

# Ben Kravitz

Assistant Professor  
Indiana University

Earth Scientist (by Joint Appointment)  
Pacific Northwest National Laboratory

## CONTACT INFORMATION

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## EDUCATION

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- 2011 **Ph.D., Atmospheric Science**, Rutgers University, New Brunswick, New Jersey  
Dissertation title: *Stratospheric Geoengineering with Black Carbon Aerosols*  
Advisor: Professor Alan Robock
- 2009 **M.S., Atmospheric Science**, Rutgers University, New Brunswick, New Jersey  
Advisors: Professor Alan Robock and Professor Georgiy Stenchikov
- 2007 **M.S., Mathematics**, Purdue University, West Lafayette, Indiana  
Advisors: Professor Shreeram Abhyankar and Professor Louis de Branges
- 2004 **B.A., Mathematics with departmental honors**, Northwestern University, Evanston, Illinois  
Departmental honors thesis title: *Investigation of the Euler Characteristic of Compact Orientable Surfaces*  
Advisor: Professor Paul Goerss

## POSITIONS HELD

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- 2020- **Adjunct Assistant Professor**, Department of Marine, Earth, and Atmospheric Sciences, North Carolina State University
- 2019- **Assistant Professor**, Department of Earth and Atmospheric Sciences, Indiana University
- 2019- **Earth Scientist (by Joint Appointment)**, Atmospheric Sciences and Global Change Division, Pacific Northwest National Laboratory

- 2016-2018 **Scientist III**, Atmospheric Sciences and Global Change Division, Pacific Northwest National Laboratory
- 2015 **Scientist II**, Atmospheric Sciences and Global Change Division, Pacific Northwest National Laboratory
- 2012-2015 **Postdoctoral Research Associate**, Atmospheric Sciences and Global Change Division, Pacific Northwest National Laboratory
- 2011-2012 **Postdoctoral Research Associate**, Department of Global Ecology, Carnegie Institution for Science
- 2008-2011 **Graduate Research Assistant**, Department of Environmental Sciences, Rutgers University
- 2009 **Part Time Lecturer**, Department of Environmental Sciences, Rutgers University
- 2008-2009 **Teaching Assistant**, Department of Environmental Sciences, Rutgers University
- 2007-2008 **Excellence Fellow**, School of Environmental and Biological Sciences, Rutgers University
- 2004-2007 **Teaching Assistant**, Department of Mathematics, Purdue University

**PEER REVIEWED PUBLICATIONS (132 total)**

**h-index = 48, 8021 citations (Google Scholar)**

**h-index = 38, 4732 citations (Web of Science)**

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1. Ma, W., H. Wang, G. Chen, L. Leung, J. Lu, P. J. Rasch, Q. Fu, **B. Kravitz**, Y. Zou, J. Cassano, and W. Maslowski (2024), Reconciling roles of natural variability and anthropogenic warming in driving observed Arctic atmospheric river trends, *Nature Communications*, accepted.
2. **Kravitz, B.** and A. C. Snyder, Pangeo-Enabled ESM Pattern Scaling (PEEPS): A customizable dataset of emulated Earth System Model output (2023), *PLoS Climate*, 2, e0000159, doi:10.1371/journal.pclm.0000159.
3. Goddard, P. B., **B. Kravitz**, D. G. MacMartin, D. Vioni, E. M. Bednarz, and W. R. Lee (2023), The impacts of stratospheric aerosol injection on Antarctic ice loss depend on injection location, *Journal of Geophysical Research*, 128, e2023JD039434, doi:10.1029/2023JD039434.
4. Bednarz, E. M., D. Vioni, A. H. Butler, **B. Kravitz**, D. G. MacMartin, and S. Tilmes (2023), Potential non-linearities in the high latitude circulation and ozone response to Stratospheric Aerosol Injection, *Geophysical Research Letters*, 50, doi:10.1029/2023GL104726.

5. Bednarz, E., A. H. Butler, D. Vioni, Y. Zhang, **B. Kravitz**, and D. G. MacMartin (2023), Injection strategy – a driver of atmospheric circulation and ozone response to stratospheric aerosol geoengineering, *Atmospheric Chemistry and Physics*, 23, 13665-13684, doi:10.5194/acp-23-13665-2023.
6. **Kravitz, B.** and T. Sikka (2023), Conducting more inclusive solar geoengineering research: A feminist science framework, *Environment and Planning E: Nature and Space*, 6, 1636-1660, doi:10.1177/25148486221132831.
7. MacMartin, D. G., **B. Kravitz**, and P. Goddard (2023), Transboundary effects from idealized regional geoengineering, *Environmental Research Communications*, 5, 091004, doi:10.1088/2515-7620/acf441.
8. Vioni, D., E. M. Bednarz, D. G. MacMartin, **B. Kravitz**, and P. B. Goddard (2023), The choice of baseline period influences the assessments of the outcomes of Stratospheric Aerosol Injection, *Earth's Future*, 11, doi:10.1029/2023EF003851.
9. Lee, W. R., D. Vioni, E. M. Bednarz, D. G. MacMartin, **B. Kravitz**, and S. Tilmes (2023), Quantifying the efficiency of stratospheric aerosol geoengineering at different altitudes, *Geophysical Research Letters*, 50, e2023GL104417, doi:10.1029/2023GL104417.
10. Vioni, D., **B. Kravitz**, A. Robock, S. Tilmes, J. Haywood, O. Boucher, M. Lawrence, P. Irvine, U. Niemeier, L. Xia, G. Chiodo, C. Lennard, S. Watanabe, J. C. Moore, and H. Muri (2023), Opinion: The Scientific and Community-Building Roles of the Geoengineering Model Intercomparison Project (GeoMIP) - Past, Present, and Future, *Atmospheric Chemistry and Physics*, 23, 5149-5176, doi:10.5194/acp-23-5149-2023.
11. Lauer, A., J. Devaney, C. Kieu, **B. Kravitz**, T. A. O'Brien, S. Robeson, P. W. Staten, and T. A. Vu (2023), A convection-permitting downscaled dataset over the Midwest, *Geoscience Data Journal*, 10, 429-446, doi:10.1002/gdj3.188.
12. Lee, W., D. MacMartin, D. Vioni, **B. Kravitz**, Y. Chen, J. Moore, G. Leguy, D. Lawrence, and D. Bailey (2023), High-latitude stratospheric aerosol injection to preserve the Arctic, *Earth's Future*, 11, e2022EF003052, doi:10.1029/2022EF003052.
13. Bednarz, E. W., D. Vioni, W. R. Lee, **B. Kravitz**, A. Jones, J. M. Haywood, J. Richter, D. G. MacMartin, and P. Braesicke (2023), Climate response to off-equatorial stratospheric sulfur injections in three Earth System Models – Part 2: Stratospheric and free-tropospheric response, *Atmospheric Chemistry and Physics*, 23, 687-709, doi:10.5194/acp-23-687-2023.
14. Vioni, D., E. W. Bednarz, W. R. Lee, **B. Kravitz**, A. Jones, J. M. Haywood, and D. G. MacMartin (2023), Climate response to off-equatorial stratospheric sulfur injections in three Earth System Models – Part 1: Experimental protocol and surface changes, *Atmospheric Chemistry and Physics*, 23, 663-685, doi:10.5194/acp-23-663-2023.

