

CURRICULUM VITAE
July 2022
LOUIS RIVOIRE

Postdoctoral Fellow
Harvard University
Department of Earth and Planetary Sciences
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Cambridge, MA 02138

RESEARCH INTERESTS

- **Detectability and statistical significance of climate signals**, including the effects of sampling limitations of spaceborne instruments and gaps in the observational record. Application: recovery of the ozone hole, changes in the strength of the overturning stratospheric circulation.
- **Non-parametric algorithm development**, use of image processing tools for robust and optimized methods. Application: jet stream tracking and labeling algorithm for use in climate studies.
- **Tropical cyclone risk assessment in future climates** with a focus on governance- and policy-relevant scenarios.
- **Dynamical and chemical processes in the global tropopause layer**: convective influence in the tropics, global cross-tropopause transport of trace gases.

PROFESSIONAL APPOINTMENTS

Harvard University
Department of Earth and Planetary Sciences
Postdoctoral Fellow, M. Linz group

Cambridge, MA
2020 - now

EDUCATION

Colorado State University
Ph.D., Atmospheric Science
Programs of Research and Scholarly Excellence

Fort Collins, CO
2020

Pierre and Marie Curie Univ. (Sorbonne Univ. affiliate)/Ecole Normale Supérieure Paris, France
M.S., Ocean, Atmosphere, Climate, and Remote Sensing 2015

Ecole Normale Supérieure Paris, France
Diploma of Ecole Normale Supérieure, in recognition of interdisciplinary curriculum 2015
with a focus on environmental sciences and geopolitics

Ecole Normale Supérieure Paris, France
B.S., Earth Sciences (atmospheric and oceanographic sciences, geology) 2013

Higher School Preparatory Classes Lyon, France
2-year intensive training for highly competitive selection to enroll at the *Grandes Ecoles* 2010-2012
Mathematics, physics, chemistry, biology, geology, geography, philosophy

PUBLICATIONS

Peer reviewed

- **L. Rivoire**, T. Birner, J. A. Knaff, N. Tourville, Quantifying the radiative impact of clouds on tropopause layer cooling in tropical cyclones, *J. Clim.*, 2020.
- W. J. Randel, **L. Rivoire**, L. L. Pan, S. Honomichl, Dry layers in the tropical troposphere observed during CONTRAST and global behavior from GFS analyses, *J. Geophys. Res.*, 2016.
- **L. Rivoire**, T. Birner, J. A. Knaff, Evolution of the upper-level thermal structure in tropical cyclones, *Geophys. Res. Lett.*, 2016.

In preparation

- **L. Rivoire**, M. Linz, P. Lin, J.N. Neu, Towards understanding robust trend detection in stratospheric ozone, *in preparation for Atmospheric Chemistry and Physics*.
- **L. Rivoire**, T. Birner, J. A. Knaff and co-authors, Convectively-driven tropopause layer cooling in reanalysis data sets, *in preparation*.

TEACHING AND MENTORING

Colorado State University

Fort Collins, CO

Teaching assistant, Atmospheric Dynamics II

2016

Wave-mean flow interaction theory and stratospheric dynamics

Undergraduate student intern advisor

2016, 2019

Graduate student intern advisor

2020

Harvard University

Cambridge, MA

Graduate student mentor

2020-2022

Undergraduate student intern advisor

2022

CONFERENCE ABSTRACTS AND INVITED LECTURES

- **Rivoire, L.**, M. Linz, J. Curbelo, C. Golja, An improved jet detection algorithm for climate studies, EGU General Assembly, Vienna, Austria, 2022.
- **Rivoire, L.**, M. Linz, J. Neu, P. Lin, A simple approach to the statistical significance of trends in stratospheric ozone, 102nd Annual Meeting of the AMS, virtual, 2022.
- **Rivoire, L.**, D. Chavas, J. A. Knaff, A multivariate approach to future tropical cyclone tracks, conference abstract, 34th AMS Conference on Hurricanes and Tropical Meteorology, virtual, 2021.
- **Rivoire, L.**, Ozone and hurricanes, outreach presentation for Earth Day, French and German Consulates in Boston, virtual, 2021.
- **Rivoire, L.**, What is cooling the tropopause above tropical cyclones?, invited seminar, NCAR, ACOM, Boulder, CO, 2019.
- **Rivoire, L.**, What is cooling the tropopause above tropical cyclones?, oral presentation, 19th Cyclone Workshop with award travel grant, Seeon, Bavaria, Germany, 2019.
- **Rivoire, L.**, Temperature tendencies in the UTLS above tropical cyclones, oral presentation, Front Range Tropical Cyclone workshop, Fort Collins, CO, 2018.
- **Rivoire, L.**, J. A. Knaff, Climatology and structure of cut-off lows in the north Atlantic, oral presentation, NOAA Center for Satellite Applications and Research - COoperative Research Program workshop, Madison, WI, 2018.
- **Rivoire, L.**, T. Birner, J. A. Knaff, Evolution of the upper-level thermal structure in reanalyzed tropical cyclones, poster presentation, 33rd AMS Conference on Hurricanes and Tropical Meteorology, Ponte Vedra, FL, 2018.
- **Rivoire, L.**, T. Birner, J. A. Knaff, Evolution of the upper-level thermal structure in tropical cyclones, poster presentation, 49th Fall Meeting of the AGU, San Francisco, CA, 2016.

