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Jacob Thomas Seeley

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Current position

December 2023 – present **Research Associate**
Department of Earth and Planetary Sciences, Harvard University

2019 – 2023 **Postdoctoral Fellow**
Center for the Environment, Harvard University
Department of Earth and Planetary Sciences, Harvard University

Education

2013 – 2018 **UC Berkeley**, Berkeley, CA — **Ph.D., Earth and Planetary Science**
Advisor: David M. Romps

2008 – 2012 **Haverford College**, Haverford, PA — **B.Sc., Physics**
Magna cum laude, Phi Beta Kappa
Minor: Philosophy

Publications (asterisk denotes equal contribution)

2024 R. Wordsworth, **J. T. Seeley**, and K. P. Shine, "Fermi resonance and the quantum mechanical basis of global warming", *Planetary Science Journal*, vol. 5, https://doi.org/10.3847/PSJ/ad226d, 2024.

2023 M. K. Henry, G. K. Vallis, N. J. Lutsko, **J. T. Seeley**, and B. McKim, "State dependence of the equilibrium climate sensitivity in a clear-sky GCM", *Geophysical Research Letters*, vol. 50, doi:10.1029/2023GL104413, 2023.

2023 G. Dagan, **J. T. Seeley**, and N. Steiger, "Convection and convective organization in hothouse climates", *Journal of Advances in Modelling Earth Systems*, vol. 15, doi:10.1029/2023MS003765, 2023.

2023 **J. T. Seeley** and R. D. Wordsworth, "Moist convection is most vigorous at intermediate atmospheric humidity", *Planetary Science Journal*, vol. 4, doi:10.3847/PSJ/acb0cb, 2023.

2022 D. M. Romps*, **J. T. Seeley***, and J. P. Edman "Why the forcing from carbon dioxide scales with the logarithm of its concentration", *Journal of Climate*, vol. 35, 4027–4047, https://doi.org/10.1175/JCLI-D-21-0275.1, 2022.

2021 **J. T. Seeley** and R. D. Wordsworth, "Episodic deluges in simulated hothouse climates", *Nature*, vol. 599, 74–79, doi:10.1038/s41586-021-03919-z, 2021.

2021 N. Jeevanjee, **J. T. Seeley**, D. Paynter, and S. Fueglistaler, "An analytical model for spatially varying clear-sky CO_2 forcing", *Journal of Climate*, doi:10.1175/JCLI-D-19-0756.1, 2021.

2021 Y. Chen, D. M. Romps, **J. T. Seeley**, S. Veraverbeke, W. J. Riley, Z. A. Mekonnen, and J. T. Randerson, "Future increases in Arctic lightning and fire risk for permafrost carbon", *Nature Climate Change*, vol. 11, 404–410, 2021.

2020 **J. T. Seeley** and N. Jeevanjee, "H_2O windows and CO_2 radiator fins: a clear-sky explanation for the peak in ECS", *Geophysical Research Letters*, vol. 47, e2020GL089609, https://doi.org/10.1029/2020GL089609, 2020.

2020 **J. T. Seeley**, N. J. Lutsko, and D. Keith, "Designing a radiative antidote to CO_2", *Geophysical Research Letters*, vol. 47, e2020GL090876, https://doi.org/10.1029/2020GL090876, 2020.

2020 N. J. Lutsko, **J. T. Seeley**, and D. Keith, "Estimating impacts and trade-offs in solar geoengineering scenarios with a moist energy balance model", *Geophysical Research Letters*, vol. 47, doi:10.1029/2020GL087290, 2020.

2019 **J. T. Seeley**, N. Jeevanjee, and D. M. Romps, "FAT or FiTT: Are anvil clouds or the tropopause temperature-invariant?", *Geophysical Research Letters*, vol. 46, doi:10.1029/2018GL080096, 2019.

2019 **J. T. Seeley**, N. Jeevanjee, W. L. Langhans, and D. M. Romps, "Formation of tropical anvil clouds by slow evaporation", *Geophysical Research Letters*, vol. 46, doi:10.1029/2018GL080747, 2019.

