ANDREW I.L. WILLIAMS

Scripps Institution of Oceanography, UC San Diego
Email: andrewwilliams@ucsd.edu // **Citizenship:** Dual U.K. and U.S.A.

EDUCATION

University of Oxford — *October 2019 - July 2023*
DPhil (PhD) in Climate Physics — Advisor: Philip Stier

University of Oxford — *October 2015 - June 2019*
Bachelors & Masters degrees in Physics — Classification: 1st

EMPLOYMENT

Postdoctoral Scholar — October 2025 - present
Scripps Institution of Oceanography

Postdoctoral Research Associate — August 2023 - August 2025
Princeton University & NOAA GFDL

Visiting Researcher — June 2022 - July 2022
TU Delft

Visiting Researcher — April 2022 - May 2022
Max Planck Institute for Meteorology

Research Associate — June 2019 - January 2020
Massachusetts Institute of Technology

Summer Undergraduate Research Fellow — Summer 2018
California Institute of Technology

GRANTS & FUNDING

SIO Institutional Postdoctoral Fellowship — 2025-2027
Scripps Institution of Oceanography, UCSD (≈ $200,000)

CIMES Postdoctoral Fellowship — 2023-2025
Princeton University (≈ $200,000)

NOAA Climate & Global Change Postdoctoral Fellowship — 2023-2025
Yale University (declined) (≈ $200,000)

NERC PhD Studentship — 2019-2023
Fully funded doctoral fellowship at the University of Oxford. (≈ £100,000)

Laidlaw Research and Leadership Scholarship — 2019
Awarded to fund research at MIT with Prof. Paul O'Gorman. (≈ £10,000)

Caltech Summer Undergraduate Research Fellowship — 2018
Awarded to fund research at Caltech with Prof. Tapio Schneider. (≈ £8,000)

AWARDS

Outstanding Early Career Presentation Award 2023
CFMIP-GASS meeting, Paris

Outstanding Student and PhD candidate Presentation Award 2022
EGU

Outstanding Student Presentation Award 2022
AGU Fall Meeting

Moritz-Heyman Scholarship 2015-2019
Scholarship for low-income students who won a place at Oxford University (£16,000 total).

St. Hilda's College, 125th Anniversary Scholarship 2019
Prize for high grades in first year examinations at Oxford (£1,250 total)

PUBLICATIONS

Manuscripts in preparation

- Risi, C. and co-authors including Williams, A. I. L.: Amplification of temperature changes with altitude in the tropics and subtropics
  Reviews of Geophysics
- Williams, A. I. L.: Tropical circulation as the statistics of convection
  Geophysical Research Letters

2026

- Davenport, D., Madan, V. and co-authors including Williams, A. I. L., JCM v1.0: A Differentiable, Intermediate-Complexity Atmospheric Model
  Geoscientific Model Development (submitted)
  10.5194/egusphere-2025-6266
- Williams, A. I. L., Bridging Clarity and Accuracy: A Simple Spectral Longwave Radiation Scheme for Idealized Climate Modeling
  Journal of Advances in Modeling Earth System
  10.1029/2025MS005405
- Williams, A. I. L. & Merlis, T.M., State-dependence of polar amplification in an idealized GCM
  Geophysical Research Letters
  10.1029/2025GL118423

2025

- Williams, A. I. L. & Jeevanjee, N., Sea-surface temperature patterns, radiative cooling, and hydrological sensitivity
  Geophysical Research Letters
  10.1029/2025GL117734
- Williams, A. I. L. & Jeevanjee, N., A robust constraint on the response of convective mass fluxes to warming
  Journal of Advances in Modeling Earth Systems
  10.1029/2024MS004695
- Watson-Parris, D. and co-authors including Williams, A. I. L., Weak surface temperature effects of recent reductions in shipping SO2 emissions, with quantification confounded by internal variability
  Atmospheric Chemistry & Physics
  10.5194/egusphere-2024-1946
- Mackie, A. , Byrne, M.P., van de Koot, E. & Williams, A. I. L., Circulation and cloud responses to patterned SST warming
  Geophysical Research Letters
  10.22541/essoar.172736799.93094846

- Herbert, R. J., Williams, A. I. L., Weiss, P., Klocke, D. & Stier, P., Isolating aerosol-climate interactions in global storm-resolving simulations
Atmospheric Chemistry & Physics
10.5194/egusphere-2024-1689

2024

- Schmidt, H. & co-authors including Williams, A. I. L., Effects of vertical grid spacing on the climate simulated in the ICON-Sapphire global storm-resolving model
Geoscientific Model Development
10.5194/gmd-17-1563-2024

- Bloch-Johnson, J. and co-authors including Williams, A. I. L., The Green's Function Model Intercomparison Project (GFMIP) Protocol
Journal of Advances in Modeling Earth Systems
10.1029/2023MS003700

2023

- Dagan, G., Yeheskel, N. & Williams, A. I. L., Enhanced radiative forcing from aerosol-cloud interactions due to large-scale circulation adjustments
Nature Geoscience
10.1038/s41561-023-01319-8

