

CURRICULUM VITAE

MARY C. BROCK

(publishes as MARY C. BARTH)

Atmospheric Chemistry Observations and Modeling / Mesoscale and Microscale Meteorology
National Center for Atmospheric Research
P. O. Box 3000, Boulder, Colorado

1. EDUCATION:

- 1985 B.S. Chemical Engineering University of Colorado
1991 Ph.D. Atmospheric Sciences University of Washington
Thesis Advisors: Drs. Dean Hegg and Peter Hobbs
Thesis Title: "Numerical Modeling of Cloud Chemistry and Acid Deposition
Associated with the Interactions of Two Rainbands and Some Comparisons with
Observations"

2. PROFESSIONAL EXPERIENCE:

- 1984–1985 Undergraduate Research Assistant
Laboratory for Atmospheric and Space Physics, University of Colorado
Boulder, Colorado.
1985–1991 Graduate Research Assistant
Cloud and Aerosol Research Group, Department of Atmospheric Sciences
University of Washington, Seattle, Washington.
1991–1994 Visiting Postdoctoral Scientist
Mesoscale and Microscale Meteorology / Atmospheric Chemistry Divisions
National Center for Atmospheric Research, Boulder, Colorado.
1994–1996 Associate Scientist III, MMM/ACD, NCAR
1996–2000 Scientist I, MMM/ACD, NCAR
2000–2004 Scientist II, MMM/ACD, NCAR
2004–2016 Scientist III, ACOM/MMM, NCAR
2016–present Senior Scientist, ACOM/MMM, NCAR
2008–present ACOM Section head 2008–2013, ACOM Group head 2013-2016, MMM Deputy
Section head 2017-present, ACOM Multiscale Model Development Group Head
2020-present.

UNIVERSITY VISITS

- 2015 Two-month UVisit to Colorado State University (hosts: Dr. Steven Rutledge, Dr.
Sue Van den Heever)
2015 Two and one-half week UVisit to Rutgers University (host: Dr. Ann Marie
Carlton)

3. SCIENTIFIC ACCOMPLISHMENTS:

Dr. Barth's research focus is on how clouds affect atmospheric chemistry and on how chemistry can affect cloud properties. Her scientific activities include examining aerosol sulfate production, studying aerosol-cloud interactions, and investigating the effects of clouds on ozone chemistry primarily using numerical models at different spatial scales.

Barth has used both models and field experiment data analysis to understand clouds and chemistry. She has implemented sulfur chemistry into the Community Climate Model, simple gas and aqueous chemistry schemes into the cloud model COMMAS and the NCAR LES model, and aqueous chemistry into the regional chemistry transport model HANK. More recently she has worked with the WRF-Chem model adding parameterizations for predicting lightning and its production of nitrogen oxides, as well as several diagnostic tools, such as tracers to forecast the location of upper troposphere air that was recently processed by thunderstorms.

Much of her recent research has focused on thunderstorms and chemistry. Dr. Barth is conducting numerical simulations with the Weather Research and Forecasting model coupled with gas and aqueous-phase chemistry to elucidate the processes that control the distribution of chemical species in thunderstorms. She has been a Principal Investigator of the Deep Convective Clouds and Chemistry ([DC3](#)) field experiment that seeks to characterize the effect of mid-latitude, continental convection on the transport and transformation of atmospheric constituents. Dr. Barth led the [high-resolution simulation](#) on a continental domain to examine the chemistry occurring during the 2006 North American Monsoon.).

Dr. Barth was also a Principal Investigator for the NSF-funded Earth System Modeling project on Chemistry and Climate in Asia (2011-2015). This project has developed a framework for performing high-resolution chemistry-climate simulations over South and East Asia and is fostering collaborations among the atmospheric chemistry, climate, health, agriculture, and hydrology communities. Dr. Barth is the Principal Investigator for the NCAR Strategic Capability (NSC) computing support of “Projection of Future Air Quality over South Asia”, which is a project to conduct 10-year present day, and three 10-year future (2045-2055) regional-scale chemistry-climate set of simulations to investigate how ozone and particulate matter will change over India, especially in the highly populated Indo-Gangetic Plain.

Dr. Barth is one of the leaders of the Multiscale Infrastructure for Chemistry and Aerosols (MUSICA) project in NCAR/ACOM. [MUSICA](#) is a global modeling framework that allows for simulations of large-scale atmospheric phenomena while still resolving chemistry at emission and exposure relevant scales. In developing this infrastructure a model-independent chemistry module is being created to provide the atmospheric chemistry solver to any of the NCAR, and other, atmosphere models along with information characterizing each chemical species via a database. MUSICA is part of the NCAR-wide System for Integrated Modeling of the Atmosphere ([SIMA](#)), for which Dr. Barth is the Science Lead.

4. COMMUNITY SERVICE:

4.1 External Service

- Member of International Commission on Clouds and Precipitation (2000-2008)
- Member of the NSF Observing Facilities Advisory Panel (OFAP) (2004-2007)
- Secretary of the AGU Atmospheric Sciences Section (Atmos. Chem.) (2006-2008)
- Member of the ARM Climate Research User Facility Science Board (2006-2008)
- Member of the steering committee for the International Global Atmospheric Chemistry Project (2010-2015)
- Member of the NSF Advisory Committee on Geosciences (2012-2015)
- Member of the MPSAC subcommittee on examining the current structure of Statistical Sciences at the NSF (2012-2014)

- Invited rapporteur for the NASA Workshop on Outstanding Questions in Atmospheric Composition, Chemistry, Dynamics and Radiation for the Coming Decade, NASA Ames Research Center, (May 2014)
- Guest Associate Editor for *Journal Geophysical Research – Atmospheres* (2014-2019)
- Member of the International Commission on Atmospheric Chemistry and Global Pollution (iCACGP) (2015-present)
- Vice-president of iCACGP for representing North America (2019-2023)
- President of iCACGP (2023-2027)
- Editor for the *Journal of the Atmospheric Sciences* (2019-2022)

4.2 NCAR/UCAR Service

- Leader of the Early Career Scientists Assembly (2000-2002)
- Member of the University Relations Committee (2000-2005)
- Member of UCAR Distinguished Achievement and Outstanding Accomplishments Awards Jury. (2001-2004; Chair, 2002)
- Leadership Academy participant (2003)
- Member of MMM Director Search Committee (2003-2004)
- Section Head Atmospheric Chemistry Modeling in ACD (2008-2013)
- Leader of NCAR's WRF-Chem modeling group (2008-2020)
- Leader of the ACOM Regional and Process Modeling Group (2014-2018)
- Member of the NSF-owned Properties Ad-Hoc Panel (2016-2018)
- Member of MMM Scientist I/II Hiring Committee (2017)
- Member, Vice Chair, and Chair of the Appointments Review Group (2017-2020)
- Member of the NCAR Strategic Computing Requests Panel (2018-2022; chair: 2020-2022)
- Member of the Science Requirements Advisory Panel (SRAP) for the NWSC-3 procurement (2019-2020)

4.3 Conference and Workshop Organizer

- Member of organizing committee for GTP workshop, Observations, Experiments, and LES: A Triad for Geophysical Turbulence Studies, August 13–15, 1998, Boulder, Colorado.
- Member of organizing committee for GTP workshop, Mixing and Reactive Turbulence Workshop, July 13–16, 1999, Boulder, Colorado.
- Member of organizing committee for Modeling Chemistry in Cloud and Mesoscale Models, March 6–8, 2003, Boulder, Colorado.
- Co-leader of the cloud chemistry case studies intercomparison at the 5th International Cloud Modeling Workshop, August 7–11, 2000, Glenwood Springs, Colorado.