15. Obahoundje, S., A. Diedhou, V. H. Nguessan-Bi, **B. Kravitz**, and J. C. Moore (2023), Implication of stratospheric aerosol geoengineering on compound precipitation and temperature extremes in Africa, *Science of the Total Environment*, 160806, doi:10.1016/j.scitotenv.2022.160806.
16. Goddard, P., **B. Kravitz**, D. G. MacMartin, and H. Wang (2022), The Shortwave Radiative Flux Response to an Injection of Sea Salt Aerosols in the Gulf of Mexico, *Journal of Geophysical Research*, 127, doi:10.1029/2022JD037067.
17. Smith, W., U. Bhattarai, D. G. MacMartin, W. R. Lee, D. Vioni, and **B. Kravitz**, and C. Rice (2022), Subpolar-focused Stratospheric Aerosol Injection Deployment Scenario, *Environmental Research Communications*, 4, 095009, doi:10.1008/2515-7620/ac8cd3.
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19. MacMartin, D. G., D. Vioni, **B. Kravitz**, J. Richter, T. Felgenhauer, W. R. Lee, D. R. Morrow, E. Parson, and M. Sugiyama (2022), Scenarios for modeling solar radiation modification, *Proceedings of the National Academy of Sciences*, 119, e2202230119, doi:10.1073/pnas.2202230119.
20. Bednarz, E., D. Vioni, A. Banerjee, P. Braesicke, **B. Kravitz**, and D. MacMartin (2022), The overlooked role of the stratosphere under a solar constant reduction, *Geophysical Research Letters*, 49, e2022GL098773, doi:10.1029/2022GL098773.
21. Obahoundje, S., V. H. Nguessan Bi, A. Diedhiou, **B. Kravitz**, and J. C. Moore (2022), Influence of stratospheric aerosol geoengineering on temperature mean and precipitation extreme indices in Africa, *International Journal of Climate Change Strategies and Management*, 14, 399-423, doi:10.1108/IJCCSM-03-2021-0028.
22. Quaglia, I., D. Vioni, G. Pitari, and **B. Kravitz** (2022), A novel approach to sulfate geoengineering with surface emissions of carbonyl sulfide, *Atmospheric Chemistry and Physics*, 22, 5757-5773, doi:10.5194/acp-22-5757-2022.
23. Cheng, W., D. G. MacMartin, **B. Kravitz**, D. Vioni, E. Bednarz, Y. Xu, Y. Luo, L. Huang, Y. Hu, P. Staten, P. Hitchcock, J. C. Moore, A. Guo, and X. Deng (2022), Changes in Hadley circulation and intertropical convergence zone under strategic stratospheric aerosol geoengineering, *NPJ Climate and Atmospheric Science*, 5, 32, doi:10.1038/s41612-022-00254-6.
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25. Jones, A., J. M. Haywood, A. A. Scaife, O. Boucher, M. Henry, **B. Kravitz**, T. Lurton, P. Nabat, U. Niemeier, R. Seferian, S. Tilmes, and D. Vioni (2022), The impact of stratospheric aerosol intervention on the North Atlantic and Quasi-Biennial Oscillations in the Geoengineering Model Intercomparison Project (GeoMIP) G6sulfur experiment, *Atmospheric Chemistry and Physics*, 22, 2999-3016, doi:10.5194/acp-22-2999-2022.
26. Vioni, D., S. Tilmes, C. Bardeen, M. Mills, D. G. MacMartin, **B. Kravitz**, and J. H. Richter (2022), Limitations of assuming internal mixing between different aerosol species: a case study with sulfate geoengineering simulations, *Atmospheric Chemistry and Physics*, 22, 1739-1756, doi:10.5194/acp-22-1739-2022.
27. Zhang, Y., D. G. MacMartin, D. Vioni, and **B. Kravitz** (2022), How large is the design space for stratospheric aerosol geoengineering?, *Earth System Dynamics*, 13, 201-217, doi:10.5194/esd-13-201-2022.
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29. Tilmes, S., J. H. Richter, **B. Kravitz**, D. G. MacMartin, A. S. Glanville, D. Vioni, D. E. Kinnison, and R. Müller (2021), Sensitivity of total column ozone to stratospheric sulfur injection strategies, *Geophysical Research Letters*, 48, e2021GL094058, doi:10.1029/2021GL094058.
30. Silva, F. N., D. A. Vega-Oliveros, X. Yan, A. Flammini, F. Menczer, F. Radicchi, **B. Kravitz**, and S. Fortunato (2021), Detecting climate teleconnections with Granger causality, *Geophysical Research Letters*, 48, e2021GL094707, doi:10.1029/2021GL094707.
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32. Vioni, D., D. G. MacMartin, **B. Kravitz**, O. Boucher, A. Jones, T. Lurton, M. Martine, M. J. Mills, P. Nabat, U. Niemeier, R. Séférian, and S. Tilmes (2021), Identifying the sources of uncertainty in climate model simulations of solar radiation modification with the G6sulfur and G6solar Geoengineering Model Intercomparison Project (GeoMIP) simulations, *Atmospheric Chemistry and Physics*, 21, 10039-10063, doi:10.5194/acp-21-10039-2021.
33. Aksamit, N. O., **B. Kravitz**, D. MacMartin, and G. Haller (2021), Harnessing stratospheric diffusion barriers for enhanced climate geoengineering, *Atmospheric Chemistry and Physics*, 21, 8845-8861, doi:10.5194/acp-21-8845-2021.
34. Bhowmick, M., S. Mishra, **B. Kravitz**, S. Sahany, and P. Salunke (2021), Response of the Indian summer monsoon to global warming, solar geoengineering, and its termination, *Scientific Reports*, 11, 9791, doi:10.1038/s41598-021-89249-6.

35. Lee, W., D. G. MacMartin, D. Vioni, and **B. Kravitz** (2021), High-latitude stratospheric aerosol geoengineering can be more effective if injection is limited to spring, *Geophysical Research Letters*, 48, e2021GL092696, doi:10.1029/2021GL092696.
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37. Vioni, D., D. G. MacMartin, and **B. Kravitz** (2021), Is turning down the sun a good proxy for stratospheric sulfate geoengineering?, *Journal of Geophysical Research*, 126, e2020JD033952, doi:10.1029/2020JD033952.
38. Jones, A., J. M. Haywood, A. C. Jones, S. Tilmes, **B. Kravitz**, and A. Robock (2021), North Atlantic Oscillation response in GeoMIP experiments G6solar and G6sulfur. Why detailed modeling is needed for understanding regional implications of solar radiation management, *Atmospheric Chemistry and Physics*, 21, 1287-1304, doi:10.5194/acp-21-1287-2021.
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41. Vioni, D., D. G. MacMartin, **B. Kravitz**, W. Lee, I. R. Simpson, and J. H. Richter (2020), Reduced poleward transport due to stratospheric heating under geoengineering, *Geophysical Research Letters*, 47, e2020GL089470, doi:10.1029/2020GL089470.
42. Yang, C.-E., F. M. Hoffman, D. M. Ricciuto, S. Tilmes, L. Xia, D. G. MacMartin, J. H. Richter, M. Mills, **B. Kravitz**, and J. S. Fu (2020), Assessing terrestrial biogeochemical feedbacks in a strategically geoengineered climate, *Environmental Research Letters*, 15, 104043, doi:10.1088/1748-9326/abac7.
43. Vioni, D., D. G. MacMartin, **B. Kravitz**, J. H. Richter, S. Tilmes, and M. J. Mills (2020), Seasonally modulated stratospheric aerosol geoengineering alters the climate outcomes, *Geophysical Research Letters*, 47, e2020GL088337, doi:10.1029/2020GL088337.
44. Tilmes, S., D. G. MacMartin, J. T. M. Lenaerts, L. van Kampenhout, L. Muntjewerf, L. Xia, C. S. Harrison, K. Krumhardt, M. J. Mills, **B. Kravitz**, and A. Robock (2020), Reaching 1.5 and 2.0°C global surface temperatures targets using stratospheric

