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**EDUCATION**

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- **University of Colorado at Boulder** Boulder, CO  
*PhD in Atmospheric and Oceanic Sciences, expected Aug. 2025; GPA: 3.97* *Aug. 2020 – Present*
  - Advisor: Prof. Jen Kay
  - Thesis: *Narrowing the Model-Observation Gap: New Methods, Tools, and Datasets to Improve Climate Change Detection*
- **Carleton College** Northfield, MN  
*Bachelor of Arts in Physics; GPA: 3.94; Honors in Physics, Magna Cum Laude* *Sep. 2014 – June 2018*
  - Thesis: Radiative transfer in the earth-atmosphere-space system

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**RESEARCH EXPERIENCE**

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- **Electric Power Research Institute** Palo Alto, CA (remote)  
*Graduate Student Research Intern* *May - July 2024*
  - Evaluated the skill of deterministic and probabilistic weather forecast models (NOAA's HRRR and RRFS) for use in day-ahead solar forecasting and grid operations.
  - Communicated the benefits and limitations of operational weather models to power systems engineers.
- **University of Oslo, Section for Meteorology and Oceanography** Oslo, Norway  
*US Fulbright Student Scholar working with Prof. Trude Storelvmo* *Aug. 2019 - May 2020*
  - Operated the NorESM2 and CESM2 global climate models. Modified of the model's parametrization of ice nucleation in mixed-phase clouds and in-model satellite simulator (COSP).
  - Processed and synthesized model predictions with observational datasets from the CALIOP and CloudSat satellite missions.
- **National Institute of Standards and Technology** Boulder, CO  
*Post-Baccalaureate Researcher working with Prof. Scott Diddams* *July 2018 - July 2019*
  - Implemented a flexible and robust digital phase-lock loop to stabilize laser frequency combs.
  - Used free-space and fiber optics to produce and characterize femtosecond near-infrared pulses.
  - Wrote programs in Python and MATLAB to model pulse evolution in optical fiber.

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**PUBLICATIONS**

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- J.K. Shaw**, D.D. Turner, S. Desouza-Machado, L.L. Strow, and Kay, J.E., "The Optimal Spectral Infrared Fingerprint of Anthropogenic Climate Change," (in prep.).
- J.K. Shaw**, D.P. Larson, and D.D. Turner, "Evaluating NOAA's HRRR v4 and RRFS v1 models as forecasters of day-ahead solar irradiance: Skill, spread, and steps forward," (in prep.).
- A. Borowiak et al., (including **J.K. Shaw**), "Methods to Identify Time of Emergence," (in prep.).
- O Bruno, **J.K. Shaw**, T. Storelvmo, and C. Hoose, "Evaluation of global climate and storm-resolving models for the representation of mixed-phase clouds and their hemispheric contrasts," (submitted).
- J.K. Shaw**, D. Swales, S. Desouza-Machado, D.D. Turner, J.E. Kay, and D.P. Schneider, "COSP-RTTOV: Flexible radiation diagnostics to enable new science applications in satellite mission design, climate change detection, and model evaluation," (accepted at Geoscientific Model Development, <https://doi.org/10.5194/egusphere-2025-169>).
- J.K. Shaw** and N. Lenssen, "Early and Widespread Emergence of Regional Warming is Robust to Observational and Model Uncertainty," (2025) Environ. Res. Lett. <https://doi.org/10.1088/1748-9326/ade458>
- Hofer, S., Hahn, L.C., **Shaw, J.K.** et al. "Realistic Representation of Mixed-phase Clouds Increases Projected Climate Warming," (2024). Communications Earth & Environment, 5, 390. <https://doi.org/10.1038/s43247-024-01524-2>
- J.K. Shaw** and J.E. Kay, "Processes Controlling the Seasonally Varying Emergence of Forced Arctic Longwave Radiation Changes," (2023). J. Climate, 36, 7337–7354. <https://doi.org/10.1175/JCLI-D-23-0020.1>