- Member of organizing committee for NCAR/UCAR Junior Faculty Forum, on Future Scientific Directions, June 18–20, 2003, Boulder, Colorado.
- Leader of the cloud chemistry case studies intercomparison at the 6th International Cloud Modeling Workshop, July 12–16, 2004, Hamburg, Germany.
- Co-chair of the International Programme Committee for the 10th International Global Atmospheric Chemistry Conference, September 2008, Annecy, France.
- Member of the Programme Committee for the 12th International Global Atmospheric Chemistry Conference, September 2012, Beijing, China.
- Lead organizer of the workshop on Health, Agricultural and Water Risks Associated with Air Quality and Climate in Asia, July 9-12, 2013, Boulder, Colorado.
- Co-organizer of the 1st Atmospheric Composition and the Asian Monsoon Training School, June 11-12, 2015, Bangkok, Thailand.
- Co-organizer of the Whiteface Mountain Cloud Chemistry Workshop, September 16-17, 2016, Wilmington, New York.
- Program organizing committee member for the Community Workshop on Developing requirements for in situ and remote-sensing capabilities in convective and turbulent environments, May 22-24, 2017, Boulder, Colorado.
- Co-organizer of the 2nd Atmospheric Composition and the Asian Monsoon Training School, June 10-12, 2015, Guangzhou, China.
- Member of the Program Committee for the 15th International Global Atmospheric Chemistry Conference / 14th International Conference on Atmospheric Chemistry and Global Pollution, September 2018, Takamatsu Kagawa, Japan.
- Member of the Organizing Committee for the 1st Fundamentals of Atmospheric Chemistry and Aerosol Modeling Workshop, August 13-15, 2018, Boulder, Colorado.
- Member of the Organizing Committee for the SIMA Workshop, June 29-July 1, 2020, virtual workshop.
- Member of the Organizing Committee for the European WRF-Chem Workshop, May 9-11, 2023, hybrid workshop.

4.4 Professional Reviews

1. Funding Agencies

- National Science Foundation (NSF)
- National Aeronautics and Space Administration (NASA)
- National Oceanic and Atmospheric Administration (NOAA)
- Natural Environment Research Council (NERC)

2. Books

- Aerosol Pollution Impact on Precipitation, A Scientific Review, Levin and Cotton (one chapter)

- Fundamentals of Atmospheric Modeling, Jacobson (book review)

3. Journals

- Aerosol and Air Quality Research
- Atmospheric Chemistry and Physics
- Atmospheric Environment
- Atmospheric Research
- Bulletin of the Atmospheric Meteorological Society
- Environmental Pollution
- Environmental Science and Pollution Research
- Geophysical Research Letters
- Geoscientific Model Development
- Journal of Applied Meteorology and Climatology
- Journal of Atmospheric Chemistry
- Journal of Geophysical Research – Atmospheres
- Journal of the Atmospheric Sciences

4. Other

- Aerosols, Clouds, Precipitation, and Climate Science Plan (a research activity endorsed by iLEAPS, IGAC, and GEWEX)

4.5 Education and Outreach

1. Teaching

- Lecturer, “The Relative Importance of Aqueous Chemistry to the Global Sulfur Cycle” and “How Aqueous Chemistry Affects Sulfate Aerosols and How Cloud Microphysics Affects Aqueous Chemistry”, 2002 ASP Summer Colloquium on Interactions among Aerosols, Climate and the Hydrological Cycle
- Lecturer, “Atmospheric Chemistry Modeling at High Resolution”, 2010 ASP Summer Colloquium on Asia in the 21st Century
- Lecturer, “Aqueous Chemistry & Heterogeneous Reactions”, ACD-North Carolina A&T Atmospheric Chemistry Class, 2011
- Two-week short-course professor, “Tropospheric Chemistry”, University of Puerto Rico, 2014
- Lecturer, “Modeling Processes”, ACAM Training School, Bangkok, Thailand, 2015
- Lecturer, “Biogenic, Lightning NO_x and Fire emissions with WRF-Chem”, WRF-Chem Tutorial, Boulder, Colorado, 2015
- Lecturer, “Aerosols and Meteorology”, 6th ISAC Summer School 2016, Castro, Lecce, Italy, 2016
- Lecturer, “Aerosols-Radiation-Microphysics Interactions in WRF-Chem”, WRF-Chem Tutorial, Boulder, Colorado, 2017

- Lecturer, “Regional Scale Chemistry Modeling”, Atmospheric Composition and the Asian Monsoon (ACAM) 2nd Training School, Guangzhou, China, 2016
- Lecturer, “Photolysis Rates”, WRF-Chem Tutorial, Boulder, Colorado, 2018
- Lecturer, “Aerosols-Radiation-Microphysics Interactions in WRF-Chem”, WRF-Chem Tutorial, Boulder, Colorado, 2018
- Lecturer, “Aerosol Interactions”, Workshop on Fundamentals of Atmospheric Chemistry and Aerosol Modeling, Boulder, Colorado, 2018

2. High School Students

- Yunjie Ma, Cherry Creek High School student science project (2002-2003)
- Cara Feldkamp, summer internship (2006)
- Hannah Davinroy, as part of the HIRO summer program (2011)
- Nancy Stone, as part of the PRECIP summer program (2015)

3. Significant Opportunities in Atmospheric Research and Science (SOARS) Proteges

- Darnell Stewart (1997, 1999)
- Andrew Church (1998)
- Rynda Hudman (2000, 2001)
- Amber Reynolds (2002, writing mentor)
- Roberto Cancel (2003)
- Marco Orozco (2005)
- Lumari Pardo (2008)
- Frances Roberts Gregory (2010)
- Meghan Applegate (2013)

4. Undergraduate Student Supervisions and Mentoring

- Kaylee Acuff, University of Colorado, 2005-2006

5. Graduate Student Supervision and Mentoring but not on Thesis Committee

- Jonathan Smith, Howard University, 2008
- Rajesh Kumar, ARIES, Nainital, India, 2009
- Anthony Cochran, North Carolina A&T, 2011
- Teerachai Amnuaylojaroen, Chiang Mai University, Chiang Mai, Thailand, 2012
- Chandan Sarangi, IIT-Kanpur, Kanpur, India, 2013
- Carlos Valles-Diaz, University of Puerto Rico, Rio Piedras, Puerto Rico, 2015
- Mauro Morichetti, Marche Polytechnic University, Ancona, Italy, 2017
- Janyl Madykova, Texas Southern University, Houston, Texas, 2020
- Miguel Hilario, University of Arizona, Tucson, AZ, 2022-2025

6. Thesis Committee Member (Ph.D. unless otherwise noted)
- Rawlings Miller, University of Arizona, 1998-2000
 - Amy Stuart, Stanford University, 1999-2002 (NCAR visitor summer 1999)
 - Karina Apodaca, Howard University, 2010 (NCAR visitor 2008-2010)
 - John Wong, University of Colorado, 2009-2013
 - Tamil Maldonado, Howard University, 2011-2014 (NCAR visitor 2011-2014)
 - Megan Bela, University of Colorado, 2013 – 2016
 - Yang Li, University of Michigan, 2015 – 2017
 - External Ph.D. Examiner for Rosa Fedele, Royal Melbourne Institute of Technology, Melbourne, Australia, 2015
 - Aaron Preston, Florida State University, 2016-2017
 - Daniel Phoenix, University of Oklahoma, 2016-2019
 - Trent Davis, (Masters) Colorado State University, 2016-2017
 - Jennie Bukowski, Colorado State University 2018-2020
 - Victoria Treadaway, University of Rhode Island, Narragansett, RI, 2018-2019
 - Mauro Morichetti, Marche Polytechnic University, Ancona, Italy, 2018-2019
 - Christopher Lawrence, University Albany, SUNY, Albany, NY, 2020-present
 - Opponent for the thesis defense of Roman Bardakov (U. Stockholm), December 2021
 - Genevieve Lorenzo, University of Arizona, Tucson, AZ, 2021-present

