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Purdue University  
Earth, Atmospheric and Planetary Sciences  
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Professional Preparation:

Ph.D., Geophysical Sciences, The University of Chicago, 1999, Prof. Jonathan Abbatt, advisor  
M.S., Geophysical Sciences, The University of Chicago, 1997  
B.S., Aerospace Engineering, The University of Illinois, 1992

Appointments:

Professor and Department Head, Purdue University, Earth, Atmospheric and Planetary Sciences, 2019 -  
Associate Professor of Atmospheric Chemistry, Massachusetts Institute of Technology, Earth, Atmospheric and Planetary Sciences and Civil and Environmental Engineering, 2011 – 2019  
Affiliate Professor, The University of Washington, Department of Atmospheric Sciences, 2008 - 2014  
Senior Scientist and Director, Atmospheric Measurement Lab, Atmospheric Science & Global Change Division, Fundamental Science Directorate, Pacific Northwest National Laboratory (PNNL), 2007 – 2011  
Research and Teaching Faculty, Institute for Atmospheric and Climate Science, ETH Zurich, 2005 – 2007  
Adjunct Professor, The University of Colorado, Department of Chemistry, 2003 - 2005  
Research Scientist I&II, Chemical Sciences Division, National Oceanic and Atmospheric Administration (NOAA) and Cooperative Institute for Research in Environmental Sciences (CIRES), The University of Colorado, 2001 - 2005  
Post Doctoral Fellow, NOAA and CIRES, 1999 – 2001  
Maneuver Analyst, Galileo Navigation Team, National Aeronautics and Space Administration (NASA) Jet Propulsion Laboratory (Contracted by Telos Information Systems), 1993 – 1994

External Activities:

UCAR President's Advisory Committee on University Relations (PACUR), 2013- 2020 and PACUR Chair, 2016-2020, Nomination Committee, 2020 - , MIT & Purdue Member Representative, 2014-  
National Center for Atmospheric Research (NCAR) Observing Facilities Assessment Panel (OFAP), 2018-  
Science for the Public (Public Broadcasting) Advisory Board, 2014 – 2021  
Atmospheric Chemistry and Physics (ACP), 2007-2019 (Special Issue Editor, 'NETCARE', 2016-2018; 'INUIT', 2013-2018; 'CARES', 2011-14; 'ICIS', 2009-11)

Honors:

Purdue Seeds of Success Award, 2020  
Victor Starr Career Development Chair, 2013-16  
NASA Group Achievement Award, MACPEX Mission, 2011

NASA Group Achievement Award, ARCTAS Mission, 2008  
DOE Outstanding Performance Award, ISDAC Campaign, 2008  
Presidential Early Career Award for Scientists and Engineers (PECASE), 2005  
CIRES Outstanding Performance Award, 2004  
NASA Group Achievement Award, CRYSTAL-FACE Mission, 2002  
NASA Group Achievement Award, Galileo Ida/Dactyl Encounter, 1993

Societies:

American Geophysical Union  
American Association of Aerosol Research  
American Meteorological Society

Internal University Service

Purdue

Department Head, 2019-

MIT

EAPS Building Committee, 2012-2018  
PAOC Rossby Award Committee, 2016-2018  
PAOC Houghton Committee, 2015-2017  
PAOC Representative to EAPS Graduate Admissions Committee, 2015  
EAPS Undergraduate Education Committee, 2012-14  
PAOC Graduate Curriculum Review 2012-13  
Planetary Faculty Search Committee (hire: Prof. Hilke Schlichting)  
Climate Faculty Search Committee (hire : Prof. Andrew Babbin)

External Service:

Conference Convener: International Workshop on Measurements of Ice Clouds from Aircraft, 2010; Telluride Science Research Center Summer Workshop on Aerosols and Clouds: Connections from the Laboratory to the Field to the Globe, 2012; Workshop on Data Analysis and Presentation of Cloud Microphysical Measurements, Boston, 2014; Fifth Ice Nucleation Intercomparison, 2014-15; 3<sup>rd</sup> International Atmospheric Ice Nucleation Conference, 2020

Conference Session Convener: American Geophysical Union Fall Meeting, 2003, 2008; American Chemical Society, 2015; American Association of Aerosol Research, 2017

Guest Editor, P.N.A.S., 2018-2019; Environmental Research Letters, Aerosol and Cloud Special Issue, 2007-08

