

ADAM M. SCHNEIDER, PhD

Professional Research Assistant, CU Boulder
Reanalysis and Reforecast Associate Scientist, CIRES
NOAA Physical Sciences Laboratory
325 Broadway
Boulder, CO 80305-3328
P 720 248 7291
Adam.Schneider@noaa.gov
US citizen

Education and Training

2006–2010: Bowling Green State University; Bowling Green, Ohio; United States
Bachelor of Science; Mathematics (May 8, 2010)

2011–2018: The University of Michigan; Ann Arbor, MI; United States
Master of Science; Atmospheric, Oceanic and Space Sciences (April 26, 2018)
Doctor of Philosophy; Atmospheric, Oceanic and Space Sciences (August 17, 2018)

2018–2021: University of California, Irvine; Irvine, California; United States
Postdoctoral Scholar; Earth System Science

Professional Experience

2012–2018: The University of Michigan; Ann Arbor, MI; United States
Graduate Research Assistant; Department of Atmospheric, Oceanic and Space Sciences

Principal Investigator(s): Mark G. Flanner

Linking cryospheric processes across scales to model non-linear albedo feedback

- Assessed multi-decadal surface albedo feedback in the Coupled Model Intercomparison Project multi-model ensemble
- Developed a parallelized Monte-Carlo photon tracking model to inform snow bidirectional reflectance measurements
- Designed the Near-Infrared Emitting and bidirectional-Monitoring Dome – a ground-based instrument that measures (1.3 μm) bidirectional reflectance – to study snow metamorphism

2018–2021: University of California, Irvine; Irvine, California; United States
Postdoctoral Scholar; Department of Earth System Science

Principal Investigator(s): Charles S. Zender; Stephen F. Price (Los Alamos National Lab)

Improving Ice Sheet Surface Mass Balance in the Energy Exascale Earth System Model (E3SM) Through Improvements to the Physical Snowpack Model

- Designed the firm layering implementation and density parameterization in version 2 of the United States Department of Energy's E3SM
- Conducted E3SM simulation ensembles at the National Energy Research Scientific Computing Center to condition firm and evaluate ice sheet climatic mass balance

2021–2022: University of California, Irvine; Irvine, California; United States
Associate Specialist; Department of Earth System Science

Principal Investigator(s): Charles S. Zender; Matthew J. Hoffman (Los Alamos National Lab)
Framework for Antarctic System Science in E3SM

- Evaluated Antarctic ice sheet melt rates in E3SM and regional climate model simulations to determine mission critical deficiencies relevant to firn processes
- Served as the snowpack and firn task leader

2022–present: University of Colorado Boulder (CU Boulder); Boulder, Colorado; United States
Professional Research Assistant and Reanalysis and Reforecast Associate Scientist;
Cooperative Institute for Research in Environmental Sciences (CIRES), affiliated with the
National Oceanic and Atmospheric Administration (NOAA) Physical Sciences Laboratory

Principal Investigator(s): Sergey Frolov (NOAA Physical Sciences Laboratory)
NOAA United Forecast System: Data Assimilation, Reanalysis and Reforecast

- Supported production of the Modeling and Data Assimilation Division's replay simulations
- Managed development of diagnostic tools for reanalysis and reforecast product evaluation
- Chaired search committees to hire reanalysis and data assimilation research scientists

Honors and Awards

2006–2007: *Academic Competitiveness Grant* (750 USD); Bowling Green, Ohio

2006–2007, 2009–2010: *Federal Pell Grants* (6,825 USD); Bowling Green, Ohio

2006–2010: *University Freshman Academic Scholarship* (8,000 USD); Bowling Green, Ohio

2009–2010: *Friends of the University Libraries Scholarship* (500 USD); Bowling Green, Ohio

2022: *2nd place, Business Pitch Competition*; Irvine, California

Leadership and Service

2013–2015: The University of Michigan; Ann Arbor, Michigan; United States
Grader; Instrumentation for Atmospheric and Space Sciences (AOSS 462)
Grader; Radiative Transfer (AOSS 532)

2020: Copernicus Publications; Göttingen, Germany
Referee; The Cryosphere

2021–2022: United Auto Workers, Local #5810; Irvine, California; United States
Campus Recording Secretary; Postdoc Unit
Head Steward; Academic Researcher Unit

2022: University of California, Irvine; Irvine, California; United States
Panelist; Climate Alliance Conference; Session 1: The Changing Climate System

2022: Elsevier; Amsterdam, Netherlands
Reviewer; Remote Sensing of Environment

2023: American Meteorological Society; Boston, Massachusetts; United States
Reviewer; Journal of Applied Meteorology and Climatology
Reviewer; Journal of Climate

2023: American Geophysical Union; Washington, D.C.; United States
Reviewer; Journal of Geophysical Research - Earth Surface

Professional Certifications

2019: *Safety Training Self-Assessment* (expires August 25, 2025)
University of California, Irvine; Irvine, California; United States