7. PostDoctoral Scientists Advisor

- Chun-Ho Liu, 2001-2002
- Christelle Barthe, 2006-2007
- Rajesh Kumar, 2013-2015
- Gustavo Cuchiara, 2017-2020
- Chandrakala Bharali, 2021-2022
- Ajay Parottil, 2023-present

8. Other

- PROJECT LEARN teacher and intern leader (1997, 1998)
- Member of the GLOBE Learning Expedition Student Research Competition Review Committee (2007)
- Invited senior scientist speaker at ASCENT (Atmospheric Science Collaborations and Enriching Networks), whose goal was to enhance interactions between female senior scientists and early career scientists with the outcome of developing mentorships between these two groups (2011)

5. HONORS and AWARDS:

- NCAR Special Recognition Award for establishing the Early Career Scientists Assembly (2003)
- AGU Editor's Citation for Excellence in Refereeing for Journal of Geophysical Research (2007)
- NCAR Special Recognition Award for leading the Deep Convective Clouds and Chemistry Field Campaign (2012)
- NASA Group Achievement Award for SEAC4RS Field Experiment (2015)
- UCAR Outstanding Accomplishment Award for Diversity (2015)
- Fellow of the American Meteorological Society (2017)

6. AWARDED PROPOSALS AND GRANTS:

- 1996-2000 Modeling the Influence of Boundary-Layer Processes on Biogenic Hydrocarbon Mixing and Chemistry, Co-PI EPA grant
University Collaborator: Dr. Kenneth Davis (University of Colorado, University of Minnesota, now at Pennsylvania State University)
- 1997-2001 Analysis and Modeling of the Transport of Lightning-generated NO_x and Other Chemical Species in Convective Cloud Systems, Co-PI on NOAA grant
University Collaborator: Dr. Steven Rutledge (Colorado State University)
- 2004-2008 Tropospheric Anthropogenic Aerosols and Climate, Co-PI on NSF grant
University Collaborator: PI Chien Wang (MIT)
- 2007-2011 Convective Scale Transport of Trace Gases Assessed with Models and Satellite Observations, PI NASA grant
University Collaborator: Dr. David Noone (University of Colorado, now at Oregon State University)
- 2010-2011 Deep Convective Clouds and Chemistry (DC3) Field Campaign, PI NSF grant
University Collaborators: Dr. Steven Rutledge (Colorado State University), Dr. William Brune (Pennsylvania State University)
- 2010-2011 Atmospheric chemistry and air quality under the monsoon and heat wave of the 2006 summer, PI on NCAR Capability Computing grant
- 2011-2015 Chemistry and Climate over Asia: Understanding the Impacts of Changing Climate and Emissions on Atmospheric Composition and Society, PI NSF EaSM grant
University Collaborator: Dr. Gregory Carmichael (University of Iowa)
- 2011-2015 Developing a Next-Generation Approach to Regional Climate Prediction at High Resolution, Co-PI on NSF EaSM grant (PI Greg Holland)
University Collaborators: Dr. Greg Hakim (University of Washington), Dr. Howard Kunreuther (University of Pennsylvania)
- 2012-2015 NCAR Chemical Forecasting and Analysis for SEAC4RS, on NASA grant (PI Louisa Emmons)
University Collaborator: Dr. Ave Arellano (University of Arizona)

- 2012-2015 Building Long-Term Partnerships with Targeted US University Programs, PI on NCAR Diversity grant
University Collaborator: Dr. William Stockwell (Howard University), Dr. Hector Jimenez (University of Puerto Rico, Mayaguez)
- 2015 Projection of Future Air Quality over South Asia, PI on NCAR Strategic Capability (NSC) computing grant
- 2016 Assessing Smoke Effects on Severe Weather and Clouds by Constraining Fire Emissions Through Data Assimilation and Applying It to Field Experiments Using High Resolution Simulations, Co-PI on NCAR Strategic Capability (NSC) computing grant
- 2017-2020 Investigating Transport and Scavenging of Ozone Precursors in Convection Through Analysis of SEAC⁴RS and KORUS-AQ Measurements, Co-PI with Alan Fried (U. Colorado) NASA ACMAP grant
- 2021-2024 Vertical Transport and Wet Scavenging of Aerosols in Convection from Local to Regional to Global Scales, Co-Is Simone Tilmes (NCAR), Jose Jimenez (U. Colorado), Pedro Campuzano-Jost (U. Colorado), Ewan Crosbie (NASA/LaRC), NASA ACCDAM grant
- 2023-2025 Creating multiscale chemistry modeling infrastructure to advance air quality forecasting, Co-Is Matthew Dawson, Louisa Emmons, Gabriele Pfister (NCAR), NOAA BIL funding

7. PUBLICATIONS LIST:

7.1 Ph.D. Dissertation

Date	Advisor	Title
1991	Dr. Dean Hegg	Numerical modeling of cloud chemistry and acid deposition associated with the interactions of two rainbands and some comparisons with observations

7.2 Refereed Journal Articles

*Publication resulting from Ph.D. dissertation

1. **Barth, M. C.**, D. A. Hegg, P. V. Hobbs, J. G. Walega, G. L. Kok, B. G. Heikes, and A. L. Lazrus, 1989: Measurements of atmospheric gas-phase and aqueous-phase hydrogen peroxide concentrations in winter on the east coast of the United States, *Tellus*, **41B**, 61-69.
2. Hegg, D. A., S. A. Rutledge, P. V. Hobbs, **M. C. Barth** and O. Hertzman, 1989: The chemistry of a mesoscale rainband. *Quart. J. Royal Meteor. Soc.*, **115**, 867–886.
- *3. **Barth, M. C.**, D. A. Hegg and P. V. Hobbs, 1992: Numerical modeling of cloud and precipitation chemistry associated with two rainbands and some comparisons with observations. *J. Geophys. Res.*, **97**, 5825-5845.
4. **Barth, M. C.**, 1994: Numerical modeling of sulfur and nitrogen chemistry in a narrow cold-frontal rainband: The impact of meteorological and chemical parameters., *J. Appl. Meteor.*, **33**, 855-868.