Mission Flight Scientist: CIRRUS III, 2006

Co-Mission Flight Scientist: ISDAC, 2008; CARES, 2010

Invited Panelist: EU, NSF, NOAA, NASA, DOE, DOE-EMSL

Manuscript Referee: Nature, Science, Nature Geosciences, Proceedings of the National Academy of Sciences, Bulletin of the American Meteorological Society, Journal of Geophysical Research, Geophysical Research Letters, Journal of Physical Chemistry, Atmospheric Chemistry and Physics, Journal of Atmospheric Chemistry, Chemical Reviews, Tellus, Aerosol Science and Technology, International Journal of Mass Spectrometry, Environmental Research Letters

Proposal Referee: NSF, NASA, NOAA, DOE, Swiss National Science Foundation, German Research Foundation, Canadian Foundation for Climate and Atmospheric Science, Canadian Research Chairs Council, United Kingdom National Environmental Research Council

Technical Interviews: Popular Science, USA Today, National Geographic, NPR, CBC Radio, New Scientist, Christian Science Monitor, Chemical and Engineering News, E&E News, American Chemical Society Focus Series, Environmental Science and Technology, La Pressa, Royal Society of Chemistry, IWP (EPA) News

Television / Podcast Interviews: MIT Faculty Forum, Science for the Public, Superheroes of Science

Technical Reviews: NOVA Lab's (PBS) "Cloud Lab"

Publications:

\*denotes first author by Cziczo group student, post-doc or visiting scientist

\*\*denotes media highlight

- \*90. Koolik, L. [5 authors] and Cziczo, D. J., A Phase Separation Inlet for Droplets, Ice Residuals, and Interstitial Aerosol Particles, *Atmos. Meas. Tech. Disc.* (2021).
- \*89. Wolf, M. J. [4 authors] and Cziczo, D. J., A biogenic secondary organic aerosol source of cirrus ice nucleating particles, *ACS Earth Space Chem.*, 5, 2074–2085 (2021).
- \*88. Roesch, C. [5 authors] and Cziczo, D. J., CCN and INP activity of middle eastern soil dust, *Aeolian Research*, 52,100729 (2021).
- \*87. Roesch, M. and Cziczo, D. J., Aqueous particle generation with a 3D printed nebulizer, *Atmos. Meas. Tech.*, 13, 6807–6812 (2020).
86. Kulkarni, G. [Cziczo 6<sup>th</sup> author of 7], A new method for operating a continuous-flow diffusion chamber to investigate immersion freezing: assessment and performance study, *Atmos. Meas. Tech.*, 13, 6631–6643 (2020).
- \*85. Zhang, C.[6 authors] and Cziczo, D. J., The effects of morphology, mobility size, and secondary organic aerosol (SOA) material coating on the ice nucleation activity of black carbon in the cirrus regime, *Atmos. Chem. Phys.*, 20, 13957–13984 (2020).
- \*84. Wolf, M. J. [18 authors] and Cziczo, D. J., A biogenic secondary organic aerosol source of cirrus ice nucleating particles, *Nature Communications*, 11, 4834 (2020).
- \*83. Wolf, M. J. [10 authors] and Cziczo, D. J., A link between the ice nucleation activity and the biogeochemistry of seawater, *Atmos. Chem. Phys.*, 20, 15341–15356 (2020).
- \*82. Zawadowicz, M. A. [6 authors] and Cziczo, D. J., Quantifying and improving the optical performance of the Laser Ablation Aerosol Particle Time of Flight Mass Spectrometer (LAAPToF) instrument, *Aero. Sci. Tech.*, DOI: 10.1080/02786826.2020.1724867 (2020).
81. Cziczo, D. J., Wolf, M. J., Gasparini, B, Münch, S. and Lohmann, U., Unanticipated Side Effects of Stratospheric Albedo Modification Proposals Due to Aerosol Composition and Phase, *Nature Scientific Reports*, 9, 18825 (2019).
80. Nichman, L., [7 authors] and Cziczo, D. J., Laboratory study of the heterogeneous ice nucleation on black carbon containing aerosol, *Atmos. Chem. Phys.*, 19, 12175–12194 (2019).
- \*79. Zawadowicz, M. A. [7 authors] and Cziczo, D. J., Model-measurement consistency and limits of bioaerosol abundance over the continental United States, *Atmos. Chem. Phys.*, 19, 13859–13870 (2019).
78. Umo, N. [Cziczo 6<sup>th</sup> author of 9], D. J., Enhanced ice nucleation activity of coal fly ash aerosol particles initiated by ice-filled pores, *Atmos. Chem. Phys.*, 19, 8783 (2019).
77. Ullrich, R. [Cziczo 3<sup>rd</sup> author of 12], Comparison of Modeled and Measured Ice Nucleating Particle Composition a Cirrus Cloud, *J. Atmos. Sci.* 76, 4 (2019).

