

Mark A. Miller

Environmental Sciences Department / Rutgers University
14 College Farm Road
New Brunswick, New Jersey 08901-8551
(848) 932-5747 (office); (516) 982-5074 (mobile); 732-932-8644 (fax);
m.miller@envsci.rutgers.edu

Present

- 2015- **Director, Institute for Earth, Ocean and Atmospheric Science, Rutgers University**
- 2015- **Eastern North Atlantic ARM Facility Site Science Team**
- 2014- **Professor of Atmospheric Science, Rutgers University**
- 2012- **Associate Editor, Journal of Climate and Applied Meteorology**
-Specialization: Remote Sensing, Cloud and Radiation Physics
- 2012- **Director, NJ Department of Environment Protection Photochemical Assessment Monitoring Station (PAMS) at Rutgers University**
-Responsibility for Meteorological Monitoring systems

Education

- 1994-1996 **DOE Global Change Post-Doctoral Fellowship, Brookhaven National Laboratory**
- 1994 **Ph.D. Meteorology: The Pennsylvania State University**
- Surface-Based Remote Sensing of Marine Boundary-Layer Clouds
- 1986 **M.S. Meteorology: The Pennsylvania State University**
- Thesis: Aerosol Generation in the Marine Boundary Layer
- 1982 **The Ohio University**
-B.S. Pre-Meteorology / Physics

Awards

- 2013 Research Excellence Award, Rutgers School of Environment and Biological Sciences
- 2009 US Department of Energy Agency Award
- 2006-7 ARM Science Team Poster Design Award
- 2002 Research Program Development Award, Brookhaven National Laboratory
- 1988 Väisälä Quality Certificate (instrumental scientific support)
- 1984 President, Chi Epsilon Pi Meteorology National Honor Society (PSU Chapter)
- 1983 Hans Neuberger Teaching Award, PSU Department of Meteorology

Research Objectives

A primary objective of my research is to gain deeper understanding of the basic physical mechanisms that regulate cloud development and maintenance, and to place these mechanisms in the context of the solar and infrared radiation streams that comprise the

Earth's radiation budget. These are among the most challenging research questions in the field of Atmospheric Science and they are inextricably intertwined with future climate prediction. A second objective of my research is to advance the technologies that are used to measure cloud and atmospheric structure and to develop, analyze, and promote new climate-change adaptation technologies such as renewable energy.

Teaching (past five years)

Physical Meteorology (3 credits); junior/senior undergraduate (average instructor effect:4.77/5.00 [3 semesters])

Remote Sensing of Oceans and Atmospheres (3 credits): junior/senior/graduate (average instructor effect:4.65/5.00 undergraduate [5 semesters]; 4.86/5.00 graduate*)

Atmospheric Physics; graduate (average instructor effect:4.79/5.00 [2 semesters])

Atmospheric Thermodynamics (3 credits); junior/senior undergraduate (average instructor effect: 4.56/5.00)

Seminar in Atmospheric Science; (average instructor effect: 4.81/5.00)

Portals to Academic Study Success; freshmen on academic probation (average instructor effect: 4.89/5.00)

Grants (2008-2015)

- US Department of Energy, 610 K (2015-2019)
- US Department of Energy, 2.29 M (2008-2015)
 - Atmospheric Systems Research Program Mobile Facility Site Science
- New Jersey Department of Environmental Protection, 148 K (2012-2015)
 - Photochemical Assessment Monitoring Site Meteorological Observations

Graduate Student and Professional Staff Supervision

Graduated:

Allison Marquardt Collow – Ph.D. (2015) - An Analysis of the Radiation Budget in Two Tropical Continental Atmospheric Columns

David Langer – M.S. (2015) – non-thesis essay: An Analysis of Hadley Cell Polar Extent Indicators Derived from Radiosonde Data

Preethi Ganapathy - M.S. (2012) – non-thesis essay: Simulating 3-D Clouds and Radiation

Greg Lehenbauer - M.S. (1997) – thesis: Using the WSR-88D to Determine Cloud Heights and Fractional Coverage (Primary supervision for University of Kansas – completed in absentia)

Post-Doctoral Students (All) and Professional Staff Supervised (Rutgers only):

Dr. Virendra Ghate, Research Faculty, Department of Environmental Sciences (2010-2013); acquired first independent grant in 2012 and second in 2013

Dr. Byung-Gon Kim, (Co-mentor); Post-doctoral student; Brookhaven National Laboratory (2001-2002)

Dr. Kirstie Stramler- Post-doctoral student; Brookhaven National Laboratory (2006)

Dr. Bryan Raney - Research Associate (partial supervision)

Lu Wang, M.S., Matt Drews B.S., Robert Zahn B.S. - Research Support (hourly)

Current Graduate Students:

Lynne Trabachino - Ph.D. (post-qualifier, expected 2015 grad)

Zhongyu Kuang - Ph.D. (post-qualifier, expected 2016 grad)

Jenny Kafka - Ph.D. (post qualifier, expected 2016 grad)

Matt Drews – M.S. (expected 2017 grad)

Graduate Committees:

Zhiren Wang – Ph.D. (completed 2013)

Natasha Hodas – Ph.D. (completed 2013)

Brian Marmo – M.S. (completed 2013)

Jessie Sagona – Ph.D. (completed 2013)

Ben Kravitz - Ph.D. (completed 2011)

Andy Sandy – Ph.D. (completed 2010)

Brian Cerruti - M.S. (completed 2010)