- **Rivoire, L.**, T. Birner, J. A. Knaff, Evolution of the fine-scale vertical structure in tropical cyclones inferred from GPS Radio Occultation measurements, oral presentation, 32nd AMS Conference on Hurricanes and Tropical Meteorology, San Juan, PR, 2016.
- **Rivoire, L.**, Dry layers in the tropical troposphere, invited lecture at Colorado State University, 2016.
- **Rivoire, L.**, T. Birner, R. H. Johnson, Sensitivity study of CAPE, poster presentation, Young Scientist Symposium on Atmospheric Research at Colorado State University, Fort Collins, CO, 2015.

RESEARCH EXPERIENCE

Internships:

Jet Propulsion Laboratory, Caltech	Pasadena, CA
Science team member for a satellite mission funded through NASA	2022
Science requirements; recent trends in stratospheric circulation	
Colorado State University	Fort Collins, CO
Intern with Dr. Thomas Birner and Dr. Richard Johnson	2015
Modulation of tropical tropopause layer characteristics by the Madden-Julian Oscillation	
National Center for Atmospheric Research - ACOM	Boulder, CO
Intern with Dr. William J. Randel	2014
Global characterization of dry tongues in the tropical troposphere	
University Pierre and Marie Curie	Paris, France
Intern at the Institute of Mineralogy, Materials Physics and Cosmochemistry	2013
Synthesis and reactivity of carbonated green rusts for the denitrification of wastewater	

Field and laboratory experience:

Colorado State University	Fort Collins, CO
• Participant in an airborne atmospheric chemistry campaign	2018
• Radiosonde launches for an inter-comparison project	2018
Haute Provence Observatory	France
Atmospheric dynamics, boundary layer and stratospheric LIDAR meteorology	2015
Météo-France	Toulouse, France
Glaciology and remote sensing of the cryosphere, introduction to weather forecasting	2014
Ecole Normale Supérieure	Alps, France
• GPS measurement campaign for a geodetic study	2013
• Mapping and structural geology	2013
Oceanography Laboratory of Villefranche-sur-Mer	Villefranche-sur-Mer, France
Marine reflection seismology, in situ atmosphere-ocean flux measurements	2013
Ecole Polytechnique (Laboratoire de Météorologie Dynamique)	Palaiseau, France
LIDAR meteorology, atmospheric pollutant transport and chemistry	2013
Paris Institute of Earth Physics	Paris, France
Geomorphological and hydrological experiments	2013
Pierre and Marie Curie University (LOCEAN)	Paris, France
Rotating tank fluid dynamics experiments	2013

COMMUNITY SERVICE

Peer review

NASA review panel (2)	Nat. Commun. (1)	Harvard College (1)	J. of Geophys. Res. (6)
Atmos. Sci. Lett. (1)	Bull. Am. Met. Soc. (1)		Int. J. Climatol. (1)

Ann. Geophys-Italy (1)

QJRMS (2)

Atmos. Chem. Phys. (1)

Other (18)

Other

International Presidential Fellow at Colorado State University

2015–2016

TECHNICAL SKILLS

- Advanced knowledge of Matlab (10+ years), working knowledge of UNIX shell, Fortran, \LaTeX , MS Office.
- Linux environment and workload managers.
- Extensive experience with large data sets and data formats including GRIB, GRIB2, NetCDF, HDF, ASCII.
- Modify model code and run ensemble simulations to improve the reliability of model projection.
- Native French speaker, fluent in English, Dutch basics.