# Travis Aerenson

Taerenson.github.io * 302-690-7030 * Taerenso@uwyo.edu

## Education

**University of Washington, Seattle, WA**
*Dec 2023*
*PhD, Atmospheric Sciences*
*Dissertation Title: Cloud Changes in Climate Models: Response to Solar and CO2 Forcing and the Relationship between Model Bias and Feedbacks*

**University of Washington, Seattle, WA**
*May 2021*
*Master of Science, Atmospheric Sciences*
*Thesis Title: When Will MISR Detect Rising High Clouds?*

**Colorado College, Colorado Springs, CO**
*May 2019*
*Bachelor of Arts, Physics*

## Research Experience

*Postdoctoral Scholar* **U Wyoming Department of Atmospheric Science, Laramie WY**
*Jan 2024-Present*

*Research Assistant,* **U Washington Department of Atmospheric Sciences, Seattle WA**
- Advised by Dr. Roger Marchand *Aug 2019-Dec 2023*

*Research Intern,* **National Center for Atmospheric Research, Boulder CO** *Jun -Aug 2018*

*Research Intern,* **National Center for Atmospheric Research, Boulder CO** *Jun -Aug 2017*

## Teaching Experience

*Guest Lecturer,* **University of Wyoming, Laramie WY** *Oct 2024*
- ATSC 2100: Global Warming: The Science of Humankind's Energy Consumption Impacting Climate

*Teaching Assistant,* **UW Department of Atmospheric Sciences, Seattle WA** *Mar 2021-Jun 2021*
- ATM S 100: Climate Justice & Energy Solutions

*Quantitative Reasoning Center Math and Physics tutor,* **Colorado College, Colorado Springs CO**
*Mar 2017-May 2019*

## Publications

In review:
**Aerenson, T**., McCoy, D., Elsaesser, G., Wu, J., Nugent, J., Brown, H., Zelinka, M., Burrows, S., Mikkelson, A.: Does it matter that we simulate clouds at the wrong time of day? *Science Advances*

**Aerenson, T**., McCoy, D., Elsaesser, G., Wu, J.: Drivers of Model Spread in Snowpack Changes Across the American Mountain West. *Journal of Climate*

Werapitiya, G., McCoy, D., Elsaesser, G., Wu, J., Gettelman, A., Eidhammer, T., **Aerenson, T.**, Song, C.: Climate Model Extratropical Cloud Feedback Constrained by Cloud Sources and Sinks in Cyclones. *Journal of Climate*

Nugent, J., Brown, H., Kirby, A., McCoy, D., Allen, G., **Aerenson, T.,** Burrows, S., Caulton, D., Fan, J., Feng, Y., Gettelman, A., Griswold, J., Leung, L., Muelmenstaedt, J., Mahfouz, N., Ovchinnikov, M,. Jones, D., Shan, Y., Song, X., Silber, I., Shpund, J., Qian, Y., Xie, S., Zelinka, M., Zhang, D., Zhang,

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G., Zhang, K.: Overview of the Nephele Perturbed Parameter Ensemble for aerosol-cloud interactions hosted in E3SMv3. *JAMES*

Published:

**Aerenson, T.,** & Marchand, R. (2025). How Do Differences in the Simulation of Present-Day Clouds Affect Cloud Feedbacks? *Journal of Geophysical Research: Atmospheres*, *130*(12), e2025JD044020. https://doi.org/10.1029/2025JD044020

**Aerenson, T.,** Marchand, R., & Zhou, C. (2024). Cloud Responses to Abrupt Solar and CO2 Forcing: 2. Adjustment to Forcing in Coupled Models. *Journal of Geophysical Research: Atmospheres*, *129*(12), e2023JD040297. https://doi.org/10.1029/2023JD040297

**Aerenson, T.,** & Marchand, R. (2024). Cloud Responses to Abrupt Solar and CO2 Forcing: 1. Temperature Mediated Cloud Feedbacks. *Journal of Geophysical Research: Atmospheres*, *129*(12), e2023JD040296. https://doi.org/10.1029/2023JD040296

