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Earth and Planetary Science  
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# David M. Romps

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## Current

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|----------------|--|
| 2018 – Present | <b>Professor</b><br>Department of Earth and Planetary Science<br>University of California, Berkeley, CA                    |
| 2011 – Present | <b>Faculty Scientist</b><br>Climate and Ecosystem Sciences Division<br>Lawrence Berkeley National Laboratory, Berkeley, CA |

## Education

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|-------------|---|---|
| 1999 – 2005 | <b>Harvard University</b> , Cambridge, MA<br>Thesis: Holography and related topics in string theory | <b>Ph.D., Physics</b>                                 |
| 1995 – 1999 | <b>Yale University</b> , New Haven, CT<br>Magna cum laude   | <b>B.S./M.S., Physics</b><br><b>B.S., Mathematics</b> |

## Previous positions

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|-------------|---|
| 2016 – 2021 | <b>Director</b><br>Berkeley Atmospheric Sciences Center, UC Berkeley, CA                        |
| 2016 – 2018 | <b>Associate Professor</b><br>Department of Earth and Planetary Science, UC Berkeley, CA        |
| 2011 – 2016 | <b>Assistant Professor</b><br>Department of Earth and Planetary Science, UC Berkeley, CA        |
| 2008 – 2010 | <b>Research Associate</b><br>Department of Earth and Planetary Sciences, Harvard University, MA |
| 2006 – 2008 | <b>Environmental Fellow</b><br>Center for the Environment, Harvard University, MA               |
| 2005 – 2006 | <b>Postdoctoral Fellow</b><br>Woods Hole Research Center, MA                                    |

## Honors and Awards

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| 2018 | <b>Atmospheric Sciences Ascent Award</b><br>American Geophysical Union, Washington, D.C.              |
| 2016 | <b>Goldman Distinguished Chair in the Physical Sciences</b><br>University of California, Berkeley, CA |
| 2013 | <b>Hellman Fellow</b><br>The Hellman Foundation, San Francisco, CA                                    |

**Publications** (group members in bold)

- 2026            **R. Öktem**, S.E. Giangrande, **D.M. Romps**, “Pinned clouds over industrial sources of heat during TRACER,” *Bulletin of the American Meteorological Society*, in press, 2026
- 2025            G. Dagan, . . . , **D.M. Romps**, . . . , “RCEMIP-ACI: Aerosol-cloud interactions in a multimodel ensemble of radiative-convective equilibrium simulations,” *Journal of Advances in Modeling Earth Systems (JAMES)*, vol. 17, no. e2025MS005141, 2025
- 2025            M. Jensen, . . . , **R. Öktem**, . . . , **D.M. Romps**, . . . , “Studying aerosol, clouds, and air quality in the coastal urban environment of southeastern Texas,” *Bulletin of the American Meteorological Society*, in press, 2025
- 2025            **D.M. Romps**, “Latent heating is proportional to droplet radius and not droplet surface area,” *Journal of the Atmospheric Sciences*, vol. 82, no. 9, 1769–1779, 2025
- 2025            **D.M. Romps**, “A method for calculating reliable supersaturation reveals low values in tropical rainy-season clouds,” *Journal of the Atmospheric Sciences*, vol. 82, no. 8, 1517–1527, 2025
- 2024            **D.M. Romps**, “Principles of stereo reconstruction of aerial objects using stationary cameras,” *Remote Sensing Letters*, vol. 15, no. 11, 1118–1131, 2024
- 2024            **D.M. Romps**, “Heat index extremes increasing several times faster than the air temperature,” *Environmental Research Letters*, vol. 19, no. 4, 041002, 2024
- 2023            **Y. Lu**, **D.M. Romps**, “Is a wet-bulb temperature of 35 °C the correct threshold for human survivability?,” *Environmental Research Letters*, vol. 18, no. 9, 094021, 2023
- 2023            **R. Öktem**, **D.M. Romps**, A. Varble, “No warm-phase invigoration of convection detected during GoAmazon,” *Journal of the Atmospheric Sciences*, vol. 80, no. 10, 2345–2364, 2023
- 2023            **Y. Lu**, **D.M. Romps**, “Predicting fatal heat and humidity using the heat index model,” *Journal of Applied Physiology*, vol. 134, no. 3, 649–656, 2023
- 2023            **D.M. Romps**, **K. Latimer**, **Q. Zhu**, T. Jurkat-Witschas, C. Mahnke, T. Prabhakaran, R. Weigel, M. Wendisch, “Air pollution unable to intensify storms via warm-phase invigoration,” *Geophysical Research Letters*, vol. 50, no. 2, e2002GL100409, 2023
- 2023            Y. Feng, R.I. Negron-Juarez, **D.M. Romps**, J.Q. Chambers, “Amazon windthrow disturbances are likely to increase with storm frequency under global warming,” *Nature Communications*, vol. 14, no. 1, 101, 2023
- 2022            **D.M. Romps**, **Y. Lu**, “Chronically underestimated: a reassessment of US heat waves using the extended heat index,” *Environmental Research Letters*, vol. 17, no. 9, 094017, 2022