- Williams, A. I. L., Watson-Parris, D., Dagan, G. & Stier, P., Dependence of fast changes in global and local precipitation on the geographical location of absorbing aerosol
Journal of Climate
10.22541/au.167364749.93845737/v1

- Williams, A. I. L., Jeevanjee, N. & Bloch-Johnson, J., Circus Tents, Convective Thresholds and the Non-Linear Climate Response to Tropical SSTs
Geophysical Research Letters
(Editor's Highlight)
10.1029/2022GL101499

2022

- Williams, A. I. L., Stier, P., Dagan, G. & Watson-Parris, D., Strong control of effective radiative forcing by the spatial pattern of absorbing aerosol
Nature Climate Change
(Press coverage)
10.1038/s41558-022-01415-4

- Dagan, G., Stier, P., Dingley, B. & Williams, A. I. L., Examining the regional co-variability of the atmospheric water and energy imbalances in different model configurations - linking clouds and circulation
Journal of Advances in Modeling Earth Systems
10.1029/2021MS002951

- Williams, A. I. L. & O'Gorman, P. A., Summer-Winter Contrast in the Response of Precipitation Extremes to Climate Change over Northern Hemisphere Land
Geophysical Research Letters
10.1029/2021GL096531

2021

- Watson-Parris, D., Williams, A. I. L., Deaconou, L. & Stier, P., Model calibration using ESEm v1.0.0 - an open, scalable Earth System Emulator
Geoscientific Model Development
10.5194/gmd-14-7659-2021

PRESENTATIONS

2026

- **Scripps Institution of Oceanography (upcoming)** **Invited talk**
  Tales of climate dynamics & outreach

2025

- **Texas A&M University** **Invited talk**
  Tales of climate dynamics & outreach
- **University of Exeter** **Invited talk**
  State-dependence of polar amplification in an idealized, ice-free GCM
- **Gordon Research Conference on Radiation and Climate** Poster
  A Simple Spectral Longwave Radiation Scheme for Idealized Climate Modeling
- **Florida State University** **Invited talk**
  The physics of tropical convection and the large-scale circulation in a warming climate
- **ECS & Cloud Feedbacks Virtual Symposium** Talk
  How do convective mass fluxes respond to global warming?
- **EGU General Assembly Meeting** Talk
  A robust constraint on the response of convective mass fluxes to warming
- **University of Washington** **Invited talk**
  A robust constraint on the response of convective mass fluxes to warming

2024

- **GFDL Lunchtime Seminar**
  A robust constraint on the response of convective mass fluxes to warming
- **CLIVAR TROPICS working group, Hamburg** **Invited talk**
  Is there a "hydrological constraint" on tropical circulation weakening?
- **City College of New York** **Invited talk**
  Physical constraints on the response of convective mass fluxes to warming
- **AOFD** Talk
  A robust constraint on the response of convective mass fluxes to warming
- **CFMIP** Talk
  A robust constraint on the response of convective mass fluxes to warming
- **Hebrew University of Jerusalem** **Invited talk**
  A robust constraint on the response of convective mass fluxes to warming
- **Princeton University** Talk
  A robust constraint on the response of convective mass fluxes to warming
- **Columbia University** **Invited talk**
  A robust constraint on the response of convective mass fluxes to warming

2023

- **University of East Anglia** **Invited talk**
  Non-linear climate response to tropical SSTs explained by a convective threshold
- **Center for Atmosphere Ocean Science, NYU** **Invited talk**
  Non-linear climate response to tropical SSTs explained by a convective threshold
- **Reading University** **Invited talk**
  Do convective mass fluxes constrain the tropical circulation response to warming?
- **Gordon Research Conference on Radiation and Climate** Poster
  Circus tents, convective thresholds and the non-linear climate response to tropical SSTs

- **CFMIP-GASS meeting** Talk
  Circus tents, convective thresholds and the non-linear climate response to tropical SSTs
  (Winner of an Outstanding Early Careerr Presentation Award)

- **ECS & Cloud Feedbacks Virtual Symposium** Talk
  Circus tents, convective thresholds and the non-linear climate response to tropical SSTs

- **4th biennial workshop on the regional climate response to aerosol** Talk
  Understanding the dependence of fast changes in global and local precipitation on the geographical location of absorbing aerosol

2022

- **AGU Fall Meeting** Talk
  Circus tents, convective thresholds, and the non-linear climate response to tropical SSTs

- **NOAA GFDL** **Invited talk**
  Strong control of effective radiative forcing by the spatial pattern of absorbing aerosol

- **Princeton University** **Invited talk**
  Circus tents, convective thresholds, and the non-linear climate response to tropical SSTs

- **Yale University** **Invited talk**
  Non-linearities in the pattern effect explained by a convective threshold

- **3rd Pan-GASS Meeting, Monterey** Poster
  Impact of warm-rain suppression on the climate of a mock-Walker circulation