Craig Anderson- M.S. (completed 2009)

Ph.D. Oral Examination Committees

Jennifer Kafka (Spring 2014), Zhongyu Kuang (Spring 2013), David Langer (Spring 2013), Allison Marquardt (Spring 2012), Lynne DiPretore (Spring 2011), Lili Xia (Spring 2011), Natasha Hodas (Fall 2010), Zhiren Wang (Spring 2010), Michael Erb (Spring 2009), Jessie Sagona (Spring 2009)

Undergraduate Research Projects Supervised

Joseph Slezak (Spring, 2015), Michael Lee (Spring, Summer 2014), David Grace (Summer 2013), Ross Giarratana (Fall 2012), Samantha Motley (Fall 2012), Matthew Drews (Spring 2012), Teresa Sikorski (Spring 2012), Daniel Manzo (Summer 2011), Kelly Ann Cicalese (Summer 2010), Nick Mangieri (Fall 2009), Courtney Tait (Summer 2010), Allison Parker, Nick Mangieri (Spring 2008)

G.H. Cook Undergraduate Honors Advisees:

Jeffrey Deppa (Spring 2011)

Jacob Carlin (Spring 2012; Co-Advisor with V. Ghate)

Chronology of Positions

- 2015- **Director, Institute for Earth, Ocean and Atmospheric Science, Rutgers University**
- 2015- **Eastern North Atlantic ARM Facility Site Science Team**
- 2014- **Professor, Rutgers University**
- 2012- **Director, NJ Department of Environment Protection Photochemical Assessment Monitoring Station (PAMS) at Rutgers University**
-Trace gas and aerosol monitoring
-Wind profiler and tower-based meteorological monitoring
- 2008-2014 **Director, Graduate Program in Atmospheric Science, Rutgers University**
- 2007-2013 **Associate Professor, Rutgers University (Tenure 2007)**
- 2003-2014 **Site Scientist, Atmospheric Radiation Measurement (ARM) Mobile Facility**
- Transportable cloud, aerosol, and climate observatory (www.arm.gov)
- Deployments: Africa, Germany, China, Portuguese Azores, India, USA, Brazil
- 2004-2007 **Associate Chief Scientist, ARM, www.arm.gov**
-DOE climate science program (Annual Budget ~ \$60 M/year)
-Responsibilities included scientific guidance and vision
- 2001-2007 **Leader, Cloud Properties Group, Brookhaven National Laboratory**
-Created group in 1998 and recruited 4 new PI's
-5 PI's, 6 M.S.-level support staff, 2 post-docs (2.5 M/yr. budget)
-Group focus: surface and satellite remote sensor measurements of cloud, aerosol, and radiation interaction
- 2001-2007 **Scientist, Brookhaven National Laboratory**
- 1999-2000 **Associate Scientist, Brookhaven National Laboratory**
- 1997-1998 **Assistant Scientist, Brookhaven National Laboratory**
Adjunct Faculty: Course Instructor, State University of New York (Stony Brook)
-Weather Prediction II (ATM 347), senior level synoptic meteorology
- 1995-1996 **Postdoctoral Fellowship, Brookhaven National Laboratory**
- 1989-1994 **Course Instructor and Research Assistant, The Pennsylvania State University**
-Instructor Oceans (Meteo 22), non-major Physical Oceanography
-Teaching assistant (Meteo 422/522), Advanced Synoptic Meteorology
-Two large field deployments of prototype cloud observing system; FIRE II and ASTEX
- 1987-1988 **Tycho Technology Inc. (subsidiary of Vaisala Inc.), Boulder, Colorado**
-Designed and manufactured UHF and VHF radar systems
-Responsibilities: staff meteorologist, radar product design

- 1984 **Summer Scientific Associate Naval Postgraduate School, Monterey, California**
 --Marine aerosol research
- 1982-1986 **Course Instructor and Research Assistant, The Pennsylvania State University**
 -Site Manager (1985): Cross-Appalachian Tracer Experiment
 -Instructor Meteorology 3, Non-Major Meteorology (over 1000 students during period)
 -Instructor Meteorology 3 Laboratory (1982)

Peer-Reviewed Publications

- [56] Ghate, V.P., **M.A. Miller**, and B.A. Albrecht, 2015: Similarities and Differences between Cumulus Topped Marine Boundary Layers, *Monthly Weather Review* (submitted).
- [55] Moustafa, S.E., A.K. Rennermalm, L.C. Smith, **M.A. Miller**, and J.R. Mioduszewski, 2014: Bimodal albedo distributions in the ablation zone of southwest Greenland's ice sheet, *The Cryosphere*, (submitted).
- [54] Collow, A.M., V.P. Ghate, **M.A. Miller**, and L. Trabachino, 2014: A one-year study of the diurnal cycle of meteorology, clouds, and radiation in the West African Sahel region, *Quart. J. Royal Met. Soc.* (submitted)
- [53] Berg, L.K., J.D. Fast, J.C. Barnard, **M.A. Miller**, and co-authors, 2014: The two column aerosol project: phase I overview and impact of elevated aerosol layers on aerosol optical depth, *Bull. Amer. Met Soc.* (in revision)
- [52] **Miller, M.A.**, K. Nitschke, T.P. Ackerman, W. Ferrell, N. Hickmon, M.Ivey, 2014: The Atmospheric Radiation Measurement Mobile Facility, *Chapter, AMS Monograph, The first 20 years of ARM* (in press)
- [51] Ghate, V.P., **M.A. Miller**, B.A. Albrecht, and C.W. Fairall, 2014: Thermodynamic and radiative structure of stratocumulus-topped boundary layers, *J. Atmos. Sci.*, **72**, 430-451.
- [50] Wood, R., M. Wyant, C. Bretherton, **M.A. Miller** and co-authors, 2014: Clouds, aerosol, and precipitation in the marine boundary layer: an ARM Mobile Facility Deployment, *Bull. Amer. Met Soc.*, (in press) ,doi:10.1175/BAMS-D-13-00180.1
- [49] Ghate, V.P, B.A. Albrecht, **M.A. Miller**, A. Brewer, and C.W. Fairall, 2014: Turbulence and Radiation in Stratocumulus Topped Marine Boundary Layer: A Case Study from VOCALS-Rex, *J. Appl. Meteor. Climatol.*, **53** (1), 117-135. doi:10.1175/JAMC-D-12-0225.1