- 2022 **N. Tarshish, D.M. Romps**, “Latent heating is required for firestorm plumes to reach the stratosphere,” *Journal of Geophysical Research: Atmospheres*, vol. 127, e2022JD036667, 2022
- 2022 **Y. Lu, D.M. Romps**, “Extending the heat index,” *Journal of Applied Meteorology and Climatology*, vol. 61, no. 10, 1367–1383, 2022
- 2022 **D.M. Romps, J.T. Seeley, J.P. Edman**, “Why the forcing from carbon dioxide scales as the logarithm of its concentration,” *Journal of Climate*, vol. 35, no. 13, 4027–4047, 2022
- 2022 **N. Tarshish and D.M. Romps**, “A closure for the virtual origin of turbulent plumes,” *Journal of the Atmospheric Sciences*, vol. 79, no. 5, 1459–1471, 2022
- 2021 **R. Öktem, D.M. Romps**, “Prediction for cloud spacing confirmed using stereo cameras,” *Journal of the Atmospheric Sciences*, vol. 78, no. 11, 3717–3725, 2021
- 2021 **D.M. Romps**, “The Rankine-Kirchhoff approximations for moist thermodynamics,” *Quarterly Journal of the Royal Meteorological Society*, vol. 147, no. 740, 3493–3497, 2021
- 2021 Y. Zhang, J. Bloch-Johnson, **D.M. Romps**, D.S. Abbot, “Evolving CO<sub>2</sub> rather than SST leads to a factor of ten decrease in GCM convergence time,” *Journal of Advances in Modeling Earth Systems*, vol. 13, no. 11, e2021MS002505, 2021
- 2021 **D.M. Romps, R. Öktem**, S. Endo, A.M. Vogelmann, “On the lifecycle of a shallow cumulus cloud: Is it a bubble or plume, active or forced?,” *Journal of the Atmospheric Sciences*, vol. 78, no. 9, 2823–2833, 2021
- 2021 J. Tian, Y. Zhang, S.A. Klein, L. Wang, **R. Öktem, D.M. Romps**, “Continental shallow cumulus cloud detection using GOES-16 satellite and ground-based stereo cameras at the DOE ARM Southern Great Plains site,” *Remote Sensing*, vol. 13, no. 2309, 2021
- 2021 C.R. Williams, K. Johnson, S.E. Giangrande, J.C. Hardin, **R. Öktem, D.M. Romps**, “Identifying insects, clouds, and precipitation using vertically pointing polarimetric radar Doppler velocity spectra,” *Atmospheric Measurement Techniques*, vol. 14, 4425–4444, 2021
- 2021 **D.M. Romps**, “Accurate expressions for the dewpoint and frost point derived from the Rankine-Kirchhoff approximations,” *Journal of the Atmospheric Sciences*, vol. 78, no. 7, 2113–2116, 2021
- 2021 A.C. Varble, . . . , **R. Öktem**, . . . , **D.M. Romps**, . . . , “Utilizing a storm-generating hotspot to study convective cloud transitions: The CACTI experiment,” *Bulletin of the American Meteorological Society*, vol. 102, no. 8, E1597–E1620, 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, no. 5, 404–410, 2021
- 2021 **D.M. Romps**, “Ascending columns, WTG, and convective aggregation,” *Journal of the Atmospheric Sciences*, vol. 78, no. 2, 497–508, 2021
- 2020 A.A. Wing, C.L. Stauffer, . . . , **D.M. Romps**, . . . , “Clouds and convective self-aggregation in a multi-model ensemble of radiative-convective equilibrium simulations,” *Journal of Advances in Modeling Earth Systems*, vol. 12, e2020MS002138, 2020
- 2020 **D.M. Romps**, “Theory of tropical moist convection,” *Fundamental Aspects of Turbulent Flows in Climate Dynamics, Lecture Notes of the Les Houches Summer School*, vol. 109, 1–45, Oxford University Press, 2020
- 2020 **D.M. Romps**, “Climate sensitivity and the direct effect of carbon dioxide in a limited-area cloud-resolving model,” *Journal of Climate*, vol. 33, no. 9, 3413–3429, 2020
- 2019 **D.M. Romps**, “Evaluating the future of lightning in cloud-resolving models,” *Geophysical Research Letters*, vol. 46, 14863–14871, 2019
- 2019 S. Endo, D. Zhang, A.M. Vogelmann, P. Kollias, K. Lamer, M. Oue, H. Xiao, W.I. Gustafson, **D.M. Romps**, “Reconciling differences between large-eddy simulations and Doppler-lidar observations of continental shallow cumulus cloud-base vertical velocity,” *Geophysical Research Letters*, vol. 46, 11539–11547, 2019
- 2019 **D.M. Romps**, J.P. Retzinger, “Climate news articles lack basic climate science,” *Environmental Research Communications*, vol. 1, 081002, 2019
- 2019 **J.T. Seeley**, **N. Jeevanjee**, **D.M. Romps**, “FAT or FiTT: Are anvil clouds or the tropopause temperature-invariant?,” *Geophysical Research Letters*, vol. 46, 1842–1850, 2019
- 2019 **J.T. Seeley**, **N. Jeevanjee**, W. Langhans, **D.M. Romps**, “Formation of tropical anvil clouds by slow evaporation,” *Geophysical Research Letters*, vol. 46, 492–501, 2019
- 2018 **D.M. Romps**, **A.B. Charn**, R.H. Holzworth, W.E. Lawrence, J. Molinari, D. Vollaro, “CAPE times P explains lightning over land but not the land-ocean contrast,” *Geophysical Research Letters*, vol. 45, no. 22, 12623–12630, 2018
- 2018 **N. Jeevanjee**, **D.M. Romps**, “Mean precipitation change from a deepening troposphere,” *Proceedings of the National Academy of Sciences*, vol. 115, no. 45, 11465–11470, 2018
- 2018 **D.M. Romps**, **R. Öktem**, “Observing clouds in 4D with multiview stereophotogrammetry,” *Bulletin of the American Meteorological Society*, vol. 99, no. 12, 2575–2586, 2018