2022: *UC Ethics and Compliance Briefing for Researchers* (expires February 22, 2024)
University of California, Irvine; Irvine, California; United States

2022: *Industry Insights for STEM scientists: Business skills & Business Model Canvas*
University of California, Irvine; Irvine, California; United States

2023: *Records Management Training*
National Oceanic and Atmospheric Administration; United States Department of Commerce

Peer-Reviewed Publications

Schneider, A., Flanner, M., & Perket, J. (2018). Multidecadal variability in surface albedo feedback across CMIP5 models. *Geophysical Research Letters*, 45, 1972–1980. <https://doi.org/10.1002/2017GL076293>

Smith, B. E., Gardner, A., **Schneider, A.,** & Flanner, M. (2018). Modeling biases in laser-altimetry measurements caused by scattering of green light in snow. *Remote Sensing of Environment*, 215, 398–410. <https://doi.org/10.1016/j.rse.2018.06.012>

Schneider, A., Flanner, M., De Roo, R., & Adolph, A. (2019). Monitoring of snow surface near-infrared bidirectional reflectance factors with added light-absorbing particles. *The Cryosphere*, 13(6), 1753–1766. <https://doi.org/10.5194/tc-13-1753-2019>

Schneider, A. M., Zender, C. S., & Price, S. F. (2022). More realistic intermediate depth dry firn densification in the Energy Exascale Earth System Model (E3SM). *Journal of Advances in Modeling Earth Systems*, 14, e2021MS002542. <https://doi.org/10.1029/2021MS002542>

Fair, Z., Flanner, M., **Schneider, A.,** & Skiles, S. M. (2022). Sensitivity of modeled snow grain size retrievals to solar geometry, snow particle asphericity, and snowpack impurities, *The Cryosphere*, 16, 3801–3814. <https://doi.org/10.5194/tc-16-3801-2022>

Schneider, A., Zender, C., Loeb, N., & Price, S. (2023). Use of shallow ice core measurements to evaluate and constrain 1980–1990 global reanalyses of ice sheet precipitation rates. *Geophysical Research Letters*, 50, e2023GL103943. <https://doi.org/10.1029/2023GL103943>

Published Data Sets

Adam Schneider, Mark Flanner. (2018). *Supporting data for the Near-Infrared Emitting and Reflectance-Monitoring Dome*. [Data set], University of Michigan - Deep Blue Data. <https://doi.org/10.7302/Z23F4MVC>

Adam M. Schneider. (2020). *E3SM simulation results and associated python analysis scripts (1.0.0)*. [Data set]. Zenodo. <https://doi.org/10.5281/zenodo.5950802>

Adam Schneider (2023). *amschne/lnd_srf_for: First production ready release (v1.0.0)*. Zenodo. <https://doi.org/10.5281/zenodo.8008098>

Adam Schneider, Jordan Schneider, Zachary Fair, & Mark Flanner. (2023). *amschne/monte_carloMPI: Production ready release (python v3) (v1.0.0)*. Zenodo. <https://doi.org/10.5281/zenodo.8076315>

Symposia Presentations

Schneider, A. M., and Flanner, M. G. (2012). Evaluating temporal evolution of surface albedo feedback using the CESM1. *Abstract A21D-0081 presented at 2012 Fall Meeting, AGU, San Francisco, Calif., 3-7 Dec.*

Schneider, A. M., and Flanner, M. (2013). Assessing decadal-scale variability in surface albedo feedback across the CMIP5 simulations. *Abstract A21B-0028 presented at 2013 Fall Meeting, AGU, San Francisco, Calif., 9-13 Dec.*

Flanner, M., and **Schneider, A. M.** (2014). Multidecadal Variability in Surface Albedo Feedback. *Abstract A21H-3132 presented at 2014 Fall Meeting, AGU, San Francisco, Calif., 15-19 Dec.*

Schneider, A. M., and Flanner, M. (2014). Measuring Snow Grain Size with the Near-Infrared Emitting Reflectance Dome (NERD). *Abstract C51B-0270 presented at 2014 Fall Meeting, AGU, San Francisco, Calif., 15-19 Dec.*

Schneider, A. M., Flanner, M., Yang, P., Yi, B., Huang, X., and Feldman, D. (2015). Monte Carlo Photon Modeling to Explore the Dependence of Snow Bidirectional Reflectance on Grain Shape and Size. *Abstract C13C-0819 presented at 2015 Fall Meeting, AGU, San Francisco, Calif., 14-18 Dec.*

Schneider, A. M., Flanner, M., Yang, P., Yi, B., Huang, X., and Feldman, D. (2016). How Can Polarization States of Reflected Light from Snow Surfaces Inform Us on Surface Normals and Ultimately Snow Grain Size Measurements? *Abstract C33B-0790 presented at 2016 Fall Meeting, AGU, San Francisco, Calif., 11-15 Dec.*

