

David A. Randall

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Born September 8, 1948 in Columbus, Ohio

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Present position: University Distinguished Professor, Department of Atmospheric Science, Colorado State University

Research interests: General circulation modeling, cloud-climate studies, cloud parameterization

Education: **B.S.**, 1971, Aeronautical and Astronautical Engineering, The Ohio State University. **M.S.**, 1971, Aeronautical and Astronautical Engineering, The Ohio State University. **Ph.D.**, 1976, Atmospheric Sciences, University of California, Los Angeles (Professor A. Arakawa, advising).

Previous positions: 09/76-09/79: Assistant Professor, Department of Meteorology, Massachusetts Institute of Technology.

09/79-06/88: Meteorologist, Global Modeling and Simulation Branch, NASA/Goddard Space Flight Center.

07/88-06/92: Associate Professor, Department of Atmospheric Science, Colorado State University

07/92--6/12: Professor, Department of Atmospheric Science, Colorado State University

Professional Society Memberships

American Meteorological Society, (Fellow) American Geophysical Union (Fellow), American Association for the Advancement of Science (Fellow)

Honors and Awards

Jule Charney Award of the American Meteorological Society, 2014. University Distinguished Professor, Colorado State University, 2012. Coordinating Lead Author for the Fifth Assessment of the Intergovernmental Panel on Climate Change. Coordinating Lead Author for the Fourth Assessment of the Intergovernmental Panel on Climate Change, which shared the 2007 Nobel Peace Prize. Abell Faculty Research Award, CSU College of Engineering, 2007. NASA's Medal for Distinguished Public Service, 2006; Distinguished Lecturer, University of Utah Department of Meteorology, 2006; Scholarship Impact Award, Colorado State University, 2005; Robert D. Cess Distinguished TAOS Seminar Speaker, 2005; NASA Group Achievement Award, 2003; Fellow, American Geophysical Union, 2002; Fellow, American Association for the Advancement of Science, 2001; Bjerknes Lecturer, Fall AGU Meeting, 2001; Cermak Outstanding Graduate Advisor Award, 1999; Abell Faculty Research and Graduate Program Support Award for Excellence, 1996; Creativity Award from the National Science Foundation, 1995; NASA Group Achievement Award, 1995; Award for "Outstanding Contributions to the ARM Program," 1995; Meisinger Award of the American Meteorological Society, 1994; American Geophysical Union Editors' Citation for Excellence in Refereeing, *JGR-Atmospheres*, 1992; NASA Group Achievement Award, 1992; Dean's Council Award, College of Engineering, Colorado State University, 1991; NASA Medal for Exceptional Scientific Achievement, 1988; GLA Best Paper Award, 1987; Fellow, American Meteorological Society, 1986; GLAS Best Paper Award, 1983; Goddard Exceptional Performance Award, 1982; GLAS Special Achievement Award, 1982.