- **TU Delft** **Invited talk**
  Clouds, aerosols and the global circulation

- **2nd Workshop on Cloud Organization, Utrecht** Poster
  Aerosol-cloud-circulation interactions in cloud-resolving simulations with an imposed SST gradient

- **CLIVAR Pattern Effect Workshop** Poster
  SST Green's Functions for regional precipitation

- **EGU General Assembly Meeting** **Invited talk**
  Strong control of effective radiative forcing and precipitation by the spatial pattern of absorbing aerosol
  (Winner of an Outstanding Student Presentation Award)

2021

- **AGU Fall Meeting** Talk
  Contrasting Seasonal Response of Northern Hemisphere Precipitation Extremes to Climate Change
  (Winner of an Outstanding Student Presentation Award)

- **AGU Fall Meeting** Poster
  Understanding the "pattern effect" of absorbing aerosol

2019

- **EGU General Assembly Meeting** Poster
  Optimizing the number of convective plumes in EDMF cloud parameterization schemes using high-resolution LES simulations

TEACHING

Mentoring of a GFDL summer intern 2024-present
Training and mentoring of a student from University of Puerto Rico at Mayagüez, working on the response of rainfall extremes to CO_2. I have continued meeting with the student to support them as they progress through graduate school.

Guest Lecturer, Colorado State University 2024
Gave a guest lecture on non-linear aspects of Earth's energy balance

Guest Lecturer, City University of New York 2023
Gave a guest lecture on basic aspects of Earth's atmopheric circulation

Supervision of an Oxford Masters' student 2022-2023
Day-to-day supervision of a Master's student studying the response of regional precipitation to SST anomalies

Teaching Assistant: Atmospheric Physics Master's Course 2020-2022
Marked homework assignments and provided weekly feedback on students' work.

Lecturer / Course Lead 2020-2023
Designed and delivered a course for first-year PhD students on modeling the global-mean climate using energy balance models. Delivered blackboard lectures and interactive Python coding demonstrations.

DIVERSITY & OUTREACH EFFORTS

Climate Up Close (climateupclose.org) 2024 – present
Small team of climate scientists committed to making the essentials of climate science accessible to a broad audience through public lectures, Q&A sessions and demos.

Harlem StreetSquash volunteer 2023 – 2024
Providing weekly math and physics tuition to students and young adults in Harlem, with the aim to ensure all participants graduate from high school, enroll in and complete a post-secondary program, and gain meaningful employment. I also assist in running weekly squash training sessions for the students.

GFDL Diversity, Equity, Inclusion & Accessibility Committee 2023 – 2025
Development and execution of DEIA efforts to monitor and enhance lab culture and community at GFDL. Activities included: outreach efforts with minority serving institutions, organizing community events to promote wellness and community within the lab and promoting diversity in hiring practices at all levels of the lab.

AOPP Equality, Diversity & Inclusion Committee 2020 – 2023
Organized the department's first student-led EDI group, which aims to develop and sustain a diverse, inclusive, and equitable academic environment and community. Activities included: collecting demographic data on student applicants to inform access efforts, setting up a community EDI library and arranging accessible coffee breaks and social events for the department.

PhD mentoring scheme 2021 – 2023
Developed a mentoring scheme which matches incoming PhD students with a postdoc or more senior PhD student who can provide advice on adjusting to graduate study at Oxford. Scheme was trialed at a small-scale before being rolled out across the entire Oxford Physics department.

Oxford Sparks 2020 – 2021
Recorded an outreach video about clouds which has reached over 150,000 people across social media.

Seren Hub 2016 – 2023
Provided interview practice and entrance exam help for Welsh students from disadvantaged backgrounds who want to study Physics or Mathematics at university.

ACADEMIC SERVICE

Peer reviewer for *Nature*, *Nature Geoscience*, *Nature Climate Change*, *npj Climate and Atmospheric Science*, *Journal of Climate*, *Journal of Advances in Modeling Earth Systems*, *Scientific Reports*, *Atmospheric Chemistry and Physics*, *Geophysical Research Letters*, *Geoscientific Model Development.*

Session Convener 2025
Convening session on "Climate Sensitivity, Radiative Feedbacks and the Pattern Effect" at the EGU General

Assembly Meeting 2025

Proposal Reviewer - Department of Energy 2024
Reviewer for DOE Funding call on "Earth System Model Development and Analysis"

Organizing Committee - CFMIP 2024 2024
CFMIP conference 2024, Boston College // website link

Organizing Committee 2023-present
GFDL's Climate Sensitivity Journal Club

Steering Committee 2023-present
ECS & cloud feedback virtual symposia // website link

Session chair 2022
Chair of session on "Absorbing Aerosols: Experiments, Observations, and Modelling" at the EGU General Assembly Meeting 2022

Policy briefing Nov-Dec 2020
Commissioned by Shadow Secretary for Health and Social Care to research the intersection between 'Pandemics and Climate Change'. Findings were written in a white paper and presented to the Government.