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Research Interests

Climate sensitivity, cloud feedback, radiative forcing

Education

Ph.D., Atmospheric Sciences, University of Washington, Dec 2010

M.S., Atmospheric Sciences, University of Washington, Dec 2007

B.S., Meteorology, Pennsylvania State University, May 2004

Professional Experience

Research scientist, Lawrence Livermore National Laboratory, Apr 2013 - present.

Post-doctoral research scholar, Lawrence Livermore National Laboratory, Jan 2011 - Mar 2013.

Graduate research assistant, Dept. of Atmospheric Sciences, Univ. of Washington, Sep 2004 - Dec 2010.

Submitted Work

Qin, Y., P. -L. Ma, **M. D. Zelinka**, S. A. Klein, T. Zhang, X. Zheng, V. E. Larson, M. Huang, 2024: Impact of Turbulence on the Relationship between Cloud Feedback and Aerosol-Cloud Interaction in an E3SMv2 Perturbed Parameter Ensemble, *J. Adv. Model. Earth Syst.*, submitted.

Hill, P. G., D. L. Finney, and **M. D. Zelinka**, 2024: Cloud feedback uncertainty in the equatorial Pacific across CMIP6 models, *Geophys. Res. Lett.*, submitted.

Bonan, D. B., J. E. Kay, N. Feldl, and **M. D. Zelinka**, 2024: Mid-latitude clouds contribute to Arctic amplification via interactions with other climate feedbacks, *Environ. Res.: Climate*, submitted.

Mauritsen, T., et al. including **M. D. Zelinka**, 2024: Earth's energy accumulation rate more than doubled, and we must pay close attention, *Nature Clim. Change*, submitted.

Feng, C., X. Liu, X. Zhao, L. Lin, Z. Lu, **M. D. Zelinka**, Y. Qin, Y. Shan, Y. Zheng, R. Saravanan, 2024: Interconnection of Aerosol Cloud Interactions and Cloud Feedback through Warm Rain Process, *Geophys. Res. Lett.*, submitted.

Zhou, C., Q. Wang, I. Tan, L. Zhang, **M. D. Zelinka**, M. Wang, 2024: Sea ice pattern effect on Earth's energy budget is characterized by hemispheric asymmetry, *Sci. Adv.*, submitted.

Published Work

91. **Zelinka, M. D.**, L.-W. Chao, T. A. Myers, Y. Qin, and S. A. Klein, 2024: Technical Note: Recommendations for Diagnosing Cloud Feedbacks and Rapid Cloud Adjustments Using Cloud Radiative Kernels, *Atmos. Chem. Phys.*, in press.

90. Thackeray, C., **M. D. Zelinka**, J. Norris, A. Hall, S. Po-Chedley, 2024: Relationship between tropical cloud feedback and climatological bias in clouds, *Geophys. Res. Lett.*, in press.

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Book Chapters

McCoy, D. T., M. E. Frazer, J. Muelmenstaedt, I. Tan, C. R. Terai, and **M. D. Zelinka**, 2024: Extratropical Cloud Feedbacks, in *Clouds and their Climatic Impacts: Radiation, Circulation, and Precipitation*, S. C. Sullivan (Ed) and C. Hoose (Ed), American Geophysical Union.

Contributing author to Forster et al. 2021: The Earth's Energy Budget, Climate Feedbacks, and Climate Sensitivity, in *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change.* Masson-Delmotte et al. (eds.). Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 923-1054, doi:10.1017/9781009157896.009.

McCoy, D.T., D. L. Hartmann, and **M. D. Zelinka**, 2017: Mixed-Phase Cloud Feedbacks, in *Mixed-phase Clouds: Observations and Modeling*, Andronache, C. (Ed.), Elsevier.

Tan, I., T. Storelvmo, and **M. D. Zelinka**, 2017: The climatic impact of thermodynamic phase partitioning in mixed-phase clouds, in *Mixed-phase Clouds: Observations and Modeling*, Andronache, C. (Ed.), Elsevier.

Dessler, A.E. and **M. D. Zelinka**, 2015: Climate Feedbacks, in *Encyclopedia of Atmospheric Sciences, 2nd edition*, Vol 2, pp. 18-25, G. R. North (editor-in-chief), J. Pyle and F. Zhang (editors).

Recent Honors & Awards

Richard P. and Linda S. Turco Lectureship, Department of Climate, Meteorology, & Atmospheric Sciences, University of Illinois Urbana–Champaign, 2024-2025.

LLNL Physical and Life Sciences Directorate Award for Excellence in Publications [Lee et al. 2024]

Zelinka et al. (2020) named "Editor's Choice Paper" by Editor-in-Chief of *Geophysical Research Letters*

American Meteorological Society Henry G. Houghton Award, 2022

Eos Research Spotlight for Zelinka et al. (2022)

Editors' Citation for Excellence in Refereeing - *Geophysical Research Letters*, 2021

LLNL Deputy Director's Science & Technology Excellence in Publication Award [Zelinka et al. 2020]

Sherwood et al. (2020) named runner-up for *Science Magazine*'s 2020 Breakthrough of the Year

LLNL Deputy Director's Science & Technology Excellence in Publication Award [Sherwood et al. 2020]

Nature Climate Change Research Highlight for Dong et al. (2020)

LLNL Physical and Life Sciences Directorate Award for Excellence in Publications [Sherwood et al. 2020]

US CLIVAR Research Highlight for Zelinka et al. (2020)

Eos Research Spotlight for Zelinka et al. (2020)