- \*76. Wolf, M. J. [6 authors] and Cziczo, D. J., Investigating the Heterogeneous Ice Nucleation of Sea Spray Aerosols Using *Prochlorococcus* as a Model Source of Marine Organic Matter, *Environ. Sci. and Tech.*, 53, 1139 (2019).
75. DeMott, P. J. [Cziczo 3<sup>rd</sup> author of 54], The Fifth International Workshop on Ice Nucleation phase 2 (FIN-02): laboratory intercomparison of ice nucleation measurements, *Atmos. Meas. Tech.*, 11, 6231–6257 (2018).
- \*74. Kong, X., Wolf, M. J., Thomson, E., Bartels-Rausch, T., Prisle, N. and Cziczo, D. J., A Continuous Flow Diffusion Chamber Study of Sea Salt Particles Acting as Cloud Nuclei: Deliquescence and Ice Nucleation, *Tellus B*, 70, 1463806 (2018).
- \*73. Christopoulos, C. D., Garimella, S., Zawadowicz, M. A., Moehler, O. and Cziczo, D. J., A Machine Learning Approach to Aerosol Classification for Single Particle Mass Spectrometry, *Atmos. Meas. Tech.*, 11, 5687–5699 (2018).
- \*,\*\*72. Garimella, S., Rothenberg, D. A., Wolf, M. J., Wang, C., Rösch, M., and Cziczo, D. J., How uncertainty in field measurements of ice nucleating particles influences modeled cloud forcing, *J. Atmos. Sci.*, doi: 10.1175/JAS-D-17-0089.1 (2018).
- \*71. Osman, M., Zawadowicz, M. A., Das, S. B., and Cziczo, D. J., Real time analyses of insoluble particles in glacial ice using single particle mass spectrometry, *Atmos. Meas. Tech.*, 10, 4459–4477 (2017).
- \*70 Garimella, S., Rothenberg, D. A., Wolf, M. J., David, R. O., Kanji, Z. A., Wang, C., Rösch, M., and Cziczo, D. J., Uncertainty in counting ice nucleating particles with continuous diffusion flow chambers, *Atmos. Chem. Phys.* 17, 10855–10864 (2017).
- \*,\*\*69. Zawadowicz, M. A., Froyd, K. D., Murphy, D. M., and Cziczo, D. J., Improved identification of primary biological aerosol particles using single particle mass spectrometry, *Atmos. Chem. Phys.* 17, 7193–7212 (2017).
- \*68. Roesch, M. and Cziczo, D. J., Dry particle generation with a 3D printed fluidized bed generator, *Atmos. Meas. Tech.* 10, 1999–2007 (2017).
67. Hiranuma, N., [10 authors] Cziczo, D. J., Development and characterization of an ice-selecting pumped counterflow virtual impactor (IS-PCVI) to study ice crystal residuals, *Atmos. Meas. Tech.*, 9, 3817–3836 (2016).
- \*66. Garimella, S., [21 authors], Cziczo, D. J., The SPectrometer for Ice Nuclei (SPIN): A new instrument to investigate ice nucleation, *Atmos. Meas. Tech.*, 9, 2781–2795 (2016).
65. Tang, M., Cziczo, D. J., and Grassian, V., Interactions of Water with Mineral Dust Aerosol: Water Adsorption, Hygroscopicity, Cloud Condensation, and Ice Nucleation, *Chem. Rev.*, DOI: 10.1021/acs.chemrev.5b00529 (2016).
- \*64. Zawadowicz, M. A, Abdelmonem, A., Mohr, C., Saathoff, H., Froyd, K. D., Murphy, D. M., Leisner, T., and Cziczo, D. J., Single-Particle Time-of-Flight Mass Spectrometry Utilizing a Femtosecond Desorption and Ionization Laser, *Anal. Chem.* 10.1021 (2015).