Selected Special Experience

Chair, Committee of Visitors, U.S. Department of Energy's Biological and Environmental Research Programs, 2016. Member, AMS Awards Committee, 2016-18, and **Chair** for 2018. Reviewing Editor, *Science* magazine, 2014 - . Member, Blue Waters Science and Engineering Team Advisory Committee Member, 2014 - 15. Science Advisory Committee, Research Institute for Global Change (RIGC), Japan Agency for Maritime Earth Science and Technology (JAMSTEC), 2013. Member, Advisory Board, Korea Institute of Atmospheric Prediction Systems (KIAPS), 2012 - 15. Member, External Advisory Board, Byrd Polar Research Center, The Ohio State University, 2013 - . Member, CISL High Performance Computing Advisory Panel, 1997 - 2011. **Chair**, Fellows Committee for the Atmospheric Science Section of the American Geophysical Union, 2009-2011. **Coordinating Lead Author** (with Olivier Boucher) for Chapter 7 (Clouds and Aerosols) of the IPCC Fifth Assessment Report. Mentor, DISCRSS V, 2010. Member, Earth Day Global Advisory Committee, 2009-10. **Founding Chief Editor**, *Journal of Advances in Modeling the Earth System (JAMES)*, 2008 - 2014. Member, University Review Panel for Computer Science Department, Colorado State University, 2009. **Chair** (from the U.S. side), U.S.-Japan Workshop on Global Change Research, 2008. **Chair**, Review Panel for NOAA's Climate Research and Modeling Program, 2008. Member, External Advisory Panel, Max Planck Institute for Meteorology, Hamburg, Germany, 2008-2016. **Chair**, External Advisory Panel, Center for Climate System Research, University of Tokyo, 2007. **Director**, Center for Multiscale Modeling of Atmospheric Processes, an NSF Science and Technology Center, 2006 - 2016. Member, Biological and Environmental Research Advisory Committee, U.S. Department of Energy, 2006 - . **Coordinating Lead Author** (with Richard Wood) for Chapter 8 (Model Evaluation) of the IPCC Fourth Assessment Report. Member, Advisory Board for the Earth and Sun Systems Laboratory, National Center for Atmospheric Research, 2006-08. **Chair**, Advisory Committee for the Mesoscale and Microscale Meteorology Division, National Center for Atmospheric Research, 2003-. Member and former **Chair** (1993-1995), NCAR's Scientific Computing Division Advisory Panel. **Chair**, U. S. Department of Energy Oversight Committee for CAPT. Member, External Review Panel for NOAA's Climate Diagnostics Center, 2001. Member, GEWEX Scientific Steering Group, 2001 - 2006. **Chief Editor**, *Journal of Climate* 1995 - 2004. **Chair**, Information Systems

Committee, American Meteorological Society, 2001-2005. Member, GISS External Advisory Panel, 2000 - 2003. Member, Directorate Review Committee, Fundamental Science Directorate, Pacific Northwest National Laboratories. **Chair** ARM Science Team Executive Committee, 1993 - 1995. **Chair**, GEWEX Modeling and Prediction Panel, 1997 - 2002. Member, American Meteorological Society Awards Committee, 1997. **Chair**, Advisory Panel for Center for Clouds, Chemistry, and Climate (C⁴), 1997 - 1999 (Member since 1994). Member, Scientific Steering Committee for the Climate System Model, 1996 -2001. **Co-Chair**, Atmospheric Model Working Group, Climate System Model, 1996 - 2002. Member, Information Systems Committee, American Meteorological Society, 1997. **Chair**, GEWEX Cloud Systems Study Science Panel, 1996 - 2000. Member, Atmospheric Model Intercomparison Project Panel, 1995-1997. **Co-Chair**, Science Working Group for SHEBA (Surface Heat Balance of the Arctic) Project, 1994-1996. **Co-Chair**, FIRE Science Team, 1983 - 2000. For DOE's CHAMMP Project, Coordinator for Atmospheric GCM Research and Liaison with ARM Science Team. **Guest Editor**, *J. Atmos. Sci.*, 1994. Member, Working Group on Numerical Experimentation (WGNE) of the World Climate Research Program, 1994 - 1997. Member, AMS Committee on Tropical Meteorology and Tropical Cyclones, 1994. Participant, ASTEX Field Program, 1992. **Chair**, College of Engineering Computing Committee, 1989-1991. **Panel Chair**, DOE Carbon Dioxide Research Program Workshop. Member, LITE Science Steering Group, National Aeronautics and Space Administration. **Lead Author** for Chapter 3 (Processes and Modeling) of the IPCC First Assessment. **Chair**, Modeling Sub-Panel, Eos Interdisciplinary Review Panel, National Aeronautics and Space Administration. Member, Eos Review Group, National Aeronautics and Space Administration. **Associate Editor**, *J. Atmos. Sci.* Member, Source Evaluation Board, Support Contract for Global Modeling and Simulation Branch, NASA/Goddard Space Flight Center. Participant, FIRE Marine Stratocumulus Field Program, 1987. **Chair**, Science Requirements Committee for Next Generation Computer, NASA Space and Earth Sciences Computer Users Committee. **Chair and Co-Program Chair**, AMS Committee on Cloud Physics. Participant in various Workshops and Seminars at the European Centre for Medium Range Weather Forecasts since 1980. Member, National Research Council Advisory Panel for the International Satellite Cloud Climatology Project. Acting Head, Climate Modeling Group, Goddard Laboratory for Atmospheric Science. Scientific Visitor (two months), University of Stockholm, Sweden. Participant, Mesoscale Air-Sea Interaction Experiment (MASEX). Scientific Visitor (three months), National Center for Atmospheric Research. Secretary, Computer Users' Committee, Goddard Modeling and Simulation Facility. Scientific Visitor (two consecutive summers, three months each), National Center for Atmospheric Research. Member, Technical Evaluation Panel for High-Speed Vector Processing Computer System, NASA/ Goddard Space Flight Center. Consultant, Goddard Institute for Space Studies and Goddard Laboratory for Atmospheric Sciences.