- aerosol geoengineering in CMIP6, *Earth System Dynamics*, 11, 579-601, doi:10.5194/esd-11-579-2020.
45. Gertler, C. G., P. A. O'Gorman, **B. Kravitz**, J. C. Moore, S. J. Phipps, and S. Watanabe (2020), Weakening of the extratropical storm tracks in idealized solar geoengineering scenarios, *Geophysical Research Letters*, 47, e2020GL087348, doi:10.1029/2020GL087348.
  46. Buck, H. J., L. J. Martin, O. Geden, P. Kareiva, L. Koslov, W. Krantz, **B. Kravitz**, J. Noël, E. A. Parson, C. Preston, D. L. Sanchez, L. Scarlett, and S. Talati (2020), Evaluating the efficacy and equity of environmental "stopgap measures", *Nature Sustainability*, 3, 499-504, doi:10.1038/s41893-020-0497-6.
  47. Weber, T., A. Corotan, B. Hutchinson, **B. Kravitz**, and R. P. Link (2020), Technical Note: Deep Learning for Creating Surrogate Models of Precipitation in Earth System Models, *Atmospheric Chemistry and Physics*, 20, 2303-2317, doi:10.5194/acp-20-2303-2020.
  48. **Kravitz, B.** and D. G. MacMartin (2020), Uncertainty and the basis for confidence in solar geoengineering research, *Nature Reviews Earth and Environment*, 1, 64-75, doi:10.1038/s43017-019-0004-7.
  49. Jiang, J., L. Cao, D. G. MacMartin, I. R. Simpson, **B. Kravitz**, W. Cheng, D. Visoni, S. Tilmes, J. H. Richter, and M. J. Mills (2019), Stratospheric Sulfate Aerosol Geoengineering Could Alter the High Latitude Seasonal Cycle, *Geophysical Research Letters*, 46, 14153-14163, doi:10.1029/2019GL085758.
  50. Cheng, W., D. G. MacMartin, K. Dagon, **B. Kravitz**, S. Tilmes, J. H. Richter, M. J. Mills, and I. Simpson (2019), Soil moisture and other hydrological changes in a stratospheric aerosol geoengineering large ensemble, *Journal of Geophysical Research*, 124, 12773-12793, doi:10.1029/2018JD030237.
  51. Simpson, I., S. Tilmes, J. Richter, **B. Kravitz**, D. MacMartin, M. Mills, J. Fasullo, and A. Pendergrass (2019), The regional hydroclimate response to stratospheric sulfate geoengineering and the role of stratospheric heating, *Journal of Geophysical Research*, 124, 12587-12616, doi:10.1029/2019JD031093.
  52. Snyder, A., R. P. Link, K. Dorheim, **B. Kravitz**, B. Bond-Lamberty, and C. Hartin (2019), Coherent joint emulation of Earth System Model temperature-precipitation realizations: fldgen v2.0, *PLoS ONE*, 14, e0223542, doi:10.1371/journal.pone.0223542.
  53. MacMartin, D.G., P. J. Irvine, **B. Kravitz**, and J. B. Horton (2019), Technical characteristics of solar geoengineering deployment will shape governance needs, *Climate Policy*, 19, 1325-1339, doi:10.1080/14693062.2019.1668347.
  54. Hecht, M., M. Veneziani, W. Weijer, **B. Kravitz**, S. Burrows, E. Hunke, N. Jeffery, J. Urrego-Blanco, H. Wang, S. Wang, J. Zhang, D. Bailey, C. Mills, P. J. Rasch, and N. Urban (2019), E3SMv0-HiLAT: A modified climate system model targeted for the

- study of high latitude processes, *Journal of Advances in Modeling Earth Systems*, 11, 2814-2843, doi:10.1029/2018MS001524.
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56. **Kravitz, B.**, D. G. MacMartin, S. Tilmes, J. H. Richter, M. J. Mills, W. Cheng, K. Dagon, A. S. Glanville, J.-F. Lamarque, I. Simpson, J. Tribbia, and F. Vitt (2019), Comparing surface and stratospheric impacts of geoengineering with different SO<sub>2</sub> injection strategies, *Journal of Geophysical Research*, 124, 7900-7918, doi:10.1029/2019JD030329.
57. Link, R., C. Lynch, A. Snyder, C. Hartin, **B. Kravitz**, and B. Bond-Lamberty (2019), Computationally efficient emulators for Earth System Models, *Geoscientific Model Development*, 12, 1477-1489, doi:10.5194/gmd-12-1477-2019.
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62. Fletcher, C. G., **B. Kravitz**, and B. Badawy (2018), Quantifying uncertainty from aerosol and atmospheric parameters and their impact on climate sensitivity, *Atmospheric Chemistry and Physics*, 18, 17529-17543, doi:10.5194/acp-18-17529-2018.
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26. Robock, A. and **B. Kravitz** (2013), Use of models, analogs, and field-tests for geoengineering research, *Geoengineering Our Climate? Ethics, Politics, and Governance, The Earthscan Science in Society Series*, Routledge, 272 pages. Also available through *Working Paper Series on Ethics, Politics, and Governance*, available online at <http://wp.me/p2zsRk-99>. (Invited opinion article)
27. **Kravitz, B.**, A. Robock, and P. J. Irvine (2013), Robust results from climate model simulations of geoengineering: GeoMIP 2013; Potsdam, Germany, 15-16 April 2013, *Eos Transactions of the American Geophysical Union*, 94, 292, doi:10.1002/2013EO330005.
28. **Kravitz, B.** (2013), Stratospheric aerosols for solar radiation management, in *Encyclopedia of Sustainability Science and Technology*, Springer, 21-38, doi:10.1007/978-1-4614-5770-1\_3.
29. **Kravitz, B.** (2013), Climate engineering with stratospheric aerosols and associated engineering parameters, *Frontiers of Engineering: Reports on Leading-Edge Engineering from the 2012 Symposium*, National Academy of Engineering, Washington: National Academies Press.
30. **Kravitz, B.**, A. Robock, and J. M. Haywood (2012), Progress in climate model simulations of geoengineering: Second GeoMIP Stratospheric Aerosol Geoengineering Workshop, *Eos Transactions of the American Geophysical Union*, 93(35), 340, doi:10.1029/2012EO350009.
31. **Kravitz, B.**, A. Robock, and J. M. Haywood (2012), Summary of the Second GeoMIP Stratospheric Aerosol Geoengineering Workshop, *SPARC Newsletter*, No. 39, July 2012, available online at <http://www.sparc-climate.org/publications/newsletter/>.
32. Robock, A., **B. Kravitz**, and O. Boucher (2011), Standardizing experiments in geoengineering: GeoMIP stratospheric aerosol geoengineering workshop, *Eos Transactions of the American Geophysical Union*, 92(23), 197-198, doi:10.1029/2011EO230008.
33. **Kravitz, B.**, A. Robock, O. Boucher, H. Schmidt, and K. E. Taylor (2011), Specifications for GeoMIP experiments G1 through G4, available online at [http://climate.envsci.rutgers.edu/GeoMIP/docs/specificationsG1\\_G4\\_v1.0.pdf](http://climate.envsci.rutgers.edu/GeoMIP/docs/specificationsG1_G4_v1.0.pdf).