Schneider, A. M., and Flanner, M. (2017). In Situ Observations of Snow Metamorphosis Acceleration Induced by Dust and Black Carbon. *Abstract C13B-0954 presented at 2017 Fall Meeting, AGU, New Orleans, Louis., 11-15 Dec.*

Kennedy, J. H., Evans, K. J., Hoffman, M. J., Price, S. F., and **Schneider, A. M.** (2019). Evaluating the surface mass balance from E3SM with LIVVkit 3.0. *Abstract C23B-1540 presented at 2019 Fall Meeting, AGU, San Francisco, Calif., 9-13 Dec.*

Price, S. F., Ng, E. G., Asay-Davis, X., Bassis, J. N., Bertagna, L., Book, C., Comeau, D. S., Dunlop, M., Evans, K. J., Hoffman, M. J., Jakeman, J., Kachuck, S. B., Kennedy, J. H., Martin, D. F., Perego, M., Petersen, M. R., Salinger, A., **Schneider, A. M.**, Stadler, G., ... Zhang, T. (2019). Probabilistic Sea Level Projections from Ice Sheet and Earth System Models (ProSPect). *Abstract C51C-1292 presented at 2019 Fall Meeting, AGU, San Francisco, Calif., 9-13 Dec.*

Schneider, A. M., Zender, C. S., and Price, S. F. (2019). Evaluation of E3SM snowpack and firn initialization and early 20th century simulations. *Abstract C51C-1321 presented at 2019 Fall Meeting, AGU, San Francisco, Calif., 9-13 Dec.*

Price, S. F. D., Hillebrand, T. R., Hoffman, M. J., Perego, M., **Schneider, A.**, Wang, W., Wolfe, J. D., & Zender, C. (2020). Towards a coupled Greenland ice sheet in E3SM, *presented at 2020 Earth System Model Development (ESMD) program area Principle Investigator (PI) and E3SM Annual All-Hands meeting, online, 26-29 Oct.*

Schneider, A., Zender, C., and Price, S. (2020). Improving snow compaction and firn densification on E3SM's ice sheets, *presented at 2020 Earth System Model Development (ESMD) program area Principle Investigator (PI) and E3SM Annual All-Hands meeting, online, 26-29 Oct.*

Whicker, C., Flanner, M., Dang, C., Cook, J. M., Williamson, C., **Schneider, A.**, and Zender, C. S. (2020). The Effects of Bubbles and Biotic Impurities on Snow and Ice Radiative Transfer Properties. *Abstract C011-0006 presented at 2020 Fall Meeting, AGU, online, 1-17 Dec.*

Schneider, A., Price, S., Wolfe, J., and Zender, C. (2021). Surface Mass Balance of the Greenland Ice Sheet in the Energy Exascale Earth System Model. *Abstract EGU21-14017 presented at 2021 EGU General Assembly, online, 19-30 Apr.*
<https://doi.org/10.5194/egusphere-egu21-14017>

Schneider, A., Zender, C., and Price, S. (2021). Precipitation Discrepancies over Ice Sheets in the WFDE5 and CRUNCEP Land Surface Forcing Datasets and their Impact on Firn Density in E3SM. *Abstract C45B-1006 presented at 2021 Fall Meeting, AGU, New Orleans, Louis. & online, 13-17 Dec.*

Fair, Z. Flanner, M., Neumann, T., Vuyovich, C., and **Schneider, A.** (2021). Quantifying volumetric scattering bias in ICESat-2 and Operation IceBridge altimetry over snow-covered surfaces. *Abstract C55A-0568 presented at 2021 Fall Meeting, AGU, New Orleans, Louis. & online, 13-17 Dec.*

Whicker C., Flanner, F., Dang, C., Zender, C., Cook, J., Gardner, A., and **Schneider, A.** (2021). SNICAR-ADv4: A Novel Physically Based Radiative Transfer Model for Glacier Snow, Firn, and Ice. *Abstract C55B-0595 presented at 2021 Fall Meeting, AGU, New Orleans, Louis. & online, 13-17 Dec.*

Schneider, A., Loeb, N., and Zender, C. (2022). Decadal Precipitation Rates from the 1980 to 1990 ECMWF Reanalysis v5 Verified over the Greenland and Antarctic Ice Sheets. *Abstract J5.5 presented at 2022 Collective Madison Meeting, Madison, Wisco. & online, 8-12 Aug.*

Technical Skills and Abilities

Programming: Python, statistical models, exploratory data analysis and visualization, parallel applications using Message Passing Interface implementations, and Git for software version control.

Other: Earth system model code development, simulations, diagnostic verification and analysis of coupled and stand-alone configurations; geospatial data analysis and cartography.

Professional Memberships

2012–present: American Geophysical Union; Washington, D.C., United States

2020–present: American Meteorological Society; Los Angeles, California; United States

2020–2022: United Auto Workers, Local #5810; Irvine, California; United States

2021: European Geosciences Union; Munich, Germany

2021: Society for Industrial and Applied Mathematics; Philadelphia, Pennsylvania; United States