

RICHARD ROTUNNO

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EDUCATION

1976	Ph.D. in Geophysical Fluid Dynamics, Princeton University
1974	M.A. in Geophysical Fluid Dynamics, Princeton University
1972	M.S. in Mechanics, State University of New York at Stony Brook
1971	B.E. in Eng. Science, State University of New York at Stony Brook

PROFESSIONAL RECORD

2016–	National Center for Atmospheric Research, Senior Scientist
2015	National Center for Atmospheric Research, Interim Director, Advanced Study Program
2010–2014	National Center for Atmospheric Research, Director, Mesoscale and Microscale Meteorology
2009–2010	National Center for Atmospheric Research, Interim Director, Mesoscale and Microscale Meteorology
1999–2009	National Center for Atmospheric Research, Assistant Director, Mesoscale and Microscale Meteorology
1989–	National Center for Atmospheric Research, Senior Scientist
1985	Massachusetts Institute of Technology, Visiting Associate Professor
1983–1989	National Center for Atmospheric Research, Scientist III
1980–1983	National Center for Atmospheric Research, Scientist II
1978–1979	Cooperative Institute for Research in Environmental Sciences, University of Colorado, Research Associate
1977–1978	Cooperative Institute for Research in Environmental Sciences, University of Colorado, Visiting Fellow
1976–1977	National Center for Atmospheric Research, Advanced Study Program, Postdoctoral Fellow

AWARDS AND HONORS

2023	National Academy of Sciences (election to)
2022	Graduate Students' Distinguished Lecture (Penn State, Meteor. and Atmos. Sci.)
2019	Cess Symposium Distinguished Speaker (Stony Brook University)
2018	Lifetime Achievement Award, Severe Local Storms Research (AMS)
2017	Carl-Gustaf Rossby Research Medal (AMS)
2016	PhD Student Distinguished Visitor (University of Reading, UK)
2014	Distinguished Visiting Lecturer (University of Washington)
2010	Banner I. Miller Award (with G. H. Bryan) (AMS)
2004	Jule G. Charney Award (AMS)
2003	Harris Lecture (Texas A&M)
2001	Gal-Chen Memorial Lecture (University of Oklahoma)
1994	Fellow of the American Meteorological Society (AMS)
1991	Banner I. Miller Award (with K. Emanuel) (AMS)
1983	Ted Fujita Award for Best Graphics (with J. Klemp) 13th Conference on Severe Local Storms (AMS)

PROFESSIONAL ACTIVITIES

2023	Summer School “The Challenge of Precipitation Prediction”, Castro Marina, Italy (Lecturer)
2019–2021	American Meteorological Society Awards Committee
2018	Summer School “Precipitation: Remote Sensing and Modelling”, Castro Marina, Italy (Lecturer)
2016	Summer School “Advances in Severe Weather Analysis: Models and Observations”, Castro Marina, Italy (Lecturer)
2014–2015	Natural Sciences and Engineering Research Council of Canada
2012	Summer School “Severe Convective Weather: Theory and Observations”, Castro Marina, Italy (Lecturer)
2009–	Nanjing University Adjunct Professor
2008–2011	Hydrological Processes in the Mediterranean Experiment (HyMeX), Scientific Steering Committee
2007	ModObs Summer School on Air-Sea Interaction, Castro Marina, Italy (Lecturer)
2005–2007	American Meteorological Society Awards Committee
2005	Summer School “From Microscale to Mesoscale”, Castro Marina, Italy (Lecturer)
2005	Hurricane Intensity Research Working Group (NOAA)
2004–	North Carolina State University Adjunct Professor
2002–2005–	Summer School on Mountain Meteorology, Trento, Italy (Coordinator and Lecturer)
2002–2003	The Hemispheric Observing System Research and Predictability Experiment (THORPEX) Scientific Steering Committee
2002	Gran Combin Summer School, Valle d’Aosta, Italy (Lecturer)
2000–2005	Mesoscale Alpine Programme (MAP) Scientific Steering Committee
1999–2001	<i>Quarterly Journal of the Royal Meteorological Society</i> Associate Editor
1998–2001	U.S. Weather Research Program (USWRP) Scientific Steering Committee
1991	Chairman, National Academy of Science Panel on Coastal Meteorology
1990–1993	AMS Committee on Mesoscale Processes
1991–1997	<i>Monthly Weather Review</i> Associate Editor
1986–1991	<i>Monthly Weather Review</i> Co-Chief Editor
1986–1991	AMS Publications Commission
1985–1988	Cooperative Institute for Mesoscale Meteorological Studies (CIMMS) Advisory Committee
1984	Department of Mathematics, Monash University, Australia (Guest Lecturer, February)
1983–1986	AMS Committee on Severe Local Storms
1981–1982	International Conference on Computational Methods and Experimental Measurements Advisory Committee
1981	Department of Mathematics, Monash University, Australia (Guest Lecturer, May–June)
1980–1983	AMS Committee on Atmospheric and Oceanic Waves and Stability