- [48] Kravitz, B., A. Robock, D.T. Shindell, and **M.A. Miller**, 2012, Sensitivity of stratospheric geoengineering with black carbon to aerosol size and altitude of injection, *J. Geophys. Res.*, **117**, D09203, doi:10.1029/2011JD017341.
- [47] **Miller, M.A.**, V.P. Ghate, R. Zahn, 2012, The radiation budget of the West African Sahel and its controls: a perspective from observations and global climate models, *J. Climate*, **25**, DOI: 10.1175/JCLI-D-11-00072.1.
- [46] Kim, Y.G., B.G. Kim, **M.A. Miller**, Q. Min, and C.K. Song, 2012, Enhanced aerosol-cloud relationships in more stable adiabatic clouds, *Asia-Pacific J. Atmos. Sci.*, **48**, 283-293, doi: 10.1007/s13143-012-0028-0.
- [45] Ghate, V.P., **M.A. Miller**, L. DiPretore, 2011, Vertical velocity structure of marine boundary layer trade wind cumulus clouds, *J. Geophys. Res.* **116**, D16206, doi:10.1029/2010JD015344.
- [44] Ching, J., N. Riemer, M. Dunn, and **M.A. Miller**, 2010, In-cloud turbulence structure of marine stratocumulus, *Geophys. Res. Lett.*, doi:10.1029/2010GL045033.
- [43] Kollias, P., **M.A. Miller**, K. Johnson, M. Jensen, and D. Troyan, 2009: Cloud, thermodynamic, and precipitation observations in West Africa during 2006, *J. Geophys. Res.*, **114**, D00E08, doi:10.1029/2008JD010641.
- [42] McComiskey, A., G. Feingold, S. Frisch, D. Turner, **M.A. Miller**, and J. Ogren, 2009: An assessment of aerosol-cloud interactions in marine stratus clouds based on surface remote sensing, *J. Geophys. Res.*, **114**, D09203, doi:10.1029/2008JD011006.
- [41] Williams, E., N. Nathou, E. Hicks, C. Pontikis, B. Russell, **M.A. Miller**, and M.J. Bartholomew, 2009: The electrification of dust-lifting gust fronts ('Haboobs') in the Sahel, *Atmospheric Research*, **91**, 292-298.
- [40] Slingo, A., N.A. Bharmal, G.J. Robinson, J.J. Settle, R.P. Allan, H.E. White, P.J. Lamb, M.A. Lele, D.D. Turner, S. McFarlane, E. Kassianov, J. Barnard, C. Flynn, and **M. A Miller**, 2008: Overview of observations from the RADAGAST experiment in Niamey, Niger. Part 1: meteorology and thermodynamic variables. *J. Geophys. Res.*, **113**, doi: 10.1029/2008JD009909.
- [39] Wulfmeyer, V., A. Behrendt, H-S., Bauer, **M.A. Miller** and co-authors, 2008: The convective and orographically-induced precipitation study. *Bull. Amer. Met Soc.*, **89**, 1477-1486.
- [38] Kim, B.G., **M.A. Miller**, S.E. Schwartz, Y. Liu, and Q. Min, 2008: The role of adiabaticity in the aerosol first indirect effect, *J. Geophys. Res.*, **113**, D05210, doi:10.1029/2007JD008961.