## **SUBMITTED MANUSCRIPTS**

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1. Jiang, J., L. Cao, Y. Xia, **B. Kravitz**, D. G. MacMartin, J. Fu, and G. Jiang, Different strategies of stratospheric aerosol injection would significantly affect climate extreme mitigation, *One Earth*.

2. Vioni, D., A. Robock, J. Haywood, M. Henry, S. Tilmes, D. G. MacMartin, **B. Kravitz**, S. Doherty, J. Moore, C. Lennard, S. Watanabe, H. Muri, U. Niemeier, O. Boucher, A. Syed, and T. S. Egbebiyi, G6-1.5K-SAI: a new Geoengineering Model Intercomparison Project (GeoMIP) experiment integrating recent advances in solar radiation modification studies, *Geoscientific Model Development*.
3. Zhang, Y., D. G. MacMartin, D. Vioni, E. Bednarz, and **B. Kravitz**, Introducing a comprehensive set of stratospheric aerosol injection strategies, *Earth System Dynamics*.
4. Yoder, L., A. Cain, A. Rao, N. Geiger, **B. Kravitz**, M. Mercer, D. Miniard, S. Nepal, T. Nunn, M. Sluder, G. Weiler, and S. Z. Attari, India and U.S. climate expert assessments for mitigation and adaptation: Identifying solutions and barriers across contexts, *Climatic Change*.
5. Vioni, D., D. G. MacMartin, and **B. Kravitz**, Sunlight Reflection Methods research for the next decade, *AGU Advances*.
6. Ryan, J. M., **B. Kravitz**, T. A. O'Brien, S. M. Robeson, and P. W. Staten, Composite analysis and clustering of patterns prior to extreme wintertime cold in the Midwest United States, *Monthly Weather Review*.
7. Cash, R., B. Gazley, D. Noonan, and **B. Kravitz**, Are Disaster Response Charities Planning for Climate Change?, *Public Administration Review*.
8. Quaglia, I., D. Vioni, E. M. Bednarz, D. G. MacMartin, and **B. Kravitz**, The potential of stratospheric aerosol injection to reduce the climatic risks of an explosive volcanic eruption, *Geophysical Research Letters*.
9. Bassetti, S., B. Hutchinson, C. Tebaldi, and **B. Kravitz**, DiffESM: Conditional emulation of temperature and precipitation in Earth System Models with 3D diffusion models, *Journal of Advances in Modeling Earth Systems*.

### **TEACHING (instructor of record unless otherwise noted)**

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Mathematical Modeling for the Geosciences (graduate level, team taught), 2021, 2023.

Professional Development for the Geosciences (graduate level, team taught), 2021 (two semesters), 2022, 2023.

Our Planet and Its Future (introductory undergraduate level), Indiana University, 2020.

Climate Change Science (undergraduate level, intensive writing course), Indiana University, 2020, 2022, 2023.

Graduate Seminar in Machine Learning for the Geosciences (co-instructor), Indiana University, 2019.

Climate Modeling (graduate level), Indiana University, 2019.

Climate Dynamics (graduate level), Indiana University, 2019, 2021, 2023.

Atmospheric Chemistry (graduate level - grader/evaluator), Rutgers University, 2011.

Physical Climatology (graduate level - guest instructor), Rutgers University, 2010.

Remote Sensing of the Atmosphere and Ocean (undergraduate/graduate), Rutgers University, 2009.

Introduction to Meteorological Analysis (undergraduate level - guest instructor and grader), Rutgers University, 2009.

Energy and Climate (undergraduate level - grader), Rutgers University, 2008.

Calculus I (undergraduate), Purdue University, 2005-2007 (4 semesters).

Calculus I (undergraduate - discussion section leader), Purdue University, 2004-2005 (2 semesters).

## **STUDENTS, MENTORING, AND OUTREACH**

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### Direct Advisees

- Paul Goddard (Postdoctoral Research Associate, 2020-2023)
- Abraham Lauer (M.S., Indiana University, 2019-2021)
- Tony Li (Ph.D., Indiana University, 2023-)
- Jovanka Nikolic (Postdoctoral Research Associate, 2020-2023)
- Trung Nguyen (Ph.D., Indiana University, 2021-)
- James Ryan (Ph.D., Indiana University, 2021-)
- Hrishikesh Sivanandan (Ph.D., Indiana University, 2022-)

### Thesis Committees

- Connor Broaddus (M.S., Indiana University)
- Etienne Chenevert (M.S., Indiana University)
- Corey Gabriel (Ph.D., Rutgers University)
- James H. Gearon (Ph.D., Indiana University)
- Joseph Hildebranski (M.S., Indiana University)
- Dan Li (Ph.D., Indiana University)
- Shay Liu (Ph.D., Indiana University)
- Lan Luan (Ph.D., Indiana University)
- Ryan O'Loughlin (Ph.D., Indiana University)

- Kwesi Quagraine (M.S., Indiana University)
- Juan Carlos Reyes Vallejo (Ph.D., Centro de Investigación Científica y de Educación Superior de Ensenada, Baja California)
- Sam Smith (Ph.D., Indiana University)
- Bethany Sutherland (Ph.D., North Carolina State University)
- Jack Virgin (Ph.D., University of Waterloo)
- Daniele Visoni (Ph.D., University of L'Aquila)
- The-Anh Vu (Ph.D., Indiana University)
- Yan Zhang (Ph.D., Cornell University)

Student research mentor

- Isabelle Amacker, Indiana University (Sustainability Fellow)
- Gail Bradbury, Rutgers University
- Lorna Burnell, University of Nottingham
- Blaz Gasparini, ETH Zurich
- Joseph Hildebranski, Indiana University
- Angelica Lopez, Indiana University (Louis Stokes Alliance for Minority Participation (LSAMP) Fellow)
- Raul Moreno, Indiana University
- Jacqueline Patterson, Indiana University
- Rick Russotto, University of Washington
- Nathan Serota, Princeton University
- Hansi Singh, University of Washington
- Bethany Sutherland, Pacific Northwest National Laboratory
- Soha Vora, Indiana University

Expert reviewer for Indiana Science Standards, Indiana Department of Education, 2022.

IU Bloomington Campus Writing Program Faculty Liaison (2020-2021).

## **HONORS AND AWARDS**

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IOP Trusted Reviewer, Institute of Physics, 2023.

