

Marie-Lou Bachèlery

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Education

- 2013–2016 **Ph. D Thesis in physical and biogeochemical oceanography**
University of Toulouse III, Laboratoire d'Etude en Géophysique et Océanographie Spatiales (LEGOS), Toulouse, France under the supervision of Isabelle Dadou and Serena Illig.
Title: *The physical and biogeochemical interannual variability in the South–Eastern Atlantic Ocean and in the Benguela Upwelling System: Remote versus local forcing.*
- 2012–2013 **Master of Physics and Chemistry of the Ocean and the Air**
University of Toulouse III, Toulouse, France, Graduated with honors (rank 1st/16).
Topic: *Physical coastal oceanography, Biogeochemistry, modelling, Chemistry of the Air*
- 2011–2012 **Master in Geosciences, Earth, Planets and natural Resources**
University of Toulouse III, Toulouse, France, Graduated with honors (rank 2nd/35).
Topic: *Fluid dynamics, seismology, Planetology, Physics and chemistry of the atmosphere and the ocean*
- 2008–2011 **Bachelor in Physics and applied Mathematics**
University of Toulouse III, Toulouse, France (rank 5/25).
Topic: *Thermodynamics, Electromagnetics, Mathematics, Mechanics, Chemistry*

Research and professional experiences

- 2021–2023 **Marie Skłodowska-Curie Actions Individual Fellowship (MSCA-IF)** Postdoctoral fellow
Geophysical Institute (GFI) of the University of Bergen (UiB), Norway. PI: Professor Noel Keenlyside. Project Name: BENGUP; Climate and marine-ecosystem seasonal predictions in the Angola-Benguela Upwelling System
- 2017–2021 **Postdoctoral fellow and research associate**
Nansen–Tutu Centre, Department of Oceanography, University of Cape Town (UCT), Cape Town, South Africa. PI: Associate professor Mathieu Rouault. *How the equatorial Kelvin Wave activity and the coastal winds modulate the interannual variability off the coast of Angola, Namibia and South Africa.*
- 2013–2016 **Ph.D Thesis**
Laboratoire d'Etude en Géophysique et Océanographie Spatiales (LEGOS), Toulouse, France. *The physical and biogeochemical interannual variability in the South–Eastern Atlantic Ocean and in the Benguela Upwelling System: Remote versus local forcing.*
- 2013 **Master 2nd year Internship**
Mediterranean Institute of Oceanography (MIO), Marseille, France. *Modelling the circulation of Mayotte Lagoon.*
- 2012 **Master 1st year Internship**
Observatoire Volcanologique du Piton de la Fournaise (OVP) – Institut de Physique du Globe de Paris (IPGP), Ile de la Réunion, France.
Software development for schools in order to observe seismic data: Sismo à l'école (seismology at school), a French educational project.

Honors

Since 2023 Review editor in Frontiers in Marine science

Sep 2021 **Marie Skłodowska-Curie Actions Individual Fellowship (MSCA-IF)**
Project BENGUP, awarded by Programme Horizon 2020 of the European Union, GAP-101025655 - 999974456

Publications

10 Publications- Citation index: 216 according to Google scholar (h-index 8). Citations numbers in the reference list correspond to Google scholar.

Peer-reviewed articles

Körner M., P. Brand, S. Illig, M. Dengler, A. Subramaniam, **M.L. Bachèlery** & G. Krahnemann (2023): Coastal trapped waves and tidal mixing control primary production in the tropical Angolan upwelling system. *Under review to Science Advances*

Bachèlery, M-L, M. Patacchiola, J. Brajard and N. Keenlyside (2023): Predicting Atlantic and Benguela Niño events with deep learning. *Submitted to Nature Communication*

(10) Illig, S. and **M.-L. Bachèlery** (2023): The 2021 Atlantic Niño and Benguela Niño Events: External forcings and air-sea interactions. *Climate Dynamics*. <https://doi.org/10.1007/s00382-023-06934-0>.