5. Yuen, P-F., D. A. Hegg, T. V. Larson and **M. C. Barth**, 1996: Parameterization of heterogeneous droplet chemistry for use in bulk cloud models, *J. Appl. Meteor.*, **35**, 679-689.
6. **Barth, M. C.** and D. B. Parsons, 1996: Microphysical processes associated with intense frontal rainbands and the effect of evaporation and melting on frontal dynamics, *J. Atmos. Sci.*, **53**, 1569-1586.
7. **Barth, M. C.** and A. T. Church, 1999: The regional and global distributions and lifetimes of sulfate aerosols from Mexico City and southeast China, *J. Geophys. Res.*, **104**, 30,231- 30,239.
8. Rasch, P. J., **M. C. Barth**, J. T. Kiehl, S. E. Schwartz, and C. M. Benkovitz, 2000: A description of the global sulfur cycle and its controlling processes in the National Center for Atmospheric Research Community Climate Model Version 3, *J. Geophys. Res.*, **105**, 1367-1385.
9. **Barth, M. C.**, P. J. Rasch, J. T. Kiehl, C. M. Benkovitz, and S. E. Schwartz, 2000: Sulfur chemistry in the National Center for Atmospheric Research Community Climate Model: Description, evaluation, features and sensitivity to aqueous chemistry, *J. Geophys. Res.*, **105**, 1387-1415.
10. Kiehl, J. T., T. L. Schneider, P. J. Rasch, **M. C. Barth**, and J. Wong, 2000: Radiative forcing due to sulfate aerosols from simulations with the National Center for Atmospheric Research Community Climate Model (CCM3), *J. Geophys. Res.*, **105**, 1441-1457.
11. Dye, J. E., B. A. Ridley, K. Baumann, W. C. Skamarock, **M. C. Barth**, M. Venticinque, E. Defer, P. Blanchet, C. Thery, P. Laroche, G. Hubler, D. D. Parrish, T. Ryerson, M. Trainer, G. Frost, J. S. Holloway, F. C. Fehsenfeld, A. Tuck, T. Matejka, D. Bartels, S. A. Rutledge, T. Lang, J. Stith, R. Zerr, 2000: An Overview of the STERAO–Deep Convection Experiment with Results for the 10 July Storm, *J. Geophys. Res.*, **105**, 10,023-10,045.
12. Skamarock, W. C., J. Powers, **M. C. Barth**, J. E. Dye, T. Matejka, D. Bartels, K. Baumann, J. Stith, D. D. Parrish, and G. Hubler, 2000: Numerical simulations of the 10 July STERAO/Deep Convection Experiment Convective System: Kinematics and transport, *J. Geophys. Res.*, **105**, 19,973–19,990.
13. Hess, P. G., S. Flocke, J-F Lamarque, **M. C. Barth**, and S. Madronich, 2000: Episodic Modeling of the Chemical Structure of the Troposphere as Revealed during the Spring MLOPEX Intensive, *J. Geophys. Res.*, **105**, 26,809-26,839.
14. Patton, E. G., K. J. Davis, **M. C. Barth**, and P. P. Sullivan, 2001: Decaying scalars emitted by a forest canopy: A numerical study, *Boundary Layer Meteorology*, **100**, 91-129.
15. **Barth, M. C.**, A. L. Stuart, and W. C. Skamarock, 2001: Numerical simulations of the July 10 Stratospheric-Tropospheric Experiment: Radiation, Aerosols and Ozone/Deep Convection storm: Redistribution of soluble tracers, *J. Geophys. Res.*, **106**, 12,381-12,400.
16. Brasseur A.-L., R. Ramarosan, A. Delannoy, W. Skamarock, **M. Barth**, 2002: Three-dimensional calculation of photolysis frequencies in the presence of clouds, *J. Atmos. Chem.*, **41**, 211-237.
17. Liu, C-H and **M. C. Barth**, 2002: Large-eddy simulation of flow and scalar transport in a modeled street canyon, *J. Appl. Meteorol.*, **41**, 660-673.

18. **Barth, M. C.**, P. G. Hess, and S. Madronich, 2002: Effect of marine boundary layer clouds on tropospheric chemistry as analyzed in a regional chemistry transport model, *J. Geophys. Res.*, **107**, (D11), 4126, doi:10.1029/2001JD000468.
19. Skamarock, W. C., J. E. Dye, E. Defer, **M. C. Barth**, J. L. Stith, B. A. Ridley, and K. Baumann, 2003: Observational- and Modeling-Based budget of lightning-produced NO_x in a continental thunderstorm, *J. Geophys. Res.*, **108**(D10), 4305, doi:10.1029/2002JD002163.
20. **Barth, M. C.**, S. Sillman, R. Hudman, M. Z. Jacobson, C.-H. Kim, A. Monod, and J. Liang, 2003: Summary of the cloud chemistry modeling intercomparison: Photochemical box model simulation, *J. Geophys. Res.*, **108**(D7), 4214, doi:10.1029/2002JD002673.
21. Liu, C-H, **M. C. Barth**, and D. Y. C. Leung, 2004: Large-eddy simulation of flow and pollutant transport in street canyons of different building height to street width ratios, *J. Appl. Meteorol.*, **43**, 1410-1424.
22. Liu, C-H, D. Y. C. Leung and **M. C. Barth**, 2005: On the prediction of air and pollutant exchange rates in street canyons of different aspect ratios using large-eddy simulation, *Atmos. Environ.*, **39**, 1567-1574.
23. Kim, S-W, C-H Moeng, J. C. Weil, and **M. C. Barth**, 2005: Lagrangian particle dispersion modeling of fumigation process using large-eddy simulation, *J. Atmos. Sci.*, **62**, 1932-1946.
24. Vila-Guerau de Arellano, J., S-W Kim, **M. C. Barth**, and E. G. Patton, 2005: Transport and chemical transformations influenced by shallow cumulus over land, *Atmos. Chem. Phys.*, **5**, 3219-3231.
25. **Barth, M.**, J. McFadden, J. Sun, C. Wiedinmyer, P. Chuang, D. Collins, R. Griffin, M. Hannigan, T. Karl, S-W Kim, S. Lasher-Trapp, S. Levis, M. Litvak, N. Mahowald, K. Moore, S. Nandi, E. Nemitz, A. Nenes, M. Potosnak, T. Raymond, J. Smith, C. Still, C. Stroud, Coupling between land ecosystems and the atmospheric hydrologic cycle through biogenic aerosol pathways, *Bull. Amer. Meteor. Soc.*, **86**, 1738-1742, 2005.
26. Kazil, J., E. R. Lovejoy, **M. C. Barth**, K.O'Brien, 2006: Aerosol nucleation over oceans and the role of galactic cosmic rays, *Atmos. Chem. Phys.*, **6**, 4905-4924.
27. **Barth, M. C.**, 2006: The importance of cloud drop representation on cloud photochemistry. *Atmos. Res.*, **82**, 294-309.
28. **Barth, M. C.**, S-W Kim, W. C. Skamarock, A. L. Stuart, K. E. Pickering, L. E. Ott, 2007: Simulations of the redistribution of formaldehyde, formic acid, and peroxides in the July 10, 1996 STERAO deep convection storm. *J. Geophys. Res.*, **112**, D13310, doi:10.1029/2006JD008046.
29. **Barth, M. C.**, S.-W. Kim, C. Wang, K. Pickering, L. Ott, G. Stenchikov, M. Leriche, S. Cautenet, J.-P. Pinty, Ch. Barthe, C. Mari, J. Helsdon, R. Farley, A. Fridlind, A. Ackerman, V. Spiridonov, B. Tosko, 2007: Cloud-scale model intercomparison of chemical constituent transport in deep convection. *Atmos. Chem. Phys.*, **7**, 4709-4731.
30. Kim, S-W, C-H Moeng, J. C. Weil, and **M. C. Barth**, 2007: Comment on "Fumigation of pollutants in and above the entrainment zone into a growing convective boundary layer: A large-eddy simulation". *Atmos. Environ.*, **41**, 7679-7682.

