

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
DPhil (PhD) in Climate Physics

October 2019 - July 2023
Advisor: Philip Stier

University of Oxford
Bachelors & Masters degrees in Physics

October 2015 - June 2019
Classification: 1st

EMPLOYMENT

Postdoctoral Scholar
Scripps Institution of Oceanography

October 2025 - present

Postdoctoral Research Associate
Princeton University & NOAA GFDL

August 2023 - August 2025

Visiting Researcher
TU Delft

June 2022 - July 2022

Visiting Researcher
Max Planck Institute for Meteorology

April 2022 - May 2022

Research Associate
Massachusetts Institute of Technology

June 2019 - January 2020

Summer Undergraduate Research Fellow
California Institute of Technology

Summer 2018

GRANTS & FUNDING

CIMES Postdoctoral Fellowship
Princeton University

2023-2025

NOAA Climate & Global Change Postdoctoral Fellowship
Yale University (declined)

2023-2025

NERC PhD Studentship
Awarded fully funded place on NERC Environmental Research Doctoral Programme at the University of Oxford, covering tuition, stipend and research grant (Approx. £100,000).

2019-2023

Laidlaw Research and Leadership Scholarship
Awarded £10,000 to fund research at MIT with Prof. Paul O’Gorman.

2019

Caltech Summer Undergraduate Research Fellowship
Awarded \$8,000 to fund research at Caltech with Prof. Tapio Schneider.

2018

AWARDS

Outstanding Early Career Presentation Award
CFMIP-GASS meeting, Paris

2023

Outstanding Student and PhD candidate Presentation Award EGU	2022
Outstanding Student Presentation Award AGU Fall Meeting	2022
Moritz-Heyman Scholarship Scholarship for low-income students who won a place at Oxford University (£16,000 total).	2015-2019
St. Hilda's College, 125th Anniversary Scholarship Prize for high grades in first year examinations at Oxford (£1,250 total)	2019

PUBLICATIONS

Manuscripts in preparation

- Davenport, D., Madan, V. and co-authors including Williams, A. I. L.: JCM v1.0 : A Differentiable, Intermediate-Complexity Atmospheric Model
Geoscientific Model Development (anticipated submission December 2025)
- Risi, C. and co-authors including Williams, A. I. L.: Amplification of temperature changes with altitude in the tropics and subtropics
Reviews of Geophysics (anticipated submission December 2025)

2025

- 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 (revised)
- Williams, A. I. L. & Merlis, T.M.: State-dependence of polar amplification in an idealized GCM
Geophysical Research Letters (revised)
- Williams, A. I. L. & Jeevanjee, N.: Sea-surface temperature patterns, radiative cooling, and hydrological sensitivity
Geophysical Research Letters (accepted)
- 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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/10.5194/gmd-17-1563-2024)
- Bloch-Johnson, J. and co-authors including Williams, A. I. L.: The Green's Function Model Intercomparison Project (GFMIIP) Protocol
Journal of Advances in Modeling Earth Systems
[10.1029/2023MS003700](https://doi.org/10.1029/2023MS003700)

2023

- Dagan, G., Yehekel, 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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/10.5194/gmd-14-7659-2021)

PRESENTATIONS

2025

- **Scripps Institution of Oceanography (upcoming)** Invited talk
Tales of climate dynamics & outreach
- **Texas A&M University (upcoming)** 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
Bridging Clarity and Accuracy: 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**
How do convective mass fluxes respond to global warming?
- **EGU General Assembly Meeting**
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 Career 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

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| Mentoring of a GFDL summer intern | 2024-present |
| <i>Training and mentoring of a student from University of Puerto Rico at Mayagüez, working on the response of rainfall extremes to CO₂. I have continued meeting with the student to support them as they progress through graduate school.</i> | |
| Guest Lecturer, Colorado State University | 2024 |
| <i>Gave a guest lecture on non-linear aspects of Earth's energy balance</i> | |
| Guest Lecturer, City University of New York | 2023 |
| <i>Gave a guest lecture on basic aspects of Earth's atmospheric circulation</i> | |
| Supervision of an Oxford Masters' student | 2022-2023 |
| <i>Day-to-day supervision of a Master's student studying the response of regional precipitation to SST anomalies</i> | |
| Teaching Assistant: Atmospheric Physics Master's Course | 2020-2022 |
| <i>Marked homework assignments and provided weekly feedback on students' work.</i> | |
| Lecturer / Course Lead | 2020-2023 |
| <i>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.</i> | |

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.