Recent Refereed Journal Publications

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Google Scholar: <https://scholar.google.com/citations?user=MpWrx7AAAAAJ&hl=en>

1. Dodson, J. B., D. A. Randall, and K. Suzuki 2013: Comparison of observed and simulated tropical cumuliform clouds by CloudSat and NICAM. *J. Geophys. Res. Atmos.*, **118**, 1-16, doi:10.1002/jgrd.50121.
2. Randall, D. A., M. D. Branson, M. Wang, S. J. Ghan, C. Craig, A. Gettelman, and J. Edwards, 2013: SP-CAM Version 2: A Community Atmosphere Model with Super-Parameterized Clouds. *EoS*, **94**, 221-228.
3. DeMott, C. A., C. Stan, and D. A. Randall, 2013: Northward Propagation Mechanisms of the Boreal Summer Intraseasonal Oscillation in the ERA-Interim Reanalysis and SP-CCSM. *J. Climate*, **26**, 1973–1992. doi: <http://dx.doi.org/10.1175/JCLI-D-12-00191.1>
4. Randall, D. A., 2013: Beyond deadlock. *Geophys. Res. Lett.*, **40**, 1-7, doi: 10.1002/2013GL057998.
5. Heikes, R. P., D. A. Randall, and C. S. Konor, 2013: Optimized icosahedral grids: Performance of finite-difference operators and multigrid solver. *Mon. Wea. Rev.*, **141**, 4450-4469. doi: <http://dx.doi.org/10.1175/MWR-D-12-00236.1>.
6. Bopape, M., F. A. Engelbrecht, D. A. Randall, and W. A. Landman, 2013: Simulations of an isolated two-dimensional thunderstorm: Sensitivity to cloud droplet size and the presence of graupel. *Asia-Pacific Journal of Atmospheric Sciences*, DOI:10.1007/s13143-014-0003-z.
7. Harper, A., A. S. Denning, I. Baker, D. A. Randall, and D. Dazlich, 2014: Impact of surface evapotranspiration on dry season climate in the Amazon forest. *J. Climate*, **27**, 574–591. doi: <http://dx.doi.org/10.1175/JCLI-D-13-00074.1>.
8. Stocker, T. F., D. Qin, G.-K. Plattner, L. V. Alexander, S.K. Allen, N.L. Bindoff, F.-M. Bréon, J.A. Church, U. Cubasch, S. Emori, P. Forster, P. Friedlingstein, N. Gillett, J.M. Gregory, D.L. Hartmann, E. Jansen, B. Kirtman, R. Knutti, K. Krishna Kumar, P. Lemke, J. Marotzke, V. Masson-Delmotte, G.A. Meehl, I. I. Mokhov, S. Piao, V. Ramaswamy, D. Randall, M. Rhein, M. Rojas, C. Sabine, D. Shindell, L.D. Talley, D.G. Vaughan and S.-P. Xie, 2013: Technical Summary. In: *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
9. IPCC, 2013: Summary for Policymakers. D. A. Randall, Drafting Author. In: *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Stocker, T. F., D.

