

Daphné LEMASQUERIER

Post-doctoral fellow

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📍 Austin, Texas, USA

📅 Born in Auxerre, France, in 1994 (27 yo)

🔗 [Personal website](#)

WORK EXPERIENCES AND INTERNSHIPS

Now January 2022	Postdoctoral Fellow, INSTITUTE FOR GEOPHYSICS, UNIVERSITY OF TEXAS AT AUSTIN, USA <ul style="list-style-type: none">> Mentor: Dr. Krista Soderlund> Project: The fluid dynamics of icy ocean worlds
November 2021 September 2018	PhD, INSTITUT DE RECHERCHE SUR LES PHÉNOMÈNES HORS ÉQUILIBRE (IRPHE), Marseille, France <ul style="list-style-type: none">> Supervisors: Michael Le Bars and Benjamin Favier> Project: Experimental and numerical study of Jupiter's dynamics: zonal jets, vortices and zonal-trophic turbulence. 🔗 Thesis manuscript
July 2018 March 2018	Research internship, IRPHE, Marseille, France <ul style="list-style-type: none">> Supervised by Michael Le Bars and Benjamin Favier (19 weeks)> Project: Two aspects of Jupiter's atmospheric dynamics: vortices and zonal flows
July 2016 April 2016	Research internship, SPINLAB (UNIVERSITY OF CALIFORNIA, LOS ANGELES), USA <ul style="list-style-type: none">> Supervised by Jonathan Aurnou (14 weeks)> Project: Libration driven elliptical instability experiments in ellipsoidal shells
July 2015 June 2015	Research internship, INSTITUT DE PLANÉTOLOGIE ET D'ASTROPHYSIQUE DE GRENOBLE (IPAG), France <ul style="list-style-type: none">> Supervised by François-Régis Orthous-Daunay (8 weeks)> Project: Comparison of the soluble organic matter content of 4 carbonaceous chondrites
January 2014	Research internship, LABORATOIRE DE GÉOLOGIE DE LYON, TERRE, PLANÈTES, ENVIRONNEMENT (LGTPE), Lyon, France <ul style="list-style-type: none">> Supervised by Thierry Alboussière (5 weeks)> Project: PIV (Particle Image Velocimetry) and LIF (Laser Induced Fluorescence) techniques applied to a penetrative convection experimental setup

EDUCATION

2017–2018	Aix-Marseille University, France <p>Second year graduate student (<i>Master 2</i>) in Fluid mechanics and non-linear physics, rank 1. Master's degree in Mechanics, Physics and Engineering obtained with highest honors</p>
2016–2017	ENS de Lyon, France <p>Preparation and admission to the <i>Agrégation en Sciences de la Vie, Sciences de la Terre et de l'Univers (SV-STU)</i>. National teaching examination in Biology and Earth sciences, rank 21</p>
2015–2016	ENS de Lyon, France <p>First-year graduate student (<i>Master 1</i>), rank 1. Major: Physics and Chemistry of the Earth and other planets. Completion of ENS Lyon diploma</p>
2014–2015	ENS de Lyon, France <p>Third-year undergraduate student (<i>Licence 3</i>) in Earth sciences, rank 1. Bachelor's degree in Earth Sciences obtained with highest honors</p>
2012–2014	Lycée Roland Garros, Le Tampon, Reunion Island, France <p><i>Classes Préparatoires aux Grandes Écoles (CPGE) en BCPST</i> Two-year intensive course preparing for the entrance examination to French "Grandes Écoles", i.e. to institutions of higher education. Major: Biology, Chemistry, Physics, Mathematics and Earth sciences.</p>
2012	Lycée Roland Garros, Le Tampon, Reunion Island, France <p>French scientific high school diploma specialized in Physics and Chemistry obtained with highest honors</p>