PUBLICATIONS

- Rotunno, R., C. Snyder and F. Judd, 2023: Upscale versus up-amplitude growth of forecast-error spectra. *J. Atmos. Sci.*, **80**, p. 63-71, <https://doi.org/10.1175/JAS-D-22-0070.1>
- Miglietta, M. M., F. Buscemi, S. Dafis, A. Papa, A. Tiesi, D. Conte, S. Davolio, E. Flaounas, V. Levizzani and R. Rotunno, 2023: A high-impact meso-beta vortex in the Adriatic Sea. *Q. J. Roy. Meteor. Soc.*, **149**, p. 637-656, <https://doi.org/10.1002/qj.4432>
- Fu, S., R. Rotunno and H. Xue, 2022: Convective updrafts near sea-breeze fronts. *Atmos. Chem. Phys.* **22**, p. 7727-7738, <https://doi.org/10.5194/acp-22-7727-2022>
- Rotunno, R., 2022: Supergradient winds in simulated tropical cyclones. *J. Atmos. Sci.*, **79**, p. 2075-2086, <https://doi.org/10.1175/JAS-D-21-0306.1>
- Kieu, D. and R. Rotunno, 2022: Characteristics of tropical-cyclone turbulence and intensity predictability. *Geophysical Research Letters*, **49**, e2021GL096544. <https://doi.org/10.1029/2021GL096544>
- Fu, S., R. Rotunno, J. Chen, X. Deng and H. Xue, 2021: A large-eddy simulation study of deep-convection initiation through the collision of two sea-breeze fronts. *Atmos. Chem. Phys.*, **21**, p. 9289-9308. <https://doi.org/10.5194/acp-2021-9>
- Miglietta, M. M., D. Carnevale, V. Levizzani and R. Rotunno, 2020: Role of moist and dry air advection in the development of Mediterranean tropical-like cyclones (medicane). *Q. J. R. Meteorol. Soc.*, **147**, p. 876-899. doi-[org.cuucar.idm.oclc.org/10.1002/qj.3951](https://doi.org/10.1002/qj.3951)
- Rousseau-Rizzi, R., R. Rotunno and G. H. Bryan, 2020: Steady State Tropical Cyclones in Axisymmetric Models, *J. Atmos. Sci.*, <https://doi.org/10.1175/JAS-D-20-0140.1>. Published Online: 07 Dec 2020
- Demirdjian, R., R. Rotunno, B. Cornuelle, C. A. Reynolds and J. D. Doyle, 2020: The Circulation Response of a Two-Dimensional Frontogenetic Model to Optimized Moisture Perturbations, *J. Atmos. Sci.*, DOI: <https://doi.org/10.1175/JAS-D-20-0102.1> Published Online: 09 Nov 2020.
- Kieu, C., R. Rotunno and Q. Wang, 2020: Frictionally Induced Feedback in a Reduced Dynamical Model of Tropical Cyclone Intensification, *J. Atmos. Sci.*, **77**, 3821 - 3831. DOI: <https://doi.org/10.1175/JAS-D-20-0092.1>
- Nystrom, R. G., R. Rotunno, C. A. Davis and F. Zhang, 2020: Consistent impacts of surface enthalpy and drag coefficient uncertainty between an analytical model and simulated tropical cyclone maximum intensity and storm structure, *J. Atmos. Sci.*, **77**, 3059 - 3080. <https://doi.org/10.1175/JAS-D-19-0357.1>
- Tao, D., R. Rotunno and M. Bell, 2020: Lilly's Model for Steady-State Tropical Cyclone Intensity and Structure, *J. Atmos. Sci.*, **77**, 1 - 51. DOI: [10.1175/JAS-D-20-0057.1](https://doi.org/10.1175/JAS-D-20-0057.1)
- Tao, D., M. Bell, R. Rotunno and P. J. van Leeuwen, 2020: Why Do the Maximum Intensities in Modeled Tropical Cyclones Vary Under the Same Environmental Conditions? *Geophysical Research Letters*. <https://doi.org/10.1029/2019GL085980>
- Rotunno, R. and G. H. Bryan, 2019: Numerical simulations of two-layer flow past topography. Part II: Lee vortices. *J. Atmos. Sci.*, **77**, 965-980.
- Fu, S., R. Rotunno and H. Xue, 2019: Response of orographic precipitation to low-level subsaturated layers. *J. Atmos. Sci.*, **76**, 3753-3771.

