

# ANDREW I.L. WILLIAMS

Scripps Institution of Oceanography, UC San Diego

**Email:** andrewwilliams@ucsd.edu // **Citizenship:** Dual U.K. and U.S.A.

## EDUCATION

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**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: 1<sup>st</sup>

## EMPLOYMENT

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**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

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**Scripps Institutional Postdoctoral Fellowship**  
Scripps Institution of Oceanography, UCSD ( $\approx$  \$200,000)

2026-2028

**CIMES Postdoctoral Fellowship**  
Princeton University ( $\approx$  \$200,000)

2023-2025

**NOAA Climate & Global Change Postdoctoral Fellowship**  
Yale University (declined) ( $\approx$  \$200,000)

2023-2025

**NERC PhD Studentship**  
Fully funded doctoral fellowship at the University of Oxford. ( $\approx$  £100,000)

2019-2023

**Laidlaw Research and Leadership Scholarship**  
Awarded to fund research at MIT with Prof. Paul O’Gorman. ( $\approx$  £10,000)

2019

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

2018

## AWARDS

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<b>Outstanding Early Career Presentation Award</b> CFMIP-GASS meeting, Paris	2023
<b>Outstanding Student and PhD candidate Presentation Award</b> EGU	2022
<b>Outstanding Student Presentation Award</b> AGU Fall Meeting	2022
<b>Moritz-Heyman Scholarship</b> Scholarship for low-income students who won a place at Oxford University (£16,000 total).	2015-2019
<b>St. Hilda's College, 125th Anniversary Scholarship</b> Prize for high grades in first year examinations at Oxford (£1,250 total)	2019

## PUBLICATIONS

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### 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* (*anticipated submission 2026*)

### 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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](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., 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](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

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## 2026

- **3rd Annual Pre-EGU Ice Cloud Workshop, Vienna (upcoming)** Invited talk  
Tropical convection in a changing climate
- **Scripps Institution of Oceanography (upcoming)** Invited talk  
Tales of climate dynamics & outreach
- **Colorado State University (upcoming)** Invited talk  
Hierarchical Climate Dynamics: From the Tropics to the Poles
- **Lamont-Doherty Earth Observatory** Invited talk  
Hierarchical Climate Dynamics: From the Tropics to the Poles

## 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 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  
*Training and mentoring of a student from University of Puerto Rico at Mayagüez, working on the response of rainfall extremes to CO<sub>2</sub>. I have continued meeting with the student to support them as they progress through graduate school.*

<b>Guest Lecturer, Colorado State University</b> <i>Gave a guest lecture on non-linear aspects of Earth's energy balance</i>	2024
<b>Guest Lecturer, City University of New York</b> <i>Gave a guest lecture on basic aspects of Earth's atmospheric circulation</i>	2023
<b>Supervision of an Oxford Masters' student</b> <i>Day-to-day supervision of a Master's student studying the response of regional precipitation to SST anomalies</i>	2022-2023
<b>Teaching Assistant: Atmospheric Physics Master's Course</b> <i>Marked homework assignments and provided weekly feedback on students' work.</i>	2020-2022
<b>Lecturer / Course Lead</b> <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>	2020-2023

## DIVERSITY & OUTREACH EFFORTS

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<b>Climate Up Close (<a href="https://climateupclose.org">climateupclose.org</a>)</b> 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.	2024 – present
<b>Harlem StreetSquash volunteer</b> 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.	2023 – 2024
<b>GFDL Diversity, Equity, Inclusion &amp; Accessibility Committee</b> 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.	2023 – 2025
<b>AOPP Equality, Diversity &amp; Inclusion Committee</b> 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.	2020 – 2023
<b>PhD mentoring scheme</b> 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.	2021 – 2023
<b>Oxford Sparks</b> Recorded an <a href="#">outreach video about clouds</a> which has reached over 150,000 people across social media.	2020 – 2021
<b>Seren Hub</b> Provided interview practice and entrance exam help for Welsh students from disadvantaged backgrounds who want to study Physics or Mathematics at university.	2016 – 2023

## ACADEMIC SERVICE

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**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*.

**Proposal Reviewer** for *NSF-AGS* and *Department of Energy*.

**Session Convener** 2025-present  
“Climate Sensitivity, Radiative Feedbacks and the Pattern Effect” at the EGU General Assembly Meeting

**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  
Climate Sensitivity & Cloud Feedback Virtual Symposium // [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.