- \*,\*\*63. Ardon-Dryer, K., Huang, Y.-W. and Cziczo, D. J., Laboratory studies of collection efficiency of sub-micrometer aerosol particles by cloud droplets on a single-droplet basis, *Atmos. Chem. Phys.*, 15, 9159–9171 (2015).
- \*62. Zawadowicz, M. A, Proud, S. R., Seppalainen, S. S. and Cziczo, D. J., Hygroscopic and phase separation properties of ammonium sulfate/organics/water ternary solutions, *Atmos. Chem. Phys.*, 15, 8975–8986 (2015).
- \*61. Ardon-Dryer, K., Garimella, S., Huang Y.-w., Christopoulos, C., and Cziczo, D. J., Evaluation of DMA Size Selection of Dry Dispersed Mineral Dust Particles, *Aero. Sci. Tech.*, 49, 828-841 (2015).
60. Atkinson, D. B., Radney, J. G., Lum, J., Kolesar, K. R. Cziczo, D. J., et al., Aerosol Optical Hygroscopicity Measurements during the 2010 CARES Campaign, *Atmos. Chem. Phys.*, 15, 4045–4061, 2015 (2015).
- \*59. Garimella, S., Y.-W. Huang, J. Seewald, and D. J. Cziczo, Cloud condensation nucleus activity comparison of dry- and wet-generated mineral dust aerosol: the significance of soluble material, *A.C.P.* 14, 6003 (2014).
58. Cziczo, D. J. and K. D. Froyd, Sampling the Composition of Cirrus Ice Residuals, *Atmos. Res.*, 142, 15-31 (2014).
- \*\*57. Cziczo, D. J. et al. Ice nucleation by surrogates of Martian mineral dust: What can we learn about Mars without leaving Earth?, *J. Geophys. Res. : Planets*, 118, 1–10 (2013).
- \*\*56. Cziczo, D. J. et al. Clarifying the dominant sources and mechanisms of cirrus cloud formation, *Science*, 340, 1320-1323 (2013).
- \*55. Friedman, B., [10 authors], Cziczo, D. J., Cloud Condensation Nuclei Measurements at a High Elevation Site: Composition and Hygroscopicity, *A.C.P.*, 13, 11839-11851 (2013).
- \*54. Pekour, M. [6 authors], Cziczo, D. J., Development of a new airborne humidigraph system, *Aero. Sci. Tech.* 47, 201-207 (2013).
53. Baustian, K. J., D. J. Cziczo, M. E. Wise, K. A. Pratt, G. Kulkarni, A. G. Hallar and M. A. Tolbert, Importance of Aerosol Composition, Mixing State and Morphology for Depositional Ice Nucleation: A Combined Field and Laboratory Approach, *J. Geophys. Res.* 117, D06217 (2012).
52. Zaveri, R.A., Shaw, W. J, Cziczo, D. J., et al., Overview of the 2010 Carbonaceous Aerosols and Radiative Effects Study (CARES), *A.C.P.*, 12, 7647–7687 (2012).
51. Pierce, J. R. et al. [Cziczo 8<sup>th</sup> author of 21], Nucleation and Condensational Growth to CCN Sizes During a Sustained Pristine Biogenic SOA Event in a Forested Mountain Valley, *A.C.P.*, 12, 3147-3163 (2012).
50. Wong, J. P. S., A. K. Y. Lee, J.G. Slowik, D. J. Cziczo, W. R. Leitch, A. Macdonald, and J. P. D. Abbatt, Oxidation of Ambient Biogenic Secondary Organic Aerosol by Hydroxyl Radicals: Effects on Cloud Condensation Nuclei Activity, *Geophys. Res. Lett.*, 10.1029/2011GL049351 (2011).