- UCAR Outstanding Accomplishment Award in Publication, University Corporation for Atmospheric Research, 2022.
- Dr. James E. Mumford Excellence in Extraordinary Teaching Award, Indiana University, 2021.
- Indiana University Trustees Teaching Award, 2021.
- Outstanding Reviewer Award, *Environmental Research Letters*, 2018.
- Recognition for being one of the most active editors in *Earth System Dynamics* for 2016, 2017, 2018, 2019, and 2022.
- Recognition for service to the community, Earth and Biological Sciences Directorate, Pacific Northwest National Laboratory, 2017.
- Outstanding Performance Award in recognition of "willingness to provide advice and mentorship to LTE and ASF staff", Pacific Northwest National Laboratory, 2017.
- Ronald L. Brodzinski Award for Early Career Exceptional Achievement, Pacific Northwest National Laboratory, 2017.
- Outstanding Performance Award in recognition for "outstanding efforts for a sponsor workshop", Pacific Northwest National Laboratory, 2017.
- National Security Directorate Carabiner Award (FY17 Q2), 2017.
- Editors' Citation for Excellence in Refereeing for *Earth's Future*, 2016 and 2017.
- CGD Special Recognition Award, National Center for Atmospheric Research, 2016.
- Outstanding Contribution to the AGU Fall Meeting Program Committee of the Global Environmental Change Focus Group, 2016.
- Bringing Excellence to Science and Technology, Earth and Biological Sciences Directorate, Pacific Northwest National Laboratory, 2015.
- Top Reviewer in American Geophysical Union Journals, 2015.
- International Union of Geodesy and Geophysics Early Career Scientist Award, 2015.
- Top Author in American Geophysical Union Journals, 2014.
- Outstanding Performance Award in recognition of "Significant Contributions and Exceptional Efforts to the Success of the Atmospheric Sciences and Global Change Division", Pacific Northwest National Laboratory, 2014.
- "Climate model response from the Geoengineering Model Intercomparison Project (GeoMIP)" was featured in *Nature* as a research highlight (doi:10.1038/501009a)
- Graduate research assistantship, NSF grant under principal investigator Professor Alan Robock to study geoengineering, Rutgers University, 2008-2011.

Winner, student poster session for FORMOSAT-3/COSMIC Annual Science Meeting (3rd place overall). NSPO, Taipei, Taiwan, 2008.

Excellence Fellowship for Doctoral Study in Atmospheric Science, School of Environmental and Biological Sciences, Rutgers University, 2007-2008.

Nomination, Graduate School Excellence in Teaching Award, Department of Mathematics, Purdue University, 2007.

2007 Purdue University Graduate Student Award for Outstanding Teaching, Committee for the Education of Teaching Assistants, Purdue University Teaching Academy, Purdue University.

Outstanding Graduate Instructor, Department of Mathematics, Purdue University, 2007.

2006-2007 Excellence in Teaching Award, Department of Mathematics, Purdue University.

Teaching assistantship, Department of Mathematics, Purdue University, 2004-2007 including summers.

Departmental honors in mathematics, Northwestern University.

National Merit Scholarship, Northwestern University.

## **INVITED PRESENTATIONS**

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5 December 2023. AeroCenter discussion on climate engineering (invited panel). NASA, Greenbelt, MD.

8 November 2023. Dynamical downscaling of stratospheric aerosol injection. NOAA Earth Radiation Budget PI Meeting, Boulder, CO.

2 August 2023. Focused scenarios: Stratospheric aerosol injection (invited panel), Growing Convergence Research Project: Generating Actionable Research to Investigate Combined Climate Intervention Strategies for Stakeholder Use, National Center for Atmospheric Research, Boulder, CO.

3 July 2023. A history of GeoMIP, University of Exeter, Exeter, UK.

20 June 2023. The importance of integration in Sunlight Reduction Methods research, U.S. National Academy of Sciences, Washington, D.C.

17 May 2023. Climate model simulations of geoengineering, National Renewable Energy Laboratory, Golden, CO.

15 April 2023. Strategies for tutoring science writing, IU Writing Tutorial Services Spring Retreat, Bloomington, IN.

- 5 April 2023. Geoengineering Europe Roundtable, Centre for Sustainability, Innovation, and Good Governance (CSIGG), virtual.
- 2 July 2022. Mission-driven research for geoengineering. 2022 Climate Engineering Gordon Research Conference, Newry, Maine.
- 28 April 2022. Some novel approaches to reduced-order climate modeling. Data-Driven Discovery Seminar Series, Pacific Northwest National Laboratory, Richland, WA.
- 11 March 2022. Uncertainties in stratospheric sulfate aerosol geoengineering. Indiana University Environmental Resilience Institute, Bloomington, IN.
- 22 November 2021. Applications of GISS ModelE. NASA Goddard Institute for Space Studies, New York, NY.
- 6 October 2021. A stratospheric aerosol geoengineering deployment mission and program. Climate Engineering Conference 2021, Berlin, Germany.
- 22 April 2021. Uncertainties in stratospheric sulfate aerosol geoengineering. Climate and Carbon Cycling Series, Yale University, New Haven, CT.
- 12 March 2021. Uncertainties in stratospheric sulfate aerosol geoengineering. Department of Geography, Texas A&M University, College Station, TX.
- 1 December 2020. Mission-driven research for solar geoengineering. DECIMALS monthly meeting, World Academy of Sciences, Trieste, Italy.
- 16 November 2020. System identification and teleconnections. CATALYST meeting, National Center for Atmospheric Research, Boulder, CO.
- 13 November 2020. Writing assignments as alternatives to traditional exams. Indiana University Center for Innovative Teaching and Learning, Indiana University, Bloomington, IN.
- 24 August 2020. Facilitating Online Courses (invited panel). Indiana University Center for Innovative Teaching and Learning, Indiana University, Bloomington, IN.
- 12 March 2020. Uncertainty and the basis for confidence in solar geoengineering research. Climate Change Technologies: Ethical, Social and Political Perspectives, University of California San Diego, San Diego, CA.
- 7 November 2019. Geoengineering: Knowledge, Uncertainty, and Risk. Environmental Science Seminar, O'Neill School of Public and Environmental Affairs, Indiana University, Bloomington, IN.
- 13 August 2019. Emulators in solar geoengineering. Summer school on geoengineering, Beijing, China.



- 30 April 2019. Community efforts in solar geoengineering. US National Academy of Sciences, Washington, DC.
- 8 November 2018. Solar geoengineering to buy time for carbon removal and mitigation. Workshop on environmental stopgaps, University of California Los Angeles, Los Angeles, CA.
- 13 June 2018. Overview of the Geoengineering Model Intercomparison Project (GeoMIP). Workshop on Arctic modeling, University of Washington, Seattle, WA.
- 1 March 2018. Geoengineering: Why research modifying the climate? PNNL Science and Technology Symposium Featuring Science and Engineering Achievement Award Recipients, Pacific Northwest National Laboratory, Richland, WA.
- 10 January 2018. Geoengineering as a design problem. Department of Earth and Atmospheric Sciences, Indiana University, Bloomington, IN.
- 5 December 2017. Compound events and long causal chains. Climate change implications for national security. US National Academy of Sciences, Washington, DC.
- 12 October 2017. The uses of Earth System Models in understanding solar geoengineering. Climate Engineering Conference 2017, Berlin, Germany.
- 9 October 2017. A review of the major activities in solar geoengineering. Climate Engineering Conference 2017, Berlin, Germany.
- 8 October 2017. An overview of the physical science of solar geoengineering. Solar Radiation Management Governance Initiative forum, Climate Engineering Conference 2017, Berlin, Germany.
- 23 July 2017. Geoengineering as a design problem. 2017 Climate Engineering Gordon Research Conference, Newry, Maine.
- 29 June 2017. Is stationarity really dead? Non-stationary weather patterns and extreme events: Informing design/planning applications for long-lived assets, Joint Global Change Research Institute, College Park, Maryland.
- 18 May 2017. What I talk about when I talk about geoengineering. Graduate Program in Atmospheric Science 10th Anniversary Symposium, Rutgers University, New Brunswick, New Jersey.
- 13 February 2017. Putting the "Engineering" in Climate Engineering. Emerging Frontiers in Research and Innovation, National Science Foundation.
- 11 January 2017. Putting the "Engineering" in Climate Engineering. Emerging Frontiers in Research and Innovation, National Science Foundation.