31. Barthe, C. and **M. C. Barth**, 2008: Evaluation of a new lightning-produced NO_x parameterization for cloud resolving models and its associated uncertainties. *Atmos. Chem. Phys.*, **8**, 4691-4710.
32. Kim, D., C. Wang, A. Ekman, **M. C. Barth**, and P. Rasch, 2008: Distribution and direct radiative forcing of carbonaceous and sulfate aerosols in an interactive size-resolving aerosol-climate model. *J. Geophys. Res.*, **113**, D16309, doi:10.1029/2007JD009756.
33. Wang C., D. Kim, A. M. L. Ekman, **M. C. Barth**, P. J. Rasch, 2009: Impact of anthropogenic aerosols on Indian summer monsoon, *Geophys. Res. Lett.*, **36**, L21704, doi:10.1029/2009GL040114.
34. Barthe, C., W. Deierling, and **M. C. Barth**, 2010: The estimation of total lightning from various storm parameters: A cloud-resolving model study. *J. Geophys. Res.*, **115**, D24202, doi:10.1029/2010JD014405.
35. Fast, J. D., W. I Gustafson Jr., E. G. Chapman, R. C. Easter, J. P. Rishel, R. A. Zaveri, G. A. Grell, and **M. C. Barth**, 2011: The Aerosol Modeling Testbed: A community tool to objectively evaluate aerosol process modules, *Bull. Atmos. Meteor. Soc.*, **92**, 343-360.
36. Vila-Guerau de Arellano, J., E. G. Patton, T. Karl, K. van den Dries, **M. C. Barth** and J. J. Orlando, 2011: On the diurnal evolution of isoprene and the hydroxyl radical over tropical forests. *J. Geophys. Res.*, **116**, D07304, doi:10.1029/2010JD014857.
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99. Wang, Y., Ma, Y.-F., Muñoz-Esparza, D., Li, C. W. Y., **Barth, M.**, Wang, T., and Brasseur, G. P. 2021: The impact of inhomogeneous emissions and topography on ozone photochemistry in the vicinity of Hong Kong Island, *Atmos. Chem. Phys.*, 21, 3531–3553, <https://doi.org/10.5194/acp-21-3531-2021>.
100. Mohan G, Vani K, Hazra A, Mallick C, Chaudhari H, Pokhrel S, Pawar S, Konwar M, Saha S, Das S. Evaluating different lightning parameterization schemes to simulate lightning flash counts over Maharashtra, India. *Atmospheric Research*. 2021; 255:105532.
101. Tilgner, A., Schaefer, T., Alexander, B., **Barth, M.**, Collett Jr., J. L., Fahey, K. M., Nenes, A., Pye, H. O. T., Herrmann, H., and McNeill, V. F., 2021: Acidity and the multiphase chemistry of atmospheric aqueous particles and clouds, *Atmos. Chem. Phys.*, <https://doi.org/10.5194/acp-21-13483-2021>.

102. David, L. M., **Barth, M.**, Höglund-Isaksson, L., Purohit, P., Velders, G. J. M., Glaser, S., and Ravishankara, A. R., 2021: Trifluoroacetic acid deposition from emissions of HFO-1234yf in India, China and the Middle East, *Atmos. Chem. Phys. Discuss.* [preprint], <https://doi.org/10.5194/acp-21-14833-2021>.
103. **Barth, M. C.**, Ervens, B., Herrmann, H., Tilgner, A., McNeill, V. F., Tsui, W. G., Deguillaume, L., Chaumerliac, N., Carlton, A., and Lance, S. M., 2021: Box model intercomparison of cloud chemistry, *J. Geophys. Res.*, 126, e2021JD035486. <http://dx.doi.org/10.1029/2021JD035486>
104. Li, M. B. McDonald, S. McKeen, H. Eskes, P. Levelt, C. Francoeur, C. Harkins, J. He, **M. Barth**, D. Henze, M. Bela, M. Trainer, J. de Gouw, G. Frost, 2021: Assessment of updated fuel-based emissions inventories over the contiguous United States using TROPOMI NO₂ retrievals, *J. Geophys. Res.*, 126, e2021JD035484. <https://doi.org/10.1029/2021JD035484>
105. Smith A, **Barth M**, Boos W, Bou-Zeid E, Kawatani Y, Lee S, Mechem D, Remer L, Rozoff C, van den Heever S, Wang Z, Wicker L, Yang P., 2020: Data Availability Principles and Practice. *J. Atmos. Sci.*, 77(12):3983-3984. doi:10.1175/JAS-D-20-0303.1.
106. Schwantes, R. F. G. Lacey, S. Tilmes, L. K. Emmons, P. H. Lauritzen, S. Walters, P. Callaghan, C. M. Zarzycki, **M. C. Barth**, D. S. Jo, J. T. Bacmeister, R. B. Neale, F. Vitt, E. Kluzek, S. R. Hall, K. Ullmann, C. Warneke, J. Peischl, I. B. Pollack, F. Flocke, G. M. Wolfe, T. F. Hanisco, F. N. Keutsch, J. Kaiser, T. P. V. Bui, J. L. Jimenez, P. Campuzano-Jost, E. C. Apel, R. S. Hornbrook, A. J. Hills, B. Yuan, A. Wisthaler, 2022: Evaluating the impact of chemical complexity and horizontal resolution on tropospheric ozone over the conterminous US with a global variable resolution chemistry model, *J. Advances in Modeling Earth Systems*, 14, e2021MS002889. doi.org/10.1029/2021MS002889.
107. Morichetti, M., S. Madronich, G. Passerini, U. Rizza, E. Mancinelli, S. Virgili, and **M. Barth**, 2022: Comparison and evaluation of updates to WRF-Chem (v3.9) biogenic emissions using MEGAN, *Geosci. Model Dev.*, 15, 6311–6339, doi.org/10.5194/gmd-15-6311-2022.
108. Clifton, O., E. Patton, S. Wang, **M. Barth**, J. Orlando, R. Schwantes, 2022: Large Eddy Simulation for Investigating Coupled Canopy and Turbulence Influences on Atmospheric Chemistry: Model Description and Application to Summer Midday Conditions at a Temperate Deciduous Forest, *J. Advances in Modeling Earth Systems*, 14, e2022MS003078, doi.org/10.1029/2022MS003078.
109. Cuchiara, G., A. Fried, **M. Barth**, M. Bela, C. Homeyer, J. Walega, P. Weibring, D. Richter, S. Woods, A. Beyersdorf, T. P. Bui, J. Dean-Day, 2023: Effect of Marine and Land Convection on Wet Scavenging of Ozone Precursors Observed during a SEAC4RS case study, *J. Geophys. Res.*, 28, e2022JD037107, doi.org/10.1029/2022JD037107.
110. Tang, W., L. Emmons, **M. Barth**, G. Pfister, R. Kumar, D. Edwards, and S. Tilmes, 2023: Capturing high-resolution air pollution features using the Multi-Scale Infrastructure for Chemistry and Aerosols version 0 (MUSCIAv0) global modeling system, *J. Geophys. Res.*, 128, e2022JD038345. doi.org/10.1029/2022JD038345.
111. Clifton, O., E. G. Patton, **M. Barth**, J. Orlando, S. Wang, and C. Baublitz, 2023: Influence of organized turbulence on OH reactivity at a deciduous forest. *Geophysical Research Letters*, 50, e2022GL102548. doi.org/10.1029/2022GL102548.

112. Brasseur, G. P., **M. Barth**, J. Kazil, E. G. Patton, and Y. Wang, 2023: Segregation of fast-reacting species in atmospheric turbulent flow, 14, 1136. doi.org/10.3390/atmos14071136.

7.3 Book Chapters

1. Kreidenweis, S., G. Tyndall, **M. Barth**, F. Dentener, J. Lelieveld, and M. Mozurkewich, Chapter 4: Aerosols and Clouds, in **Atmospheric Chemistry and Global Change**, eds. Brasseur, G. P., J. J. Orlando, and G. S Tyndall, 133-179, 1999.
2. Kumar, R., **M. C. Barth**, L. Delle Monache, S Ghude, G. Pfister, M. Naja, G. Brasseur, (2017) An Overview of Air Quality Modeling Activities in South Asia. 27-47. 10.1007/978-3-319-59489-7_2.