Professional Activities, Service, & Leadership Roles

Steering Group, CMIP7 Data Request (Atmosphere Theme), Jul 2024–present

External Peer Reviewer, NASA Langley Research Center Science Directorate, Nov 2023

Programme Advisory Group, Uncertainty in Climate Sensitivity due to Clouds (CloudSense) Research Programme, Sep 2023–present

CFMIP Scientific Steering Committee, Jul 2023–present

Discussion Leader, 2023 Gordon Research Conference on Radiation & Climate

AGU Global Environmental Change Fellows Committee, 2022–2024

Contributing Author for IPCC 6th Assessment Report, 2019–2021

Convener, Extratropical Cloud Feedbacks Session, 2020 CFMIP Meeting

Discussion Leader, 2019 Gordon Research Conference on Radiation & Climate

LLNL Physical and Life Sciences Postdoc Committee, 2017–2020

Section Editor for *Current Climate Change Reports* Topical Collection on Climate Feedbacks, 2014–2017

Contributor to climatefeedback.org, 2017–present

Chair, 2011 Gordon Research Seminar on Radiation and Climate

Proposal reviewer for DOE, European Research Council, NASA, and NSF

Editor for *P. Natl. Acad. Sci.*

Reviewer for:
Atmosphere | *Atmos. Ocean* | *Atmos. Chem. Phys.* | *Atmos. Meas. Tech.* | *Atmos. Sci. Lett.*
B Am Meteorol Soc | *Clim. Dynam.* | *Climatic Change* | *Earth's Future* | *Earth System Dynamics*
Earth System Science Data | *Environ. Res. Lett.* | *Geophys. Res. Lett.* | *Geosci. Model Dev.*
J. Adv. Model. Earth Syst. | *J. Appl. Meteorol. Clim.* | *J. Atmos. Oceanic Technol.* | *J. Atmos. Sci.*
J. Climate | *J. Geophys. Res* | *J. Meteorol. Soc. Jpn.* | *Nature* | *Nat. Clim. Change* | *Nat. Commun.*
Nat. Geosci. | *npj Climate and Atmospheric Science* | *P. Natl. Acad. Sci.* | *Sci. Rep.* | *Surv. Geophys.*

Recent Invited Presentations

Univ. of Illinois Urbana–Champaign, Dept. of Climate, Meteorology, & Atmospheric Sciences, 22 Oct 2024

CERES Science Team Meeting, 2 Oct 2024

LLNL Senior Staff Meeting, 1 Jul 2024

NASA Ames Research Center, Earth Science Division, 20 Jun 2024

Yale University, School of the Environment, 25 Apr 2024

AGU Fall Meeting: The Flows of Energy Through the Climate System Session, 12 Dec 2023

AGU Fall Meeting: Climate Sensitivity and Feedbacks Session, 11 Dec 2023

University of Cambridge Centre for Atmospheric Science, Department of Chemistry, 24 Oct 2023

Yale University School of the Environment, 27 Apr 2023

AGU Fall Meeting: Atmospheric Physics, Radiation, Clouds, and Aerosols Session, 15 Dec 2022

"Moving the field forward" Panel, Pattern Effect Workshop, 12 May 2022

Yale University, School of the Environment, 21 Apr 2022

Aerosol and Cloud, Convection and Precipitation Webinar Series, 19 Apr 2021

University of Maryland Baltimore County Department of Physics Colloquium, 24 Feb 2021

University of Toronto Physics Colloquium, 28 Jan 2021

AGU Fall Meeting: CMIP6 Climate Model Evaluation Session, 8 Dec 2020

The National Academies of Sciences, Engineering, and Medicine Workshop "Data in Motion: New Approaches to Advancing Scientific, Engineering and Medical Progress", 14-15 October 2020

2020 Princeton AOS Summer Workshop, 17-21 Aug 2020

2020 CESM Workshop (Plenary talk), 15 June 2020

ECS & Cloud Feedback Symposia, 28 May 2020

Imperial College London, Atmospheric Physics Group Webinar, 12 May 2020

Global Model Cloud-Aerosol Research Webinar Series, 2 April 2020

Advisees

Post-Docs

Li-Wei Chao

Yi Qin (Post-doc, PNNL)

Timothy Myers (Research Scientist, NOAA/CIRES)

Chen Zhou (Associate Professor, Nanjing University)

Graduate Students

Zac Espinosa (University of Washington)

Undergraduate Students

Russell Hunter (Duke Univesity / Second Lieutenant, US Space Force)

Thea Moellerstedt (UC Berkeley)

Scott Feldman (Meteorologist, Verisk Weather Solutions)

Outreach Activities

LLNL Technical Lightning Talk: Community Cohorts program for new hires, 24 Aug 2023.

LLNL - Las Positas College Science and Engineering Seminar Series, 20 Apr 2023.

Science on Saturday, The Future in Focus: Predicting Climate Change through Observations, Modeling, and Artificial Intelligence, 4 Mar 2023.

Castro Valley Rotary Club, 13 Sep 2022.

Science on Saturday, The Future in Focus: Predicting Climate Change through Observations, Modeling, and Artificial Intelligence, 26 Feb 2022.

San Joaquin County Office of Education Climate Change Summit, 26 Sep 2020

Panel Discussant, Wild and Scenic Film Festival, Bankhead Theater, Livermore, CA, Jan 2020

Univ. of Washington Dept. of Atmospheric Sciences and Program on Climate Change Outreach Teams, Sep 2004 – Dec 2010

Last updated: November 22, 2024