– Ludivine Oruba –

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Born August 15, 1985 - French nationality

Current position :

Since 2017 : Associate Professor (Maître de Conférences) at Sorbonne Université (Paris), Geosciences Department, LATMOS (Laboratoire ATmosphères et Observations Spatiales).

Education :

July 2024 : Diploma "Habilitation à Diriger des Recherches (HDR)" (highest academic qualification in research supervision) - Sorbonne Université
2012–2017 : Post-doc, Department of Physics, École Normale Supérieure (Paris).
Topic : Geophysical fluid dynamics. Including a 5 months research visit at the University of Cambridge (UK).
2009–2012 : PhD (Meteorology) Laboratoire de Météorologie Dynamique (LMD, École Normale Supérieure), Université Pierre et Marie Curie (Paris)
Topic : Influence of the jet stream characteristics for the non-linear development and trajectory of mid-latitude storms. Advisors : Guillaume Lapeyre and Gwendal Rivière.
2008–2009 : M2 "Océan, Atmosphère et Surfaces Continentales" (with honors)
Master's Degree in Meteorology and Oceanography, University Toulouse III (France).
2007–2008 : One year intensive preparation for the "Agrégation de Physique" (highest level teaching training in Physics), obtained on July 2008 with rank 20 (over 1591 applicants).
2006–2007 : M1 "Sciences de la Matière, spécialité Physique" (with honors)
Master 1st year's Degree in Physics, Department of Physics, École Normale Supérieure de Lyon (France).
2005–2006 : L3 "Sciences et Technologies, spécialité Physique" (with honors)
Equivalent to a Bachelor degree in Physics, Department of Physics, École Normale Supérieure de Lyon (France).
2003-2005 : Two years in "Classes Préparatoires aux Grandes Écoles" in Paris (intensive training in Maths, Physics and Chemistry).

Teaching

Teaching activities as associate professor at Sorbonne University (192 hours per year since 2017). Courses include : *Geophysical Fluid Dynamics* (Master 2), *Waves and dynamics in the ocean and atmosphere* (Master 1), *Physics of the ocean and atmosphere* (Master 1), *Experimental classes in physics* (Master 1 and Master 2).

Peer-reviewed publications

[20] 2024, X. Zhao, L. **Oruba**, D. Hauser, B. Zhang, E. Dormy : What can Hurricane SAM (2021)

tell us about ocean waves under tropical cyclones ?, *J. Geophys. Res. : Ocean.*, **129**, e2024JC020957.
[19] 2024, E. Dormy, L. **Oruba**, K. Emanuel : Eye Formation and energetics in a dry model of Tropical Cyclones, *J. Atmos. Sci.*, **81**, 1565–1578.
[18] 2024, M. Thiam, L. **Oruba**, G. de Coetlogon, M. Wade, B. Diop, A. K. Farota : Impact of the sea surface temperature in the north-eastern tropical Atlantic on precipitation over Senegal, *accepted for publication in J. Geophys. Res. : Atmospheres.*
[17] 2022, Soward, A. M., L. **Oruba**, E. Dormy : Bénard convection in a slowly rotating penny shaped cylinder subject to constant heat flux boundary conditions, *J. Fluid Mech.*, **951**, A5.
[16] 2022, **Oruba**, L., D. Hauser, S. Planes, E. Dormy : Ocean waves in the South Pacific : complementarity of SWIM and SAR observations, *Earth and Space Science*, **9**, e2021EA002187.
[15] 2021, **Oruba**, L., A. M. Soward, E. Dormy : Inertial wave activity during spin-down in a rapidly rotating penny shaped cylinder, *J. Fluid Mech.*, **915**, A53.
[14] 2021, Hauser, Tourain, Hermozo, Alraddawi, Aouf, Chapron, Dalila, Dalphinet, Delaye, Dormy, Gouillon, Gressani, Grouazel, Guitton, Husson, Mironov, Mouche, Ollivier, **Oruba**, Piras, Rodriguez-Suquet, Schippers, Tison, Tran : New observations from the SWIM radar on board CFOSAT : instrument validation and ocean wave measurement assessment, *IEEE TGARS*, **1**, 05-26.
[13] 2020, **Oruba**, L., A. M. Soward, E. Dormy : On the inertial wave activity during spin-down in a rapidly rotating penny shaped cylinder : a reduced model, *J. Fluid Mech.*, **888**, A9.
[12] 2018, **Oruba**, L., P. A. Davidson & E. Dormy : Formation of eyes in large-scalcyclonic vortices, *Phys. Rev. Fluids*, **3**, 013502.
[11] 2018, Dormy, E., L. **Oruba** & L. Petitdemange : Three Branches of Dynamo Action, *Fluid Dyn. Res.*, **50**, 01 1415.
[10] 2017, Garcia, F., L. **Oruba** & E. Dormy : Equatorial Symmetry Breaking and the Loss of Dipolarity in Rapidly Rotating Dynamos, *Geophys. & Astrophys. Fluid Dyn.*, **111**, 380-393.
[9] 2017, **Oruba**, L., A. M. Soward & E. Dormy : Spin-down in a rapidly rotating cylinder container with mixed rigid and stress-free boundary conditions, *Journal of Fluid Mechanics*, **818**, 205-240.
[8] 2017, **Oruba**, L., S. Planes, G. Siu, Y. Chancerelle & E. Dormy : Rapid oceanic response to tropical cyclone Oli (2010) in the South Pacific, *J. Phys. Oceanogr.*, **47**, 471-483.
[7] 2017, **Oruba**, L., P. Davidson & E. Dormy : Eye formation in rotating convection, *J. Fluid Mech.*, **812**, 890-904.
[6] 2016, **Oruba**, L. : On the role of thermal boundary conditions in dynamo scaling laws, *Geophys. & Astrophys. Fluid Dyn.*, **110(6)**, 529-545, doi : 10.1080/03091929.2016.1217523.
[5] 2014, **Oruba**, L. et E. Dormy : Transition between viscous dipolar and inertial multipolar dynamos, *Geophys. Res. Lett.*, vol. **41**, doi :10.1002/2014GL062069.
[4] 2014, **Oruba**, L. et E. Dormy : Predictive scaling laws for spherical rotating dynamos, *Geophy. J. Int.*, vol. **198**, 828–847.
[3] 2013, **Oruba**, L., G. Lapeyre et G. Rivière : On the poleward motion of midlatitude cyclones in a baroclinic meandering jet, *J. Atmos. Sci.*, vol. **70**, 2629–2649.
[2] 2013, Rivière G., J.-B. Gilet et L. **Oruba** : Understanding the regeneration stage undergone by surface cyclones crossing a mid-latitude jet in a two-layer model, *J. Atmos. Sci.*, vol. **70**, 2832–2853.
[1] 2012, **Oruba**, L., G. Lapeyre et G. Rivière : On the northward motion of midlatitude cyclones in a barotropic meandering jet, *J. Atmos. Sci.*, vol. **69**, 1793–1810.

