

Curriculum Vitae

DeMott, Paul J., Ph.D. Senior Research Scientist/Scholar

A. Vital Statistics

Born: November 23, 1957; US Citizen.

Current Position: Senior Research Scientist/Scholar
Department of Atmospheric Science
Colorado State University
Fort Collins, CO 80523
(970) 491-8257 Fax: (970) 491-8483
Internet: pdemott@lamar.colostate.edu
Web: <http://lamar.colostate.edu/~pdemott>

B. Education

- B.S. Atmospheric Science, State University of New York at Albany (1979)
- M.S. Atmospheric Science, Colorado State University (1982)
- Ph.D. Atmospheric Science, Colorado State University (1990)

C. Professional Experience

2002-present: Senior Research Scientist/Scholar, Department of Atmospheric Science, Colorado State University

1995-2002: Research Scientist, Department of Atmospheric Science, Colorado State University

Research focus is on ice formation by atmospheric aerosols in tropospheric clouds. Approaches include laboratory, observational and numerical modeling studies.

Activities: Conceive and direct laboratory and field research studies, analyze experimental data, perform numerical cloud model simulations, software development, write research proposals and technical papers, make presentations at scientific conferences, supervise research of graduate students and postdoctoral fellows, supervise technical and work-study personnel, participate on national and international scientific working groups and panels, peer review.

Research Grants Worked on as Principal, Co-Principal Investigator, or Co-Investigator:

- Measurements and Analysis of Ice Nuclei Relevant to West Coast U.S. Precipitation (PI, DOE – 2015)
- Collaborative Research: Ground-based measurements to constrain aerosol-cloud-precipitation interactions in West Coast U.S. storms (Co-I, NSF AGS – 2015)
- Ice Nucleation Measurements on the DOE G-1 Aircraft for CALWATER2 (PI, DOE – 2015)

- Laboratory and surface-based studies to quantify globally-relevant ice nucleating particle concentrations and compositions (PI, NSF AGS – 2014)
- CCI Phase II, Center for Aerosol Impacts on Climate and the Environment (Co-I, NSF Chemistry – 2013)
- Aerosol Indirect Effects on the Anvil Characteristics, Cold Pool Forcing, Stratiform-Convective Precipitation Partitioning and Latent Heating of Mesoscale Convective Systems (Co-I, DOE – 2013)
- Measurements to constrain black carbon and biomass burning aerosol contributions to ice cloud formation (PI, NASA: 2012)
- Ice Nuclei and Ice Formation Processes in Tropical Cumulus Clouds (PI, NSF:2010)
- Quantifying the Source of Atmospheric Ice Nuclei from Biomass Burning Aerosols (PI, NOAA: 2010)
- Anthropogenic Versus Natural Aerosol Contributions to Ice Nuclei Populations in CALWATER (PI, California Energy Commission via UCSD: 2010)
- ARRA: Collaborative Research: Laboratory and Ground-Based Studies Addressing Key Issues in Atmospheric Ice Nucleation (PI, NSF: 2009)
- ETBC: Collaborative Research: Exploring forest ecosystem response to water availability and the impact on biogeochemical and water cycles (Co-PI, NSF: 2009)
- Ice Nuclei relation to aerosol properties in mixed-phase clouds: Data analysis and model parameterization (Co-PI, DOE: 2009)
- Ice nuclei and Ice initiation in Mid-latitude Clouds in Springtime: Background and Dust-affected (PI, NSF: 2006)
- Investigation of Hygroscopicity and Cloud- and Ice-nucleating Activities of Carbonaceous and Combustion-derived Aerosol Particles (PI, NASA-2006)
- Modeling studies of aerosol-cold cloud interactions (Co-PI, NASA: 2005)
- Acquisition of Instrumentation for Enhancing Studies of Aerosol-Cloud Interactions (Co-PI, NSF-MRI: 2005-2006)
- Investigation of hygroscopicity and cloud- and ice-nucleating activities of combustion aerosols (PI, DOE-NIGEC: 2005-2007)
- Ice Nuclei and ice formation in Arctic clouds: Observations, parameterization and implications from the M-PACE (PI, DOE-ARM: 2005)
- Aerosol Effects on Warm and Cold Clouds (PI, NSF: 2005-2007)
- Collaborative Research: Physical and Chemical Impacts on the Ice Nucleating Properties of Atmospheric Particles in Springtime (Co-PI, NSF: 2003-2005)
- The Role of Ice Nuclei in the Evolution of Supercooled and Mixed-phase Clouds (PI, NSF: 2003-2005)

- Upper Troposphere Ice Nuclei Measurements in the Cirrus Regional Study of Tropical Anvils and Cirrus Layers – Florida Area Cirrus Experiment (PI, NASA: 2002-2003)
- Single Particle Mass Spectroscopy of Ice Nucleating Particles (Co-PI, NSF: 2001-2003)
- Homogeneous and Heterogeneous Ice Formation in Upper Tropospheric Conditions (PI, NSF: 2000-2004)
- Ice Formation Processes in Upper Tropospheric Cloud Conditions (PI, NSF: 1997-2000)
- Freezing Characteristics of Soot/Sulfate Aerosols (PI, NASA: 1998-2002)
- Relations between Ice Nuclei and Ice Formation in Clouds (Co-PI, NSF: 1998-2001)
- Ice Nuclei Measurements in the Subsonic Aircraft Contrail and Cloud Effects Special Study (Co-PI, NASA:1995-1998)
- Atmospheric Ice Nucleating Aerosols (Co-PI, NSF: 1994-1997)

1985-1995: Research Associate, Department of Atmospheric Science, Colorado State University

Research Grants Worked on as Co-Principal Investigator:

- Atmospheric Ice Nucleating Aerosols (NSF: 1994-1997)
- Laboratory and Numerical Model Studies on Ice Formation in Clouds (NSF: 1986-1994)
- Condensation and Ice Nucleation Kinetics at Low Temperatures and Pressures (US Air Force: 1985-1986)
- Measurements of Ice Nuclei in Winter Storms (NCAR/NSF: 1993-1995)
- North Dakota Tracer Experiment (NOAA/CIRA: 1993)

Director, Cloud Simulation and Aerosol Laboratory: Oversaw laboratory business account activities involving testing of cloud seeding generators and cloud microphysical instrumentation for private entities.

1979-1985: Graduate Research Assistant, Department of Atmospheric Science, Colorado State University

Projects worked on:

- Colorado Orographic Seeding Experiments (NSF: 1979-1985)
- Condensation and Ice Nucleation Kinetics at Low Temperatures and Pressures (US Air Force: 1983-1985)

D. Honors and Awards

Colorado State University Engineering College Distinguished Alumnus Award in Atmospheric Science - 2009

Featured Author Commentary in Thomson Reuter's Science Watch Emerging Research Fronts in Geosciences, February 2009

Intergovernmental Panel on Climate Change (IPCC) contributing author and reviewer – IPCC awarded 2007 Nobel Peace Prize

Colorado State University Distinguished Service Award - 2003

American Geophysical Union, Geophysical Research Letters Editor's Award for Excellence in Peer Review - 2003, 2012

NASA Group Achievement Award, Cirrus Regional Study of Tropical Anvils and Cirrus Layers – Florida Area Cirrus Experiment (CRYSTAL-FACE) Science Team, 2003

Best Student Paper, 57th Annual Meeting of the Southwestern and Rocky Mountain Division, AAAS, 22-25 April, 1981, Greeley, CO.

E. Professional Societies and Activities

- International Association of Meteorology and Atmospheric Sciences
 - Committee on Nucleation and Atmospheric Aerosols, Co-Chair (2004-2013), Member (2000-2013), Honorary Member (life)
 - International Commission on Clouds and Precipitation (2004-2013); Awards Committee (2012).
 - Session Convenor, IAMAS Assembly (2009)
 - Session Convenor, IUGG (2011; 2015)
- American Meteorological Society, member; Associate editor, Journal of the Atmospheric Sciences (2008-2010); Subject Matter Editor, Bulletin of the American Meteorological Society (2004-2010); Associate Editor, Journal of Applied Meteorology (1996-2001); Committee on Cloud Physics (1997-2000); Committee on Planned and Inadvertent Weather Modification (1991-1994); session convenor, Fifth Symposium on Aerosol-Cloud-Climate Interactions (2013)
- American Geophysical Union, member; Fall Meeting Session Chair (2002, 2008, 2009, 2014); Fall Meeting Session Convenor (2004, 2015).
- American Association for Aerosol Research; member, Tutorial (2009)
- American Chemical Society, member
- International Aerosol Conference, Session Convenor and Tutorial (2010)
- Scientific Advisory Board Member for BACCHUS (Impact of Biogenic versus Anthropogenic emissions on Clouds and Climate: towards a Holistic Understanding), proposal to the 7th EU Framework Programme Theme 6 (2013-)
- NCAR Observing Facilities Assessment Panel (2010-2014)