49. Baumgardner, D. [Cziczo 8<sup>th</sup> author of 28], In Situ, Airborne Instrumentation: Addressing and Solving Measurement Problems in Ice Clouds, B.A.M.S. 10.1175/BAMS-D-11-00123.1 (2011).
- \*48. Hiranuma N., M. Kohn, M. S. Pekour, D. A. Nelson, J. E. Shilling, and D. J. Cziczo, Droplet Activation, Separation, and Compositional Analysis: Laboratory Studies and Atmospheric Measurements, A.M.T. 10.5194/amt-4-2333-2011 (2011).
47. Slowik, J. G., D. J. Cziczo, and J. P. D. Abbatt, Analysis of Cloud Condensation Nuclei Composition and Growth Kinetics Using a Pumped Counterflow Virtual Impactor and Aerosol Mass Spectrometer, A.M.T. 10.5194/amt-4-1677-2011 (2011).
- \*46. Friedman, B., G. Kulkarni, J. Beránek, A. Zelenyuk, J. A. Thornton, and D. J. Cziczo, Ice Nucleation and Droplet Formation by Bare and Coated Soot Particles, J. Geophys. Res. 10.1029/2011JD015999 (2011).
- \*45. Pekour, M. and D. J. Cziczo, Wake Capture, Particle Breakup and Other Artifacts Associated with Counterflow Virtual Impaction, Aero. Sci. Tech. 45, 748 (2011).
- \*44. Kulkarni, G., M. Pekour, A. Afchine, D. M. Murphy, and D. J. Cziczo, Comparison of Experimental and Numerical Studies of the Performance Characteristics of a Pumped Counterflow Virtual Impactor, Aero. Sci. Tech. 45, 382 (2011).
43. McFarquhar, G. [Cziczo 11<sup>th</sup> author of 28], Indirect and Semi-Direct Aerosol Campaign (ISDAC): The Impact of Arctic Aerosols on Clouds, B.A.M.S. 10.1175/2010BAMS2935.1 (2010).
42. Kamphus, M., M. Ettner-Mahl, T. Klimach, F. Drewnick, L. Keller, D. J. Cziczo, S. Mertes, S. Borrmann, and J. Curtius, Chemical Composition of Ambient Aerosol, Ice Residues and Cloud Droplet Residues in Mixed-Phase Clouds: Single Particle Analysis During the Cloud and Aerosol Characterization Experiment (CLACE 6), A.C.P. 10, 8077 (2010).
41. Spichtinger, P., and D. J. Cziczo, Impact of Heterogeneous Ice Nuclei on Homogeneous Freezing Events, J. Geophys. Res. 10.1029/2009JD012168 (2010).
40. Kammermann, L. [Cziczo 4<sup>th</sup> author of 9], Arctic Atmospheric Aerosol Composition 3: CCN Prediction Using Hygroscopic Growth Factors as a Chemistry Proxy, J. Geophys. Res. 10.1029/2009JD012447 (2010).
39. Cziczo, D. J. et al., Deactivation of Ice Nuclei Due to Atmospherically Relevant Surface Coatings, Environ. Res. Lett., 10.1088/1748-9326/4/4/044013 (2009).
38. Cziczo, D. J. et al., Inadvertent Climate Modification Due to Anthropogenic Lead, Nature Geosciences, 10.1038/ngeo499 (2009).
- \*37. Friedman, B. Herich, H., Kammermann, L., Gross, D. S., Arneth, A., Holst, T., and Cziczo, D. J., Arctic Atmospheric Aerosol Composition 1: Ambient Aerosol Characterization, J. Geophys. Res. 10.1029/2009JD011772 (2009).