International conferences (oral presentations) :

- 2024, *19èmes Journées de l'Hydrodynamique*, Nantes, France.
- 2024, *WISE (Wind waves in the Earth System)* Meeting, Cargèse, France.

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- 2023 [Invited speaker], *MSRI Program on Mathematical problems in fluid dynamics (part 2)*, Berkeley, USA.
- 2023 [Invited speaker], *Advanced Summer School on Mathematical Fluids Dynamics II*, Cargèse, France.
- 2021 [Invited speaker], *ICERM Hamiltonian Methods and Asymptotic Dynamics Workshop*, Brown University, USA.
- 2021 [Invited speaker], *32ème IUPAP Conference on Computational Physics*, United Kingdom/virtual.
- 2019, *1st CFOSAT International Science Team Meeting*, China.
- 2019, *WITGAF (Waves, Instabilities and Turbulence in Geophysical and Astrophysical Flows)*, Cargèse, France.
- 2018, *16èmes Journées de l'Hydrodynamique*, Marseille, France.
- 2016, *AOGS (Asia Oceania Geosciences Society) Meeting*, China.
- 2016, *European GdR Dynamo*, Spain.
- 2016, *IUTAM Symposium*, Italy.
- 2015, *International GDR Dynamo*, India.
- 2014, *IUTAM (International Union of Theoretical and Applied Mechanics) Symposium*, India.
- 2014, *European GDR Dynamo*, Cambridge, UK.
- 2013, *AGU (American Geophysical Union) Fall Meeting*, USA.
- 2011, *15th Cyclone Workshop*, USA.
- 2020, *EGU (European Geosciences Union) General Assembly*, Austria.

Fundings

- co-PI of the Maeva project (funded by TOSCA/CNES) on modelling of large ocean waves and their impact on coral reefs (2018-...).
- PI of the SWAG project, funded by the Alliance Sorbonne Université (2019-2020).
- Financial support from the Tellus INSU-INSMI Program (co-PI of the project, 2018).
- Financial support from the LEFE/INSU Program (PI of the project, 2017 and 2018).
- Financial support from the Mission Interdisciplinaire of CNRS. InPhyNiTi Program : Interfaces des Physiques Numériques et Théoriques (PI of the CycloNum project, 2015 and 2016).