- 18 October 2016. Mapping the interdisciplinary landscape of climate engineering (Panel discussion). Climate engineering and the Arctic: Integrating public engagement and climate science, Cornell University, Ithaca, New York.
- 17 October 2016. Geoengineering as a design problem. Climate engineering and the Arctic: Integrating public engagement and climate science, Cornell University, Ithaca, New York.
- 22 June 2016. An overview of the Geoengineering Model Intercomparison Project (GeoMIP). ISI-MIP Second Workshop, Potsdam, Germany. (Poster)
- 28 January 2016. What we know about geoengineering from climate models (and what we don't). National Center for Atmospheric Research, Boulder, Colorado.
- 20 October 2015. The Geoengineering Model Intercomparison Project Phase 6 (GeoMIP6): Simulation Design and Preliminary Results. EMBRACE-CMIP Analysis and Modelling Workshop, Dubrovnik, Croatia.
- 2 July 2015. Progress in the Geoengineering Model Intercomparison Project (GeoMIP). 26th International Union of Geodesy and Geophysics General Assembly, Prague, Czech Republic.
- 27 June 2015. Human influences on climate: Representing climate-society feedbacks in climate models. U11 Early Career Scientist Symposium, 26th International Union of Geodesy and Geophysics General Assembly, Prague, Czech Republic.
- 12 March 2015. SRM impacts on the hydrological cycle. SRM Science Conference, Cambridge, United Kingdom.
- 25 February 2015. What we know about geoengineering (and what we don't). NASA Goddard Space Flight Center, Greenbelt, Maryland.
- 18 February 2015. An energetics perspective on hydrological cycle changes due to geoengineering. Binghamton University, Vestal, New York.
- 13 February 2015. An energetics perspective on hydrological cycle changes due to geoengineering. University of Washington, Seattle, Washington.
- 10 December 2014. One postdoc's perspective on being successful at PNNL. Advanced Study and Development group, Atmospheric Sciences and Global Change Division, Pacific Northwest National Laboratory.
- 9 December 2014. The GeoMIP perspective on interactions with ESGF. ESGF and UV-CDAT Conference, Lawrence Livermore National Laboratory, Livermore, California.
- 21 November 2014. An energetic perspective on hydrological cycle changes due to geoengineering. Lawrence Livermore National Laboratory, Livermore, California.

- 15 October 2014. The role of climate models in studying Solar Radiation Management. Environmental Affairs Symposium, Lewis & Clark College, Portland, Oregon.
- 20 August 2014. Feedback, uncertainty, and the role of climate models in Solar Radiation Management. Climate Engineering Conference 2014, Berlin, Germany.
- 6 March 2014. A new method of comparing climate forcing agents. University of Illinois Urbana-Champaign, Urbana, Illinois.
- 13 January 2014. A new method of comparing climate forcing agents. University of Colorado, Boulder, Colorado.
- 19 April 2013. Climate model results from the Geoengineering Model Intercomparison Project (GeoMIP). UK Met Office, Exeter, United Kingdom.
- 16 April 2013. Mind the Gap - Climate Engineering between Models and Reality (Panel discussion). Institute for Advanced Sustainability Studies, Potsdam, Germany.
- 21 March 2013. Climate model results from the Geoengineering Model Intercomparison Project (GeoMIP). Climate 2013: The next-generation of climate models and knowledge discoveries through the extreme high-performance simulations and big data, Lawrence Berkeley National Laboratory, Berkeley, California.
- 13 September 2012. Climate engineering with stratospheric aerosols and associated engineering parameters. 2012 National Academy of Engineering Frontiers of Engineering Meeting, Warren, Michigan.
- 14 May 2012. GeoMIP – Current Status. IMPLICC final symposium, Max Planck Institute for Chemistry, Mainz, Germany.
- 27 April 2012. Geoengineering: Can we do it? Should we do it? (Panel discussion) MIT Sustainability Summit 2012, Massachusetts Institute of Technology, Cambridge, Massachusetts.
- 26 April 2012. Geoengineering: Whiter skies? Department of Earth, Atmospheric, and Planetary Sciences, Massachusetts Institute of Technology, Cambridge, Massachusetts.
- 3 April 2012. Stratospheric geoengineering with black carbon aerosols. Department of Chemical Engineering, Oxford University, Oxford, United Kingdom.
- 19 January 2012. Research developments in Solar Radiation Management. Geoengineering Our Climate: Science, Ethics, and Governance, Ottawa, Ontario.
- 1 September 2011. Stratospheric geoengineering with black carbon aerosols. Interdisciplinary Centre on Climate Change, Waterloo, Ontario.
- 7 December 2010. Stratospheric geoengineering with black carbon aerosols. Pacific Northwest National Laboratory, Richland, Washington.

- 17 November 2010. Geoengineering and the climate effects of volcanic eruptions. Graduate seminar course, Department of Environmental Sciences, Rutgers University, New Brunswick, New Jersey.
- 16 April 2010. Stratospheric geoengineering with sulfate aerosols. Center for Energy and Environmental Policy Lunchtime Seminar, Massachusetts Institute of Technology, Cambridge, Massachusetts.
- 19 December 2008. Climate effects of the 2008 Okmok and Kasatochi eruptions. The 2008 eruptions of Okmok and Kasatochi volcanoes, Alaska, American Geophysical Union 2008 fall meeting, San Francisco, California.

### FUNDING (Principal Investigator or Named Co-Investigator only)

Status	Title and Agency	PI(s) and amount
2023– 2024	Applying a High-Resolution, Turbulence-Resolving Virtual Land-Sea Interface Flow Laboratory to Canonical U.S. Atlantic Coast Situations (National Renewable Energy Laboratory)	<b>Ben Kravitz:</b> \$91,496
2018– 2024	A Methodological Study of Big Data and Atmospheric Science (National Science Foundation)	Elisabeth Lloyd and <b>Ben Kravitz:</b> \$500,738
2023– 2025	High-Latitude Application and Testing of Earth System Models (HiLAT) Science Focus Area (SFA) Phase III (Department of Energy)	Wilbert Weijer (LANL): \$11,100,000 (\$212,390 to IU)
2022	Climate Resilience and Managing Water Resources (National Science Foundation)	<b>Ben Kravitz:</b> \$94,090
2022– 2025	Dynamical Downscaling to Quantify Extreme Events Under Stratospheric Sulfate Aerosol Injection (National Oceanographic and Atmospheric Administration)	<b>Ben Kravitz</b> and James Hurrell (CSU): \$539,661 (\$472,924 to IU)
2022– 2025	Assessing and comparing impacts of solar climate intervention in CESM2 ensembles utilizing strategically located marine cloud brightening and stratospheric aerosol injection (National Oceanographic and Atmospheric Administration)	C.-C. Jack Chen (NCAR): \$749,790 (\$18,072 to IU)