- [37] Liu, Y. B. Geerts, **M.A. Miller**, P.H. Daum, and R. McGraw, 2008: Threshold radar reflectivity for drizzling clouds, *Geophys. Res. Lett.*, 35, L03807, doi:10.1029/2007GL031201.
- [36] Pinker, R.T., D. Sun, **M.A. Miller**, and G.J. Robinson, 2007: Diurnal cycle of land surface temperature in a desert encroachment zone as observed from satellites, *Geo. Res. Lett.* 34, L11809, doi:10.1029/2007GL030186.
- [35] **Miller, M.A.** and A. Slingo, 2007: The Atmospheric Radiation Measurement (ARM) Mobile Facility (AMF) and its first international deployment: measuring radiative flux divergence in West Africa, *Bull. Amer. Met Soc.*, Bulletin of the American Meteorological Society, 88, 1229-1244.
- [34] Kollias, P., E.E. Clothiaux, **M.A. Miller**, B.A. Albrecht, G.L. Stephens, and T.P. Ackerman, 2007: Millimeter-Wavelength Radars-New Frontier in Atmospheric Cloud Research, *Bull. Amer. Met Soc.*, 88, 1608-1624.
- [33] Liu, Y, P.H. Daum, R. McGraw, **M.A. Miller**, and S. Niu, 2006: Theoretical expression for the autoconversion rate of the cloud droplet number concentration, *Geo. Res. Lett.*, L16821, doi:10.1029/2007GL030389.
- [32] Slingo, A., T.P. Ackerman, R.P. Allan, E.I. Kassianov, S.A. McFarlane, G.J. Robinson, J.C. Barnard, **M.A. Miller**, J.E. Harries, J.E. Russell, and S. Dewitte, 2006, Observations of the impact of a major Saharan dust storm on the Earth's radiation balance, *Geo. Res. Lett.*, 10.1029/2006GL027869.
- [31] Mather, J.H., S.A. McFarlane, **M.A. Miller**, and K.L. Johnson, 2006: Cloud properties and associated heating rates in the Tropical Western Pacific, *J. Geophys. Res.*, 112, doi:10.1029/2006JD007555.
- [30] Kollias, P., E.E. Clothiaux, **M. A. Miller**, E. Luke, K.L. Johnson, K.P. Moran, K.P. Widener, and B.A. Albrecht, 2006: The Atmospheric Measurement Program cloud profiling radars: second generation sampling strategies, processing, and cloud data products, *J. Atmos. Ocean. Tech.*, 24, 1199-1214.
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- [27] Turner, D., A. Vogelmann, **M.A. Miller** and coauthors, 2006: Optically thin liquid water clouds: their importance and our challenge, *Bull. Amer. Met Soc.*, 88, 177–190.
- [26] Xie, S., Zhang, M.A., Branson, M., Cederwall, R.T., Del Genio, A.D., Eitzen, E.A., Ghan, S.J., Iacobellis, S.F., Johnson, K.L., Khairoutdinov, M., Klein, S.A., Kreuger, S.K., Wuyin, L., Lohmann, U., **M.A. Miller** and coauthors, 2005: Simulations of midlatitude frontal clouds by SCMs and CRMs during the March 2000 IOP, *J. Geophys. Res.*, 110, D15S03, doi:10.1029/2004JD005119.
- [25] **Miller, M.A.**, K. Knobelspiesse, R. Frouin, M.J. Bartholomew, R.M. Reynolds, C. Pietras, G. Fargion, P. Quinn, and F. Thieuleux, 2005: Analysis of shipboard aerosol optical thickness measurements from multiple sun photometers aboard the R/V Ronald H. Brown during ACE-Asia, *Applied Optics*, 44, 3805-3819.
- [24] Kollias, P., E.E. Clothiaux, B.A. Albrecht, **M.A. Miller**, K.P. Moran, and K.L. Johnson, 2004: The atmospheric radiation measurement program cloud profiling radars: an evaluation of signal processing and sampling strategies, *J. Atmos. Ocean. Tech.*, 22, 930-947.
- [23] Benkovitz, C.M., S.E. Schwartz, M. P. Jensen, **M. A. Miller**, R. C. Easter and T.S. Bates, 2004: Modeling atmospheric sulfur over the Northern Hemisphere during the Aerosol Characterization Experiment 2 experimental period. *J. Geophys. Res.*, 109, D22207, doi:10.1029/2004JD004939.
- [22] Diner, D.J., T.P. Ackerman, T.L. Anderson, J. Bösenberg, A.J. Braverman, R.J. Charlson, W.D. Collins, R. Davies, B.N. Holben, C. A. Hostetler, R.A. Kahn, J.V. Martonchik, R. Menzies, **M.A. Miller**, and coauthors, 2004: Progressive aerosol retrieval and assimilation global observing network (PARAGON): and integrated approach for characterizing aerosol climatic and environmental interactions, *Bull. Amer. Met Soc.*, 85, 1491–1501.
- [21] Kahn, R.A., J. Ogren, T.P. Ackerman, J. Bösenberg, R.J. Charlson, D.J. Diner, B.N. Holben, **M.A. Miller**, R.T. Menzies, and J.H. Seinfeld, 2004: Aerosol data sources and their roles within PARAGON, *Bull. Amer. Met Soc.*, 85, 1511-1522.
- [20] Diner, D.J., R.T. Menzies, R.A. Kahn, T.L. Anderson, J. Bösenberg, R.J. Charlson, B.N. Holben, C.A. Hostetler, **M.A. Miller**, and coauthors, 2004: Using the PARAGON framework to establish an accurate, consistent, and cohesive long-term aerosol record, *Bull. Amer. Met Soc.*, 85, 1535-1548.
- [19] Halthore, R.N., **M.A. Miller**, J. Ogren, P. Sheridan, D. Slater, and T. Stoffel, 2004: Further developments in closure experiments for surface diffuse irradiance under cloud-free skies at a continental site. *Geophys. Res. Lett.*, 31, L07111.