Student supervision

- [Graduate] Advisor of L. Milhamont since 1st October 2024.
- [Graduate] Co-advisor of E. Rebouillat (UPF/Sorbonne U.) since 1st October 2024.
- [Graduate] Participation in M. Thiam's thesis advising (Sorbonne U./ U. Gaston Berger, Senegal, 2021-2024).
- [Graduate] Co-advisor of X. Zhao (Nanjing U., long-term stay at Sorbonne U., 2022-2025).
- [Master 2] Advisor of J.Collard (4-months internship, 2025).
- [Master 2] Advisor of L. Milhamont (4-months internship, 2024).
- [Master 2] Co-advisor of E. Rebouillat (4-months internship, 2024).
- [Master 2] Participation in A. Riquier's internship advising (4-months internship, 2021).
- [3A École Polytechnique] Co-advisor of N. Petropoulos (4-months internship, 2020).
- [3A École Polytechnique] Co-advisor of J.B. Gay (4-months internship, 2019).
- [Master 1] Participation in Y. Wang's internship advising (3-months internship, 2022).
- [Master 1] Advisor of N. Poulain (3-months internship, 2022).
- [Master 1] Advisor of L. Launay (2-months internship, 2019).

- [3rd year Bachelor's degree] Co-advisor of M. Wu (1-month internship, 2018).

Service to profession - Research

[Sorbonne U.]
- Since 2024 : Head of the Dynamics Team in the Atmosphere Department at LATMOS.
- Since 2020 : Member of the LATMOS laboratory committee.
- 2021 : Coordinator of the Cycle de l'Eau theme of EUR IPSL-CGS.

[National level]
- Since 2023 : Scientific advisory board member of the TOSCA-OCEAN committee of CNES.
- Member of thesis monitoring committees for L. Vinour (LOPS, 2019-2021), T. Jonville (LATMOS, 2023-) and M. Carenso (LMD, 2024-)
- 2018 : Examiner on the thesis jury of J. Bonnici (Thesis director : P. Billant, Ladhyx, École Polytechnique, 2018).

[International]
- 2026 : Co-organizer of a 3-month program at the Institut Henri Poincaré (IHP), in Paris, to be held in 2026 : *Mathematical developments in Geophysical Fluid Dynamics.*
- 2024 : Co-organizer of the conference *Mathematical Aspects of Geophysical and Astrophysical Fluid Dynamics* at Newcastle University (UK) held in January 2024.
- Referee for *Geophysical Journal International*, *Geophysical & Astrophysical Fluid Dynamics*, *Journal of Fluid Mechanics* and *Physical Review Letters.*

Service to profession - Teaching

[Sorbonne U.]
- Since Sept. 2024 : Member of the École Doctorale 129 committee
- Since Sept. 2023 : Responsible for the *Waves and Dynamics of the Atmosphere and Ocean* course, Master SOAC/MOCIS, Sorbonne U.
- Since 2020 : Responsible for the *Physics, Chemistry and Ecology of the Environment* course, Master in Environmental Sciences and Policy (Sorbonne-U./Sciences Po Paris).
- 2020, 2021, 2024 : Member of the Group VIII commission for the promotion of associate professors and full professors at Sorbonne U.
- 2021 : Member of the ATER commission (sections 35-36-37) at Sorbonne U.
- 2019 and 2021 : Member of the commission for the Prime d'Investissement Unique (PIU).
- Since 2019 : Member of the Institut Pierre Simon Laplace (IPSL) training committee Climate graduate School (École Universitaire de Recherche EUR IPSL-CGS).

[National level]
- 2023 : Member of the jury for the position of associate professor in Geophysics 0269 at the École Normale Supérieure de Lyon.
- 2021, 2022 and 2023 : Member of the jury for the entrance exam to the École Normale Supérieure.
- 2018 : Jury member for the 5th French Physicists' Tournament.
- 2016 and 2017 : Administrative manager for the entrance exam to the École Normale Supérieure (MP series).

Scientific communication

- Interview for the radio program 'RTL Bonsoir' (RTL) : Cyclone Belal (La Réunion) (January

2024).
- Article in the Images de Sciences series, 'The Conversation' : Un cyclone dans la nuit (October 2021).
- Interview for the radio program 'La Terre au Carré' (France Inter) *Les évènements climatiques extrêmes*, February 08, 2021.
- Interview for a TV documentary on Tropical Cyclones, RMC production (interview : February 2021).
- Article in 'Pour la Science' magazine, *Des cyclones plus déstructeurs ?* co-written with E. Dormy (December 2020).
- Brève de Science (CNRS), Equations and tropical cyclones (August 2020).
- Interview for the TV channel France Info, Hurricane Dorian (September 2019).
- Participation in the radio program 'Le Grand Atelier' (France Inter) with the French explorer Jean-Louis Etienne (14 April 2019).
- Interview for Radio France Internationale, Cyclone Idai (March 2019).
- Interview for a documentary on Tropical Cyclones on the TV RMC channel (interview : February 2018, broadcast : 13 August 2019).
- Scientific Expert to the Assemblée Nationale, in the frame of the Mission of information on the management of the major climatic events in the littoral zones of both metropolitan and overseas France, Interview at the Assemblée Nationale on the 25th of January, 2018.
- Interview for the radio program 'La Méthode scientifique' (France Culture), *Dans l'oeil du cyclone* (17 October 2017).

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