- Co-organizer, The International Workshop on Comparing Ice Nucleation Measuring Systems (ICIS 2007), 10-28 September 2007, Karlsruhe, Germany
- Co-organizer, The Fifth International Ice Nucleation Workshop (FIN) (2014-2015)
- CalWater Steering Committee (2014-present)
- NCAR Ice Initiative Steering Committee (2003-present)
- Intergovernmental Panel on Climate Change: Contributing author to Third Assessment Report – Climate Change 2001
- DOE Pacific Northwest Laboratory Aerosol Climate Initiative Advisory Committee (2009-present)
- GEWEX Cloud Systems Studies Working Group II - Cirrus (1998-present)
- NASA-SUCCESS II Planning Committee (1998-1999)
- North Dakota Tracer Experiment Planning Committee (1992-1993)
- Winter Icing in Storms Project Steering Committee (1994 -1997)
- Weather Modification Association, member, Editorial Board (1988-1991)
- Peer reviewer (Nature, Science, Journal of Geophysical Research, Geophysical Research Letters, Journal of the Atmospheric Sciences, Journal of Applied Meteorology, Journal of Atmospheric and Oceanic Technology, Journal of Physical Chemistry, Chemical Reviews, Atmospheric Chemistry and Physics, Atmospheric Environment, Atmospheric Research, Journal of Weather Modification, Journal of Photochemistry and Photobiology, NSF, NOAA, NASA, DOE, WMO, National Research Council, National Center for Atmospheric Research, ETHZ-Switzerland, Canadian Foundation on Climate and the Atmospheric Sciences, National (U.K.) Environmental Research Council, ANR-France, Helmholtz Society, American Chemical Society, German-Israeli Foundation, City University of New York, Research Corporation)

F. Publications

Author more than 130 papers published in refereed scientific journals, 2 book chapters, more than 150 conference papers, 40 formal reports to private and public institutions, numerous annual and final reports on research grants. Reviewed papers:

Horn, R. D., W. G. Finnegan and P. J. DeMott, 1982: Experimental studies of nucleation by dry ice. *J. Appl. Meteor.*, **21**, 1567-1570.

DeMott, P.J., W.G. Finnegan and L.O. Grant, 1983: An application of chemical kinetic theory and methodology to characterize the ice nucleating properties of aerosols used in weather modification. *J. Clim. Appl. Meteor.*, **22**, 1190-1203.

Hindman, E. E., R. D. Borys and P. J. DeMott, 1983: Hydrometeorological significance of rime ice deposits in the Colorado Rockies. *Water Res. Bull.*, **19**, 619-624.

- Borys, R.D., E.E. Hindman, and P.J. DeMott, 1988: The chemical fractionation of atmospheric aerosol as a result of snow crystal formation and growth. *J. Atmos. Chem.*, **7**, 213-239.
- DeMott, P. J., 1988: Comparisons of the behavior of AgI-type ice nucleating aerosols in laboratory-simulated clouds. *J. Wea. Mod.*, **20**, 44-50.
- Ward, P. J. and P. J. DeMott, 1989: Preliminary experimental evaluation of SnomaxTM, *Pseudomonas syringae*, as an artificial ice nucleus for weather modification. *J. Wea. Mod.*, **21**, 9-13.
- DeMott, P.J., 1990: An exploratory study of ice nucleation by soot aerosols. *J. Appl. Meteor.*, **29**, 1072-1079.
- DeMott, P.J. and D.C. Rogers, 1990: Freezing nucleation rates of dilute solution droplets measured between -30 and -40C in laboratory simulations of natural clouds. *J. Atmos. Sci.*, **47**, 1056-1064.
- DeMott, P. J., 1991: Comments on 'The persistence of seeding effects in an orographic cloud seeded with silver iodide burned in acetone'. *J. Appl. Meteor.*, **30**, 1376-1380.
- Rogers, D.C., and P.J. DeMott, 1991: Advances in laboratory cloud physics 1987 - 1990. *Rev. of Geophys.*, **29**, Supplement Vol. 1, 80-87.
- Meyers, M.P., P.J. DeMott, and W.R. Cotton, 1992: New primary ice nucleation parameterizations in an explicit cloud model. *J. Appl. Meteor.*, **31**, 708-721.
- DeMott, P.J., M.P. Meyers, and W.R. Cotton, 1994: Parameterization and impact of ice initiation processes relevant to numerical model simulations of cirrus clouds. *J. Atmos. Sci.*, **51**, 77-90.
- Rogers, D.C., P.J. DeMott and L.O. Grant, 1994: Concerning primary ice nuclei concentrations and water supersaturation in the atmosphere. *Atmospheric Research*, **33**, 151-168.
- Stith, J.L., D.A. Burrows, and P.J. DeMott, 1994: Initiation of ice: comparison of numerical model results with observations of ice development in a cumulus cloud. *Atmospheric Research*, **32**, 13-30.
- DeMott, P.J., 1995: Quantitative descriptions of ice formation mechanisms of silver iodide-type aerosols. *Atmospheric Research*, **38**, 63-99.
- DeMott, P. J., A. B. Super, G. Langer, D. C. Rogers, and J. T. McPartland, 1995: Comparative characterizations of the ice nucleus ability of AgI aerosols by three methods. *J. Wea. Mod.*, **27**, 1-16.
- Meyers, M. P., P. J. DeMott, and W. R. Cotton, 1995: Comparison of seeded versus non-seeded orographic cloud simulations with an explicit cloud model. *J. Appl. Meteor.*, **34**, 834-846.
- DeMott, P.J., S.M. Kreidenweis, and D.C. Rogers, 1997: The susceptibility of ice formation in upper tropospheric clouds to insoluble aerosol components. *J. Geophys. Res.*, **102**, 19575-19584.

- Chen, Y., S.M. Kreidenweis, L.M. McInnes, D.C. Rogers and P.J. DeMott, 1998: Single particle analyses of ice nucleating particles in the upper troposphere and lower stratosphere, *Geophys. Res. Lett.*, **25**, 1391-1394.
- DeMott P.J., D.C. Rogers, S.M. Kreidenweis, Y. Chen. C.H. Twohy, D. Baumgardner, A.J. Heymsfield, and K.R. Chan., 1998: The role of heterogeneous freezing nucleation in upper tropospheric clouds: Inferences from SUCCESS, *Geophys. Res. Lett.*, **25**, 1387-1390.
- Franc, G. D. and P.J. DeMott, 1998: Cloud activation characteristics of airborne *Erwinia carotovara* cells. *J. Appl. Meteor.*, **37**, 1293-1300.
- Gerber, H., C. H. Twohy, B. Gandrud, A. J. Heymsfield, P. J. DeMott, and D. C. Rogers, 1998: Measurement of wave-cloud microphysics with two new aircraft probes, *Geophys. Res. Lett.*, **25**, 1117-1120.
- Kreidenweis, S.M., Y. Chen, P.J. DeMott, and D.C. Rogers, 1998: Isolating and identifying atmospheric ice-nucleating aerosols: A new technique. *Atmospheric Research*, **46**, 263-278.
- Rogers, D.C., P.J. DeMott, S.M. Kreidenweis, and Y. Chen, 1998: Measurements of ice nucleating aerosols during SUCCESS, *Geophys. Res. Lett.*, **25**, 1383-1386.
- DeMott, P.J., Y. Chen, S.M. Kreidenweis, D.C. Rogers and D. Eli Sherman, 1999: Ice formation by black carbon particles, *Geophys. Res. Lett.*, **26**, 2429-2432.
- Chen, Y, P.J. DeMott, S.M. Kreidenweis, D.C. Rogers and D. Eli Sherman, 2000: Ice formation by sulfate and sulfuric acid aerosol particles under upper tropospheric conditions, *J. Atmos. Sci.*, **57**, 3752-3766.
- Prenni, A.J, R.L. Siefert, T.B. Onasch, M.A. Tolbert and P.J. DeMott, 2000: Design and characterization of a fluidized bed aerosol generator: A source for dry, sub-micrometer aerosol. *Aerosol Sci. and Technol.*, **32**, 465-481.
- Prenni, A.J., P.J. DeMott, S.M. Kreidenweis, D.E. Sherman, L.M. Russell and Y. Ming, 2001: The effects of low molecular weight dicarboxylic acids on cloud formation. *J. Phys. Chem. A.*, **105**, 11240-11248.
- Rogers, D.C., P.J. DeMott, S.M. Kreidenweis and Y. Chen, 2001: A continuous flow diffusion chamber for airborne measurements of ice nuclei, *J. Atmos. Oceanic Technol.*, **18**, 725-741.
- Rogers, D.C., P.J. DeMott, and S.M. Kreidenweis, 2001: Airborne measurements of tropospheric ice nucleating aerosol particles in the Arctic Spring, *J. Geophys. Res.*, **106**, 15,053-15,063.
- DeMott, P.J., 2002: *Laboratory studies of cirrus cloud processes*, Chapter 5 in *Cirrus*, D.K. Lynch, K. Sassen, D.O.C Starr, G. Stephens Eds., Oxford University Press, New York.
- Lin, R-F., D.O.C Starr, P.J. DeMott, R. Cotton, K. Sassen, E. Jensen, B. Karcher, and X. Liu, 2002: Cirrus parcel model comparison project phase 1: The critical components to simulate cirrus initiation explicitly, *J. Atmos. Sci.*, **59**, 2305-2329.