- McGraw, Z., Storelvmo, T., Polvani, L. M., Hofer, S., **Shaw, J. K.**, Gettelman, A., “On the Links Between Ice Nucleation, Cloud Phase, and Climate Sensitivity in CESM2,” (2023). *Geophysical Research Letters*, 50, e2023GL105053.  
<https://doi.org/10.1029/2023GL105053>
- B. Medeiros, **J. Shaw**, J.E. Kay, and I. Davis, “Assessing Clouds Using Satellite Observations Through Three Generations of Global Atmosphere Models,” (2023). *Earth and Space Science*, 10, e2023EA002918.  
<https://doi.org/10.1029/2023EA002918>
- J. Zhu, B.L. Otto-Bliesner, E.C. Brady, A. Gettelman, J.T. Bacmeister, R.B. Neale, C.J. Poulsen, **J.K. Shaw**, Z.M. McGraw, J.E. Kay, “LGM paleoclimate constraints inform cloud parameterizations and equilibrium climate sensitivity in CESM2,” (2022). *Journal of Advances in Modeling Earth Systems*, 14, e2021MS002776.  
<https://doi.org/10.1029/2021MS002776>
- J. Shaw**, Z. McGraw, O. Bruno, T. Storelvmo, and S. Hofer, “Using satellite observations to evaluate model microphysical representation of Arctic mixed-phase clouds,” (2022). *Geophysical Research Letters*, 49, e2021GL096191.  
<https://doi.org/10.1029/2021GL096191>
- J.K. Shaw**, C. Fredrick, and S.A. Diddams, “Versatile digital approach to laser frequency comb stabilization,” *OSA Continuum* 2, 3262-3271 (2019). <https://doi.org/10.1364/OSAC.2.003262>

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## INVITED TALKS

2025 CESM Workshop, *Evaluating CESM Against Satellite Spectral Radiation Observations*

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## SELECTED POSTERS AND PRESENTATIONS

- 105th AMS Annual Meeting, *Evaluating NOAA’s HRRR v4 and RRFS v1 models as forecasters of day-ahead solar irradiance: Skill, spread, and steps forward* (presentation), *Atmospheric, Oceanic, and Cryospheric Sciences REU at the University of Colorado Boulder* (poster co-author)
- 2024 AGU Annual Meeting, *Apples-to-apples radiation comparisons speed the detection of Arctic climate change* (poster)
- 104th AMS Annual Meeting, *The Atmospheric, Oceanic, and Cryospheric Sciences REU at the University of Colorado Boulder* (poster co-author)
- 2023 AGU Fall Meeting, *New Spectral Radiation Diagnostics for Climate Change Detection, Model Evaluation, and Satellite Mission Design* (presentation), *Observational Uncertainty is Necessary for Assessing Time-of-Emergence* (presentation)
- 2023 Gordon Research Conference on Climate and Radiation, *Enhancing Climate Change Detection with Spectral Radiation* (poster)
- AMS Collective Madison Meeting 2022, *Emerging seasonal changes in Arctic Longwave Radiation* (presentation)
- International Radiation Symposium 2022, *Emerging seasonal changes in Arctic Longwave Radiation* (presentation)
- Graduate Climate Conference 2021, *Observations of Seasonal Changes in the Arctic Energy Budget* (poster)
- CESM 2021 Annual Workshop, *Evaluation of clouds in three generations of CAM using satellite simulators and observations* (poster)

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## HONORS AND AWARDS

- 2025 CESM Graduate Student Award
- 2025 University of Colorado Boulder Campus Sustainability Award for Student Leadership
- ATOC Student Service Award (Spring 2025)
- 3rd Place, CU Boulder ESSS Poster Conference
- ATOC Student Service Award (Spring 2024)
- Outstanding Student Presentation Award (OSPA), AGU 2023 Fall Meeting
- ATOC Student Service Award (Spring 2023)
- ATOC Student Teaching Award (Spring 2023)
- Future Investigators in NASA Earth and Space Science and Technology (FINESST) Grant recipient with Professor Jennifer Kay (2022).
- International Radiation Symposium Student Travel Award (2022)
- CIRES Graduate Student Travel Grant (2022)

ATOC Student Service Award (Spring 2022)

Honorable Mention, 2020 National Science Foundation (NSF) Graduate Research Fellowship Program (GRFP)

Fulbright Student Research Grant Recipient (2019-2020), Norway

Distinction in Senior Thesis, Carleton College

Campus Nominee, Barry Goldwater Scholarship 2017, Carleton College

Dean's List 2014, 2015, 2016 (Carleton College)

Carleton Distinguished Scholar

National Merit Scholar

## SERVICE

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*Peer Reviewer:* Atmospheric Chemistry and Physics, Earth System Science Data, Global Planetary Change, Journal of Climate, Journal of Geophysical Research: Atmospheres, Journal of Hydrometeorology

ATOC Justice, Equity, Diversity, and Inclusivity Committee, CU Boulder	August 2020 - Present
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ATOC Graduate Application Program Mentor, CU Boulder	August 2020 - Present
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ATOC REU Planning Committee, CU Boulder	January 2021 - April 2025
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ATOC First-Year Graduate Student Mentor, CU Boulder	August 2021 - August 2023
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ATOC REU Graduate Student Mentor, CU Boulder	Summers 2021, 2022, and 2023
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ATOC Curriculum Committee, CU Boulder	September 2022 - May 2023
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Student Departmental Advisor, Physics, Carleton College	Sep. 2017 - June 2018
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Physics Department Curriculum Committee, Carleton College	Sep. 2017 - June 2018
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