- \*36. Herich, H. [8 authors] Cziczo, D. J., Arctic Atmospheric Aerosol Composition 2: Hygroscopic Growth Properties, *J. Geophys. Res.* 10.1029/2008JD011574 (2009).
- \*35. Herich, H. [6 authors] Cziczo, D. J., Water Uptake of Clay and Desert Dust Aerosols at Sub- and Supersaturations, *P.C.C.P.* 10.1039/b901585j (2009).
34. Cozic, J. Mertes, S., Verheggen, B., Cziczo, D. J., et al., Black Carbon Enrichment in Atmospheric Ice Particle Residuals Observed in Lower Tropospheric Mixed-Phase Clouds, *J. Geophys. Res.*, 10.1029/2007JD009266 (2008).
- \*33. Gallavardin, S., U. Lohmann, and D. J. Cziczo, Analysis and Differentiation of Mineral Dust by Single Particle Laser Mass Spectrometry, *I.J.M.S.*, 274, 52 (2008).
- \*32. Gallavardin, S. Froyd, K. D., Lohmann, U., Moehler, O., Murphy, D. M., and Cziczo, D. J., Single Particle Laser Mass Spectrometry Applied to Differential Ice Nucleation Experiments at the AIDA Chamber, *Aero. Sci. Tech.*, 42, 773 (2008).
- \*31. Herich, H. Kammermann, L., Gysel, M., Weingartner, E., Baltensperger, U., Lohmann, U., and Cziczo, D., J., In-situ determination of atmospheric aerosol composition as a function of hygroscopic growth, *J. Geophys. Res.*, 10.1029/2008JD009954 (2008).
30. Murphy, D. M., Hudson, P. K., Cziczo, D. J., et al., Distribution of Lead in Single Atmospheric Particles, *A.C.P.*, 7, 3763 (2007).
29. Murphy, D. M., D. J. Cziczo, P. K. Hudson, and D. S. Thomson, Carbonaceous Material in Aerosol Particles in the Lower Stratosphere and Tropopause Region, *J. Geophys. Res.*, 10.1029/2006JD007297 (2007).
28. Richardson, M. S., DeMott, P. J., Kreidenweis, S. M., Cziczo, D. J., et al., Measurements of Heterogeneous Ice Nuclei in the Western U.S. in Springtime and Their Relation to Aerosol Sources, *J. Geophys. Res.*, 10.1029/2006JD007500 (2007).
27. Cziczo, D. J., D. S. Thomson, T. Thompson, P. J. DeMott, and D. M. Murphy, Aerosol Mass Spectrometry Studies of Ice Nuclei and Other Low Number Density Particles, *I.J.M.S.*, 258, 21 (2006).
26. Abbatt, J. P. Benz, S., Cziczo, D. J., Kanji, Z., Lohmann, U., Moehler, O., Solid Ammonium Sulfate Aerosols as Ice Nuclei: A Pathway for Cirrus Cloud Formation, *Science*, 313, 1770 (2006).
25. Boulter, J. E., D. J. Cziczo, A. M. Middlebrook, D. S. Thomson, and D. M. Murphy, Design and Performance of a Pumped Counterflow Virtual Impactor, *Aero. Sci. Tech.*, 40, 969 (2006).
24. Murphy, D. M., Cziczo, D. J., et al., Single-Particle Mass Spectrometry of Tropospheric Aerosol Particles, *J. Geophys. Res.*, 10.1029/2006JD007340 (2006).
23. Zobrist, B. [Cziczo 9<sup>th</sup> author of 13], Oxalic Acid as Heterogeneous Ice Nucleus in the Upper Troposphere and its Indirect Aerosol Effect, *A.C.P.D.*, 6, 3115 (2006).