- Du, Y., R. Rotunno and F. Zhang, 2019: Impact of vertical wind shear on gravity wave propagation in the land-sea breeze circulation at the equator. *J. Atmos. Sci.*, **76**, 3247–3265.
- Tao, D., K. Emanuel, F. Zhang, R. Rotunno, M. M. Bell and R. G. Nystrom, 2019: Evaluation of the assumptions in the steady-state tropical cyclone self-stratified outflow using three-dimensional convection-allowing simulations. *J. Atmos. Sci.*, **76**, 2995–3009.
- Miglietta, M. M. and R. Rotunno, 2019: Development mechanisms for Mediterranean tropical-like cyclones (medicanes). *Q. J. Roy. Met. Soc.* <https://doi-org.cuucar.idm.oclc.org/10.1002/qj.3503>
- Peng, K., R. Rotunno, G. H. Bryan and J. Fang, 2019: Evolution of an Axisymmetric Tropical Cyclone before Reaching Slantwise Moist Neutrality. *J. Atmos. Sci.*, **76**, 1865–1884.
- Rotunno, R., G. S. Romine and H. B. Bluestein, 2018: A simple model for the anomalous counterclockwise turning of the surface wind with time over the Great Plains of the United States. *J. Atmos. Sci.*, **75**, 2971–2981.
- Peng, K., R. Rotunno and G. H. Bryan, 2018: Evaluation of a time-dependent model for the intensification of tropical cyclones. *J. Atmos. Sci.*, **75**, 2125–2138.
- Du, Y. and R. Rotunno, 2018: Diurnal cycle of rainfall and winds near the south coast of China. *J. Atmos. Sci.*, **75**, 2065–2082.
- Rotunno, R. and G. H. Bryan, 2018: Numerical Simulations of two-layer flow past topography. Part I: The leeside hydraulic jump. *J. Atmos. Sci.*, **75**, 1231–1241.
- Bluestein, H. B., G. S. Romine, R. Rotunno, D. W. Reif and C. C. Weiss, 2018: On the anomalous counterclockwise turning of the surface wind with time in the Plains of the United States. *Mon. Wea. Rev.*, **146**, 467–484.
- Miglietta, M. M., J. Mazon and R. Rotunno, 2017: Numerical simulations of a tornadic supercell over the Mediterranean. *Wea. Forecasting*, **32**, 1209–1226.
- Pichelli, E., R. Rotunno and R. Ferretti, 2017: Effects of the Alps and Apennines on forecasts for Po Valley convection in two HyMeX cases. *Q. J. R. Meteorol. Soc.* doi:10.1002/qj.2872.
- Bryan, G. H., N. A. Dahl, D. S. Nolan and R. Rotunno, 2017: An eddy injection method for large-eddy simulations of tornado-like vortices. *Mon. Wea. Rev.*, **145**, 1937–1961.
- Rotunno, R., P. M. Markowski and G. H. Bryan, 2017: Near-ground vertical vorticity in supercell thunderstorm models. *J. Atmos. Sci.*, **74**, 1757–1766.
- Nolan, D. S., G. H. Bryan, N. A. Dahl and R. Rotunno, 2017: Tornado vortex structure, intensity, and surface wind gusts in large-eddy simulations with fully developed turbulence. *J. Atmos. Sci.*, **74**, 1573–1597.
- Sun, Y. Q., R. Rotunno and F. Zhang, 2017: Contributions of moist convection and internal gravity waves to building the atmospheric $-5/3$ kinetic energy spectra. *J. Atmos. Sci.*, **74**, 185–201.
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- Rotunno, R., G. H. Bryan, D. S. Nolan and N. A. Dahl, 2016: Axisymmetric tornado simulations at high Reynolds number. *J. Atmos. Sci.*, **73**, 3843–3854.
- Rotunno, R. and M. Lehner, 2016: Two-layer stratified flow over a valley. *J. Atmos. Sci.*, **73**, 4065–4076.
- Miglietta, M. M., A. Manzato and R. Rotunno, 2016: Characteristics and predictability of a supercell during HyMeX SOP1. *Q. J. R. Meteorol. Soc.*, DOI:10.1002/qj.2872.
- Miglietta, M. M. and R. Rotunno, 2015: An EF3 multi-vortex tornado over the Ionian region: is it time for a dedicated warning system over Italy? *Bull. Amer. Met. Soc.*, **97**, 337–344.