(9) Stirnimann, L., TG. Bornman, HM. Verheye, **M-L. Bachèlery**, J. Van der Poel, S.E. Fawcett (2021). Plankton community composition and productivity near the Subantarctic Prince Edward Islands archipelago in autumn. *Limnology and Oceanography* 66 (12), 4140-4158, <https://doi.org/10.1002/lno.11949>. (3 citations).

(8) Illig, S., **Bachèlery, M-L.** and J. Lübbecke (2020). Why do Benguela Niños lead Atlantic Niños? *Journal of Geophysical Research: Ocean*, <https://doi.org/10.1029/2019JC016003> (11 citations).

(7) **Bachèlery, M-L.**, S. Illig and M. Rouault (2020). Interannual Coastal Trapped Waves in the Angola-Benguela Upwelling System and Benguela Niño and Niña events. *Journal of Marine Systems*, Vol 203, March 2020, 103262. <https://doi.org/10.1016/j.jmarsys.2019.103262> (20 citations).

(6) Illig, S. and **Bachèlery, M-L.** (2019). Propagation of Subseasonal Equatorially-Forced Coastal Trapped Waves down to the Benguela Upwelling System. *Nature - Sci Rep.*, 9, 5306 <https://doi.org/10.1038/s41598-019-41847-1> (32 citations).

(5) Illig, S., **Bachèlery, M-L.**, and Cadier, E. (2018). Subseasonal coastal-trapped wave propagations in the southeastern Pacific and Atlantic Oceans: 2. Wave characteristics and connection with the equatorial variability. *Journal of Geophysical Research: Oceans*, 123. <https://doi.org/10.1029/2017JC013540> (30 citations).

(4) Illig, S., Cadier, E., **Bachèlery, M-L.**, and Kersale, M. (2018). Subseasonal coastal-trapped wave propagations in the southeastern Pacific and Atlantic Oceans: 1. A new approach to estimate wave amplitude. *Journal of Geophysical Research: Oceans*, 123. <https://doi.org/10.1029/2017JC013539> (29 citations).

(3) **Bachèlery, M-L.**, S. Illig, and I. Dadou (2016b), Forcings of nutrient, oxygen, and primary production interannual variability in the southeast Atlantic Ocean. *Geophys. Res. Lett.*, 43, doi:10.1002/2016GL070288 (23 citations).

(2) **Bachèlery, M-L.**, S. Illig, and I. Dadou (2016a), Interannual variability in the South-East Atlantic Ocean, focusing on the Benguela Upwelling System: Remote versus Local forcing. *J. Geophys. Res. Oceans*, 120, doi: 10.1002/2015JC011168 (67 citations).

(1) Dadou, I., V. Sanial, K. Gueirrero, **M-L. Bachèlery**, S. Chastanet, G. Alory, S. Somot (2016), Reproduire la circulation thermohaline à échelle réduite et comprendre son rôle dans le climat. La météorologie, doi: 10.4267/2042/59937 (1 citations).

To be submitted in 2023

Bachèlery, M-L, S. Koseki and N. Keenlyside (to be submitted to Journal of Geophysical Research: Ocean), Evaluation of the Benguela Nino-Nina events in the CMIP6 historical simulations.

Koseki S., R. Vazquez, W. Cabos, C. Gutiérrez, D. V. Sein, **M-L Bachèlery** (to be submitted to Frontiers in Marine Science) Dakar Niño variability under global warming investigated by a high-resolution regionally coupled model

Peer-reviewed conferences and proceedings

Bachèlery, M-L., Illig, S., Rouault, M., (2018). How low-frequency Equatorial Kelvin Wave activity and local coastal winds modulate the south-eastern interannual Atlantic variability? Proceedings of 34th Annual conference of the South African Society for Atmospheric Science, Durban, South-Africa, 20-21 September 2018, pp 18-21, ISBN 978-0-520-80825-5.