22. Jensen, E. [Cziczo 13<sup>th</sup> author of 18], Ice Supersaturations Exceeding 100% at the Cold Tropical Tropopause: Implications for Cirrus Formation and Dehydration, *Atmos. Chem. Phys.*, 5, 851 (2005).
21. Brock, C. A. [Cziczo 8<sup>th</sup> author of 23] Chemical and Microphysical Characteristics of Aerosols in the Free Troposphere Near the West Coast of North America, *J. Geophys. Res.*, 10.1029/2003JD004198 (2004).
20. Hudson, P. K., Murphy, D. M., Cziczo, D. J. et al., Biomass burning particle measurements: characteristic composition and chemical processing, *J. Geophys. Res.* 10.1029/2003JD004398 (2004).
19. Jost, H.-J. [Cziczo 8<sup>th</sup> author of 19] In-situ observations of mid-latitude forest fire plumes deep in the stratosphere, *Geophys. Res. Lett.*, 10.1029/2003GL019253 (2004).
18. Murphy, D. M., Cziczo, D. J., et al., Particle Generation and Resuspension in Aircraft Inlets When Flying in Clouds, *Aero. Sci. Tech.*, 38, 400 (2004).
17. Murphy, D. M., D. J. Cziczo, P. K. Hudson, M. E. Schein, and D. S. Thomson, Particle Density Inferred from Simultaneous Optical and Aerodynamic Diameters Sorted by Composition, *J. Aero. Sci.*, 35, 135 (2004).
16. Ray, E. A. Rosenlof, K. H., Richard, E. C., Hudson, P. K., Cziczo, D. J., et al., Evidence of the Effect of Summertime Midlatitude Convection on the Subtropical Lower Stratosphere from CRYSTAL-FACE Tracer Measurements, *J. Geophys. Res.*, 10.1029/2003JD004143 (2004).
15. Tuck, A. [Cziczo 8<sup>th</sup> author of 15] Horizontal Variability 1-2 km Below the Tropical Tropopause, *J. Geophys. Res.*, 10.1029/2003JD003942 (2004).
14. Cziczo, D. J., et al., Observations of Organic Species and Atmospheric Ice Formation, *Geophys. Res. Lett.*, 10.1029/2004GL019822 (2004).
13. Cziczo, D. J., D. M. Murphy, P. K. Hudson, and D. S. Thomson, Single Particle Measurements of the Chemical Composition of Cirrus Ice Residue During CRYSTAL-FACE, *J. Geophys. Res.*, 10.1029/2003JD004032 (2004).
12. Cziczo, D. J., et al., A Method for Single Particle Mass Spectrometry of Ice Nuclei, *Aero. Sci. Tech.*, 37, 460 (2003).
11. DeMott, P. J., D. J. Cziczo, A. Prenni, D. M. Murphy, S. Kreidenweis, D. S. Thomson, and R. Borys, Compositions and Concentrations of Atmospheric Ice Nuclei, *P.N.A.S.*, 100, 14655 (2003).
10. Eliason, T. L., S. Aloisio, D. J. Donaldson, D. J. Cziczo and V. Vaida, Processing of Unsaturated Organic Acid Films and Aerosols by Ozone, *Atmos. Environ.*, 37, 2207 (2003).
9. Wise, M. E., S. D. Brooks, D. J. Cziczo, and M. A. Tolbert, Solubility and Freezing Effects of Fe<sup>2+</sup> and Mg<sup>2+</sup> Solutions at Upper Tropospheric and Lower Stratospheric Temperatures and Compositions, *J. Geophys. Res.*, 10.1029/2003JD003420 (2003).

8. Cziczo, D. J., D. M. Murphy, D. S. Thomson, and M. Ross, Composition of Individual Particles in the Plume Wakes of an Athena II Rocket and the Space Shuttle, *Geophys. Res. Lett.*, 10.1029/2002GL015991 (2002).
7. Braban, C. F., D. J. Cziczo, and J. P. D. Abbatt, Deliquescence of Ammonium Sulfate Particles at Sub-Eutectic Temperatures, *Geophys. Res. Lett.*, 28, 3879 (2001).
6. Cziczo, D. J. and J. P. D. Abbatt, Ice Nucleation in  $\text{NH}_4\text{HSO}_4$ ,  $\text{NH}_4\text{NO}_3$ , and  $\text{H}_2\text{SO}_4$  Aqueous Particles: Implications for Cirrus Cloud Formation, *Geophys. Res. Lett.*, 28, 963 (2001).
5. Cziczo, D. J., D. S. Thomson, and D. M. Murphy, Ablation, Flux and Atmospheric Implications of Meteors Inferred from Stratospheric Aerosol, *Science*, 291, 1772 (2001).
4. Cziczo, D. J., and J. P. D. Abbatt, Infrared Observations of the Response of NaCl,  $\text{NH}_4\text{HSO}_4$ ,  $\text{MgCl}_2$ ,  $\text{NH}_4\text{HSO}_4$ , and  $\text{NH}_4\text{NO}_3$  Aerosols to Changes in Relative Humidity from 298 to 238 K, *J. Phys. Chem. A.*, 104, 4825 (2000).
3. Arora, O. P., D. J. Cziczo, A. M. Morgan, J. P. D. Abbatt, and R. F. Niedziela, Uptake of Nitric Acid by Sub-Micron-Sized Ice Particles, *Geophys. Res. Lett.*, 26, 3621 (1999).
2. Cziczo, D. J., and J. P. D. Abbatt, Deliquescence, Efflorescence, and Supercooling of  $(\text{NH}_4)_2\text{SO}_4$  Aerosols at Low Temperature: Implications for Cirrus Cloud Formation and Aerosol Phase in the Atmosphere, *J. Geophys. Res.*, 104, 13,781 (1999).
1. Cziczo, D. J., J. B. Nowak, J. H. Hu, and J. P. D. Abbatt, Infrared Spectroscopy of Model Tropospheric Aerosols as a Function of Relative Humidity: Observations of Deliquescence and Crystallization, *J. Geophys. Res.*, 102, 18,843 (1997).