

Dr. Francisco Spaulding-Astudillo Postdoctoral Scholar

✉ spauldingastudillo@gmail.com

☎ (815)-621-6825

🔗 LinkedIn Website Github

Education

Doctor of Philosophy (Ph.D.)

Geophysics and Space Physics

UCLA

📅 2021-2023

📍 Los Angeles, CA

Master of Science (M.S.)

Geophysics and Space Physics

UCLA

📅 2018-2021

📍 Los Angeles, CA

Bachelor of Science (B.S.)

Geophysical Sciences

University of Chicago

📅 2013-2017

📍 Chicago, IL

Skills

- Data analysis and visualization (Python, MATLAB, Fortran, CDO)
- Advanced mathematics (linear algebra, calculus, ODEs/PDEs)
- Computational fluid dynamics (Navier-Stokes, finite difference, gradient descent, verification, validation, incompressible flow)
- Applied physics (thermodynamics, spectroscopy, conservation laws)
- Numerical climate modeling (CMIP6, ERA5, MERRA-2)
- Numerical radiative transfer (RFM)
- Written and verbal communication (4 papers written; 3 oral and 10 conference presentations)
- Mentoring and advising (at masters and undergraduate level)

Work Experience

Postdoctoral Scholar

University of California, Los Angeles

📅 2024 – Current 📍 Los Angeles, CA

Research:

- Boundary-driven intensification of mature hurricanes in a warmer climate
- Dynamics of tropical congestus clouds in convection-resolving simulations
- Impact of warming on the frequency and intensity of surface precipitation

Advising:

- Co-advisor to 2 master's students in UCLA Atmospheric and Ocean Sciences Department

Grant Writing:

- Co-author of funding proposal with Dr. Bjorn Benneke, primary investigator of James Webb Space Telescope (JWST) exoplanet program

Graduate Student Researcher

University of California, Los Angeles

📅 2018 – 2023 📍 Los Angeles, CA

Project 1: Applied spectroscopy to extract cloud height information (in review: *Nature Geoscience*)

- Discovered that water absorption line control the formation height of tropical congestus clouds using high-resolution infrared spectroscopy
- Designed and ran radiation experiments with state-of-the-art Reference Forward Model, resulting in 1 journal publication and 1 oral presentation at the 2023 AGU Fall Meeting

Project 2: Improved prediction of severe, episodic convective storms using quasi-equilibrium thermodynamics (in review: *PSJ*)

- Identified statistical imbalances between heat transport and potential energy as key factors in episodic storm activity in some climate models
- Updated and ran CMIP6 model using Fortran, Linux, and Bash; and analyzed 2 TB geospatial data in Python, resulting in 1 publication and 1 oral presentation

Project 3: Response of the climate system to varying water concentration (Spaulding-Astudillo and Mitchell 2023)

- Carried out the first sensitivity study of a CMIP6 model to water saturation vapor pressure to quantify the potential effects of climate change
- Designed the study, ran the experiments, analyzed 10 TB geospatial data in Python, published in 1 journal, and presented the results at 3 conferences

Graduate Teaching Assistant

University of California, Los Angeles

📅 2019 – 2023 📍 Los Angeles, CA

EPSS Courses: Solar System & Planets; Intro to Oceanography

- Instructed, supported, and created formative assessments for 100 students in undergraduate STEM courses, emphasizing front-of-class, student-led derivations

Science Communication

American Geophysical Union Fall Meeting

📅 December 2023 📍 San Francisco, CA

- 12-min oral presentation: *The physical origin of tropical congestus clouds* in “Atmospheric Convection: Processes, Dynamics, and Links to Weather and Climate” session
- 12-min oral presentation: *A proposal for the origin of oscillating convection in planetary atmospheres* in “Atmospheres, Climate, and Potential Habitability of Rocky Exoplanets” session