CURRICULUM VITAE
July 2022

LOUIS RIVOIRE

Postdoctoral Fellow
Harvard University
Department of Earth and Planetary Sciences
lrivoire@fas.harvard.edu

20 Oxford Street
Cambridge, MA, 02138

RESEARCH INTERESTS

- **Tropical cyclone risk assessment in future climates** with a focus on governance- and policy-relevant scenarios.
- **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.
- **Dynamical and chemical processes in the global tropopause layer**: convective influence in the tropics, global cross-tropopause transport of trace gasses.

CURRENT POSITION

Harvard University — Cambridge, MA
Department of Earth and Planetary Sciences — 2020 - now
Postdoctoral Fellow, M. Linz group

EDUCATION

Colorado State University — Fort Collins, CO
Ph.D., Atmospheric Science — 2020
Programs of Research and Scholarly Excellence

Sorbonne University — 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 with a focus on environmental sciences and geopolitics — 2015

Ecole Normale Supérieure — Paris, France
B.S., Earth Sciences — 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, Instrumental limitations to the detectability of long-term trends in stratospheric ozone, *Atmospheric Chemistry and Physics*.
- **L. Rivoire**, M. Linz, J. Curbelo, co-authors, JetLag: a Lagrangian description of the jet streams for climate applications.
- **L. Rivoire**, T. Birner, J. A. Knaff and co-authors, Convectively-driven tropopause layer cooling in reanalysis data sets.

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 Germand 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 (over 30)

NASA review panels	Nat. Commun.	Harvard College	J. of Geophys. Res.
Atmos. Sci. Lett.	Bull. Am. Met. Soc.		Int. J. Climatol.
Ann. Geophys.	QJRMS		Atmos. Chem. Phys.

Other

International Presidential Fellow at Colorado State University 2015–2016

TECHNICAL SKILLS

- 10+ years of Matlab experience including labeled n-dimensional array tools, working knowledge of Linux, Bash, Fortran, HTML, Markdown, Python (2 courses).
- Linux environment and workload managers.
- Extensive experience with large data sets and data formats including GRIB, GRIB2, NetCDF, HDF, ASCII, TIFF.
- Graphic design software (Adobe Photoshop, Blender), LaTeX, scientific literature databases, MS Office.
- Native French speaker, fluent in English, Dutch basics.