected member for the non-permanents of the laboratory concil of MSC.
- 2022-2025 **French IPHO scientific comitee**, French Ministry of Education  
Member of the scientific comitee of the selection and training of the french team for the International Physics Olympiads (IPHO).
- 2023 **Young Physicists Meeting**, Paris  
Organisation of the RJP 2023, a one-day conference reuniting 150 PhD students and Post-Docs in french laboratories

## Outreach

- 2023 **Fête de la science**, Université Paris Cité  
Presentation of scientific experiments to the general public.
- 2023 **Before du grand congrès de la SFP**, Cité des sciences et de l'industrie  
Demonstration of a scientific experiment for the general public.
- 2018-2019 **Cours aux ernests**, ENS  
Short courses explaining the basics of physics for non-physics students.
- 2018 **Fête de la science**, ENS  
Presentation of scientific experiments for the general public.

## Teaching

2022-2025	<b>LASER</b> , École d'Ingénieurs Denis Diderot (EIDD) Master 1 — Tutorials to master's students about the physics of lasers 18 h / year (20 students per class)
2022-2025	<b>Preparation for the International Physicists' Tournament (IPT)</b> , Université Paris Cité Bachelor (3rd year) — Supervising the university's team for the IPT 24 h / year, (10 students per class)
2023-2025	<b>Wave phenomena</b> , Préparation à l'agrégation interne, Université Paris Cité Master 2 — Refresher course about waves in physics for candidates to the agrégation 6 h / year, (30 students per class)
2024-2025	<b>Electromagnetism</b> , Préparation à l'agrégation interne, Université Paris Cité Master 2 — Refresher course about electrodynamics for candidates to the agrégation 6 h / year, (30 students per class)
2022-2025	<b>Préparation au montage</b> , Préparation à l'agrégation interne, Université Paris Cité Master 2 — Preparation of the experimental evaluation for candidates to the agrégation 14 h / year, (15 students per class)
2022-2023	<b>Physique expérimentale</b> , Master MEEF, Université Paris Cité Master 1 — Supervision of practical work for candidates to the CAPES competitive exam 27 h in total, (15 students per class)
2021-2022	<b>Colles de physique</b> , Prépa Hadamart Bachelor (1st and 2nd years) — Preparation of exams for students in "classe prépa" 2 hours per week, 3 students per session
2019-2020	<b>Tutorat</b> , Jean Zay state boarding school Bachelor (1st and 2nd years) — Personalized tutoring for scholarship holder students Four one-hour session per week, one student per session
2017-2019	<b>Soutien bénévole</b> , Maison des Jeunes Talents Bachelor (1st and 2nd years) — Preparation of exams for students in "classe prépa" 2 hours per week, 3 to 9 students per session