- [18] Knobelspiesse, K.D., C. Pietras, G.S. Fargion, M. Wang, R. Frouin, **M.A. Miller**, A. Subramaniam and W.M. Balch, 2003: Maritime aerosol optical properties measured by handheld sun photometers. *Remote Sen. of Env.*, 93, 87-106.
- [17] Miller, N.L., A.W. King, **M.A. Miller**, and coauthors, 2004: The DOE Water Cycle Pilot Study, *Bull. Amer. Met Soc.*, 86, 359-374.
- [16] **Miller, M.A.**, M.J. Bartholomew, and R.M. Reynolds, 2004: The accuracy of marine shadow-band measurements of aerosol optical thickness and Angstrom exponent. *J. Atmos. Ocean. Tech.*, 21, 397-409.
- [15] Kim, B.G., S.E. Schwartz, **M.A. Miller**, and Q. Min, 2003: Effective radius of cloud droplets by ground-based remote sensing: relationship to aerosol. *J. Geophys. Research*, 108(D23), 4740-4758.
- [14] Benkovitz, C.A., **M.A. Miller**, S.E. Schwartz, O.Kwon, 2001: Dynamical Influences on the Distribution and Loading of SO₂ and Sulfate Over North America, the North Atlantic and Europe in April 1987. *Geophysics, Geochemistry, Geosciences*, Vol. 2, #2000GC000129.
- [13] Porter, J.N., **M.A. Miller**, C. Motell, and C.Pietras, 2001: Use of hand-held sun photometers for measurements of aerosol optical thickness at sea. *J. Atmos. Ocean. Tech.* Vol. 18, pp. 765-774.
- [12] Reynolds, M.R., **M.A. Miller**, and M.J. Bartholomew, 2001: A fast-rotating, spectral shadowband radiometer for marine applications. *J. Atmos. Ocean. Tech.*, Vol. 18, No. 2, pp. 200–214
- [11] Voss, K.J., E.J. Welton, P.K. Quinn, R. Frouin, **M.A. Miller**, and R.M. Reynolds, 2001: Aerosol optical depth measurements during the Aerosols99 experiment, *J. Geophys. Research*, 106, 20811-20820.
- [10] Quinn, P.K., D.J. Coffman, T.S. Bates, T.L. Miller, J.E. Johnson, E.J. Welton, C. Neusüss, **M.A. Miller**, and P. Sheridan: Aerosol Optical Properties during INDOEX 1999, 2001: Means, Variability, and Controlling Factors, *J. Geophys. Research*, 107(D18), 10.1029/2000JD000037, 2002.
- [9] Chin, H.S.N., D.J. Rodriguez, R.T. Cedarwall, C.C. Chuang, A.S. Grossman, J.J. Yio, Q. Fu, **M.A. Miller**, 2000: A microphysical retrieval scheme for continental low-level stratiform clouds: impacts of the sub-adiabatic character on microphysical properties and radiation budgets. *Monthly Weather Review*, Vol. 128, No. 7, pp. 2511–2527.
- [8] Clothiaux, E.E., K.P. Moran, B.E. Martiner, T.P. Ackerman, G.G. Mace, T.Uttal, J. H. Mather, K. Widener, **M.A. Miller**, and D.J. Rodriguez, 1999: The atmospheric

- radiation measurement program cloud radars, part 1: operational modes. *J. Atmos. Ocean. Tech.* Vol. 16, No. 7, pp. 819–827.
- [7] Clothiaux, E.E. T.P. Ackerman, G.G. Mace, K.P Moran, R.T. Marchand, **M.A. Miller**, and B.E. Martner, 1998: Objective determination of cloud heights and radar reflectivities using a combination of active remote sensors at the ARM CART sites. *Journ. Appl. Meteor.* Vol. 39, No. 5, pp. 645–665.
- [6] **Miller, M.A.**, M.P. Jensen, and E.E. Clothiaux, 1998: Diurnal cloud and thermodynamic variations in the stratocumulus transition regime: a case study using in situ and remote sensors. *J. Atmos. Sci.*, **55**, 2294-2310.
- [5] **Miller, M.A.**, J. Verlinde, C. Gilbert, G. Lehenbauer, J. Tongue, E.E Clothiaux, 1998: Detection of non-precipitating clouds with the WSR-88D: a theoretical and experimental survey of capabilities and limitations. *Weather and Forecasting.*, **13**, 1046-1062.
- [4] **Miller, M.A.** and B.A. Albrecht, 1995: Surface-based observations of mesoscale cumulus-stratocumulus interaction during ASTEX. *J. Atmos. Sci.*, **16**, 2809-2826.
- [3] Clothiaux, E.E., **M.A. Miller**, B.A. Albrecht, T.A. Ackerman, J. Verlinde, D.M. Babb, R.M. Peters, and W.J. Syrett, 1995: An evaluation of a 94-GHz radar for remote sensing of cloud properties. *J. Atmos. Ocean. Tech.*, **12**, 201-229.
- [2] Fairall, C.W., J.B. Edson and **M.A. Miller**, 1990: Heat Fluxes, Whitecaps, and Sea Spray. *Surface Waves and Fluxes Vol.1-Current Theory*. edited by G.L. Geernaert and W.J. Plant, Kluwer Academic Publishers, 173-208.
- [1] Borrmann, S.H., K.L. Davidson and **M.A. Miller**, 1987: Aerosol size distributions in the marginal ice zone during the 1983 marginal ice zone experiment. *J. Geophys. Res.*, **92**, 6971-6976.

