

Jessica Vial

Laboratoire de Météorologie Dynamique (LMD Jussieu, Paris 5°)

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Climate scientist and researcher in atmospheric physics

Strong expertise in tropical and mid-latitude meteorology: climate modeling, process understanding, data analysis and dissemination of scientific information

Contributing author for the next IPCC report (AR6) in the chapter on radiative forcing, feedbacks and climate sensitivity

Research Experience

2019 – **Post Doctoral Research Scientist**

Laboratoire de Météorologie Dynamique (LMD Jussieu, Paris)

Funded by the European project CONSTRAIN. Project leader at LMD: Sandrine Bony

- *Analyzing the diurnal cycle of oceanic tradewind cumuli in numerical simulations, including the new generation (CMIP6) of global climate models and mesoscale models of higher resolution (kilometer- to hectometer-scale resolutions)*
- *Participation to the EUREC4A field campaign in the Tropical Atlantic tradewind area from January to February 2020*
- *Using the EUREC4A observations to assess the realism of model behavior, in terms of the diurnal cycle of cloudiness, the mesoscale organization of the shallow convection and the interactions between clouds, boundary layer turbulence and lower tropospheric vertical mixing. The ultimate goal is to constrain the climate sensitivity estimates of the models.*

2017 – 2018 **Post Doctoral Research Scientist**

Max-Planck-Institut für Meteorologie (MPI-M), Hamburg

Group leader: Thorsten Mauritsen

- *First attempt in quantifying the contribution of cloud radiative effects in extratropical cyclone dynamics. Exploration of a European case studies observed during the field campaign NAWDEX.*
- *First extended study of the diurnal cycle in oceanic tradewind cumulus clouds and convection using modern investigation tools, including storm-resolving and large-eddy simulations run over large domains in realistic configurations, and observations from in-situ measurements and satellite-based retrievals*
- *5-week expedition on the German research vessel “Polarstern” on the south-north Atlantic transect (from Punta Arena, Chile to Bremerhaven, Germany): optical measurements of aerosols, water vapor and cloud properties*

2016 – 2017 **Post Doctoral Research Scientist**

Laboratoire d’Océanographie et du Climat : Experimentation et Approches Numériques (LOCEAN, Paris) and Centre National de Recherches Météorologiques (CNRM, Toulouse)

Funded by the European project MORDICUS. Project leader at LOCEAN: Francis Codron

Colaborators: Cassou C., Bony S., Ruprich-Robert Y.

Quantifying and understanding the role of the Atlantic Multidecadal Overturning Circulation in the tropical precipitation and circulation responses to increased atmospheric concentration in CO₂. This was done by analysing global climate model experiments using the CNRM-CM5 coupled model.

2014 – 2015 **Post Doctoral Research Fellow – Funded by a CNES grant**

Laboratoire de Météorologie Dynamique (LMD Jussieu, Paris) and CNRM (Toulouse)
Colaborators: Bony S., Dufresne J. L., Roehrig., R

Development of an analysis framework to understand the role of the shallow convective mixing in controlling the present-day representation of tradewind shallow cumulus clouds and its response to ocean warming. I realized and analysed perturbed-physics experiments using uni-column versions of the IPSL climate model.

2012 – 2013 **Post Doctoral Research Scientist**

LMD Jussieu (Paris)

Supervision: Bony S. and Dufresne J. L.

1 year scientific visit at Columbia University (New York)

Invitation by Pierre Gentine

Development of a new methodology to better estimate the relative contributions of tropospheric adjustments and climate feedbacks to the inter-model spread in climate sensitivity estimates in global climate models. The tropospheric adjustments and climate feedbacks were computed by the use of the radiative kernel approach.

Teaching & student supervision

2017 – 2018 **Supervision of a master student** (MPI / Hamburg University)

Sept. 2015 **Lecturer (on invitation)** - « Clouds and Climate Sensitivity » for master and PhD students
Organised for the Leipzig Graduate School (LGS-CAR) by Karoline Block (Leipzig University, Germany)

2010 – 2011 **Assistant professor** (2h/week) in mathematics to freshmen students
During my PhD at the University of East Anglia (England)

2007 – 2008 **Private tutor** in mathematics to juniors and high school studentship
Employee of Acadomia compagny

Education

2008 – 2011 **Fully funded PhD in Environmental Sciences**

Climatic Research Unit (CRU) at the University of East Anglia (England)

Supervision: Osborn T. and Goodess C.

Title: Climate Model Simulations of Winter Northern Hemisphere Atmospheric Blocking: Statistical Assessment, Dynamical Perspective, Regional Impacts and Future Change

2006 – 2007 **BSc. (Hons) Mathematics & Geophysics, First Class Honors**

Victoria University of Wellington (New Zealand)

Final year project title: Future Changes in Precipitation Extremes for New Zealand: Statistical Method of Extreme Values

Supervision: Deen S. at the National Institute of Water and Atmospheric Research (NIWA)

2004 – 2005 **Freshmen-sophomore in Environmental Science program, Meteorology option**

EAI Tech Institute at Sophia Antipolis (France)

2003 – 2004 **Freshmen year, general applied Mathematics/Sciences program, Mathematics option**

University of Nice-Sophia Antipolis at Nice (France)

2002 **High school diploma, advanced levels in Mathematics, Physics and Chemistry**

Joseph Zobel secondary school in Martinique (France)

Selected conferences & workshops

- Seminars to present my work in various laboratories in France and abroad : Columbia University and New York University (USA, 2013), CNRM Toulouse (2014, 2015), MPI Hamburg (2018), LMD Paris (2015, 2019), LOCEAN Paris (2019), LOPS Brest (2019), IGE Grenoble (2019), LOA Lille (2019)
- Workshops to prepare for the EUREC4A field campaign : hosted by MPI (Ringberg, Germany) and LMD (Sorbonne University, Paris) in 2019
- European Geosciences Union (EGU) General Assembly in Vienna (Austria): 2010 (oral), 2017 (oral)
- Annual workshops for the Cloud Feedback Model Intercomparison Project (CFMIP): 2012 (oral), 2014 (poster), 2015 (oral + poster), 2016 (oral), 2018 (oral)
- Workshop for the International Space Science Institute (ISSI) team at Bern (Switzerland) on “Shallow Clouds and Water Vapor, Circulation and Climate Sensitivity” : 2016, 2017. On invitation
- Annual workshop for the World Climate Research Programme (WCRP) at Ringberg (Germany) in 2015 on « Clouds, Circulation and Climate Sensitivity » (oral). On invitation
- Workshop on atmospheric blocking at Reading (England) in 2011 (oral). On invitation

Climate Outreach

- 2015 : Co-authorship in the French journal « La Météorologie », article on climate sensitivity and its uncertainties
- 2016 : Press interviews for the newspaper « Figaro » and the online media « Atlantico » on the topic of the role of midlatitude clouds in the changing climate
- 2019 : Animations and conferences for the general public and school students

Funding & Awards

- 2014: 2-year post-doctoral research grant from CNES
- 2011: Secured two months' extension to my PhD studentship funding
- 2010: Financial support for the EGU General Assembly
- 2009: Financial support for conferences-orientated travel expenses
- 2008: School of Environmental Sciences 3-year PhD studentship (England)
- 2007: Awarded a scholarship securing the final year's university fees of my Bsc. (New Zealand)