

# Dr. Hongwei Sun

## Contact Information

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Department of Atmospheric Sciences  
University of Hawaii at Manoa  
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## Education

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Harvard University, *Doctor of Philosophy (Environmental Science)*, 05/2023  
Tsinghua University, *Master of Science (Atmospheric Science)*, 06/2018  
Sun Yat-Sen University, *Bachelor of Science (Atmospheric Science)*, 06/2015

## Working Experiences

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Department of Atmospheric Sciences, University of Hawaii

- Starting in 08/2025: *Tenure-track assistant professor*
- 09/2024-07/2025: *Non-compensated faculty*

Department of Atmospheric and Climate Science, University of Washington

- 08/2023-08/2025: *Postdoc scholar*

Department of the Geophysical Sciences, University of Chicago

- 06/2023-08/2023: *Postdoc scholar*

## Research Interests

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Large-scale stratospheric dynamics and aerosols, stratospheric aerosol injection.  
Coupled multiscale plume-in-grid model development.  
Small-scale aerosol-cloud interactions, marine cloud brightening.  
Interactions between the environment and renewable energies.

## Publications

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- H Sun**, S Bourguet, L Luan, D Keith. 2024. *Stratospheric transport and tropospheric sink of solar geoengineering aerosol: a Lagrangian analysis*. npj Climate and Atmospheric Science.
- H Sun**, S Bourguet, S Eastham, D Keith. 2023. *Optimizing Injection Locations Relaxes Altitude-Lifetime Trade-Off for Stratospheric Aerosol Injection*. Geophysical Research Letters.
- H Sun**, S Eastham, D Keith. 2022. *Developing a Plume-in-Grid model for plume evolution in the stratosphere*. Journal of Advances in Modeling Earth Systems.
- J Huang, P Lou, **H Sun**, Y Luo, ZC Zhao. 2019. *Numerical experimental study on the potential climatic impacts of large-scale wind farms in China*. Advances in Climate Change Research.
- H Sun**, Y Luo, Z Zhao, R Chang. 2018. *The impacts of Chinese wind farms on climate*. Journal of Geophysical Research: Atmospheres.
- In Preparation:
- H Sun**, P Blossey, R Wood, E Erfani, S Doherty, J Chun. *The Response of Aerosol-Cloud Interactions to Global Warming Can Inhibit the Cooling Effects of Marine Cloud Brightening*. About to submit.
- H Sun** and S Eastham. *Implementing Size-resolved Stratospheric Sulfate Aerosol in the GEOS-Chem Model to Simulate Pinatubo Volcano Eruption*. In preparation.

Z Hu and H Sun. *Using Convolutional Neural Network to Detect Aircraft Contrails Based on Satellite Images*. In preparation.

## Conference Presentations

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2024. AGU Fall Conference. Washington DC, USA. “*A Lagrangian Analysis of Particle Transport in the Stratosphere: How QBO Modulates Stratosphere-to-Troposphere Flux (ST-Flux)?*”. Poster.
2024. Micro2Macro Workshop. Laramie (WY), USA. “*How Aerosol-Cloud Interactions Respond to Climate Change in Large Eddy Simulations*”. Poster.
2024. APARC Reanalysis Intercomparison (A-RIP) Workshop. Boulder, USA. “*Quantifying Stratospheric Particle Transport and Exploring Related Physical Drivers: A Lagrangian Analysis*”. Online oral.
2024. CFMIP conference. Boston, USA. “*Response of Aerosol-Cloud Interactions to Global Warming in Large Eddy Simulations*”. Poster.
2023. AGU Fall Conference. San Francisco, USA. “*Analyzing Zonal Asymmetry of Particle Transport in the Stratosphere: Is Injection Longitude Worth Considering for Stratospheric Aerosol Injection?*”. Oral.
2022. AGU Fall Conference. Chicago, USA. “*Exploring Injection Locations for Stratospheric Aerosol Geoengineering to Maximize Particle Lifetime in the Stratosphere*”. Poster.
2022. SPARC (Stratosphere-troposphere Processes And their Role in Climate) conference. Colorado, USA. “*Investigating Particle Transport in the Stratosphere Based on Stratospheric Aerosol Injection*”. Poster.
2022. 10th International GEOS-Chem Conference. Saint Louis, USA. “*Developing and Coupling a Lagrangian Plume Model into GEOS-Chem Model to Resolve Subgrid Plumes in the Stratosphere*”. Oral.
2022. Gordon Research Conference: Climate Engineering. Newry, USA. “*Developing a Plume-in-Grid Model to Simulate Plume Evolution for Stratospheric Aerosol Injection*”. Poster.
2019. AGU Fall Conference. San Francisco, USA. “*Long-term Behavior of Stratospheric Aerosol Plumes in a Solar Geoengineering Scenario*”. Oral.
2017. 4th International Conference Energy & Meteorology. Bari, Italy. “*Regional climate model suggests upstream wind farms have weak but significant impacts on wind speed in Beijing during winter*”. Poster.

## Invited Talks and Seminars

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2025. *Seminar in Atmospheric Physics and Chemistry*. University of Washington.
2025. [Seminar](#) at Department of Earth System Science. Tsinghua University.
2024. [Seminar](#) at Department of Earth and Environmental Sciences. Chinese University of Hong Kong.
2024. *Atmospheric Sciences Special Seminar*. University of Hawaii.
2023. *Seminar in Atmospheric & Climate Dynamics*. University of Washington.
2023. *Reviewer 2 does Geoengineering podcast*. Available on [Spotify](#) and [Apple](#) Podcasts.
2023. *Solar Climate Intervention Virtual Symposia*. Online ([Recording](#)).
2023. Atmospheric Science & Engineering Laboratory, Washington University in St. Louis.
2023. *TAB Talks* (Tsinghua Alumni in Boston Talks). Online ([Recoding](#) in Chinese).
2022. *Graduate Student & Postdoc Seminar*. Harvard University.

## Teaching and Mentoring Experiences

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2024. Guest Lecturer: *Exploring Atmospheric and Climate Science*, University of Washington.

2024. Mentor in the [CICOES undergraduate intern program](#) at University of Washington.

- Student: Liam Schiffer (Undergraduate from University of Wisconsin, Madison).
- [Project](#): Using Data-Driven Methods to Estimate Cloud Radiative Effects.

2023. Invited speaker for the Roundtable Discussion: *Teaching as an International Scholar* at Harvard Teaching Conference.

2022. *Certificate of Distinction in Teaching*, awarded by Harvard University.

2021. Teaching Fellowship: *Energy within Environmental Constraints*, Harvard University.

2020. Teaching Fellowship: *Introduction to Meteorology and Climate*, Harvard University.

2016. Teaching Fellowship: *Calculus I*, Tsinghua University.

## Professional Service

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**Peer reviewer for:** *Atmospheric Chemistry and Physics (ACP)*, *Earth's Future*, *Geophysical Research Letters (GRL)*, *Science Advances*, *Scientific Reports*.

**AGU session conveners** ([2024](#), [2025](#)):

- *Stratospheric Dynamics, Aerosol Processes, and the Interactions with the Troposphere*.
- *Boundary Layer Clouds and Climate Change*.

**2024.** Judge of the National Collegiate Research Conference (2024) at Harvard University.