Poletti, A. N., W Frierson, D. M., **Aerenson, T.,** Nikumbh, A., Carroll, R., Henshaw, W., & Scheff, J. (2024). Atmosphere and ocean energy transport in extreme warming scenarios. *PLOS Climate*, *3*(2), e0000343. https://doi.org/10.1371/JOURNAL.PCLM.0000343

**Aerenson, T.,** Marchand, R., Chepfer, H., Medeiros, B. (2022). When Will MISR Detect Rising High Clouds? *Journal of Geophysical Research: Atmospheres, 127(2)*, e2021JD035865. https://doi.org/10.1029/2021JD035865

**Aerenson, T.,** Tebaldi, C., Sanderson, B., Lamarque, J.F. (2018). Changes in a suite of indicators of extreme temperature and precipitation under 1.5 and 2 degrees warming. *Environmental Research Letters* https://doi.org/10.1088/1748-9326/aaafd6

## Grants and Proposals

Funding Agency: Department of Energy Established Program to Stimulate Competitive Research (DOE-EPSCoR)
Role: Co-I
Status: *Pending*
Title: Creating the framework for the next generation Energy Exascale Earth System Model (E3SM) at PROCEED (Perturbed physics ensemble Regression Optimization Center for ESM Evaluation and Development)
Amount Requested: $3,525,182

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Funding Agency: NASA Research Opportunities in Space and Earth Science (ROSES) (2024)
Role: PI
Status: *Declined*
Title: Snow Energetics and SWE in the SnowEx Campaigns and Models (SESSCaM)
Amount Requested: $730,813

## Scientific Presentations

Aerenson, T., R. Marchand, T. Ackerman 2024: “MISR Observed Trends in Cloud Top Height and Constraints on High Cloud Altitude Feedbacks” AGU Fall Meeting: Terra: 25 Years of the Earth Observing System Flagship Observatory, Washington, DC. *Poster*

Aerenson, T., D. McCoy, G. Elsaesser 2024: “Causes of Model Spread in Predictions of Hydroclimate in the Mountain West” AGU Fall Meeting: Hydroclimate and Extremes in the Western United States in a Changing Climate, Washington, DC. *Poster*

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Aerenson, T., D. McCoy 2024: "How Much Does the Cloud Diurnal Cycle Impact SWCRE?" Micro2Macro Origins of Climate Change Uncertainty Workshop, Laramie, WY. *Poster*

Aerenson, T., D. McCoy, G. Elsaesser 2024: "How Might we Improve Predictions of Regional Hydroclimate" Oxford Workshop on Model Uncertainty, Oxford, UK. *Oral*

Aerenson, T., D. McCoy, G. Elsaesser 2024: "Can We Do Better at Predicting Regional Hydroclimate" CESM Workshop, Boulder, CO. *Oral*

Aerenson, T. 2023: "The Relationship Between Simulated Present-Day Cloud Attributes and Cloud Feedbacks" University of Washington Department of Atmospheric Sciences Colloquium, Seattle, WA. *PhD Defense*

Aerenson, T., R. Marchand, C. Zhou 2023: "Cloud Adjustments to Solar and CO2 Forcing in Coupled Models" CFMIP Meeting, Paris, FR. *Poster*

Aerenson, T., R. Marchand 2023: "The Contribution of Mean-State Bias to Cloud Feedbacks in Climate Models" CFMIP Meeting, Paris, FR. *Poster*

Aerenson, T., R. Marchand 2023: "The Contribution of Mean-State Bias to Cloud Feedbacks in Climate Models" University of Wyoming Department of Atmospheric Science Seminar, Laramie, WY. *Invited Seminar*

Aerenson, T., R. Marchand 2023: "Using ISCCP and MISR Satellite Simulators to Understand Cloud Feedbacks" NASA GSFC CPC Seminar, Greenbelt, MD. *Virtual Invited Seminar*