- 2018 C.J. Muller, **D.M. Romps**, “Acceleration of tropical cyclogenesis by self-aggregation feedbacks,” *Proceedings of the National Academy of Sciences*, vol. 115, no. 12, 2930–2935, 2018
- 2018 **S.Q. Duan**, J.S. Wright, **D.M. Romps**, “On the utility (or futility) of using stable water isotopes to constrain the bulk properties of tropical convection,” *Journal of Advances in Modeling Earth Systems*, vol. 10, no. 2, 516–529, 2018
- 2017 **D.M. Romps**, “An exact expression for the lifting condensation level,” *Journal of the Atmospheric Sciences*, vol. 74, no. 12, 3891–3900, 2017
- 2017 **J.P. Edman**, **D.M. Romps**, “Beyond the rigid lid: Baroclinic modes in a structured atmosphere,” *Journal of the Atmospheric Sciences*, vol. 74, no. 11, 3551–3566, 2017
- 2017 **D.M. Romps**, A.M. Vogelmann, “Methods for estimating 2D cloud size distributions from 1D observations,” *Journal of the Atmospheric Sciences*, vol. 74, no. 10, 3405–3417, 2017
- 2016 **D.M. Romps**, “Clausius-Clapeyron scaling of CAPE from analytical solutions to RCE,” *Journal of the Atmospheric Sciences*, vol. 73, no. 9, 3719–3737, 2016
- 2016 **J.T. Seeley**, **D.M. Romps**, “Tropical cloud buoyancy is the same in a world with or without ice,” *Geophysical Research Letters*, vol. 43, no. 7, 3572–3579, 2016
- 2016 **D.M. Romps**, “Reply to comments on “MSE minus CAPE is the true conserved variable for an adiabatically lifted parcel,”” *Journal of the Atmospheric Sciences*, vol. 73, no. 6, 2577–2583, 2016
- 2016 **D.M. Romps**, “The Stochastic Parcel Model: A deterministic parameterization of stochastically entraining convection,” *Journal of Advances in Modeling Earth Systems*, vol. 8, no. 1, 319–344, 2016
- 2016 **D.M. Romps**, **N. Jeevanjee**, “On the sizes and lifetimes of cold pools,” *Quarterly Journal of the Royal Meteorological Society*, vol. 142, no. 696, 1517–1527, 2016
- 2016 **N. Jeevanjee**, **D.M. Romps**, “Effective buoyancy at the surface and aloft,” *Quarterly Journal of the Royal Meteorological Society*, vol. 142, no. 695, 811–820, 2016
- 2015 **J.T. Seeley**, **D.M. Romps**, “Why does convective available potential energy (CAPE) increase with warming?,” *Geophysical Research Letters*, vol. 42, no. 23, 10429–10437, 2015
- 2015 **W. Langhans**, **D.M. Romps**, “The origin of water-vapor rings in tropical oceanic cold pools,” *Geophysical Research Letters*, vol. 42, no. 18, 7825–7834, 2015