- DeMott, P.J., D.J. Cziczo, A.J. Prenni, D.M. Murphy, S.M. Kreidenweis, D.S. Thomson, R. Borys and D.C. Rogers, 2003: Measurements of the concentration and composition of nuclei for cirrus formation. *Proceedings of the National Academy of Sciences*, **100**, No. 25, 14655-14660.
- DeMott, P.J., K. Sassen, M. Poellot, D. Baumgardner, D.C. Rogers, S. Brooks, A.J. Prenni, and S.M. Kreidenweis, 2003: African dust aerosols as atmospheric ice nuclei. *Geophys. Res. Lett.*, **30**, No. 14, 1732, doi:10.1029/2003GL017410.
- Cziczo, D.J., P.J. DeMott, C. Brock, P.K. Hudson, B. Jesse, S.M. Kreidenweis, A.J. Prenni, J. Schreiner, D.S. Thomson, and D.M. Murphy, 2003: A Method for Single Particle Mass Spectroscopy of Ice Nuclei. *Aerosol Sci. and Technol.*, **37**, 460-470.
- Prenni, A.J., P.J. DeMott, and S.M. Kreidenweis, 2003: Water uptake of internally mixed particles containing ammonium sulfate and dicarboxylic acids. *Atmos. Environ.*, **37**, 4243-4251.
- Sassen, K., P.J. DeMott, J. Prospero, and M.R. Poellot, 2003: Saharan Dust Storms and Indirect Aerosol Effects on Clouds: CRYSTAL-FACE Results. *Geophys. Res. Lett.*, **30**, No. 12, 1633, doi:10.1029/2003GL017371.
- Cziczo, D.J., P. J. DeMott, S. D. Brooks, A. J. Prenni, D. S. Thomson, D. Baumgardner, J. C. Wilson, S. M. Kreidenweis, and D. M. Murphy, 2004: Observations of organic species and atmospheric ice formation, *Geophys. Res. Lett.*, **31**, 12116, doi:10.1029/2004GL019822.
- Brooks, S.D., P.J. DeMott and S.M. Kreidenweis, 2004: Water Uptake by Particles Containing Humic Materials and Mixtures of Humic Materials with Ammonium Sulfate. *Atmos. Environ.*, **38**, 1859-1868.
- Archuleta, C.A., P.J. DeMott, and S.M. Kreidenweis, 2005: Ice nucleation by surrogates for atmospheric mineral dusts and mineral dust/sulfate particles at cirrus temperatures. *Atmos. Chem. Phys.*, **5**, 2617–2634.
- Kreidenweis, S. M., K. Koehler, P. J. DeMott, A. J. Prenni, C. M. Carrico, and B. Ervens, 2005: Water activity and activation diameters from hygroscopicity data – Part I: Theory and application to inorganic salts. *Atmos. Chem. Phys.*, **5**, 1357–1370.
- Lin, R-F., D. O’C. Starr, J. Reichardt, and P. J. DeMott, 2005: Nucleation in Synoptically Forced Cirrostratus, *J. Geophys. Res.*, **100**, D8, D08208, 10.1029/2004JD005362, 30 April 2005.
- Phillips, V. T. J., S. C. Sherwood, C. Andronache, A. Bansemer, W. C. Conant, P. J. DeMott, R. C. Flagan, A. Heysmfield, H. Jonsson, M. Poellot, J. H. Seinfeld, T. Vanreken, V. Varutbangkul and J. C. Wilson, 2005: Anvil Glaciation in a Deep Cumulus Updraft over Florida Simulated with an Explicit Microphysics Model. Part I - The Impact of Various Nucleation Processes. *Q.J. Royal Met. Soc.*, **131**, 2019–2046.
- Cziczo, D. J., D. S. Thomson, T. L. Thompson, P. J. DeMott, and D. M. Murphy, 2006: Particle Analysis by Laser Mass Spectrometry (PALMS) studies of ice nuclei and other low number density particles. *Intl. J. Mass Spectrometry*, **258** (1-3): 21-29.

- Koehler, K., S. M. Kreidenweis, P. J. DeMott, A. J. Prenni, C. M. Carrico, B. Ervens, and G. Feingold, 2006: Water activity and activation diameters from hygroscopicity data – Part II: Application to organic species. *Atmos. Chem. Phys.*, **6**, 795-809.
- Kreidenweis, S. M., M. D. Petters, and P. J. DeMott, 2006: Deliquescence-controlled activation of organic aerosols. *Geophys. Res. Lett.*, **33**, L06801, doi:10.1029/2005GL024863.
- Petters, M.D., S.M. Kreidenweis, J.R. Snider, K. Koehler, Q. Wang, A.J. Prenni, and P.J. DeMott, 2006: Cloud formation on polymerized organic aerosol. *Tellus*, **58B**, 196–205.
- Petters, M.D., A.J. Prenni, S.M. Kreidenweis, P.J. DeMott, A. Matsunaga, Y.B. Lim, and P.J. Ziemann, 2006: Chemical aging and the hydrophobic-to-hydrophilic conversion of carbonaceous aerosol. *Geophys. Res. Lett.*, **33**, L24806, doi:10.1029/2006GL027249.
- Van den Heever, S.C., G. Carrico, W.R. Cotton, P. J. DeMott and A.J. Prenni, 2006: Impacts of Nucleating Aerosol on Florida Storms. Part I: Mesoscale Simulations. *J. Atmos. Sci.*, **63**, 1752-1775.
- Fridlind, A. M., A. S. Ackerman, G. McFarquhar, G. Zhang, M. R. Poellot, P. J. DeMott, A. J. Prenni, and A. J. Heymsfield (2007), Ice properties of single-layer stratocumulus during the Mixed-Phase Arctic Cloud Experiment: 2. Model results, *J. Geophys. Res.*, **112**, D24202, doi:10.1029/2007JD008646.
- Kärcher, B., O. Möhler, P.J. DeMott, S. Pechtl, and F. Yu, 2007: Insights into the role of soot aerosols in cirrus cloud formation, *Atmos. Chem. Phys.*, **7**, 4203–4227.
- Koehler, K. A., S. M. Kreidenweis, P. J. DeMott, A. J. Prenni, and M. D. Petters, 2007: Potential impact of Owens (dry) Lake dust on warm and cold cloud formation, *J. Geophys. Res.*, **112**, D12210, doi:10.1029/2007JD008413.
- Möhler, O., P.J. DeMott, G. Vali, and Z. Levin, 2007: Microbiology and atmospheric processes: The role of biological particles in cloud physics, *Biogeosciences*, **4**, 1059–1071.
- Petters, M.D., A.J. Prenni, S.M. Kreidenweis, P.J. DeMott, 2007: On measuring the critical diameter of cloud condensation nuclei using mobility selected aerosol particles. *Aerosol. Sci. and Technol.*, **41**, 907–913.
- Prenni, A.J., J.Y. Harrington, M. Tjernström, P.J. DeMott, A. Avramov, C.N. Long, S.M. Kreidenweis, P.Q. Olsson, J. Verlinde, 2007: Can Ice-Nucleating Aerosols Affect Arctic Seasonal Climate? *Bull. Amer. Meteor. Soc.*, **88**, No. 4, 541-550.
- Prenni, A.J., P.J. DeMott, C. Twohy, D.C. Rogers, S.D. Brooks, S.M. Kreidenweis, A.J. Heymsfield and M.R. Poellot, 2007: Examinations of ice formation processes in Florida cumuli using ice nuclei measurements of anvil ice crystal particle residues. *J. Geophys. Res.*, **112**, D10221, doi:10.1029/2006JD007549.
- Prenni, A. J., M. D. Petters, S. M. Kreidenweis, P. J. DeMott, and P.J. Ziemann, 2007: Cloud droplet activation of secondary organic aerosol. *J. Geophys. Res.*, **112**, D10223, doi:10.1029/2006JD007963.