Status	Title and Agency	PI(s) and amount
2021– 2022	Climate Change Vulnerability and Resilience of the Nonprofit Social Safety Net (IU Lilly Family School of Philanthropy Research Fund)	Beth Gazley (IU): \$12,000
2021– 2022	Educating for Environmental Change (Brabson Library and Educational Foundation)	J. Adam Scribner (IU): \$30,000
2021– 2023	Fundamental limits and trade-offs of stratospheric aerosol geoengineering (National Science Foundation)	Douglas G. MacMartin (Cornell): \$398,143 (\$28,433 to IU)
2021– 2023	Geoengineering Assessment spanning Uncertainty, Strategies, and Scenarios (GAUSS)	Douglas G. MacMartin (Cornell): \$1,600,000 (\$128,156 to IU)
2020– 2022	Mesoscale-Microscale Coupling for Wind Energy (National Renewable Energy Laboratory)	<b>Ben Kravitz:</b> \$199,726
2019– 2021	Dynamical Downscaling for Indiana in the 21st Century (Indiana University Prepared for Environmental Change Grand Challenge)	<b>Ben Kravitz:</b> \$94,433
2019– 2022	Marine Sky Brightening: Prospects and Consequences (National Science Foundation)	<b>Ben Kravitz:</b> \$299,994
2018	Emulating climate models using deep learning (Laboratory Directed Research and Development, Pacific Northwest National Laboratory)	<b>Ben Kravitz:</b> \$20,000
2018	Producing coherent and unbiased joint temperature-precipitation realizations from Earth System Models (Laboratory Directed Research and Development, Pacific Northwest National Laboratory)	Abigail Snyder (PNNL): \$19,461

Status	Title and Agency	PI(s) and amount
2017	Revealing dynamic spatial patterns in earth science data using deep learning (Laboratory Directed Research and Development, Pacific Northwest National Laboratory)	Xingyuan Chen (PNNL): \$50,000
2017	Development of PNNL capability to apply the Nalu computational fluid dynamics code to simulate inflow conditions for real-world wind farms (Laboratory Directed Research and Development, Pacific Northwest National Laboratory)	Larry Berg (PNNL): \$44,000
2017	Metrics and diagnostics to quantify high latitude climate change (Laboratory Directed Research and Development, Pacific Northwest National Laboratory)	Susannah M. Burrows (PNNL) and <b>Ben Kravitz</b> : \$30,000
2017	Exploring the space of achievable climate objectives through climate engineering (U.S. Department of Defense)	<b>Ben Kravitz</b> and Douglas G. MacMartin (Caltech): \$60,000
2015 – 2016	A rigorous evaluation of the potentials and the limitations of climate perturbations using systems engineering approaches (U.S. Department of Defense)	<b>Ben Kravitz</b> and Douglas G. MacMartin (Caltech): \$196,000
2015	Using multiple-degree-of-freedom feedback to auto-tune climate models (Laboratory Directed Research and Development, Pacific Northwest National Laboratory)	<b>Ben Kravitz</b> : \$65,000
2015	A rigorous evaluation of the potentials and the limitations of climate perturbations using systems engineering approaches (U.S. Department of Defense)	<b>Ben Kravitz</b> and Douglas G. MacMartin (Caltech): \$300,000
2015	Junior faculty workshop on Geoengineering Earth's Climate (National Center for Atmospheric Research)	Simone Tilmes (NCAR), Alan Robock (Rutgers), <b>Ben Kravitz</b> , and Andrew Conley (NCAR): \$40,000

Status	Title and Agency	PI(s) and amount
2013	Chemical sensing of climate change induced stress at the ecosystem level (Signature Discoveries Initiative, Pacific Northwest National Laboratory)	<b>Ben Kravitz:</b> \$10,000
2007 – 2008	Excellence Fellowship for Doctoral Study in Atmospheric Science (School of Environmental and Biological Sciences, Rutgers University)	<b>Ben Kravitz:</b> \$25,000

## INTELLECTUAL PROPERTY

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Convection-permitting downscaling of climate change 1950-2100 (A. J. Lauer and **B. Kravitz**), <https://scholarworks.iu.edu/dspace/handle/2022/27098> (GNU Public License).

Explicit feedback for climate modeling (**B. Kravitz**), [https://github.com/bkravitz/feedback\\_suite](https://github.com/bkravitz/feedback_suite) (GNU Public License).

fldgen v1.0 (R. Link, A. Snyder, and **B. Kravitz**), <https://github.com/JGCRI/fldgen>, IP ID No. 31464-E (Pacific Northwest National Laboratory).

Climate Island (C. Tynes, N. Cramer, A. Wright-Mockler, and **B. Kravitz**), IP ID No. 31710-E (Pacific Northwest National Laboratory).

E3SMv0-HiLAT, <https://github.com/lanl/E3SMv0-HiLAT>, IP ID No. 31881-E (Pacific Northwest National Laboratory).

## SERVICE AND SYNERGISTIC ACTIVITIES

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**Editor**, *Earth System Dynamics*.

**Peer reviewer**, *Advances in Atmospheric Science*, *Advances in Space Research*, *The Anthropocene Review*, *Artificial Intelligence for the Earth System*, *Atmospheric Chemistry and Physics*, *Atmospheric Research*, *Atmospheric Science Letters*, *The Bridge*, *Bulletin of the American Meteorological Society*, *Challenges*, *Climate Action*, *Climate Dynamics*, *Climate Policy*, *Climatic Change*, *Complexity*, *Critical Reviews in Environmental Science and Technology*, *Earth and Planetary Science Letters*, *Earth System Dynamics*, *Earth's Future*, *Economics Research International*, *Environmental Health Perspectives*, *Environmental Modeling and Software*, *Environmental Research: Climate*, *Environmental Research Letters*, *Environmental Science: Atmospheres*, *Eos Transactions of the American Geophysical Union*, *Frontiers in Climate*, *Frontiers in Earth Science*, *Geophysical Research Letters*, *Geosciences*, *Geoscientific Model Development*, *Global and Planetary Change*, *International Journal of*

*Climatology, Journal of Advances in Modeling Earth Systems (JAMES), Journal of Atmospheric and Oceanic Technology, Journal of Climate, Journal of Geophysical Research-Atmospheres, Marine Environmental Research, Meteorologische Zeitschrift, Mitigation, Mitigation and Adaptation Strategies for Global Change, Nature, Nature Climate Change, Nature Communications, Nature Food, Nature Scientific Reports, NPJ Climate and Atmospheric Science, Philosophical Transactions of the Royal Society A, Philosophy and Technology, PLoS One, Proceedings of the National Academy of Sciences, Proceedings of the Royal Society A, Physica Scripta, Science Advances, Science of the Total Environment, Sustainability, Water Research.*

**Proposal reviewer**, *Belgian Vrije University, ETH Zurich, European Research Council, German Research Foundation, National Science Center Poland, U.K. National Environment Research Council, U.S. National Oceanic and Atmospheric Administration, U.S. National Science Foundation, South African National Research Foundation, Swiss National Science Foundation, The World Academy of Sciences, WWTF Vienna.*

**Member**, *American Geophysical Union, European Geophysical Union.*

**Contributing Author**, Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report, Working Group I, Chapter 4: Future global climate: scenario-based projections and near-term information.

**Contributing Author**, Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report, Working Group I, Chapter 7: Clouds and Aerosols.

**Chair and Steering Committee Member**, Geoengineering Model Intercomparison Project (GeoMIP), <http://climate.envsci.rutgers.edu/GeoMIP/>, 2010-2020.

**Steering Committee Member**, Indiana University Environmental Resilience Institute (2020-2023).

**Bloomington Faculty Council**, 2020-2024. (2020-2022: Student Affairs Committee, 2022-2024: Research Affairs Committee [Co-Chair], Executive Committee)

**University Faculty Council**, 2023-2024. (Research Affairs Committee [Co-Chair])

**CITL Faculty Advisory Board**, 2022-2023.

**Contributing Author**, AGU Ethical Framework for Climate Engineering, 2023-2024.

**Working Group Member**, Indiana University Environmental Resilience Institute Social and Environmental Justice Action Plan, 2020.