- Du, Y. and R. Rotunno, 2015: Thermally driven diurnally periodic wind signals off the east coast of China. *J. Atmos. Sci.*, **72**, 2806–2821.
- Du, Y., R. Rotunno and Q. Zhong, 2015: Analysis of WRF-simulated diurnal boundary layer winds in eastern China using a simple 1D model. *J. Atmos. Sci.*, **72**, 714–727.
- Rotunno, R., 2014: Secondary circulations in rotating-flow boundary layers. *Aust. Met. Ocean. J.*, **6**, 27–35.
- Du, Y. and R. Rotunno, 2014: A simple analytical model of the nocturnal low-level jet over the Great Plains of the United States. *J. Atmos. Sci.*, **71**, 3674–3683.
- Miglietta, M. M. and R. Rotunno, 2014: Numerical simulations of sheared conditionally unstable flows over a mountain ridge. *J. Atmos. Sci.*, **71**, 1747–1762.
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- Bryan, G. H. and R. Rotunno, 2013: The optimal state for gravity currents in shear. *J. Atmos. Sci.*, **71**, 448–468.
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- Miglietta, M. M., and R. Rotunno, 2012: Application of theory to simulations of observed cases of orographically forced convective rainfall. *Mon. Wea. Rev.*, **140**, 3039–3053.
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- Emanuel, K. and R. Rotunno, 2011: Self-stratification of tropical cyclone outflow. Part I: Implications for storm structure. *J. Atmos. Sci.*, **68**, 2236–2249.
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- Schmidli, J. and R. Rotunno, 2011: Influence of the valley surroundings on valley wind dynamics. *J. Atmos. Sci.*, **69**, 561–577.
- Drobinski, P., Rotunno, R. and T. Dubos, 2011: Linear theory of the sea breeze in a thermal wind. *Q. J. Roy. Met. Soc.*, **137**, 1602–1609.
- Rotunno, R., J. B. Klemp, G. H. Bryan and D. J. Muraki, 2010: Models of non-Boussinesq lock-exchange flow. *J. Fluid Mech.*, **675**, 1–26.
- Miglietta, M. M., and R. Rotunno, 2010: Numerical simulations of low-CAPE flows over a mountain ridge. *J. Atmos. Sci.*, **67**, 2391–2401.
- Schmidli, J. and R. Rotunno, 2010: Mechanisms of along-valley winds and heat exchange over mountainous terrain. *J. Atmos. Sci.*, **67**, 3033–3047.
- Rotunno, R., Y. Chen, W. Wang, C. Davis, J. Dudhia, and G. Holland, 2009: Large-eddy simulation of an idealized tropical cyclone. *Bull. Amer. Met. Soc.*, **90**, 1783–1788.
- Bryan, G. H., and R. Rotunno, 2009: The maximum intensity of tropical cyclones in axisymmetric model simulations. *Mon. Wea. Rev.*, **137**, 1770–1789.
- Bryan, G. H., and R. Rotunno, 2009: An evaluation of an analytic model for the maximum intensity of tropical cyclones. *J. Atmos. Sci.*, **66**, 3042–3060.
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- Miglietta, M. M., and R. Rotunno, 2009: Numerical simulations of conditionally unstable flows over a mountain ridge. *J. Atmos. Sci.*, **66**, 1865–1885.
- Davolio S., M. M. Miglietta, A. Moscatello, F. Pacifico, A. Buzzi, and R. Rotunno, 2009: Numerical forecast and analysis of a tropical-like cyclone in the Ionian Sea. *Nat. Hazard Earth Syst. Sc.*, **9**, 551–562.
- Miglietta, M. M., A. Moscatello, and R. Rotunno, 2008: Analisi di un mesociclone tropicale sulla Puglia. *Rivista di Meteorologia Aeronautica*, **4**, 22–28.
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- Bryan, G. H., and R. Rotunno, 2008: The influence of near-surface, high-entropy air in hurricane eyes on hurricane intensity. *J. Atmos. Sci.*, **66**, 148–158.
- Reeves, H. D. and R. Rotunno, 2008: Orographic flow response to variations in upstream humidity. *J. Atmos. Sci.*, **65**, 3557–3570.