Presentations Since 2000

- 2014 - The Climate of the West African Sahel: A Perspective from Observations, Global Climate Models, and the Drinking Water Adviser (**invited**, NASA Goddard Institute for Space Studies, May 30, Manhattan, NY)
- 2013 - St/Sc/Cu Cloud Processes Breakout Session, Charter and Overview of Low Cloud Science, ASR Science Team Meeting, Potomac, Maryland, March 21
 - Clouds and Climate: New Strategies to Address Old Questions (**keynote speaker**, 50th Anniversary Meeting of the Korean Meteorological Society, April 18, Seoul, Korea)

- Superstorm Sandy; A Perspective from Ground Zero (**invited**, Experts Forum, Korea Institute of Atmospheric Prediction Systems, April 17, Seoul, Korea)

- 2012
 - Unraveling the Life Cycle of Low Clouds (**invited**, ASR Working Group Meeting, November 1, Rockville, MD (V. Ghate presented)
 - Cloud and Radiative Effects over West Africa using a Top-Down, Bottom-Up Approach (**invited**, Brookhaven National Laboratory, June 5, Upton, NY)

- 2011
 - On the Real and Simulated Life of Photons over the West African Sahel- Rutgers University, November 18
 - Morphology and Dynamics of Non-precipitating Marine Fair Weather Cumulus Clouds, V.P. Ghate and M.A. Miller (**invited**, ASR STM, Miller presented)

- 2010
 - Integrity of Global Climate Model Simulations of the West African Climate
 - Lamont-Doherty Observatory of Columbia University (**invited**)
 - University of Illinois (**invited**)
 - Purdue University (**invited**)

- 2009
 - On the performance of the IPCC and NCAR climate models in West Africa (**invited**), Atmospheric Systems Research (ASR), Cloud Modeling Working Group Meeting, September 29, Boulder, CO.
 - To See or Not to See: Adventures in Visibility (**invited**), Federal Aviation FAA Team Aviation Safety Seminar, May 19, Middletown HS South.
 - Miller, M.A. Controls on the Atmospheric Radiative Divergence Budget in West Africa, 3rd International African Monsoon Multidisciplinary Analysis Conference, July 20-24, Ouagadougou, Burkina Faso, Africa (presentation by P. Lamb)
 - RADAGAST Reprise: new results from West Africa, (**invited**), ARM Science Team Meeting, Louisville, KY, April 2.
 - AMF MBL-CAP Site Selection: Clouds, Aerosol, Precipitation in the Marine Boundary Layer (CAP-MBL) Breakout Session, ARM Science Team Meeting, Louisville, KY, (April 2).
 - An AMF Ancillary Site on Pico Island, Azores:MBL-CAP Breakout Session, ARM Science Team Meeting, Louisville, KY (April 2)
 - Cloud Properties Working Group Meeting: shallow convection as a CPWG initiative, ARM Science Team Meeting, Louisville, KY (April 1)
 - ARM Science and Infrastructure Steering Committee Meeting, ARM Science Team Meeting, Louisville, KY (April 3)

- 2008
 - DOE ARM Cloud Properties Working Group, Landsdowne, VA (November 12-13): A case for shallow convection as an ARM science question; final plenary (November 13).

- American Geophysical Union Spring Meeting, Ft. Lauderdale, FL (May 27-30): The Cloud and Land Surface Interaction Campaign: CLASIC **(May 29, Session H43D, invited)**
- US Consulate, Lisbon Portugal: The US Department of Energy's ARM Mobile Facility: Monitoring Marine Stratocumulus at Graciosa, Azores; US Consulate Staff, (August 5)
- Monmouth Flying Club: "To See or Not to See: Adventures in Visibility"; **(April 19, invited)**.
- ARM Heating Rate Profile Workshop (January 8)-University of Niamey, Niger, Africa: Subject: An ARM Mobile Facility Primer (January 16-17: rescheduled due to travel restriction)
- Cloud and Land-Surface Interaction Campaign (CLASIC) Planning Meeting, Dallas, TX; Overview of CLASIC (February 1)
- NASA Goddard Institute for Space Studies: Subject: Regimes within the First Aerosol Indirect Effect **(February 9, invited)**
- ARM Science Team Meeting: Cloud Droplet Nucleation and Aerosol Indirect Effects (March 26)
- ARM Science Team Meeting: The Cloud and Land-Surface Interaction Campaign (CLASIC) (March 28)
- The ARM Mobile Facility: Cloud and Aerosol Interaction Science Institute of Atmospheric Science, Chinese Academy of Science, Beijing, China **(April 18, invited)**
- Nanjing Institute of Geography and Limnology, Chinese Academy of Science, Nanjing, China: The ARM Mobile Facility: Cloud and Aerosol Interaction Science **(April 20, invited)**
- Lanzhou University, Lanzhou, China: The ARM Mobile Facility: Cloud and Aerosol Interaction Science **(April 23, invited)**
- The Cloud and Land Surface Interaction Campaign (CLASIC): (invited) American Geophysical Union Spring Meeting (May 22-25)
- The Cloud and Land Surface Interaction Campaign (CLASIC), Division Seminar, Brookhaven National Laboratory (early July)
- Greenland as a potential new ARM Site, DOE ARM Futures Meeting, Reston, VA (October 31-November 1)
- Early Results from the Cloud and Land Surface Interaction Campaign (CLASIC), DOE ARM Science Team Executive Committee Meeting, December 17

2006

- Convective Orographic Precipitation Study Organizing Workshop (COPS): The ARM Mobile Facility (invited; presented by Dr. Dave Turner, University of Wisconsin on my behalf)
- African Monsoon Multi-disciplinary Analysis US Workshop: The ARM Mobile Facility in West Africa **(invited)**
- African Monsoon Multi-disciplinary Analysis US Workshop: The Cloud and Land Surface Interaction Campaign **(invited)**
- US Interagency Water Cycle Steering Committee, Washington, D.C., The Cloud and Land Surface Interaction Campaign **(invited)**

- ARM Science Team Meeting, Albuquerque, NM: The ARM Mobile Facility
- 2005 The Hyperspectral Imaging and Sounding of the Environment (HISE) Topical Workshop: Toward Continuously Remotely Sensed Cloud Microphysical Structure for the Calculation of Heating Rate Profiles (**invited**)