- Richardson, M. S., P. J. DeMott, S. M. Kreidenweis, D. J. Cziczo, E. Dunlea, J. L. Jimenez, D. S. Thompson, L. L. Ashbaugh, R. D. Borys, D. S. Westphal, G. S. Cassacio and T. L. Lersch, 2007: Measurements of heterogeneous ice nuclei in the Western U.S. in springtime and their relation to aerosol characteristics. *J. Geophys. Res.*, **112**, D02209, doi:10.1029/2006JD007500.
- Verlinde, J., J. Y. Harrington, G. M. McFarquhar, V. T. Yannuzzi, A. Avramov, S. Greenberg, N. Johnson, G. Zhang, M. R. Poellot, J. H. Mather, D. D. Turner, E. W. Eloranta, B. D. Zak, A. J. Prenni, J. S. Daniel, G. L. Kok, D. C. Tobin, R. Holz, K. Sassen, D. Spangenberg, P. Minnis, T. P. Tooman, M. D. Ivey, S. J. Richardson, C. P. Bahrman, M. Shupe, P. J. DeMott, A. J. Heymsfield, and R. Schofield, 2007: The Mixed-Phase Arctic Cloud Experiment (M-PACE). *Bull. Amer. Meteor. Soc.*, **88**, 205-221.
- Kaye, P. H., E. Hirst, R. S. Greenaway, Z. Ulanowski, E. Hesse, P. J. DeMott, C. Saunders, and P. Connolly, 2008: Classifying atmospheric ice crystals by spatial light scattering. *Optics Letters*, **33**, 1545-1547.
- Kreidenweis, S. M., M. D. Petters, and P. J. DeMott, 2008: Single-parameter estimates of aerosol water content, *Environ. Res. Lett.*, **3**, 035002 (7pp), doi:10.1088/1748-9326/3/3/035002.
- Phillips, V. T. J., P. J. DeMott, and C. Andronache, 2008: An Empirical Parametrisation of Heterogeneous Ice Nucleation for Multiple Chemical Species of Aerosol. *J. Atmos. Sci.*, **65**, 2757-2783.
- Popovicheva O. B., Persiantseva N. M., Shonija N. K., P. J. DeMott, K. Koehler, M. D. Petters, S. M. Kreidenweis, V. Tishkova, B. Demirdjian, J. Suzanne, 2008: Water interaction with hydrophobic and hydrophilic soot particles. *Phys. Chem. Chem. Phys.*, **10**, 2332 – 2344 (DOI:10.1039/B718944N).
- DeMott, P. J., K. Sassen, M. R. Poellot, D. Baumgardner, D. C. Rogers, S. D. Brooks, A. J. Prenni, and S. M. Kreidenweis, 2009: Correction to “African dust aerosols as atmospheric ice nuclei,” *Geophys. Res. Lett.*, **36**, L07808, doi:10.1029/2009GL037639.
- DeMott, P. J., M. D. Petters, A. J. Prenni, C. M. Carrico, S. M. Kreidenweis, J. L. Collett, Jr., and H. Moosmüller, 2009: Ice nucleation behavior of biomass combustion particles at cirrus temperatures, *J. Geophys. Res.*, **114**, D16205, doi:10.1029/2009JD012036.
- Eidhammer, T., P. J. DeMott, and S. M. Kreidenweis, 2009: A comparison of heterogeneous ice nucleation parameterizations using a parcel model framework. *J. Geophys. Res.*, **114**, D06202, doi:10.1029/2008JD011095.
- Koehler, K. A., P. J. DeMott, S. M. Kreidenweis, M. D. Petters, C. Carrico, O. B. Popovicheva, A. Kamaev, N. Shonija, E. Kireeva, T. Khokhlova, N. Shonija, 2009: Cloud condensation nuclei and ice nucleation activity of hydrophobic and hydrophilic soot particles, *Phys. Chem. Chem. Phys.*, **11**, 7906 – 7920.

- Koehler, K. A., S. M. Kreidenweis, P. J. DeMott, M. D. Petters, A. J. Prenni, C. M. Carrico, 2009: Hygroscopicity and cloud droplet activation of mineral dust aerosol. *Geophys. Res. Lett.*, **36**, L08805, doi:10.1029/2009GL037348 .
- Petters, M. D., M. T. Parsons, A. J. Prenni, P. J. DeMott, S. M. Kreidenweis, C. M. Carrico, A. P. Sullivan, G. R. McMeeking, E. Levin, C. E. Wold, J. L. Collett, Jr., and H. Moosmüller, 2009: Ice nuclei emissions from biomass burning. *J. Geophys. Res.*, **114**, D07209, doi: 10.1029/2008JD011532.
- Petters, M. D., C. M. Carrico, S. M. Kreidenweis, A. J. Prenni, P. J. DeMott, J. L. Collett, Jr., and H. Moosmüller, 2009, Cloud condensation nucleation activity of biomass burning aerosol, *J. Geophys. Res.*, **114**, D22205, doi:10.1029/2009JD012353.
- Prenni, A. J., M. D. Petters, A. Faulhaber, C. M. Carrico, P. J. Ziemann, S. M. Kreidenweis and P. J. DeMott, 2009: Heterogeneous ice nucleation measurements of secondary organic aerosol generated from ozonolysis of alkenes, *Geophys. Res. Lett.*, **36**, L06808, doi:10.1029/2008GL036957.
- Prenni, A. J., P. J. DeMott, D. C. Rogers, S. M. Kreidenweis, G. M. McFarquhar, G. Zhang, and M. R. Poellot, 2009: Ice nuclei characteristics from M-PACE and their relation to ice formation in clouds. *Tellus*, **61B**, DOI: 10.1111/j.1600-0889.2009.00415.x, 436-448.
- Pratt, K. A., P. J. DeMott, J. R. French, Z. Wang, D. L. Westphal, A. J. Heymsfield, C. H. Twohy, A. J. Prenni, and K. A. Prather, 2009: In-situ detection of biological particles in cloud ice-crystals. *Nature Geoscience*, **2**, 398-401, doi:10.1038/ngeo521.
- Stith, J. L., V. Ramanathan, W. A. Cooper, G. Roberts, P. J. DeMott, G. Carmichael, C.D. Hatch, B. Adhikary, C. H. Twohy, D. C. Rogers, D. Baumgardner, A. J. Prenni, T. Campos, R. S. Gao, J. Anderson, and Y. Feng, 2009: An overview of aircraft observations from the Pacific Dust Experiment campaign. *J. Geophys. Res.*, **114**, D05207, doi:10.1029/2008JD010924.
- Twohy, C. H., S. M. Kreidenweis, T. Eidhammer, E. V. Browell, A. J. Heymsfield, A. R. Bansmer, B. E. Anderson, G. Chen, S. Ismail, P. J. DeMott and S. C. Van Den Heever 2009: Saharan Dust Particles Nucleate Droplets in Eastern Atlantic Clouds, Saharan dust particles nucleate droplets in eastern Atlantic clouds, *Geophys. Res. Lett.*, **36**, L01807, doi:10.1029/2008GL035846.
- DeMott, P. J., and A. J. Prenni, 2010: New Directions: Need for defining the numbers and sources of biological aerosols acting as ice nuclei, *Atmos. Environ.*, **44**, 1944-1945.
- DeMott, P.J., A. J. Prenni, X. Liu, M. D. Petters, C. H. Twohy, M. S. Richardson, T. Eidhammer, S. M. Kreidenweis, and D. C. Rogers, 2010: Predicting global atmospheric ice nuclei distributions and their impacts on climate, *Proc. Natnl. Acad. Sci.*, **107** (25), 11217-11222.
- Eidhammer, T., P. J. DeMott, A. J. Prenni, M. D. Petters, C. H. Twohy, D. C. Rogers, J. Stith, A. Heymsfield, Z. Wang, S. Haimov, J. French, K. Pratt, K. Prather, S. Murphy, J. Seinfeld, R. Subramanian, and S. M. Kreidenweis 2010: Ice initiation