7.4.1 Journal Articles Submitted

1. Acharja, P., S. Ghude, B. Sinha, **M. Barth**, R. Kulkarni, V. Sinha, R. Kumar, K. Ali, G. Govardhan, I. Gultepe, M. Rajeevan, 2022: Thermodynamical framework for effective mitigation of high aerosol loading in the Indo-Gangetic Plain during winter, submitted to Scientific Reports, [submitted 11/2022]
2. Cummings, K. A., K. E. Pickering, et al., **M. Barth**, M. Bela, Y. Li, D. Allen, E. Bruning, D. MacGorman, C. Ziegler, M. Biggerstaff, B. Fuchs, T. Davis, L. Carey, R. Mecikalski, and D. Finney, 2023: Evaluation of lightning flash rate parameterizations in a cloud-resolved WRF-Chem simulation of the 29-30 May 2012 Oklahoma severe supercell system observed during DC3, submitted to *J. Geophys. Res.* [submitted 06/2023]
3. Pickering, K. E., Y. Li, K. A. Cummings, **M. C. Barth**, D. J. Allen, E. C. Bruning, and I. B. Pollack, 2023: Lightning NOx in the May 29-30, 2012 Deep Convective Clouds and Chemistry (DC3) Severe Storm and its Downwind Chemical Consequences, submitted to *J. Geophys. Res.* [submitted 06/2023]
4. Bhareni, C., **M. Barth**, R. Kumar, S. D. Ghude, V. Sinha, and B. Sinha, 2023: Role of atmospheric aerosols in severe winter fog over Indo Gangetic Plains of India: a case study, submitted to Atmos. Chem. Physics, [submitted 07/2023]

7.4.2 Journal Articles in Revision

7.5 Internally Refereed Publications

1. **Barth, M.**, McFadden, J., Sun, J., Wiedinmyer, C., Chuang, P., Collins, D., Griffin, R., Hannigan, M., Karl, T., Kim, S.-W., Lasher-Trapp, S., Levis, S., Litvak, M., Mahowald, N., Moore, K., Nandi, S., Nenes, A., Potosnak, M., Raymond, T.M., Smith, J.N., Stroud, C., and C. Still. 2005: 'UCAR/NCAR Junior Faculty Forum on Future Scientific Directions'. NCAR technical note, NCAR TN-467+PROC.

7.6 Non-refereed Papers

1. **Barth, M. C.**, Hegg, D. A., and P. V. Hobbs, 1991: Numerical modeling of cloud chemistry and acid deposition associated with the interactions of two rainbands and some comparisons with observations, Final Report to the Electric Power Research Institute under Research Agreement RP1630-45, June 1991.
2. **Barth, M. C.**, 1993: Evolution of chemical transformations in convection that has a trailing stratiform region, Conference on Atmospheric Chemistry, American Meteorological Society, Anaheim, California, 17 - 22 January 1993, 49-52.
3. **Barth, M. C.** and D. B. Parsons, 1995: Microphysical processes associated with intense frontal rainbands and the impact of evaporation and melting on frontal dynamics, Cloud Physics Conference, 75th Annual Meeting American Meteorological Society, Dallas, Texas, 15 - 20 January 1995, 226-230.
4. **Barth, M. C.**, P. Hess, and S. Madronich, 1996: The accuracy of approximate numerical solver techniques in solving the gas-aqueous chemical system, International Conference on Clouds and Precipitation, Zurich, Switzerland, 19-23 August 1996, 1062-1065.
5. **Barth, M. C.**, P. Rasch, and J. Kiehl, 1996: Sulfur chemistry in the NCAR community climate model, International Conference on Clouds and Precipitation, Zurich, Switzerland, 19-23 August 1996, 1181-1183.
6. **Barth, M. C.** and W. W. Grabowski, 1998: Preliminary results of cloud effects on the photochemistry in and around stratocumulus, in Report of the Fourth International Cloud Modelling Workshop, WMO Report 29, 83-87.
7. **Barth, M. C.**, and P. Hess, 1998: Effect of aqueous chemistry in a regional chemistry transport model, Conference on Cloud Physics, Everett, Washington, USA, 17-21 August 1998, 197-200.
8. Patton, E. G., K. J. Davis, **M. C. Barth**, and C.-H. Moeng, 1999: Large-eddy simulation of convective boundary layer mixing of decaying scalars emitted by a forest canopy, 13th Symposium on Boundary Layers and Turbulence, Dallas, Texas, USA, 10-15 January 1999,
9. **Barth, M. C.**, W. C. Skamarock, and A. L. Stuart, 2000: The influence of cloud processes on the distribution of chemical species for the 10 July 1996 STERAO/Deep Convection Storm, in International Conference on Clouds and Precipitation Proceedings, Reno, Nevada, USA, 14-18 August 2000, 960-963.
10. Patton, E. G., **M. C. Barth**, K. J. Davis, and P. P. Sullivan: 2000: The Interactions Between Turbulence and Photochemistry in the Planetary Boundary Layer, Air and Waste Management Association International Symposium on the Measurement of Toxic and Other Related Air Pollutants, September 12-14, 2000, Research Triangle Park, NC, 2000. (cdrom)
11. **Barth, M.**, 2001: Modeling the effects of clouds on chemical constituents, IGAC newsletter, Issue 23, April 2001, 13-15.
12. Liu, C-H, **M. C. Barth**, and S. Madronich, 2002: Large-eddy simulation of flow and scalar dispersion inside a street canyon, in Proceedings of the 12th Joint Conference on the Applications of Air Pollution Meteorology with the Air and Waste Management Association, May 20-24, 2002.