- Qin, G.-K. Plattner, M. Tignor, S. K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P. M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
10. Boucher, O., D. Randall, P. Artaxo, C. Bretherton, G. Feingold, P. Forster, V.-M. Kerminen, Y. Kondo, H. Liao, U. Lohmann, P. Rasch, S. K. Satheesh, S. Sherwood, B. Stevens and X. Y. Zhang, 2013: Clouds and Aerosols. In: *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
 11. Krishnamurthy, V., C. Stan, D. A. Randall, R. P. Shukla, and J. L. Kinter III, 2014: Simulation of the South Asian Monsoon in a Coupled Model with an Embedded Cloud-Resolving Model. *J. Climate*, **27**, 1121–1142. doi: <http://dx.doi.org/10.1175/JCLI-D-13-00257.1>
 12. Medina, I. D., A. S. Denning, I. T. Baker, J. A. Ramirez and D. A. Randall, 2014: A Sampling Method for Improving the Representation of Spatially Varying Precipitation and Soil Moisture using the Simple Biosphere Model. *J. Adv. Modeling Earth Syst.*, **6**, 1-11, doi:10.1002/2013MS000251.
 13. DeMott, C. A., C. Stan, D. A. Randall, and M. Branson, 2014: Intraseasonal Variability in Coupled GCMs: The Roles of Ocean Feedbacks and Model Physics. *J. Climate*, **27**, 4970-4994, doi: <http://dx.doi.org/10.1175/JCLI-D-13-00760.1>.
 14. Arnold, N., M. Branson, M. A. Burt, D. S. Abbot, Z. Kuang, D. A. Randall, and E. Tziperman, 2014: Effects of explicit atmospheric convection at high CO₂. *Proc. Nat. Acad. Sci.*, **111**, 10943–10948.
 15. Bopape, M.-J., F. Engelbrecht, D. A. Randall, and W. A. Landman, 2014: Advances towards the development of a cloud-resolving model in South Africa. *South African Journal of Science*, **110**, Art. #2013-0133, 12 pages. <http://dx.doi.org/10.1590/sajs.2014/20130133>.
 16. McCrary, R. R., D. A. Randall, and C. Stan, 2014: Simulations of the West African Monsoon with a Super-Parameterized Climate Model. Part 1: The Seasonal Cycle. *J. Climate*, **27**, 8303–8322. doi: <http://dx.doi.org/10.1175/JCLI-D-13-00676.1>.
 17. McCrary, R. R., D. A. Randall, and C. Stan, 2014: Simulations of the West African Monsoon with a Super-Parameterized Climate Model. Part 2: African Easterly Waves. *J. Climate*, **27**, 8323–8341. doi: <http://dx.doi.org/10.1175/JCLI-D-13-00677.1>
 18. Thayer-Calder, K., and D. A. Randall, 2015: Examining Boundary Layer Quasi-Equilibrium with Cloud Model Simulations. *Geophys. Res. Lett.*, **42**, doi: 10.1002/2014GL062649.
 19. Wood, L., J. Daily, H. Michael, B. Palmer, K. Schuchardt, D. Dazlich, R. Heikes, and D. A. Randall, 2015: A global climate model agent for high spatial and temporal resolution data. *The International Journal of High Performance Computing Applications*, **29**, 107-116.