- by aerosol particles: Measured and predicted ice nuclei concentrations versus measured ice crystal concentrations in an orographic wave cloud. *J. Atmos. Sci.*, **67**, 2417–2436. doi: 10.1175/2010JAS3266.1
- Heymsfield, A., D. Baumgardner, P. DeMott, P. Forster, K. Gierens, B. Kärcher, 2010: Contrail microphysics. *Bull. Amer. Meteor. Soc.*, 91 (4), 465-472.
- Koehler, K. A., S. M. Kreidenweis, P. J. DeMott, M. D. Petters, A. J. Prenni, O. Möhler, 2010: Investigations of the impact of natural dust aerosol on cold cloud formation. *Atmos. Chem. Phys.*, **10**, 11955–11968.
- Pratt, K. A., C. H. Twohy, S. M. Murphy, R. C. Moffet, A. J. Heymsfield, C. J. Gaston, P. J. DeMott, P. R. Field, D. C. Rogers, T. R. Henn, M. K. Gilles, J. H. Seinfeld, and K. A. Prather, 2010: Dry lakebed salts serve as natural cloud nuclei. *J. Geophys. Res.*, **115**, D15301, doi:10.1029/2009JD013606.
- Pratt, K. A., C. H. Twohy, A. J. Heymsfield, S. M. Murphy, P. J. DeMott, R. Subramanian, Z. Wang, J. G. Hudson, J. H. Seinfeld, K. A. Prather, 2010: In-situ Chemical Characterization of Aged Biomass Burning Aerosols Impacting Cold Wave Clouds, *J. Atmos. Sci.* **67**, 2451-2468.
- Pratt, K. A., S. M. Murphy, R. Subramanian, P. J. DeMott, G. L. Kok, T. Campos, A. J. Prenni, D. C. Rogers, A. J. Heymsfield, J. H. Seinfeld, and K. A. Prather, 2010: Flight-based chemical characterization of biomass burning aerosols within two prescribed burn smoke plumes, In preparation for submission to *Atmos. Chem. Phys.*
- Richardson, M. S., P. J. DeMott, S. M. Kreidenweis, M. D. Petters, M. D., and C. M. Carrico, 2010: Observations of ice nucleation by ambient aerosol in the homogeneous freezing regime. *Geophys. Res. Lett.*, **37**, L04806, doi:10.1029/2009GL041912.
- Sullivan, R. C., M. D. Petters, P. J. DeMott, S. M. Kreidenweis, H. Wex, D. Niedermeier, F. Stratmann, P. Reitz, and J. Schneider, 2010: Irreversible loss of ice nucleation surface sites in mineral dust particles induced by sulphuric acid condensation. *Atmos. Chem. Phys.*, **10**, 11471-11487.
- Sullivan, R. C., L. Miñambres, P. J. DeMott, A. J. Prenni, C. M. Carrico, E. J.T. Levin, and S. M. Kreidenweis, 2010: Chemical processing does not always impair heterogeneous ice nucleation of mineral dust particles. *Geophys. Res. Lett.*, **37**, L24805, doi:10.1029/2010GL045540.
- Twohy, C. H., P. J. DeMott, K. A. Pratt, R. Subramanian, G. L. Kok, S. M. Murphy, T. Lersch, K. A. Prather, J. H. Seinfeld, A. J. Heymsfield, and Z. Wang, 2010: Relationships of Biomass Burning Aerosols to Ice in Orographic Wave Clouds, *J. Atmos. Sci.* **67**, 2437-2450, doi: 10.1175/2010JAS3310.1.
- Baumgardner, D., J. L. Brenguier, A. Bucholtz, H. Coe, P. DeMott, T. J. Garrett, J. F. Gayet, M. Hermann, A. Heymsfield, A. Korolev, M. Kramer, A. Petzold, W. Strapp, P. Pilewskie, J. Taylor, C. Twohy, M. Wendisch, W. Bachalo, and P. Chuang, 2011: Airborne instruments to measure atmospheric aerosol particles,

- clouds and radiation: A cook's tour of mature and emerging technology *Atmos. Research*, **102**, 10-19, DOI: 10.1016/j.atmosres.2011.06.02
- DeMott, P. J., J. G. Hudson, U. Bundke, and G. C. Roberts, 2011: Cloud condensation and ice nuclei, in *Airborne Measurements –Methods and Instruments*, Wiley, in preparation.
- DeMott, P. J., O. Möhler, O. Stetzer, G. Vali, Z. Levin, M. D. Petters, M. Murakami, T. Leisner, U. Bundke, H. Klein, Z. Kanji, R. Cotton, H. Jones, M. Petters, A. Prenni, S. Benz, M. Brinkmann, D. Rzesanke, H. Saathoff, M. Nicolet, S. Gallavardin, A. Saito, B. Nillius, H. Bingemer, J. Abbatt, K. Ardon, E. Ganor, D. G. Georgakopoulos, and C. Saunders, 2010: Resurgence in ice nucleation research. *Bull. Amer. Meteor. Soc.*, **92**, 1623-1635.
- Jones, H., M. Flynn, P. DeMott, and O. Möhler, 2011: Manchester Ice Nucleus Counter (MINC) measurements from the 2007 International workshop on Comparing Ice nucleation Measuring Systems (ICIS-2007). *Atmos. Chem. Phys.*, **11**, 53-65.
- Kanji, Z., P. J. DeMott, O. Möhler, and J. P. D. Abbatt, 2011: Results from the University of Toronto Continuous Flow Diffusion Chamber at International Workshop on Comparing Ice Nucleation Measuring Systems (ICIS 2007), *Atmos. Chem. Phys.*, **11**, 31-41.
- Niedermeier, D., S. Hartmann, T. Clauss, H. Wex, A. Kiselev, R. C. Sullivan, P. J. DeMott, M. D. Petters, P. Reitz, J. Schneider, E. Mikhailov, B. Sierau, O. Stetzer, B. Reimann, U. Bundke, R. A. Shaw, A. Buchholz, T. F. Mentel, and F. Stratmann, Experimental study of the role of physicochemical surface processing on the IN ability of mineral dust particles. *Atmos. Chem. Phys.*, **11**, 11131-11144, 2011
- Pratt, K. A., Murphy, S. M., Subramanian, R., DeMott, P. J., Kok, G. L., Campos, T., Rogers, D. C., Prenni, A. J., Heymsfield, A. J., Seinfeld, J. H., and Prather, K. A.: Flight-based chemical characterization of biomass burning aerosols within two prescribed burn smoke plumes, *Atmos. Chem. Phys.*, **11**, 12549-12565.
- Reitz, P. C. Spindler, T. F. Mentel, L. Poulain, H. Wex, K. Mildenerger, D. Niedermeier, S. Hartmann, T. Clauss, F. Stratmann, R. C. Sullivan, P. J. DeMott, M. D. Petters, B. Sierau, and J. Schneider, Surface modification of mineral dust particles by thin coatings: Implications for CCN and IN abilities. *Atmos. Chem. Phys.*, **11**, 7839-7858, 2011
- Stith, J. L., C. H. Twohy, P. J. DeMott, D. Baumgardner, T. Campos, R. Gao, and J. Anderson, 2011: Observations of ice nuclei and heterogeneous freezing in a Western Pacific extratropical storm. *Atmos. Chem. Phys.*, **11**, 6229-6243.
- Field, P. R., A. J. Heymsfield, B. J. Shipway, P. J. DeMott, K. A. Pratt, D. C. Rogers, J. L. Stith, and K. A. Prather, 2012: Ice in Clouds Experiment - Layer Clouds. Part II: Testing Characteristics of Heterogeneous Ice Formation in Lee Wave Clouds. *J. Atmos. Sci.*, **69**, 1066-1079.