Aerenson, T., R. Marchand, C. Zhou 2022: "Cloud Response to Abrupt Changes in Solar Forcing and $CO_2$ Concentrations" AGU Fall Meeting: Advances in Solar Radiation Modification Research, Chicago, IL. *Poster*

Aerenson, T., R. Marchand, C. Zhou 2022: "Cloud Response to Abrupt Changes in Solar Forcing and $CO_2$ Concentration" University of Washington Department of Atmospheric Sciences Seminar on Atmospheric Physics and Chemistry, Seattle, WA. *seminar*

Aerenson, T., R. Marchand 2022: "Cloud Response to Abrupt Changes in Solar Forcing and $CO_2$ Concentrations" CFMIP Meeting: Cloud Processes and Radiative Feedbacks, Seattle, WA. *Oral*

Aerenson, T. 2021: "Cloud Rapid Adjustments and Feedbacks to Abrupt Changes in Solar and $CO_2$ Induced Forcings" AGU Fall Meeting: Advances in Climate Engineering Research. *Virtual Poster*

Aerenson, T., R. Marchand 2021: "Cloud Rapid Adjustments and Feedbacks to Abrupt Changes in Solar and $CO_2$ Induced Forcing" CFMIP Meeting. *Virtual Poster*

Aerenson, T. 2021: "When Will MISR Detect Rising High Clouds?" University of Washington Department of Atmospheric Sciences Physics and Chemistry Seminar. *Virtual Seminar*

Aerenson, T., R. Marchand 2021: "Time of Emergence: When Will We See High Clouds Get Higher?" AMS Annual Meeting. *Remote oral presentation and discussion session*

Aerenson, T., R. Marchand, 2020: "Time of Emergence: When do Climate Models Predict Rising Cloud-Top-Height (CTH) Should be Detected by MISR?" CFMIP Meeting on Clouds, Precipitation, and Climate Sensitivity. *Remote submitted slide and discussion session*

Aerenson, T., R. Marchand, 2020: "When will we see high clouds get higher?" MISR Science Team Meeting, Pasadena, CA. *Oral*

Aerenson, T., 2019: "Climate Models and Climate Change Reversibility" Colorado College Physics Department Senior Seminar Series, Colorado Springs, CO. *seminar*

Aerenson, T., C. Tebaldi, B. Sanderson, J.F. Lamarque, 2017: "Climate Extremes in Low Warming Scenarios" NCAR CGD Integrated Assessment Modelling Weekly Meeting, Boulder, CO. *Oral*

## Service

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*Postdoc Representative,* **UWyo Department of Atmospheric Science, Laramie, WY.**
*Oct 2024 – Present*

*Peer-to-peer Mentoring Coordinator,* **UW Department of Atmospheric Sciences, Seattle WA.**
*Jul 2022 – Dec 2023*

*Diversity and Inclusion Group Coordinator,* **UW Department of Atmospheric Sciences, Seattle WA.**
*Jul 2021 – Mar 2023*

*Campus Sustainability Fund Intersectional Sustainability Board,* **University of Washington, Seattle WA.**
*Aug – Oct 2020*

**Refereed Manuscripts for the Following Journals:** *Journal of Geophysical Research: Atmospheres, JAMES, PLOS ONE, Atmospheric Chemistry and Physics (ACP), Earth and Space Science, Nature: Communications Earth and Environment, Earth and Space Science, Geophysical Research Letters (GRL), Nature Communications*

**Reviewed Proposals for the Following Programs:** *NASA Postdoctoral Program (NPP): Earth Science, NASA Postdoctoral Program (NPP): Technology Development*

## Scholarships and Awards

**Certificate of Distinguished Service** 2022: University of Washington Department of Atmospheric Sciences

**Top Scholar Award** 2019: University of Washington Department of Atmospheric Sciences