- 2015 **D.M. Romps**, “MSE minus CAPE is the true conserved variable for an adiabatically lifted parcel,” *Journal of the Atmospheric Sciences*, vol. 72, no. 9, 3639–3646, 2015
- 2015 **D.M. Romps, R. Öktem**, “Stereo photogrammetry reveals substantial drag on cloud thermals,” *Geophysical Research Letters*, vol. 42, no. 12, 5051–5057, 2015
- 2015 **N. Jeevanjee, D.M. Romps**, “Effective buoyancy, inertial pressure, and the mechanical generation of boundary-layer mass flux by cold pools,” *Journal of the Atmospheric Sciences*, vol. 72, no. 8, 3199–3213, 2015
- 2015 **D.M. Romps, A.B. Charn**, “Sticky thermals: Evidence for a dominant balance between buoyancy and drag in cloud updrafts,” *Journal of the Atmospheric Sciences*, vol. 72, no. 8, 2890–2901, 2015
- 2015 **J.P. Edman, D.M. Romps**, “Self-consistency tests of large-scale-dynamics parameterizations for single-column modeling,” *Journal of Advances in Modeling Earth Systems*, vol. 7, no. 1, 320–334, 2015
- 2015 **R. Öktem, D.M. Romps**, “Observing atmospheric clouds through stereo reconstruction,” *IS&T/SPIE Electronic Imaging*, vol. 9393, 93930H-1, 2015
- 2015 **J.T. Seeley, D.M. Romps**, “The effect of global warming on severe thunderstorms in the United States,” *Journal of Climate*, vol. 28, no. 6, 2443–2458, 2015
- 2015 **W. Langhans, K. Yeo, D.M. Romps**, “Lagrangian investigation of the precipitation efficiency of convective clouds,” *Journal of the Atmospheric Sciences*, vol. 72, no. 3, 1045–1062, 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
- 2014 M. Duarte, A.S. Almgren, K. Balakrishnan, J.B. Bell, **D.M. Romps**, “A numerical study of methods for moist atmospheric flows: compressible equations,” *Monthly Weather Review*, vol. 142, no. 11, 4269–4283, 2014
- 2014 **D.M. Romps**, “An analytical model for tropical relative humidity,” *Journal of Climate*, vol. 27, no. 19, 7432–7449, 2014
- 2014 **R. Öktem, Prabhat, J. Lee, A. Thomas, P. Zuidema, D.M. Romps**, “Stereo photogrammetry of oceanic clouds,” *Journal of Atmospheric and Oceanic Technology*, vol. 31, no. 7, 1482–1501, 2014
- 2014 **J.P. Edman, D.M. Romps**, “An improved weak-pressure-gradient scheme for single-column modeling,” *Journal of the Atmospheric Sciences*, vol. 71, no. 7, 2415–2429, 2014