- Miglietta, M. M., S. Davolio, A. Moscatello, F. Pacifico and R. Rotunno, 2008: The role of surface fluxes in the development of a tropical-like cyclone in southern Italy. *Adv. Sci. Res.*, **2**, 35-39.
- Moscatello, A., M.M. Miglietta and R. Rotunno, 2008: Numerical analysis of a Mediterranean "hurricane" over south-eastern Italy. *Mon. Wea. Rev.*, **136**, 4373-4397.
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- Bryan, G. H., Rotunno, R., 2008: Gravity currents in a deep anelastic atmosphere. *J. Atmos. Sci.*, **65**, 536-556.
- Reeves, H. D., Y.-L. Lin and R. Rotunno, 2007: Dynamic forcing and mesoscale variability of heavy precipitation events over the Sierra Nevada mountains. *Mon. Wea. Rev.*, **136**, 62-77.
- Kirshbaum, D. J., R. Rotunno, and G. H. Bryan, 2007: The spacing of orographic rainbands triggered by small-scale topography. *J. Atmos. Sci.*, **64**, 4222-4245.
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- Zhang, F., N. Bei, R. Rotunno, C. Snyder and C. C. Epifanio, 2007: Mesoscale predictability of moist baroclinic waves: Cloud-resolving experiments and multistage error growth dynamics. *J. Atmos. Sci.*, **64**, 3579-3594.
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- Skamarock, W. C., R. Rotunno and J. B. Klemp, 2002: Catalina eddies and coastally trapped disturbances. *J. Atmos. Sci.*, **59**, 2270-2278.
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