2016 **J. T. Seeley** and D. M. Romps, "Tropical cloud buoyancy is the same in a world with or without ice", *Geophysical Research Letters*, vol. 43, doi:10.1002/2016GL068583, 2016.

2015 **J. T. Seeley** and D. M. Romps, "Why does tropical convective available potential energy (CAPE) increase with warming?", *Geophysical Research Letters*, vol. 42, doi:10.1002/2015GL066199, 2015.

2015 **J. T. Seeley** and D. M. Romps, "The effect of global warming on severe thunderstorms in the United States", *Journal of Climate*, vol. 28, 2443–2458, 2015.

2015 A. Tranter, S. Sofia, **J. T. Seeley**, M. Kaicher, J. McClean, R. Babbush, P. V. Coveney, F. Mintert, F. Wilhelm, P. J. Love, "The Bravyi-Kitaev transformation: properties and applications", *International Journal of Quantum Chemistry*, vol. 115, no. 19, 1431–1441, 2015.

2014 D.M. Romps, **J. T. Seeley**, D. Vollaro, J. Molinari, "Projected increase in lightning strikes in the United States due to global warming", *Science*, vol. 346, no. 6211, 851–854, 2014.

2012 **J. T. Seeley**, M. Richard, P. Love, "The Bravyi-Kitaev transformation for quantum computation of electronic structure", *Journal of Chemical Physics*, vol. 137, 2012.

2012	S. Yuan, M. Kim, **J. T. Seeley**, J.C. Lee, S. Lal, S.L. Cooper, "Inelastic light scattering measurements of a pressure-induced quantum liquid in $KCuF_3$", *Physical Review Letters*, vol. 109, 2012.

Honors

February 2018	**T. C. Chamberlin Postdoctoral Fellowship (declined)** Department of the Geophysical Sciences, University of Chicago
February 2018	**Bernoulli Postdoctoral Fellowship (declined)** Department of Physics, University of Oxford; Center for Space and Habitability, University of Bern
December 2017	**Outstanding student paper award (OSPA)** American Geophysical Union (AGU) Fall Meeting 2017
June 2017	**Best oral presentation by a student** 21st Conference on Atmospheric and Oceanic Fluid Dynamics
April 2014	**Graduate Research Fellowship** National Science Foundation
January 2013	**Berkeley Graduate Fellowship** University of California, Berkeley
May 2012	**Louis B. Green Prize in Physics** Haverford College

Outreach

2018	**Co-founder, Climate Up Close (CUC)** www.climateupclose.org This outreach organization facilitates face-to-face interactions between climate scientists and the public.
August 2018	**CUC tour in Central Pennsylvania** 9 events over the course of a week, 500 total attendees
January 2019	**CUC tour in Philadelphia, PA** 4 events in a weekend, 300 total attendees
January 2022	**CUC tour in the Florida Panhandle** 5 events over the course of a week, 400 total attendees
May 2023	**CUC tour in Chicago** 5 events over the course of a week, 400 total attendees

Teaching

Summer 2020	**Summer Undergraduate Research Fund supervisor** Project title: "The future of lightning in a warming world" (Harvard University) 2 students supervised

Fall 2017, 2018	**Graduate Student Reader** EPS 7: Climate Change (UC Berkeley)
Spring 2015	**Graduate Student Instructor** L&S 70b: Global Warming (UC Berkeley)
Fall 2014	**Graduate Student Instructor** EPS 181: Atmospheric Physics and Dynamics (UC Berkeley)
Fall 2012	**Teaching Assistant** PHYS 213: Thermal Physics (University of Illinois at Urbana-Champaign)

Academic references

Robin D. Wordsworth	**Associate Professor** Harvard University Environmental Science and Engineering Affiliate, Department of Earth and Planetary Science rwordsworth@seas.harvard.edu (617) 384-8069
David M. Romps	**Professor** University of California, Berkeley Department of Earth and Planetary Science romps@berkeley.edu (510) 642-7095
William D. Collins	**Director, Climate and Ecosystem Sciences Division (CESD)** Lawrence Berkeley National Lab (LBNL) wdcollins@lbl.gov (510) 495-2407