PUBLICATIONS

- ▶ Sutherland, B.R., Ma, Y., Flynn, M.R., Frank, D., Linden, P.F., Lemasquerier, D., Le Bars, M., Pacary, C., Jamin, T., Dauvois, T. & Joubaud, S. (2021), **Plumes in rotating fluid and their transformation into tornados**, *Journal of Fluid Mechanics*, 924, A15, [doi:10.1017/jfm.2021.618](https://doi.org/10.1017/jfm.2021.618)
- ▶ Lemasquerier, D., Favier, B. & Le Bars, M. (2021), **Zonal jets at the laboratory scale: hysteresis and Rossby waves resonance**, *Journal of Fluid Mechanics*, 910, A18, [doi:10.1017/jfm.2020.1000](https://doi.org/10.1017/jfm.2020.1000) [arXiv:2008.10304](https://arxiv.org/abs/2008.10304)
- ▶ Lemasquerier, D., Favier, B. & Le Bars, M. (2020), **Gas giant-like zonal jets in the laboratory**, *Physical Review Fluids*, 5, 110506, [doi:10.1103/PhysRevFluids.5.110506](https://doi.org/10.1103/PhysRevFluids.5.110506) [arXiv:2011.12178](https://arxiv.org/abs/2011.12178)
- ▶ Lemasquerier, D., Facchini, G., Favier, B. & Le Bars, M. (2020), **Remote determination of the shape of Jupiter's vortices from laboratory experiments**, *Nature Physics*, 16, 695-700, [doi:10.1038/s41567-020-0833-9](https://doi.org/10.1038/s41567-020-0833-9) [arXiv:2011.11279](https://arxiv.org/abs/2011.11279)
- ▶ Lemasquerier, D., Grannan, A. M., Vidal, J., Cébron, D., Favier, B., Le Bars, M., & Aurnou, J. M. (2017), **Libration-driven flows in ellipsoidal shells**, *Journal of Geophysical Research: Planets*, 122(9), 1926-1950, [doi:10.1002/2017JE005340](https://doi.org/10.1002/2017JE005340)

CONFERENCES AND SEMINARS

- ▶ **Invited seminar at ISTerre (Grenoble, France)**: Modelling the large-scale dynamics of Jupiter (*December 2, 2021*).
- ▶ **Invited seminar at Oxford University (UK)** (Atmospheric, Oceanic and Planetary Physics Department): Two aspects of Jupiter's fluid dynamics in the lab: vortices and zonal jets (*June 10, 2021*).
- ▶ **Invited seminar at MIT (USA)** (Dept of Earth, Atmospheric and Planetary Sciences): Two aspects of Jupiter's fluid dynamics in the lab: vortices and zonal jets (*September 17, 2020*).

GDR NAVIER-STOKES 2.0

PARIS – OCTOBER 2021

[Abstracts](#) National research group meeting on turbulence. Oral presentation: “Experimental quantification of transport by zonostrophic turbulence” by D.Lemasquerier, B.Favier and M.Le Bars

RENCONTRES DU NON-LINÉAIRE

ONLINE DUE TO COVID-19 – MARCH 2021

[Abstract](#) Oral presentation: “Mise en évidence expérimentale d'une hystérésis entre deux régimes de jets zonaux : une résonance d'ondes de Rossby” by D.Lemasquerier, B.Favier and M.Le Bars

AMERICAN GEOPHYSICAL UNION (AGU) FALL MEETING

ONLINE DUE TO COVID-19 – DECEMBER 2020

[Abstract](#) [Video of the oral presentation](#) Oral presentation in the session *The Interiors of Jupiter and Saturn in the Era of Juno and Cassini I*: “Zonal jets in the laboratory: a transition towards zonostrophic turbulence?” by D.Lemasquerier, B.Favier and M.Le Bars

STUDY OF THE EARTH'S DEEP INTERIOR (SEDI)

ONLINE DUE TO COVID-19 – NOVEMBER 2020

[Abstract](#) [Poster](#) Poster in the session *Other Planets: Observations & Modelling*: “Zonal jets emerging from fast-rotating forced turbulence: an experimental study” by D.Lemasquerier, B.Favier and M.Le Bars

AMERICAN PHYSICAL SOCIETY - DIVISION OF FLUID DYNAMICS (APS/DFD)

SEATTLE – NOVEMBER 2019

[Abstract](#) [Oral presentation](#) [Poster submitted for the Gallery of Fluid Motion](#) Oral presentation in the *Geophysical Fluid Dynamics* session: “Gas giants' zonal jets in the laboratory” by D.Lemasquerier, B.Favier and M.Le Bars. Milton Van Dyke Award Winner for the poster at the Gallery of Fluid Motion

AMERICAN GEOPHYSICAL UNION (AGU) FALL MEETING

WASHINGTON – DECEMBER 2018

[Abstract](#) [Oral presentation](#) Oral presentation in the *Nonlinear Geophysics* session: “An experimental study of sheared vortices in a rotating and stratified flow” by D.Lemasquerier, G.Facchini, B.Favier and M.Le Bars

AMERICAN PHYSICAL SOCIETY - DIVISION OF FLUID DYNAMICS (APS/DFD)

PORTLAND – NOVEMBER 2016

[Video submitted for the Gallery of Fluid Motion](#) Participation to the Gallery of Fluid Motion with the video : “Libration-Driven Elliptical Instability Experiments in Ellipsoidal Shells” by D. Lemasquerier, A. Grannan, B. Favier, D. Cébron, M. Le Bars, J. Aurnou