- Garcia, E., T. C. J. Hill, A. J. Prenni, P. J. DeMott, G. D. Franc and S. M. Kreidenweis, 2012: Biogenic ice nuclei in boundary layer air over two U.S. High Plains agricultural regions, *J. Geophys. Res.* **117**, D18209, doi:10.1029/2012JD018343.
- Levin, E. J. T., A. J. Prenni, M. D. Petters, S. M. Kreidenweis, R. C. Sullivan, S. A. Atwood, J. Ortega, P. J. DeMott and J. N. Smith, 2012: An annual cycle of size-resolved aerosol hygroscopicity at a forested site in Colorado. *J. Geophys. Res.* **117**, D06201, doi:10.1029/2011JD016854.
- Niemand, M., O. Moehler, B. Vogel, H. Vogel, C. Hoose, P. Connolly, H. Klein, H. Bingemer, P. DeMott, J. Skrotzki, and T. Leisner, 2012: Parameterization of immersion freezing on mineral dust particles: An application in a regional scale model. *J. Atmos. Sci.*, **69**, 3077-3092.
- Prenni, A. J., P. J. DeMott, A. P. Sullivan, R. C. Sullivan, S. M. Kreidenweis, and D. C. Rogers, 2012: Biomass burning as a potential source for atmospheric ice nuclei: Western wildfires and prescribed burns. *Geophys. Res. Lett.*, **39**, L11805, doi:10.1029/2012GL051915.
- Tobo, Y., P. J. DeMott, M. Raddatz, D. Niedermeier, S. Hartmann, S. M. Kreidenweis, F. Stratmann, and H. Wex, 2012: Impacts of chemical reactions on ice nucleation of kaolinite particles: A case study for levoglucosan and sulfuric acid, *Geophysical Res. Lett.*, **39**, L19803, doi:10.1029/2012GL053007.
- Creamean, J. M., K. J. Suski, D. Rosenfeld, A. Cazorla, P. J. DeMott, R. C. Sullivan, A. B. White, F. M. Ralph, P. Minnis, J. M. Comstock, J. M. Tomlinson, and K. A. Prather, 2013: Dust and Biological Aerosols from the Sahara and Asia Influence Precipitation in the Western United States, *Science*, **339**, 1572-1578.
- DeMott, P. J., R. C. Sullivan, M. J. Ruppel, T. C. Hill, R. Mason, A. P. Ault, K. A. Prather, D. B. Collins, M. J. Kim, A. Bertram, T. Bertram, V. K. Grassian, and G. D. Franc, 2013: Laboratory Measurements of Ice Nuclei Concentrations from Ocean Water Spray, in *Nucleation and Atmospheric Aerosols, 19th International Conference, AIP Conf. Proc.* **1527**, 941-944.
- DeMott, P. J., J. G. Hudson, U. Bundke, and G. C. Roberts, 2013: Cloud condensation and ice nuclei, *Chapter 4.6 in Airborne Measurements for Environmental Research: Methods and Instruments*, M. Wendisch and J.-L. Brenguier, Eds., Wiley, 641 pp.
- Huffman, J. A., Prenni, A. J., DeMott, P. J., Pöhlker, C., Mason, R. H., Robinson, N. H., Fröhlich-Nowoisky, J., Tobo, Y., Després, V. R., Garcia, E., Gochis, D. J., Harris, E., Müller-Germann, I., Ruzene, C., Schmer, B., Sinha, B., Day, D. A., Andreae, M. O., Jimenez, J. L., Gallagher, M., Kreidenweis, S. M., Bertram, A. K., and Pöschl, U.: High concentrations of biological aerosol particles and ice nuclei during and after rain, *Atmos. Chem. Phys.*, **13**, 6151-6164, doi:10.5194/acp-13-6151-2013, 2013.
- Meskhidze, N., M. D. Petters, K. Tsigaridis, T. Bates, C. O'Dowd, J. Reid, E. R. Lewis, B. Gantt, M. D. Anguelova, P. V. Bhawe, J. Bird, A. H. Callaghan, D. Ceburnis, R. Chang, A. Clarke, G. de Leeuw, G. Deane, P. J. DeMott, S. Elliot, M. C. Facchini, C. W. Fairall, L. Hawkins, Y. Hu, J. G. Hudson, M. S. Johnson, K. C.

- Kaku, W. C. Keene, D. J. Kieber, M. S. Long, M. Mårtensson, R. L. Modini, C. L. Osburn, K. A. Prather, A. Pszenny, M. Rinaldi, L. M. Russell, M. Salter, A. M. Sayer, A. Smirnov, S. R. Suda, T. D. Toth, D. R. Worsnop, A. Wozniak, S. R. Zorn, 2013: Production mechanisms, number concentration, size distribution, chemical composition, and optical properties of sea spray aerosols. *Atmosph. Sci. Lett.*, **14**: 207–213, doi: 10.1002/asl2.441.
- Phillips, V. T. J., P. J. DeMott, C. Andronache, K. Pratt, K. A. Prather, R. Subramanian, and C. Twohy, 2013: Improvements to an Empirical Parameterization of Heterogeneous Ice Nucleation and its Comparison with Observations. *J. Atmos. Sci.*, **70**, 378-409.
- Prather, K. A., T. H. Bertram, V. H. Grassian, G. B. Deane, M. D. Stokes, P. J. DeMott, L. I. Aluwihare, B. Palenik, F. Azam, J. H. Seinfeld, R. C. Moffet, M. J. Molina, C. D. Cappa, F. M. Geiger, G. C. Roberts, L. M. Russell, A. P. Ault, J. Baltrusaitis, D. B. Collins, C. E. Corrigan, L. A. Cuadra-Rodriguez, C. J. Ebben, S. D. Forestieri, T. L. Guasco, S. P. Hersey, M. J. Kim, W. Lambert, R. L. Modini, W. Mui, B. E. Pedler, M. J. Ruppel, O. S. Ryder, N. Schoepp, R. C. Sullivan, and D. Zhao, 2013: Bringing the ocean into the laboratory to probe the chemical complexity of sea spray aerosol, *Proc. Natnl. Acad. Sci.*, **110** (19), 7550-7555, www.pnas.org/cgi/doi/10.1073/pnas.1300262110.
- Prenni, A. J. Y. Tobo, E. Garcia, P. J. DeMott, C. McCluskey, S. M. Kreidenweis, J. Prenni, A. Huffman, U. Pöschl, and C. Pöhlker, 2013: The impact of rain on ice nuclei populations. *Geophys. Res. Lett.*, **40**, doi:10.1029/2012GL053953.
- Rosenfeld, D., R. Chemke, P. J. DeMott, R. C. Sullivan, R. Rasmussen, F. McDonough, J. Comstock, B. Schmid, J. Tomlinson, H. Jonsson, K. Suski, and K. Prather, 2013: The Common Occurrence of Highly Supercooled Drizzle and Rain near the Coastal Regions of the Western United States, *J. Geophys. Res. - Atmos.*, **118**, 9819–9833, doi:10.1002/jgrd.50529.
- Tobo, Y., Prenni, A.J., DeMott, P.J., Huffman, J.A., McCluskey, C.S., Tian, G., Pöhlker, C., Pöschl, U., Kreidenweis, S.M., 2013: Biological aerosol particles as a key determinant of ice nuclei populations in a forest ecosystem. *J. Geophys. Res. - Atmos.*, **118**, 10100-10110, doi:10.1002/jgrd.50801.
- Creamean, J. M., C. Leeb, Thomas C. Hill, A. P. Ault, P. J. DeMott, A. B. White, F. M. Ralph, and K. A. Prather, 2014: Chemical Properties of Insoluble Precipitation Residue Particles, *J. Aerosol Sci.*, **76**, 13-27, doi: 10.1016/j.jaerosci.2014.05.005.
- Fan, J., L. R. Leung, P. J. DeMott, J. M. Comstock, B. Singh, D. Rosenfeld, J. M. Tomlinson, A. White, K. A. Prather, P. Minnis, J. K. Ayers, and Q. Min, 2013: Aerosol impacts on California winter clouds and precipitation during CalWater 2011: local pollution vs. long-range transported dust, *Atmos. Chem. Phys.* **14**, 3063-3064, 2014, 19921–19970
- Gerber, H., and P. J. DeMott, 2014: Response of the FSSP-100 and PVM-100A to Small Ice Crystals, *J. Atmos. Ocean. Technol.*, **31**, 2145-2155, doi: 10.1175/JTECH-D-13-00228.1.

- Hill, T. C. J., B. F. Moffett, P. J. DeMott, D. G. Georgakopoulos, W. L. Stump, and G. D. Franc, 2014: Measurement of ice nucleation-active bacteria on plants and in precipitation by quantitative PCR. *Appl. Environ. Microbiol.* **80**(4):1256-1267, DOI: 10.1128/AEM.02967-13.
- Levin, E. J. T, A.J. Prenni, B. Palm, D. Day, P. Campuzano-Jost, P. M. Winkler, S.M. Kreidenweis, P.J. DeMott, J. Jimenez, and J.N. Smith, 2013: Size-resolved aerosol composition and its link to hygroscopicity at a forested site in Colorado, *Atmos. Chem. Phys.*, **14**, 2657–2667, 2014.
- Levin, E. J. T, Levin, G. R. McMeeking, P. J. DeMott, C. S. McCluskey, C. E. Stockwell, R. J. Yokelson & S. M. Kreidenweis, 2014: A New Method to Determine the Number Concentrations of Refractory Black Carbon Ice Nucleating Particles, *Aerosol Science and Technology*, **48**:12, 1264-1275, DOI: 10.1080/02786826.2014.977843.
- Liu, S., A. C. Aiken, Caleb Arata, M. K. Dubey, C. E. Stockwell, R. J. Yokelson, E. A. Stone, T. Jayarathne, A. L. Robinson, P. J. DeMott, and S. M. Kreidenweis, 2014: Aerosol single scattering albedo dependence on biomass combustion efficiency: Laboratory and field studies, *Geophys. Res. Lett.*, **41**, 742–748, doi:10.1002/2013GL058392.
- McCluskey, C. S., P. J. DeMott, A. J. Prenni, E. J. T. Levin, G. R. McMeeking, A. P. Sullivan, T. C. J. Hill, S. Nakao, C. M. Carrico, and S. M. Kreidenweis, 2014: Characteristics of atmospheric ice nucleating particles associated with biomass burning in the US: prescribed burns and wildfires, *J. Geophys. Res. Atmos.*, **119**, doi:10.1002/2014JD021980.
- Ortega, J., A. Turnipseed, J. N. Smith, A. B. Guenther, T. G. Karl, D. A. Day, D. Gochis, E. G. Patton, A. J. Prenni, E. J. T. Levin, S. M. Kreidenweis, P. J. DeMott, Y. Tobo, A. Hodzic, Y. Cui, P. C. Harle, R. S. Hornbrook, E. C. Apel, R. K. Monson, A. S. D. Eller, J. P. Greenberg, M. Barth, P. Campuzano-Jost, B. B. Palm, J. L. Jimenez, A. C. Aiken, M. K. Dubey, J. Offenberg, C. Geron, M. G. Ryan, P. J. Fornwalt, 2014: Overview of the Manitou Experimental Forest Observatory: Site description and selected science results from 2008-2013. *Atmos. Chem. Phys.*, **14**, 6345–6367.
- Stockwell, C. E., R. J. Yokelson, S. M. Kreidenweis, A. L. Robinson, P. J. DeMott, R. C. Sullivan, J. Reardon, K. C. Ryan, D. W. C. Griffith, and L. Stevens, 2014: Trace gas emissions from combustion of peat, crop residue, biofuels, grasses, and other fuels: Configuration and FTIR component of the fourth fire lab at Missoula experiment (FLAME-4), *Atmos. Chem. Phys.*, **14**, 9727–9754.
- Tobo, Y., P. J. DeMott, T. C. J. Hill, A. J. Prenni, N. G. Swoboda-Colberg, G. D. Franc, and S. M. Kreidenweis, 2014: Organic matter matters for ice nuclei of agricultural soil origin. *Atmos. Chem. Phys.*, **14**, 8521–8531.
- Vali, G., P. J. DeMott, O. Möhler, and T. F. Whale, 2014: Ice nucleation terminology, *Atmos. Chem. Phys. Discuss.*, **14**, 22155–22162.
- Wex, H., P. J. DeMott, Y. Tobo, S. Hartmann, M. Raddatz, T. Clauss, D. Niedermeier, and F. Stratmann, 2014: Kaolinite particles as ice nuclei: learning from the use of