13. **Barth, M. C.**, 2004: Relative importance of the production and destruction of chemically reactive species in deep convection, in Proceedings of the 14th AMS Conference on Cloud Physics, Ogden, UT, June 3-7, 2002.
14. **Barth, M. C.**, R. Cancel, K. Ross, S.-W. Kim, 2004: The importance of cloud drop representation on cloud photochemistry, in Proceedings of the 14th International Conference on Clouds and Precipitation, July 19-23, 2004.
15. **Barth, M. C.**, S.-W. Kim, W. C. Skamarock, 2004: Simulating aqueous chemistry in the July 10 STERAO deep convective storm using WRF model, in Proceedings of the 2nd International Workshop on Next Generation NWP Model, May 17-18, 2004.
16. Kim, S.-W., **M. C. Barth**, W. C. Skamarock, 2004: WRF model simulations of aqueous chemistry in the July 10 STERAO deep convective storm, in Proceedings of the WRF/MM5 User's Workshop, June 22-25, 2004.
17. Kim, S.-W., C.-H. Moeng, J. C. Weil, **M. C. Barth**, 2004: Lagrangian particle dispersion modeling of the fumigation process using large-eddy simulation, in Proceedings of the 16th Symposium on Boundary Layers and Turbulence, August 9-13, 2004.
18. Kim, S.-W., **M. C. Barth**, C.-H. Moeng, 2004: The effect of shallow cumulus convection on the segregation of chemical reactants, in Proceedings of the 16th Symposium on Boundary Layers and Turbulence, August 9-13, 2004.
19. **Barth, M. C.**, 2006: The role of adsorption of chemical species onto ice and snow in deep convection, in proceedings from the 12th Conference on Cloud Physics, Madison, WI, 10-14 July 2006. <http://ams.confex.com/ams/Madison2006/techprogram/programexpanded346.htm>
20. Acuff, K. and **M. Barth**, 2006: Chemical species redistribution by deep convection and its sensitivity to different types of storms, in proceedings of the 7th WRF Users Workshop, Boulder, Colorado, 19-22 June 2006. <http://www2.mmm.ucar.edu/wrf/users/workshops/WS2006/WorkshopPapers.htm>
21. Vila-Guerau de Arellano, J., S-W Kim, **M. C. Barth**, E. G. Patton, 2006: Transport and chemical transformations influenced by shallow cumulus over land, in preprints of 17th Symposium on Boundary Layers and Turbulence, San Diego, California, 21-25 May 2006. <http://ams.confex.com/ams/BLTA9BioA/techprogram/programexpanded351.htm>
22. Leriche, M. S. Cautenet, **M. Barth**, N. Chaumerliac, 2007: Modeling of the July 10 STERAO storm with the RAMS model: Chemical species redistribution including gas phase and aqueous phase chemistry, In Air Pollution Modeling and its Application XVIII, edited by C. Borrego and E. Renner, pp. 437-446, Elsevier, Amsterdam, The Netherlands.
23. **Barth, M.**, T. Birner, N. McFarlane, D. Pendlebury, J. Petch, 2006: Modeling of Deep Convection and of Chemistry and their Roles in the Tropical Tropopause Layer: SPARC-GEWEX/GCSS-IGAC Workshop: Victoria, BC, Canada, June 12-15, 2006, IGAC Activities Newsletter, 31-37.
24. **Barth, M.**, T. Birner, N. McFarlane, D. Pendlebury, J. Petch, 2007: Modelling of Deep Convection and Chemistry and their Roles in the Tropical Tropopause Layer: SPARC-GEWEX/GCSS-IGAC Workshop, June 12-15, 2006, Victoria, BC, Canada, SPARC Newsletter, 7-12.

25. Petch, J., McFarlane, N., Pendlebury, D., **Barth, M.** and Birner, T., 2007: Modelling of Deep Convection and Chemistry in the Tropical Tropopause Layer: Outcomes from the SPARC-GEWEX-IGAC Workshop, GEWEX Newsletter, August 2007, 10-11.
26. Wang, X., L. Emmons, C. Wiedinmyer, P. Romero-Lankao, H. Qin, **M. Barth**, G. Carmichael, and G. Brasseur, 2012: Health Impacts of Air Quality and Climate Change Workshop, April 9-11, 2012, IGAC Newsletter, 47, 16-17.
27. Jiang, X., **M. C. Barth**, C. Wiedinmyer, and S. T. Massie, 2013: Influence of anthropogenic aerosols on the Asian monsoon: A case study using the WRF-Chem model, *Atmos. Chem. Phys. Discuss.*, 13, 21,383-21,425.
28. **Barth, M.**, G. Carmichael, C. Wiedinmyer, L. Emmons, S. Massie, and P. Romero-Lankao, 2014: Workshop on Health, Agricultural and Water Risks Associated with Air Quality and Climate in Asia, July 9-12, 2013, IGAC Newsletter, 51, 8-8.
29. **Barth, M. C.**, J. Wong, M. M. Bela, K. E. Pickering, Y. Li, K. Cummings, 2014: Simulations of Lightning-Generated NO_x for Parameterized Convection in the WRF-Chem Model, in Proceedings from the XV International Conference on Atmospheric Electricity, Norman, Oklahoma, 15-20 June, 2014, http://www.nssl.noaa.gov/users/mansell/icae2014/preprints/Barth_336.pdf.
30. Cummings, K., K. Pickering, **M. Barth**, M. Bela, Y. Li, D. Allen, E. Bruning, D. MacGorman, S. Rutledge, B. Fuchs, A. Weinheimer, I. Pollack, T. Ryerson, and H. Huntrieser, 2014: A WRF-Chem Flash Rate Parameterization Scheme and LNO_x Analysis of the 29-30 May 2012 Convective Event in Oklahoma during DC3, in Proceedings from the XV International Conference on Atmospheric Electricity, Norman, Oklahoma, 15-20 June, 2014, http://www.nssl.noaa.gov/users/mansell/icae2014/preprints/Cummings_328.pdf.
31. **Barth, M.**, R. Gautam, F. Fierli, N. T. K. Oanh, 2015: 1st Atmospheric Composition and the Asian Monsoon Training School on “Satellite and Model Data Use for Aerosols and Air Quality”, IGAC Newsletter, 55, 10-11.
32. **Barth, M. C.**, A. M. Carlton, S. M. Lance, 2017: Whiteface Mountain Cloud Chemistry Workshop, IGAC Newsletter, 59, 16-17.
33. Pan, Laura, Jim Crawford, Xuemei Wang, Jianchun Bian, **Mary Barth**, Ritesh Gautam, and Federico Fierli, 2017: The Third Workshop on Atmospheric Composition and the Asian Monsoon (ACAM) and the Second ACAM Training School, 46, 32-33.
34. Geerts, B., D. Raymond, **M. Barth**, A. Detwiler, P. Klein, W.-C. Lee, P. Markowski, G. Mullendore, 2017: Community Workshop on Developing Requirements for In Situ and Remote Sensing Capabilities in Convective and Turbulent Environments (C-RITE), UCAR/NCAR Earth Observing Laboratory, <https://doi.org/10.5065/D6DB80KR>

INVITED TALKS

1. September 1998: Clouds and Chemistry, Chemistry and Clouds, ASP/NCAR
2. February 2001: Large Eddy Simulations of Isoprene Chemistry in the Convective Boundary Layer, NOAA Aeronomy Laboratory seminar

3. July 2002: The Relative Importance of Aqueous Chemistry to the Global Sulfur Cycle, ASP Summer Colloquium/NCAR
4. July 2002: How Aqueous Chemistry Affects Sulfate Aerosols, ASP Summer Colloquium/NCAR
5. August 2002: Effect of Cloud Chemistry on Boundary Layer Chemistry, Telluride Atmospheric Chemistry Workshop
6. November 2002: Relative Importance of Cloud Chemistry in Deep Convection, University of Wyoming, Dept. of Atmospheric Sciences seminar
7. February 2003: Cloud Processing: What are the links with climate and how well are we modeling them?, Chemistry Climate Interactions Workshop, Santa Fe, NM
8. December 2004: Simulating the Redistribution of Formaldehyde in Deep Convection Using the Weather Research Forecast Model Coupled with Aqueous Chemistry, AGU Fall Meeting, San Francisco, CA
9. February 2006: Cloud Chemistry Simulations of a Thunderstorm, Harvard University, Atmospheric Sciences Seminar
10. March 2006: Cloud Chemistry Simulations of a Thunderstorm, University of South Florida, Environmental Research Interdisciplinary Colloquium
11. October 2006: Convective-Scale Cloud Chemistry Simulations of a Thunderstorm, Colorado State University, Atmospheric Sciences Colloquium
12. October 2006: Convective-Scale Cloud Chemistry Simulations of a Thunderstorm, NOAA/ESRL, Chemical Sciences Division Seminar
13. December 2006: Processing of Chemical Constituents by Deep Convection, AGU Fall Meeting, San Francisco, CA
14. October 2007: Relevance of and challenges in the representation of surface and boundary layer processes in mesoscale chemistry transport models, Expert Workshop on the Relevance of Surface and Boundary Layer Processes for the Exchanges of Reactive- and Greenhouse Gases, Wageningen, Netherlands
15. January 2008: Advances in Cloud Chemistry, Peter V. Hobbs Symposium, AMS annual meeting, New Orleans, Louisiana
16. July 2008: Effect of Deep Convection on Chemical Species Transport in the Central US, International Conference on Clouds and Precipitation, Cancun, Mexico
17. October 2008: Thunderstorms and Chemistry: Cloud-scale simulations to understand the influence of convective outflows on the upper troposphere composition, University of North Dakota, Atmospheric Sciences Seminar
18. January 2009: Deep Convective Clouds and Chemistry (DC3): Description of the proposed field campaign and modeling of lightning NO_x in the DC3 study areas, American Meteorological Society annual meeting, Phoenix, Arizona
19. August 2009: Introduction: Biogenic Emissions to the Atmosphere, Gordon Research Conference, Waterville, New Hampshire [introductory talk]