SUMMER SCHOOLS AND WORKSHOPS

- GREZUMAR WORKSHOP (ISTERRE, ETH ZURICH AND IRPHE TEAMS)** ZURICH (SWITZERLAND) – NOVEMBER 2021
Oral presentation (20'): "Zonal jets emerging from rapidly rotating turbulence".
- INTERNAL GEOPHYSICS SUMMER SCHOOL** [↗](#) LES HOUCHES (FRANCE) – JULY 2021
Oral presentation (5'): "Zonal jets emerging from rapidly rotating turbulence: an experimental study".
- KITP WORKSHOP: LAYERING IN ATMOSPHERES, OCEANS AND PLASMAS** [↗](#) ONLINE – JANUARY 2021
Oral presentation (5') for the workshop: "Zonal jets at the laboratory scale: a transition towards zonostrophic turbulence?".
- PHYSICS AT THE EQUATOR: FROM THE LAB TO THE STARS** [↗](#) LYON (FRANCE) – OCTOBER 2019
Poster presentation: "Gas giants' zonal jets in the laboratory".
- WAVES, INSTABILITIES AND TURBULENCE IN GEOPHYSICAL AND ASTROPHYSICAL FLOWS** [↗](#) CARGÈSE (CORSICA) – JULY 2019
Oral presentation (15'): "Experimental and numerical study of gas giants zonal jets".
- WORKSHOP GREZUMAR (ISTERRE, ETH ZURICH AND IRPHE TEAMS)** LAUSANNE (SWITZERLAND) – MAY 2019
Oral presentation (15') : "Two aspects of Jupiter's atmospheric dynamics: vortices and zonal flows".
- CISM – FLUID MECHANICS OF PLANETS AND STARS** UDINE (ITALY) – APRIL 2018

TEACHING AND SUPERVISION EXPERIENCE

- 2018–2021 **Aix-Marseille Université, France**
General physics teaching (optics, mechanics and thermodynamics). Academic level: undergraduate students (majors: Mathematics, Physics, Chemistry and Computer sciences). 64 hours per year for three years.
- Sept-Nov 2021 **IRPHE, Marseille, France.** Co-supervision (25%) of the beginning of Djihane Benzeggouta's PhD.
- May-June 2019 **IRPHE, Marseille, France.** Supervision (100%) of the internship of Alex Monfort (second year undergraduate student). Duration: 4 weeks.
- June 2019 **IRPHE, Marseille, France.** Supervision (100%) of the intership of Eilyn Bouchaud-Deliot, year 11 student at *lycée Sévigné* (Marseille). Duration: 1 week

OUTREACH

- ▶ January 2021 – Article in *Pour La Science* # 519 (french version of *Scientific American*), **La Grande Tache rouge de Jupiter... en laboratoire !.** [↗ Online article](#)
- ▶ July 2020 – Article in *The Conversation (France)*, **Un jacuzzi pour recréer Jupiter en laboratoire.** [↗ Online article](#)
- ▶ March 2019 – Video by *Zeste de science* (CNRS scientific popularization YouTube channel), **Objectif Jupiter | ZdS#29.** [↗ https://youtu.be/T8AupTdMolo](https://youtu.be/T8AupTdMolo)
- ▶ March 2019 – Publication of four articles with Frédéric Chambat (LGTP, ENS Lyon) on *PlanetTerre*, a website of pedagogical resources in Earth Sciences. Transcriptions of Frédéric Chambat's lectures (2015) for the doctoral school "**Shape, rotation and tides of the Earth: mathematical, geophysical and historical insights**".
[↗ Article #1](#) [↗ Article #2](#) [↗ Article #3](#) [↗ Article #4](#)

AWARDS AND FELLOWSHIPS

- October 2021 L'Oréal-UNESCO prize "For Women In Science", Young Talents French program. [↗ Article](#)
- November 2019 Milton Van Dyke Award for a poster at the Gallery of Fluid Motion (APS/DFD Conference). [↗ Poster](#)
- September 2018 ENS de Lyon doctoral fellowship

SKILLS AND PERSONAL INTERESTS

- Experimental skills** Particle image velocimetry, Laser induced fluorescence, LabVIEW, Arduino, Rotating and stratified systems
- Computer proficiencies** MacOS, Windows and Linux operating systems; Office and writing softwares (Microsoft Office, LibreOffice, \LaTeX); Programming (Matlab, Python, basic knowledge of Fortran98); Graphism softwares (Adobe Photoshop, Inkscape, Gimp); Direct Numerical Simulations; Quasi-geostrophic numerical models; Pseudo-spectral and Spectral Elements methods
- Languages** French (mother tongue), english (fluent), spanish (basic)
- Personal Interests** Photography (numerical and silver), hiking, drawing and painting, swimming