- 2014 **D.M. Romps**, “Rayleigh damping in the free troposphere,”  
Journal of the Atmospheric Sciences, vol. 71, no. 2, 553–565, 2014
- 2013 **N. Jeevanjee, D.M. Romps**, “Convective self-aggregation, cold pools, and domain size,” Geophysical Research Letters, vol. 40, 2013
- 2013 **K. Yeo, D.M. Romps**, “Measurement of convective entrainment using Lagrangian particles,” Journal of the Atmospheric Sciences, vol. 70, no. 1, 266–277, 2013
- 2012 **D.M. Romps**, “On the equivalence of two schemes for convective momentum transport,” Journal of the Atmospheric Sciences, vol. 69, no. 12, 3491–3500, 2012
- 2012 **D.M. Romps**, “Numerical tests of the weak pressure gradient approximation,” Journal of the Atmospheric Sciences, vol. 69, no. 9, 2846–2856, 2012
- 2012 **D.M. Romps**, “Weak pressure gradient approximation and its analytical solutions,” Journal of the Atmospheric Sciences, vol. 69, no. 9, 2835–2845, 2012
- 2012 J. Molinari, **D.M. Romps**, D. Vollaro, and L. Nguyen, “CAPE in tropical cyclones,” Journal of the Atmospheric Sciences, vol. 69, no. 8, 2452–2463, 2012
- 2011 **D.M. Romps**, Z. Kuang, “A transilient matrix for moist convection,” Journal of the Atmospheric Sciences, vol. 68, no. 9, 2009–2025, 2011
- 2011 **D.M. Romps**, “Response of tropical precipitation to global warming,” Journal of the Atmospheric Sciences, vol. 68, no. 1, 123–138, 2011
- 2010 P.N. Blossey, Z. Kuang, **D.M. Romps**, “Isotopic composition of water in the tropical tropopause layer in cloud-resolving simulations of an idealized tropical circulation,” Journal of Geophysical Research, vol. 115, D24309, 2010
- 2010 **D.M. Romps**, “A direct measure of entrainment,” Journal of the Atmospheric Sciences, vol. 67, no. 6, 1908–1927, 2010
- 2010 **D.M. Romps**, Z. Kuang “Nature versus nurture in shallow convection,” Journal of the Atmospheric Sciences, vol. 67, no. 5, 1655–1666, 2010
- 2010 **D.M. Romps**, Z. Kuang “Do undiluted convective plumes exist in the upper tropical troposphere?” Journal of the Atmospheric Sciences, vol. 67, no. 2, 468–484, 2010
- 2009 **D.M. Romps**, Z. Kuang, “Overshooting convection in tropical cyclones,” Geophysical Research Letters, vol. 36, L09804, 2009
- 2008 **D.M. Romps**, “The dry-entropy budget of a moist atmosphere,” Journal of Atmospheric Sciences, vol. 65, no. 12, 3779–3799, 2008

- 2005 A. Simons, A. Strominger, D.M. Thompson (**D.M. Romps**), X. Yin,  
“Supersymmetric branes in  $\text{AdS}_2 \times \text{S}^2 \times \text{CY}_3$ ,” Physical Review D, vol. 71, no. 6,  
066008, 2005, hep-th/0406121
- 2004 D.M. Thompson (**D.M. Romps**), “AdS solutions to the 2D type 0A effective  
action,” Physical Review D, vol. 70, no. 10, 106001, 2004, hep-th/0312156
- 2004 A. Strominger, D.M. Thompson (**D.M. Romps**), “Quantum Bousso bound,”  
Physical Review D, vol. 70, no. 4, 044007, 2004, hep-th/0303067
- 2002 D.M. Thompson (**D.M. Romps**), “Descent relations in type 0A/0B,”  
Physical Review D, vol. 65, no. 10, 106005, 2002, hep-th/0105314