- different types of kaolinite and different coatings. *Atmos. Chem. Phys.*, **14**, 5529–5546.
- DeMott, P. J., A. J. Prenni, G. R. McMeeking, Y. Tobo, R. C. Sullivan, M. D. Petters, M. Niemand, O. Möhler, and S. M. Kreidenweis, 2015: Integrating laboratory and field data to quantify the immersion freezing ice nucleation activity of mineral dust particles, *Atmos. Chem. Phys.*, **15**, 393–409.
- Hiranuma, N., S. Augustin-Bauditz, H. Bingemer, C. Budke, J. Curtius, A. Danielczok, K. Diehl, K. Dreischmeier, M. Ebert, F. Frank, N. Hoffmann, K. Kandler, A. Kiselev, T. Koop, T. Leisner, O. Möhler, B. Nillius, A. Peckhaus, D. Rose, S. Weinbruch, H. Wex, Y. Boose, P. J. DeMott, J. D. Hader, T. C. J. Hill, Z. A. Kanji, G. Kulkarni, E. J. T. Levin, C. S. McCluskey, M. Murakami, B. J. Murray, D. Niedermeier, M. D. Petters, D. O’Sullivan, A. Saito, G. P. Schill, T. Tajiri, M. A. Tolbert, A. Welti, T. F. Whale, T. P. Wright, and K. Yamashita, 2015: A comprehensive laboratory study on the immersion freezing behavior of illite NX particles: a comparison of 17 ice nucleation measurement techniques, *Atmos. Chem. Phys.*, **15**, 2489–2518.
- Mason, R. H., C. Chou, C. S. McCluskey, E. J. T. Levin, C. L. Schiller, T. C. J. Hill, J. A. Huffman, P. J. DeMott, and A. K. Bertram, The micro-orifice uniform deposit impactor-droplet freezing technique (MOUDI-DFT) for measuring concentrations of ice nucleating particles as a function of size: improvements and initial validation, *Atmos. Meas. Tech.*, **8**, 2449–2462, 2015.
- Mason, R. H., M. Si, J. Li, C. Chou, R. Dickie, D. Toom-Sauntry, C. Pöhlker, J. D. Yakobi-Hancock, L. A. Ladino, K. Jones, W. R. Leitch, C. L. Schiller, J. P. D. Abbatt, J. A. Huffman, and A. K. Bertram, 2015: Ice nucleating particles at a coastal marine boundary layer site: correlations with aerosol type and meteorological conditions, *Atmos. Chem. Phys. Discuss.*, **15**, 16273–16323.
- Wang, X. C. M. Sultana, J. Trueblood, T. C. J. Hill, F. Malfatt, C. Lee, O. Laskina, K. A. Moore, C. M. Beall, C. S. McCluskey, G. C. Cornwell, Y. Zhou, J. L. Cox, M. A. Pendergraft, M. V. Santander, T. H. Bertram, C. D. Cappa, F. Azam, P. J. DeMott, V. H. Grassian and K. A. Prather, Microbial Control of Sea Spray Aerosol Composition: A Tale of Two Blooms, *ACS Central Science*, **1** (3), 124–131, DOI: 10.1021/acscentsci.5b00148.

G. Invitations and Presentations

More than 90 presentations made at scientific conferences and meetings. Selected ones:

Invited presentation, “Field and Laboratory Studies on Ice Nucleating Particles,” National Academy of Sciences *Sackler Collouquium on Improving Our Fundamental Understanding of the Role of Aerosol-Cloud Interactions in the Climate System*, Irvine, CA, 23-24 June 2015.

Invited talk, “Studies of the abundance and compositions of organic ice nucleating particles in the atmosphere,” to the *Symposium on Transformations of Matter in the Troposphere*, American Chemical Society Meeting, March 22, 2015, Denver, CO.

Invited talk, “Ice Nucleating Particles and their Role in California Winter Clouds,” for the *American Geophysical Union Fall Meeting*, Dec. 17, 2014.

Invited lecture, “Ice nucleation by atmospheric aerosols,” for the *International Training Course on Weather Modification*, CMATC, Aug. 25, 2014, Beijing, PRC.

Invited lecture, “Some Past Research on Cloud Seeding Aerosols,” for the *International Training Course on Weather Modification*, CMATC, Aug. 25, 2014, Beijing, PRC.

Invited lecture, “Ice Nuclei Measurements and Applications,” for the *International Training Course on Weather Modification*, CMATC, Aug. 26, 2014, Beijing, PRC.

Invited presentation, “Integrating measurement methods to characterize ice nucleating particles from oceanic and other sources,” for the Telluride Science Center Workshop, *Aerosols and Clouds: Connections from the Laboratory to the Field to the Globe*, Telluride, CO, August 4, 2014.

Invited presentation, “Marine Ice Nucleating Particles and the Need for Southern Ocean Measurements,” for the *Workshop on Clouds, Aerosols and the Air-Sea Interface of the Southern Oceans*, March 18, 2014, Seattle, WA

Invited presentation, “Investigations of Marine Ice Nucleating Particles,” at *Sixth Symposium on Aerosol-Cloud-Climate Interactions*, 94th Annual Meeting of the Amer. Meteor. Soc., February 3-7, 2014, Atlanta, GA.

Invited presentation, “Investigations of organic and microbiological atmospheric ice nucleating particles,” *AGU Fall Meeting*, December, 9-13, 2013, San Francisco, CA.

Invited presentation, “Studies of the Diversity and Influence of Atmospheric Aerosols as Ice Nuclei,” at the *Hereaus Foundation Seminar on Water Vapor and Ice in The Atmosphere*, 12 June 2013, Bad Honneg, Germany.

Invited seminar, “Exploring the Diversity and Influence of Atmospheric Aerosols as Ice Nuclei,” *MIT Atmospheric Science Seminar Series*, February 25, 2013, Boston, MA.

Invited talk, “Measurements of African dust aerosol properties as ice nuclei in the laboratory and atmosphere,” *AGU Fall Meeting*, December, 3-7, 2012, San Francisco, CA.

Invited talk, “Studies of sources of inorganic and organic ice nuclei, Telluride Science Center’s Workshop - *Aerosols and Clouds: Connections from the Laboratory to the Field to the Globe*, Telluride, CO, 7-10 August, 2012.

Invited talk, “Ice Nuclei Sources, Concentrations, and Relation to Aerosol Properties,” *16th International Conference on Clouds and Precipitation*, Leipzig, Germany, 30 July – 3 August, 2012.

Invited talk, “Quantifying sources of inorganic and organic atmospheric ice nuclei,” *95th Canadian Chemistry Conference and Exhibition*, Calgary, Alberta, Canada, May 29, 2012.

Invited seminar, “Investigations of ice nuclei concentration dependence on temperature, aerosol concentration, and aerosol composition,” Physics Department, Leibniz Institute for Tropospheric Research, Leipzig, Germany, March 20, 2012.