 - ARM Science Team Meeting: The Influence of Stability on Cloud Droplet Effective Radius and Determined by Ground-based Remote Sensing (invited)
 - ARM Science Team Meeting: The ARM Mobile Facility (AMF)
 - ACHMED and IRD, West African Meteorological Agencies: The ARM Mobile Facility
- 2004 -NASA Goddard Institute for Space Studies: The ARM Broadband Heating Rate Profile Project (**invited**)

 - BNL Executive Management Invited Lecture: Remote Sensing of Clouds (**invited**)
 - Princeton Geophysical Fluid Dynamics Laboratory: Aerosols over the World's Oceans (**invited**)
 - ARM Cloud Products: GEWEX Cloud Workshop, Reading, England (**invited**)
 - Cloud and Land Surface Interactions: A Proposal for an Intensive Observation Period to the ARM Cloud Properties Working Group: ARM Cloud Properties Working Group Meeting
- 2003 -Active Remote Sensing of Cloud Layers (ARSCL) Statistics: a value-added product, ARM Cloud Properties Working Group

 - ARM Value-Added Cloud Products: ARM Cloud Properties Working Group (annual report)
- 2002 -Brookhaven Lecture: Clouds and Climate through a Soda Straw (invited)

 - Stevens Institute: Aerosols over the World's Oceans (**invited**)
 - Goddard Space Flight Center: Aerosol Optical Thickness and Angstrom Exponent from a Marine Fast-Rotating Shadow-band Radiometer
 - Water cycle variability in a small watershed: a one-month comparison of modeled and measured precipitation over the Southern Great Plains, American Meteorological Society Annual Meeting.
 - ARM Value-Added Cloud Products: ARM Cloud Properties Working Group (annual report)
- 2001 -Development of a Regional Water and Energy Science Program: Laboratory-Directed Research and Development Review Committee

 - ARM Value-Added Cloud Products: ARM Cloud Properties Working Group (annual report)
- 2000 -The DOE Water Cycle Pilot Study: USGCRP Water Cycle Steering Committee Meeting

-ARM Value-Added Cloud Products: Cloud Properties Working Group (annual report)

Community Service

-Journal Reviewer (journals served over the past five years): Journal of Geophysical Research (Atmospheres); Journal of Climate; Journal of the Atmospheric Sciences; Atmospheric Chemistry and Physics, Journal of Applied Meteorology and Climatology, Journal of Oceanic and Atmospheric Technology, Proceedings of the Royal Society, Reviews of Geophysics, Soil Science

- 2015
 - Co-Chair, ASR Low Cloud Science Group (ongoing)
 - ASR Proposal Review Panel, February 18, Rockville, MD
- 2014
 - Co-Chair, ASR Low Cloud Science Group (ongoing)
 - ASR Proposal Review Panel, April 9, Gaithersburg, MD
 - DOE ASR Science and Infrastructure Steering Committee Meeting, March 13-14, Potomac, MD
- 2013
 - Co-Chair, ASR Low Cloud Science Group (ongoing)
 - ASR Proposal Review Panel, July 18, Gaithersburg, MD
 - DOE ASR Science and Infrastructure Steering Committee Meeting, March 21-22
- 2012
 - ASR Proposal Review Panel, May 30, Gaithersburg, MD
 - Two-Column Aerosol Project (TCAP) Opening Ceremony, July 25, Cape Cod National Seashore, North Truro, MA
 - DOE Scientific Focus Area (SFA) Review Pacific Northwest National Laboratory, August 28-30, College Park, MD
 - DOE ASR Science and Infrastructure Steering Committee, August 21, Herndon, VA
- 2011
 - GOAmazon2014 Scientific Workshop, August 26-27, Crystal City, Arlington, VA
 - DOE ASR Science and Infrastructure Steering Committee
 - DOE ASR program Mobile Facility Survey Team Brazilian Consular and site visit, Manaus, Brazil, March 14-18
 - DOE ASR program Mobile Facility Survey Team Cape Cod, MA, April 25
- 2010
 - DOE ASR Science and Infrastructure Steering Committee
 - DOE ARM program Mobile Facility Survey Team Indian Consular and site visit, Nainital, India, February 22-26.
- 2009
 - DOE ARM Science and Infrastructure Steering Committee
- 2008
 - DOE ARM Cloud Modeling Working Group Meeting, Princeton, NJ (11/11-13)
 - DOE ARM program Mobile Facility Survey Team US Consular and site visit, Garciosa and San Miguel, Azores, Portugal, April 8-13.