Ph.D Thesis

Bachèlery, M-L., 2016. Variabilité cotière physique et biogéochimique en Atlantique Sud-Est : rôle du forçage atmosphérique local versus téléconnexion océanique ("Coastal physical and biogeochemical variability in the Southeastern Atlantic: Role of local atmospheric forcing versus oceanic teleconnection"). Ph.D thesis, Université Paul Sabatier (Toulouse, France).

Scientific presentations (first author only)

Invited lectures and talks

- 2022 Lecture for the TRIATLAS summer school on Ocean, Climate and Marine Ecosystem, Tamandare, Brazil: *"From physics to Fish: The dynamics of the Eastern Boundary Upwelling System"*.
- 2020 Lecture for the Nansen-Tutu TRIATLAS summer school on Ocean, Climate and Marine Ecosystem, Cape Town, South-Africa: *"Local and remote impacts on the marine ecosystems of the South-Eastern Atlantic."*
- 2019 Nansen Centre, Bergen, Norway: *"The Angola-Benguela Upwelling system: interannual and decadal variability."*

Other oral presentations (from 2018)

- 2022 TRIATLAS General Assembly: *"Evaluation of the Benguela Nino-Nina events in the CMIP6 historical simulations"*.
- 2020 TRIATLAS General Assembly (web meeting): *"Low-frequency modulation of the coastal interannual temperature variability."*
- 2019 EGU General Assembly, Vienna, Austria: *"Interannual Coastal Trapped Waves in the Angola Benguela Upwelling System and Benguela Niño and Niña events."*
- 2018 Nansen Tutu Centre seminar, Cape Town, South Africa: *"Role of the Equatorial Kelvin Wave activity in modulating the South-Eastern interannual variability."*
- 2018 2 seminars at the Marine Research and the Bjerknes Centre, Bergen, Norway and at the Laboratoire d'océanographie physique et spatiale, Brest, France: *"Interannual variability of the southeastern atlantic: Forcing and low-frequency modulation."*
- 2018 PREFACE final meeting, Arrecife, Lanzarote: *"How the low-frequency Equatorial Kelvin Wave activity, local ocean stratification and coastal winds modulate the South-Eastern Atlantic interannual variability?"*.
- 2018 34th Annual conference of the South African Society for Atmospheric Science, Durban, South Africa: *"How low-frequency Equatorial Kelvin Wave activity and local coastal winds modulate the south-eastern interannual Atlantic variability?"*.

Organization of scientific meetings

- 2020 EGU General Assembly. Co-convener of session “*Tropical & subtropical climate variability: ocean processes, air-sea interactions, climate modes, teleconnections and impacts*”.
- 2019 EGU General Assembly. Co-convener of session “*Tropical & Subtropical Ocean Circulation, Equatorial to Mid-Latitude Air-Sea Interactions*”.

Teaching and supervision of Bachelor, Master and Ph.D students

- 2023 Teaching in the Advanced Climate dynamics course in UiB
- 2019-2020 Co-supervision of one Ph.D project (Serge Tomety) at the University of Cape Town, South-Africa.
- 2018 Supervision of one honour project (Liisa Shangheta) at the University of Cape Town, South Africa.
- 2017 Co-supervision of one honor project (Nick Salonen) at the University of Cape Town, South-Africa.
- 2016 Co-advisor of a Master Internship at both, University of Cape Town, South-Africa and University Paul Sabatier, Toulouse, France.

Activities of dissemination of science for the general public

- 2014-2015 Demonstration of educational experiments (practical work on oceanic convection and El Nino) to middle and high school teacher, LEGOS, Toulouse, France
- 2014 Demonstration of educational experiments (practical work on oceanic convection and El Nino) to master students in oceanography, University of Toulouse III, Toulouse, France
- 2013-2016 Participation in the “*La Novela*” Festival event organized by la cité de l’Espace (city of space) in Toulouse, France

Experience at sea

- 2015 Integrated Ecosystem Programme, Southern Benguela (IEP:BG) Cruise (Department of Environmental Affairs Oceans and Coast – Cape Town, South Africa): 10 days aboard the Algoa. Measured Microbes (Biomass abundance, RNA extraction)