Invited talks, “Dependence of ice formation in Sierra winter orographic clouds on the mixing state of aerosols serving as ice nuclei,” and “Recent field measurements of ice nuclei concentration relation to aerosol properties,” *2011 AGU Fall Meeting*, San Francisco, CA December, 6, 2011.

Invited talk, “Insights into the roles of different aerosol types as ice nuclei,” *Gordon Research Conference on Atmospheric Chemistry*, Mt. Snow, VT July 27, 2011.

Invited presentations, “Recent insights into ice nuclei abundance, composition, and relation ice formation in clouds,” and “Summary of ICIS-2007,” at the *International Workshop on Ice Nucleation in Tropospheric Clouds (IN2clouds)*, Ettlingen, Germany May 23-25, 2011.

Invited talk, “Investigating and parameterizing physical, chemical, and thermodynamic dependencies of ice nuclei concentrations,” at the *2010 AGU Fall Meeting*, San Francisco, December 2010.

Invited talk, “Ice nuclei measurements,” for *EUFAR-ICARE session “Emerging Technologies for Airborne Measurements”*, October 2010, Toulouse

Invited tutorial, “Ice nucleation by atmospheric aerosols,” *International Aerosol Conference 2010*, Helsinki, FI, 28 August 2010.

Invited talk, “Quantifying ice nucleation by atmospheric aerosols: Some findings and challenges” for the *Telluride Science Center’s Aerosol Cloud Chemistry Workshop*, Telluride, CO, August 2010.

Invited seminar, “Measuring ice nucleating aerosols and predicting their impacts on clouds and climate,” *Institute of Meteorology and Climate Science, Karlsruhe Institute of Technology*, Karlsruhe, Germany, January 19, 2010.

Invited tutorial, “Ice formation by atmospheric aerosols,” *Amer. Assn. for Aerosol Research Annual Conf.*, Minneapolis, MN, October 2009.

Invited colloquium, “Predicting atmospheric ice nuclei distributions and their impacts on climate,” at *ETH-Zurich*, Zurich, Switzerland, October, 2009.

Invited seminar, “Recent measurements of ice nuclei and their relation to ice formation in clouds,” *Department of Earth and Atmospheric Sciences, Georgia Tech.*, October, 2008.

Invited talk, “Mineral dust impacts on ice formation: Insights from laboratory and field studies,” *3rd International Workshop on Mineral Dust*, Leipzig, Germany, September 2008.

Invited talk, “Collection and Interpretation of Atmospheric Ice Nuclei Measurements,” for the *Front Range Aerosol Program* meeting, NCAR, May 22, 2008.

Invited plenary, “Measurements of ice phase transitions involving atmospheric aerosols,” *American Chemical Society Spring Meeting*, New Orleans, LA, April 2008.

Invited talk, “Characteristics and Cloud Interactions of Ice Nucleating Aerosols From Asian Continental Emissions During the Pacific Dust Experiment” at the *AGU Fall Meeting*, San Francisco, December 2007.

Invited Plenary Speaker, "Progress and Issues in Quantifying Ice Nucleation Involving Atmospheric Aerosols," *17th International Conference on Nucleation and Atmospheric Aerosols*, Galway, Ireland, August 2007.

Invited presentations, "Atmospheric ice nuclei concentrations and characteristics: constraining the role of biological ice nuclei," and "Ice formation by different aerosol types and implications for aerosol effects on mixed-phase clouds" at *IUGG/IAMAS Assembly and Symposia*, Perugia, Italy, July 2007.

Invited seminars, "Ice Nuclei Variability, Relation to Ambient Aerosol Properties, and Impacts on Mixed-Phase Clouds" and "Laboratory Studies of Ice Formation by Mineral Dust and Soot-Containing Aerosol Particles", *Meteorological Research Institute*, Japan, January 2007.

Invited talk, "A look at clouds: what is a cloud, what is its origin and what can we predict and model about its destiny?" *European Science Foundation Exploratory Workshop: Microbiological Meteorology*, Avignon, France, March 1, 2006

Invited seminar, "Atmospheric Ice Formation by Mineral Dust Particles: Recent Laboratory and Field Studies". *Forschungszentrum Karlsruhe Institute for Meteorology and Climate Research*, Karlsruhe, Germany, March 7, 2006

Invited lecture, "Aerosol chemistry and ice clouds". *IGAC Specialty Conference on Aerosol Indirect Effects*, Manchester, England, January 2005.

Invited seminar, "Aerosol Impacts on Upper Tropospheric Ice Formation". *Colloquium of the Dept. of Atmos. Sci., University of Wyoming*, Laramie, Wyoming, 3 October, 2003.

Invited talk, "Aerosol-ice cloud interactions", Session on Aerosol Cloud Interactions at *European Geophysical Society/American Geophysical Union/European Union of Geophysics Joint Meeting*, Nice, France, April, 2003.

Invited talk, "The Physics and Chemistry of Aerosol Indirect Effects on Ice-phase Clouds" for the *Colorado State University Department of Atmospheric Science 40th Anniversary*, July 2002.

Invited seminar, "Atmospheric Particulate Matter and Cirrus Clouds". Colorado State University chapter of *Sigma Xi National Research Honor Society*, November 2001.

Invited seminar, "Measurements and modeling of ice formation by aerosols in upper tropospheric conditions", Atmospheric Chemistry Group, *Harvard University*, December 2000.

Invited participant, Workshop on "Addressing the Current State of Weather Modification Science as a Basis for Future Environmental Sustainability and Policy Development," *National Research Council*, November 2000.

Invited seminar, "Measurements and modeling of ice phase transitions by aerosol particles in upper tropospheric conditions", Dept. of Geophysical Sciences, *University of Chicago*, November 1999.

Invited lecture, "Laboratory studies of cirrus cloud processes", *Topical Cirrus Conference, Optical Society of America Annual Meeting*, Baltimore, MD, October 1998.

Invited lecture, "The role of atmospheric aerosols in cloud and precipitation formation". *Conference on Hail Damage Mitigation and Hail Science*, Bismarck, ND, March 1996.

Invited seminar, "Measurements on ice formation in upper tropospheric cloud conditions", *NCAR M³ Division*, Boulder, CO, August 1995.

Invited lecture, "Research activities at the Colorado State University Cloud Simulation and Aerosol Laboratory", *Chinese Academy of Meteorological Sciences*, May 1989.

Invited seminar, "Ice nucleation: 'Time' for a different perspective." *National Center for Atmospheric Research - Convective Storms Division*. 3 May, 1983, Boulder, CO.

H. Advisory and Supervisory Experience

<u>Person</u>	<u>Title</u>	<u>Supervisory role</u>	
<u>Period</u>			
Brian Jesse 1986-2005	Electronics Technician	Immediate	supervisor
Mark Branson	Work study/M.S. student	Supervisor/advising	1988-1993
David Torgerson 1991-1993	Work study in Physics	Immediate	supervisor
Tara Jensen 1992-1993	M.S. student	Informal advising	
Ian Baker 1993-1994	M.S. student	Supervisor/advising	
John Robb 1994-1995	Graduate Student hourly	Supervisor	
Randy Vetter	Undergraduate hourly	Assistant supervisor	1995
Suzanne Hyde	Undergraduate hourly	Assistant supervisor	1995
Craig Huey	Undergraduate hourly	Assistant supervisor	1996
Yalei Chen 1996-1999	Ph.D. student	Informal advising	
Tony Prenni 2000-2002	NOAA Postdoctoral Fellow	Co-advisor	
Cassie Archuleta 2000-2003	M.S. student	Advising,	Committee
Sarah Brooks 2002-2004	Postdoctoral Fellow	Co-advisor	
Kristen Koehler 2002-2007	M.S./Ph.D. student	Committee member	
Matt Richardson 2003-2008	Ph.D. student	Committee member	
Markus Petters 2004-2006	Postdoctoral Fellow	Co-advisor	
Matthew Parsons 2007-2008	Postdoctoral Fellow	Co-advisor	
Trude Eidhammer 2007-2008	Postdoctoral Fellow	Co-advisor	
Ryan Sullivan	Postdoctoral Fellow	Co-advisor	2009-2010

Paul J. DeMott

James Carpenter 2010-present	M.S. student	Committee Member	
Yutaka Tobo 2010-2012	Postdoctoral Fellow	Co-Advisor	
Gavin McMeeking 2011	Postdoctoral Fellow	Co-Advisor	
Christina McCluskey present	M.S., Ph.D. student	Committee Member	2011-
Ezra Levin 2013-	Postdoctoral Fellow	Co-Advisor	
Christina McCluskey 2014-	M.S. student	Committee member	2011-2013
Kaitlyn Suski 2014-	Postdoctoral Fellow	Co-Advisor	
Gregory Schill	Postdoctoral Fellow	Co-Advisor	2014-