**Faculty Liaison**, IU Bloomington Campus Writing Program, 2020-2021.

**Application Expert**, Supercomputing 2020 Student Cluster Competition and IndySCC 2023.



**Division Portfolio Lead**, Atmospheric Sciences and Global Change Division, Pacific Northwest National Laboratory, 2016-2018.

**Scientist and Engineer Development Program**, Pacific Northwest National Laboratory, 2017-2018.

**Reviewer**, AGU/NASA Data Visualization and Storytelling Competition, 2016-2023.

**Reviewer**, Scientific Assessment of Ozone Depletion: 2022.

**Organizing Team Member**, Remote Sensing trial event at the National Science Olympiad competition, 2017.

**International Steering Committee Member**, Carbon Dioxide Removal Model Intercomparison Project (CDRMIP).

**Committee Member**, Fall Program Committee for Global Environmental Change, American Geophysical Union Fall Meeting, 2015-2023.

**Committee Member**, American Geophysical Union position statement on geoengineering, 2017.

**Coordinator**, Science Social, Atmospheric Sciences and Global Change Division, Pacific Northwest National Laboratory, 2015-2017.

**Coordinator**, Young Scientists Paper Discussion group, Pacific Northwest National Laboratory, 2014.

### **Departmental Committees**

- Policy Committee, Department of Earth and Atmospheric Sciences, Indiana University, 2019-2021.
- Graduate Studies Committee, Department of Earth and Atmospheric Sciences, Indiana University, 2019-2023.
- Department strategy drafting team, Department of Earth and Atmospheric Sciences, Indiana University, 2019.
- 100-level course task force, Department of Earth and Atmospheric Sciences, Indiana University, 2018-2019.
- Climate modeling faculty search, Department of Earth and Atmospheric Sciences, Indiana University, 2018-2019.
- Seminar committee, Department of Global Ecology, Carnegie Institution for Science, 2011-2012 academic year.

### **Scientific Organizer/Steering Committee Member**

- Thirteenth GeoMIP workshop, University of Exeter, 3 – 7 July 2023.

- Climate Resilience and Water Resources, funded by NSF, 13-21 October 2022.
- "Can we use climate networks to prevent the next big heat wave?" Indiana University Networks Institute, 1 April 2022.
- Climate Engineering Conference 2021 (CEC21), Virtual, March 2021.
- Tenth GeoMIP workshop (virtual), 29 June – 10 July 2020.
- Ninth GeoMIP workshop, Beijing Normal University, 15-16 August 2019.
- Eighth GeoMIP Workshop, ETH Zurich, 16-17 April 2018.
- Seventh GeoMIP Workshop, Newry, Maine, 23 July 2017.
- Climate Engineering Conference 2017 (CEC17), Berlin, 9-12 October 2017.
- Sixth GeoMIP Workshop, University of Oslo, 21-22 June 2016.
- Fifth GeoMIP Workshop and associated Early Career Summer Workshop on Geoengineering, National Center for Atmospheric Research, Boulder, Colorado, 20-24 July 2015.
- Climate Impacts of SRM geoengineering, Institute for Advanced Sustainability Studies, Potsdam, Germany, 9-10 March 2015.
- Climate Engineering Conference 2014 (CEC14), <http://ce-conference.org/>.
- Fourth GeoMIP Workshop, Laboratoire de Météorologie Dynamique, Paris, France, 25-26 April 2014.
- GeoMIP 2013, Institute for Advanced Sustainability Studies, Potsdam, Germany, 15-16 April 2013.
- Second GeoMIP Stratospheric Aerosol Geoengineering Workshop, UK Met Office, Exeter, United Kingdom, 30-31 March 2012.
- GeoMIP Stratospheric Aerosol Geoengineering Workshop, Rutgers University, New Brunswick, New Jersey, 10-12 February 2011.

#### **Conference Session Convener**

- GC100: Advances in Climate Engineering Research, American Geophysical Union Fall Meeting 2023, San Francisco, California.
- GC005: Advances in Climate Engineering Research, American Geophysical Union Fall Meeting 2021, New Orleans, Louisiana.
- Natural Science Advances in SRM, CEC21: Climate Engineering Conference, Online.

- Aerosol and climate geoengineering, 13th Symposium on Aerosol-Cloud-Climate Interactions, 101st Annual Meeting of the American Meteorological Society, 10-14 January 2021, New Orleans, Louisiana.
- Solar Geoengineering Benefits and Risks: Modeling, Impacts, Analogs, Engineering, Ethics, and Governance. Simone Tilmes, Daniele Visoni, Ben Kravitz, and Alan Robock. American Geophysical Union Fall Meeting 2019, San Francisco, California.
- Being Cognizant of the Framing of Solar Geoengineering in Scenario Design. Ben Kravitz, Peter J. Irvine, and Masa Sugiyama. Scenarios Forum 2019, Denver, Colorado.
- Geoengineering and the Arctic. Ben Kravitz and Douglas G. MacMartin, conveners. Climate Engineering Conference 2017, Berlin, Germany.
- Putting the "Engineering" in Climate Engineering. Ben Kravitz and Douglas G. MacMartin, conveners. Climate Engineering Conference 2017, Berlin, Germany.
- The Geoengineering Model Intercomparison Project: Where have we been and where should we go? Ben Kravitz and Alan Robock, conveners. Climate Engineering Conference 2017, Berlin, Germany.
- Multi-disciplinary assessments of radiation management. Ben Kravitz, Alan Robock, Trude Storelvmo, and Simone Tilmes, conveners. American Geophysical Union 2016 Fall Meeting, San Francisco, California.
- Geoengineering. Alan Robock, Ben Kravitz, and Ulrike Niemeier, conveners. 9 July 2015. Our Common Future Under Climate Change, Paris, France.
- The Potential for Carbon- and Climate-Engineering to Offset Global Change (Sessions U7 and JP2), IUGG General Assembly 2015, <http://www.iugg2015prague.com/>.
- Strategies for cooling Earth: Solar geoengineering and carbon dioxide removal. Piers Forster, Jennifer Wilcox, Hauke Schmidt, Ben Kravitz, Marica McNutt, and Edward Dunlea, conveners. Session GC038, American Geophysical Union 2014 Fall Meeting, San Francisco, California.
- GC053: Climate modeling simulations to test geoengineering. Alan Robock, Ben Kravitz, William Harbert, and Lianjie Huang, conveners. American Geophysical Union 2012 Fall Meeting, San Francisco, California.

#### **Edited Volumes and Special Issues of Journals**

- "Development Implications of Geoengineering" special issue of *World Development*.

- "The Earth system at global warming of 1.5°C and 2.0°C" special issue of *Earth System Dynamics*.
- "The model intercomparison project on the climatic response to volcanic forcing (VolMIP)" special issue of *Earth System Dynamics*.
- "Simulations of stratospheric sulfate aerosol geoengineering with the Whole Atmosphere Community Climate Model (WACCM)" special issue of *Journal of Geophysical Research—Atmospheres*. (Proposer)
- "The Geoengineering Model Intercomparison Project (GeoMIP): Simulations of solar radiation reduction methods" joint special issue of *Atmospheric Chemistry and Physics* and *Geoscientific Model Development*. (Proposer and Guest Editor)
- "The Geoengineering Model Intercomparison Project (GeoMIP)" special issue of *Journal of Geophysical Research—Atmospheres*. (Proposer)
- *Volume 1, Global Environmental Change*, of the *Springer Handbook of Global Environmental Pollution*. Section 1.10: Greenhouse Gases and Geoengineering. (Section Editor)