CURRICULUM VITAE
July 2022

LOUIS RIVOIRE

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RESEARCH INTERESTS

- **Tropical cyclone risk assessment in future climates** with a focus on governance- and policy-relevant scenarios. Applications to extreme precipitation events and climate intervention technologies.
- **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.

PROFESSIONAL EXPERIENCE

Harvard University, *Cambridge, MA* — Jul 2020 - present
Postdoctoral Fellow
Department of Earth and Planetary Sciences

Jet Propulsion Laboratory, Caltech, *Pasadena, CA* — Dec 2021 - present
Science team member
Providing expertise for a new satellite mission funded by NASA

Colorado State University, *Fort Collins, CO* — Aug 2015 - May 2020
Graduate research and teaching assistant

Colorado State University, *Fort Collins, CO* — Mar - Jul 2015
Climate dynamics intern with Dr. Thomas Birner and Dr. Richard Johnson
Modulation of tropical tropopause layer characteristics by the Madden-Julian Oscillation

National Center for Atmospheric Research, *Boulder, CO* — Mar - Jul 2014
Atmospheric chemistry intern with Dr. William J. Randel
Global characterization of dry layers in the tropical troposphere

Peer review since 2016

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

EDUCATION

Colorado State University, *Fort Collins, CO* 2020
Ph.D., Atmospheric Science
Funded by PRSE award recognizing high-impact research

Sorbonne University, *Paris, France* 2015
M.S., Ocean, Atmosphere, Climate, and Remote Sensing
with distinction of Diploma of Ecole Normale Supérieure granted for additional coursework in environmental sciences and geopolitics.

Ecole Normale Supérieure, *Paris, France* 2013
B.S., Earth Sciences

Higher School Preparatory Classes, *Lyon, France* 2010-2012
2-year intensive training for highly competitive selection to enroll at the *Grandes Ecoles*
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* 2016
Teaching assistant, Atmospheric Dynamics II
Wave-mean flow interaction theory and stratospheric dynamics
Undergraduate student intern advisor 2016, 2019
Harvard University, *Cambridge, MA*
Graduate student mentor 2020-2022
Harvard College undergraduate student intern advisor 2022

CONFERENCE ABSTRACTS AND INVITED LECTURES

- **Rivoire, L.**, M. Linz, J. Curbelo, Detecting tropopause folding events using satellite data, SPARC General Assembly General Assembly, Boulder, CO, 2022.
- **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:

University Pierre and Marie Curie, *Paris, France* Jun - July 2013
Intern at the Institute of Mineralogy, Materials Physics and Cosmochemistry
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

TECHNICAL SKILLS

Computational:

- 10+ years of Matlab experience including labeled n-dimensional array tools, working knowledge of Linux, Bash, Fortran, HTML, Markdown, some Python.
- 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.

Languages: English (fluent), French (native), Dutch (CEFR level A2).