- DOE ARM Futures Meeting, Reston Virginia, October 21-22, Reston, VA.
- Organizer and Chair: Cloud and Land Surface Interaction Experiment (CLASIC) First Annual Workshop, March 26-27, Norman, Oklahoma (25 participants).
- Co-Chair: Special Session on Radiative Atmospheric Divergence in West Africa; Atmospheric Radiation Measurement Program Science Team Meeting, March 10-14, Norfolk, Virginia.
- Chair: Special Session on AMF Measurements during the Convective Orographic Precipitation Study (COPS); Atmospheric Radiation Measurement Program Science Team Meeting, March 10-14, Norfolk, Virginia.
- Chair: Special Session on Cloud and Land Surface Interaction Experiment (CLASIC); Atmospheric Radiation Measurement Program Science Team Meeting, March 10-14, Norfolk, Virginia.
- ARM Science Team Executive Committee Meeting, March 13-14, Norfolk, Virginia.
- 2007 -DOE ARM Futures Workshop—invited participant, Washington, DC
- Co-Chair, Land Surface Modeling Session, American Geophysical Union, Spring Session, Acapulco, Mexico
- 2004-2007 Principal Investigator: ARM Cloud and Land Surface Interaction Campaign (CLASIC): June 8-30, 2007
- Proposed experiment to examine land-surface cloud feedbacks
- Developed Science Plan
- Multi-agency, multi-platform, budget approximately \$5.5M
- Nine aircraft including NASA ER-2 and Helicopter Observation Platform (Duke University)
- Four land surface super sites
- CIRPAS Rapid Scanning X-Band Radar and NSF CASA Array
- Enhanced radiosonde network
- 2005 Principal Investigator: Marine Stratus Radiation, Aerosol, and Drizzle Experiment
- Won proposal competition for ARM Mobile Facility deployment
- March-September 2005 at Pt. Reyes National Seashore, California
- High quality cloud/aerosol data set collected
- 2003 Co-founded the ARM Broadband Heating Rate Profile Focus Group
- Project to continuously compute atmospheric column absorption with realistic clouds
- 2001-2005 -United States Global Change Research Program Water Cycle Steering Committee
- International Geophysical Observing Strategy: Water Cycle Theme Development
- Commissioned Report: The ARM Atmospheric Emitted Radiance Interferometers
- 2005 -Organizing Committee: Hyperspectral Imaging and Sounding of the Environment

- 2004 -Faculty Search Committee-Marine Sciences Department (SUNY at Stony Brook)
- 2003-present -DOE ARM Science Team Executive Committee
- 2001 -Water Cycle Dynamics and Prediction Program: Science Plan Development Team
- 1998-2003 -Co-Chair, DOE ARM Cloud Properties Working Group (50 members)
- 1997-1999 -Associate Editor: Weather and Forecasting (Remote Sensing-specialty)

Service to Rutgers University

- 2010-2012 - Graduate Excellence Fellowship Committee (Chair, 2012)
- 2010-2012 - Physical and Mathematical Sciences and Engineering Area Committee
- 2008-2011 - University Senator for the School of Biological and Environmental Sciences
- 2008-2010 - Chair, Environmental Science Computer Committee, (2008-2010)
- 2008 -Rutgers Faculty Traveling Seminar, June 2-6, 2008
- 2007 -DES Space Committee

Service to DOE and Brookhaven National Laboratory

- Written contribution to DOE ARM Futures Report: Greenland as a new fixed ARM Site
- Supervised projects that met DOE quarterly metrics required by Office of Management and Budget
- Represented ARM Chief Scientist at DOE Biological and Environmental Research Advisory Committee (BERAC): Climate Focus Scientific oversight committee for DOE's BER Division
- BNL Cloud Properties Group that I led was responsible for 3 of 10 key research findings in past 5-years that were selected by DOE for presentation to BERAC (Co-author on two of these projects)
- Organized multiple ARM Working Group Meetings
- Served on BNL Continuing Scientist Review Committee

Notable Projects and Contributions

- 2007 -Supervised processing of cloud radar data from Pt. Reyes, CA: released to community.
- 2003 -Implemented first continuous cloud microphysical retrieval algorithm based on ARM data (MICROBASE).
- 2000 -Created operational infrastructure and processed entire ARM Cloud radar data set, Active Remote Sensing of Cloud Layers (ARSCL), which is the most frequently requested of all products in the ARM Archive.
- 1998-2003 NASA Sensor Inter-Comparison and Merger for Biological and Interdisciplinary Ocean Studies (SIMBIOS)—The Marine Shadow-band Network Database

- aerosol corrections for satellite ocean color
- Developed new technology (marine fast-rotating shadow-band radiometer)
- First system to measure aerosol optical properties at sea without stabilized platform
- System deployed on 130 separate cruises resulting in the largest ocean aerosol database collected to date—all oceans sampled during six year project
- SIMBIOS project concluded in 2003; technology still deployed on several vessels
- 1994 Associate Site Scientist: Monterey Area Ship Tracks Experiment
- Advised and participated in collection of cloud microphysical from ship
- 1992 Site Scientist, Atlantic Stratocumulus Transition Experiment (ASTEX)
- Authored and Co-authored two of the first papers dealing with the use of 95-GHz cloud radar in cloud-related climate research
- Designed and operated surface data acquisition system
- 1991 Associate Site Scientist for First International Satellite Climatology Project Regional Experiment
- First deployment of prototype 95-GHz Doppler Cloud Radar
- 1988-1991 Co-Developer Pennsylvania State University Cloud Observing System
- Assisted in the design and calibration of a prototype 95-GHz Cloud Radar
- System contained multiple active sensors including a lidar, multiple-channel microwave radiometer, and UHF and VHF radars

Other Community Service

- 2009 *Clouds for Kids!* , Princeton Montessori School, Princeton, NJ
- 2011 Science Exposition-Littlebrook Elementary School, Princeton, NJ
- Short course: *Clouds-R-US*
- 2012 Science Exposition-Littlebrook Elementary School, Princeton, NJ
- Short course: Clouds-R-US Chapter 2 [K-3] and Clouds and Climate [4-5]
- 2013 Science Exposition-Littlebrook Elementary School, Princeton, NJ
- Short course: Buoyancy in a Bag [2] and Superstorm Sandy [4-5]