20. Firl, G., and D. A. Randall, 2015: Fitting and Analyzing Large-Eddy Simulations Using Multiple Trivariate Gaussians. *J. Atmos. Sci.*, **72**, 1094-1116. doi: <http://dx.doi.org/10.1175/JAS-D-14-0192.1>.
21. Arnold, N. P., M. Branson, Z. Kuang, D. A. Randall, and E. Tziperman, 2015: MJO intensification with warming in the super-parameterized CESM. *J. Climate*, **28**, 2706-2724. doi: <http://dx.doi.org/10.1175/JCLI-D-14-00494.1>
22. Arnold, N. P., and D. A. Randall, 2015: Global-scale convective aggregation: Implications for the MJO. *J. Adv. Modeling Earth Syst.*, **7**, doi:10.1002/2015MS000498.
23. Burt, M. A., D. A. Randall, and M. D. Branson, 2016: Dark warming. *J. Climate*, **29**, 705-719.
24. Kooperman, G. J., M. S. Pritchard, M. A. Burt, M. D. Branson, and D. A. Randall, 2016: Robust effects of cloud super-parameterization on simulated daily rainfall intensity statistics across multiple versions of the Community Earth System Model. *J. Adv. Modeling Earth Syst.*, **8**, doi:10.1002/2015MS000574.
25. Randall, D. A., C. DeMott, C. Stan, M. Khairoutdinov, J. Benedict, R. McCrary, and K. Thayer-Calder, 2016: Simulations of the tropical general circulation with a multiscale global model. Chapter 15 of *Multiscale Convection-Coupled Systems in the Tropics: A tribute to Dr. Michio Yanai*, R. G. Fovell and W.-W. Tung, Eds. *Meteorological Monographs*, **56**, published by the American Meteorological Society. DOI: <http://dx.doi.org/10.1175/AMSMONOGRAPHS-D-15-0016.1>.
26. Randall, D. A., A. D. Del Genio, L. J. Donner, W. D. Collins, and W. A. Klein, 2016: The Impact of ARM on Climate Modeling. Chapter 26 of *The Atmospheric Radiation Measurement (ARM) Program: The First 20 Years*, D. D. Turner and R. Ellingson, Eds. *Meteorological Monographs*, **57**, published by the American Meteorological Society. DOI: 10.1175/AMSMONOGRAPHS-D-15-0050.1
27. DeMott, C. A., J. J. Benedict, N. P. Klingaman, S. J. Woolnough, and D. A. Randall, 2016: Diagnosing ocean feedbacks to the MJO: SST-modulated surface fluxes and the moist static energy budget. *J. Geophys. Res. Atmos.*, **121**, 8350–8373, doi:10.1002/2016JD025098.
28. Kooperman, G. J., M. S. Pritchard, M. A. Burt, M. D. Branson, and D. A. Randall, 2016: Impacts of cloud super-parameterization on projected daily rainfall intensity climate changes in multiple versions of the Community Earth System Model. *J. Adv. Modeling Earth Syst.*, **8**, doi:10.1002/2016MS000715.
29. Eldred, C., and D. A. Randall, 2017: Total energy and potential enstrophy conserving schemes for the shallow water equations using Hamiltonian methods: Derivation and Properties (Part 1). *Geoscientific Model Development*, **10**, 791–810.
30. Zelinka, M. D., D. A. Randall, M. J. Webb, and S. A. Klein, 2017: Clearing clouds of uncertainty. *Nature Climate Change*, **7**, 674-678.

31. DeMott, C. A., B. O. Wolding, E. D. Maloney, and D. A. Randall, 2017: The shape of MJO heating in the Indian Ocean: Relationship to seasonal mean moisture and MJO propagation or decay. Undergoing revisions for the *Journal of Geophysical Research*.
32. Ullrich, P. A., C. Jablonowski, J. Kent, P. H. Lauritzen, R. Nair, K. A. Reed, C. M. Zarzycki, D. M. Hall, D. Dazlich, R. P. Heikes, C. Konor, D. A. Randall, T. Dubos, Y. Meurdesoif, X. Chen, L. Harris, C. Kühnlein, V. Lee, A. Qaddouri, C. Girard, M. Giorgetta, D. Reinert, J. Klemp, S.-H. Park, W. Skamarock, H. Miura, T. Ohno, R. Yoshida, R. Walko, A. Reinecke, and K. Viner, 2017: DCMIP2016: A Review of Non-hydrostatic Dynamical Core Design and Intercomparison of Participating Models. Undergoing revisions for *Geoscientific Model Development*.
33. Burt, M. A., and D. A. Randall, 2017: Simulations of Arctic Winter and Spring Cloud Regimes. Undergoing revisions for *J. Adv. Modeling Earth Syst*.
34. Konor, C. S., and D. A. Randall, 2017: Impacts of the Horizontal and Vertical Grids on the Numerical Solutions of the Dynamical Equations. Part I: Nonhydrostatic Inertia-Gravity Modes. Submitted to *Geoscientific Model Development*.
35. Konor, C. S., and D. A. Randall, 2017: Impacts of the Horizontal and Vertical Grids on the Numerical Solutions of the Dynamical Equations. Part II: Quasi-Geostrophic Rossby Modes. Submitted to *Geoscientific Model Development*.

Books

- Randall, D. A., Ed., 2000: *General Circulation Model Development. Past, Present, and Future*. Academic Press, 807 pp., ISBN-13: 978-0125780100.
- Randall, D. A., 2012: *Atmosphere, Clouds, and Climate*. Princeton University Press, 277 pp., ISBN-13: 978-0691143750.
- Randall, D. A., 2015: *An Introduction to the Global Circulation of the Atmosphere*. Princeton University Press, 442 pp., ISBN-13: 978-0691148960.