20. August 2010: Atmospheric Chemistry Modeling at High Resolution, ASP Colloquium Lecture, Boulder, Colorado
21. August 2010: Atmospheric Chemistry Modeling at High Resolution, Third International Workshop on Next-Generation Numerical Weather Prediction Models, Jeju Island, Korea
22. October 2010: Thunderstorms and Chemistry: Examining the regional-scale effects on the upper troposphere and precipitation, JPL seminar, Pasadena, California
23. July 2011: Career Path doing Research on Clouds and Chemistry, Atmospheric Science Collaborations and Enriching Networks (ASCENT) talk, Steamboat Springs, Colorado
24. December 2012: Overview of the Deep Convective Clouds and Chemistry Field Experiment, AGU Fall Meeting, San Francisco, California
25. January 2013: Thunderstorms and Atmospheric Chemistry, AMS 12th Annual Student Conference, Austin, Texas
26. January 2013: Overview of the Deep Convective Clouds and Chemistry Field Experiment, AMS 6th Conference on the Meteorological Applications of Lightning Data, Austin, Texas
27. June 2013: Overview of recent advances in understanding the chemical and physical processes associated with thunderstorms, Workshop on Atmospheric Composition and the Asian Summer Monsoon (ACAM), Kathmandu, Nepal
28. January 2014: Thunderstorms and Chemistry – Overview of the DC3 Field Project with a Focus on Scavenging of Soluble Trace Gases, NOAA/ESRL/CSD seminar, Boulder, Colorado
29. August 2014: Evaluation of Regional-Scale Convective Simulations with Airborne Observations from the DC3 Campaign, Atmospheric Composition and Convection Workshop, Pasadena, California.
30. December 2014: Understanding and Prediction of Convective Transport, Scavenging, and Lightning-Produced Nitrogen Oxides Based on DC3 Thunderstorm Cases, AGU Fall Meeting, San Francisco, California.
31. April 2015: Effects of Thunderstorms on Tropospheric Trace Gas Chemistry, Colorado State University Atmospheric Sciences Seminar, Fort Collins, Colorado.
32. August 2015: Thunderstorm Processing of Hydrogen Peroxide and Methyl Hydrogen Peroxide, University of Colorado, Mechanical Engineering Department Seminar, Boulder, Colorado.
33. June 2016: Role of Thunderstorms on Upper Troposphere Ozone – What We Have Learned from DC3, Laboratoire d'Aerologie Seminar, CNRS, Toulouse, France.
34. December 2016: Role of Thunderstorms on Upper Troposphere Ozone – What We Have Learned from DC3, Invited talk at the AGU Fall Meeting, San Francisco, California.
35. January 2017: Role of Thunderstorms on Upper Troposphere Ozone – What We Have Learned from DC3, Invited talk at the 19th Conference on Atmospheric Chemistry, Seattle, Washington.

36. January 2017: Modeling and Analysis of Aerosol-Cloud Interactions in a Severe Convection Case with an Elevated Smoke Plume, Invited talk at the Ninth Symposium on Aerosol-Cloud-Climate Interactions, Seattle, Washington.
37. February 2017: Role of Thunderstorms on Upper Troposphere Ozone – What We Have Learned from DC3, Department of Atmospheric Sciences Seminar, Texas A&M University, College Station, Texas.
38. April 2017: Thunderstorms and Atmospheric Composition: A Meeting of Cloud Physics, Dynamics, Lightning, and Chemistry, Department of Climate and Space Sciences and Engineering Seminar, University of Michigan, Ann Arbor, Michigan.
39. October 2017: Thunderstorms and Atmospheric Composition: A Meeting of Cloud Physics, Dynamics, Lightning, and Chemistry, Department of Atmospheric Science, University of Alabama, Huntsville, Alabama.
40. October 2017: A Community Effort for Furthering Cloud Chemistry Studies, 36th American Association for Aerosol Research Annual Conference, Raleigh, North Carolina.
41. February 2019: Modeling Tropospheric Chemistry, Aerosol Modeling Workshop, Kantary Hills Hotel, Chiang Mai, Thailand, (2019)
42. February 2019: Aerosol Interactions with Radiation and Clouds, Aerosol Modeling Workshop, Kantary Hills Hotel, Chiang Mai, Thailand, (2019)
43. February 2019: Examples of Research and Operational Air Quality Models, Aerosol Modeling Workshop, Kantary Hills Hotel, Chiang Mai, Thailand, (2019)
44. February 2019: Global vs. Regional Chemistry-Climate modeling, Aerosol Modeling Workshop, Kantary Hills Hotel, Chiang Mai, Thailand, (2019)
45. March 2019: Modeling Tropospheric Chemistry and Future Modeling of Air Quality at NCAR/ACOM, International Workshop on Chemistry Climate Interaction [IWCCI], Pune, India, (2019)
46. May 2019: MUSICA & MICM, Progress and Plans, MUSICA Kickoff Meeting, Boulder, Colorado, United States of America, (2019)
47. July 2019: Introducing MUSICA: A New Modeling Infrastructure for Simulation of Chemical Weather and Chemical Climate, IUGG General Assembly, Montreal, Canada.
48. September 2019: Atmospheric Acidity and the Role of Clouds on Air Quality, MAC MAQ Conference, Davis, California.
49. September 2019: Cloud & Chemistry Processes Affecting Atmospheric Composition, Atmospheric & Environmental Chemistry Seminar, Harvard University, Cambridge, Massachusetts.
50. July 2020: Role of Airborne Sampling: Understanding Cloud/Storm Effects on Atmospheric Composition, Virtual Community Workshop on Future Use of NASA Airborne Platforms to Advance Earth Science Priorities, online.
51. November 2020: “Multi-scale modeling of air quality: Developing the MUSICA model”, 24 November 2020, Thailand Consortium for Atmospheric Research (TCAR), online.

52. September 2022: “Challenges and Recent Developments in Atmospheric Chemistry”, 8 September 2022, IGAC Early Career Short Course, Manchester, United Kingdom.
53. October 2022: “The Role of Meteorological Processes on the Lifecycle of Aerosols”, 3 October 2022, AAAR Tutorial Lecture, recorded.
54. November 2022: “Vertical Transport of Soluble Trace Gases and Aerosols in Deep Convection”, 18 November 2022, Frontiers in Atmospheric Chemistry Seminar Series, online.
55. May 2023: “Developing the Next Generation Chemistry Modeling with MUSICA, the Multiscale Infrastructure for Chemistry and Aerosols”, 10 May 2023, European WRF-Chem Workshop, hybrid.
56. August 2023: “Cloud Chemistry – Addressing Organic Acid Formation via Box Modeling in Context of Whiteface Mountain Measurements”, 1 August 2023, Gordon Research Conference, in person.