

## Curriculum Vitae

Daniel J. Cziczo

January, 2018

Massachusetts Institute of Technology  
Earth, Atmospheric and Planetary  
Sciences Civil and Environmental  
Engineering

### Degrees:

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

### Employment:

Associate Professor of Atmospheric Chemistry, Massachusetts Institute of Technology, Earth, Atmospheric and Planetary Sciences and Civil and Environmental Engineering, 2011 –

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 Positions Currently Held:

UCAR President's Advisory Committee on University Relations (PACUR), 2013- and PACUR Chair, 2016-, MIT Member Representative, 2014-

Science for the Public (Public Broadcasting) Advisory Board, 2014 –

Atmospheric Chemistry and Physics (ACP), 2007- (Special Issue Editor, 'NETCARE', 2015-; 'INUIT', 2013-; 'CARES', 2011-14; 'ICIS', 2009-11)

### Honors:

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  
Sigma Gamma Tau (National Honor Society for Aerospace Engineering), 1989 and  
University of Illinois Chapter President 1991-1992, Secretary 1990-1991

Societies:

American Geophysical Union  
American Association of Aerosol Research  
American Chemical Society  
American Meteorological Society

Undergraduate Students Advised:

Dove, L., 2015- ; Rutkowski, E., 2016-; Goodell, M., 2017-; Christopoulos, C., 2014-17;  
Koolik, L., 2015-2016; Rider, E., 2015; Crownhart, C., 2014; Seppalainen, S., 2014; Berlin,  
S., 2012-13; Keeler, R., 2012

B.S. Student Thesis Supervised:

Christopoulos, C., “A machine learning approach to aerosol classification”, 2017 \*received  
EAPS award for outstanding senior thesis; Koolik, L., “Characterization of a 3D Printed  
Pumped Counterflow Virtual Impactor and an Aerodynamic Lens Concentrator”, 2016;  
Berlin, S., “Low-temperature aerosol freezing: Validating the limits of an electrodynamic  
balance (EDB)”, 2013\*received EAPS award for outstanding senior thesis

M.S. Students Supervised:

Koolik, L., “The Phase Separation Inlet for Droplets, Ice Residuals, and Interstitial Aerosols”,  
2017, (CEE), Scientist at Environcorp; Berlin, S., “An electrodynamic balance (EDB) for  
extraterrestrial cloud formation studies”, 2014 (EAPS), Scientist at Environcorp

Ph.D. Students Supervised:

Wolf, M., 2015- (in progress); Zawadowicz, M., “Understanding the Chemistry of  
Atmospheric Particulates”, 2017, Post-doc at PNNL; Garimella, S., “A vertically-integrated  
approach to climate science”, 2016, Research Scientist at ACME; Friedman, B. (co-advised  
with J. Thornton, University of Washington), “Field and Laboratory Perspectives on the  
Cloud Nucleating Abilities of Aerosol Particles”, 2014, Scientist as WARB; Herich, H. (co-  
advised with U. Lohmann at ETH), “Chemical Composition and Cloud Formation Potential  
of Aerosols”, 2008, Scientist at EMPA

Post Doctoral Fellows Supervised:

Johnson, A., 2014- (in progress); Roesch, C., 2016 – 2017, Post-doc at EHT-Zurich; Roesch,  
M., 2015-2017, Engineer at ETH-Zurich; Lance, S., 2015-16, Faculty at SUNY Albany;  
Ardon-Dryer, K., 2012-15, Research Scientist at Harvard; Huang, Y.-w., 2011-14, Scientist at  
Los Gatos Research; Kulkarni, G., 2008-10 (PNNL), Scientist at PNNL; Gallavardin, S.,  
2007-9 (ETH), Scientist at MPI

Visiting Scientists and Students:

Shen, X., KIT, 2018-(in progress); Komurcu, M., New Hampshire Research Scientist, 2016-17; Xiangrui, K., Research Scientist at Gotheburg, 2016; Marht, F., ETH-Zurich Ph.D. student, 2015; Proud, S., Research Scientist at Oxford, 2013-14.

#### Teaching Experience:

12.338/.814/1.842, Aerosol and Cloud Chemistry and Microphysics, Spring 2012 -  
12.335/.835, Experimental Atmospheric Chemistry, Fall 2012 -  
12.422, Planetary Atmospheres, Spring 2017 –  
MIT Professional Education “Summer Short Program” on “Climate Change: From Science to Solutions”, Summer 2016 –  
12.993, The Science of Geoengineering, 2016  
12.340, Global Warming Science, Spring 2012 & 2015; EdX version, spring, 2014 & 2016  
8.292/12.330, Fluid Physics, Fall 2013  
EAPS Independent Activities Period Seminar Series, IAP 2012 & 2013  
ETH Zurich ACS-1235, ACS-1235, Cloud Microphysics, 2005-2007  
University of Colorado, Chem-5181, Mass Spectrometry and Chromatography, 2003&2004  
University of Chicago, GeoSci-133, Atmospheric Science Teaching Assistant, Spring 1995-1998

#### Internal Service

EAPS Building Committee, 2012-  
PAOC Rossby Award Committee, 2016-  
MIT Atmospheric Chemistry, 2012-  
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  
2012 Planetary Faculty Search Committee (hire: Prof. Hilke Schlichting)  
2015 Climate Faculty Search Committee (hire : Prof. Andrew Babbin)

#### External Service:

Organizer: 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

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

Conference Session Chair: American Geophysical Union, American Association of Aerosol Research, International Aerosol Conference, International Conference on Clouds and Precipitation

American Association of Aerosol Research (AAAR) Young Investigators Committee, 2010-2013

Guest Editor, 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, 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: NASA Space Sciences, NOAA Climate and Global Change Program, US National Science Foundation, DOE Atmospheric Systems Research, 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, New Scientist, Christian Science Monitor, Chemical and Engineering News, Environmental Science and Technology, La Pressa, Royal Society of Chemistry, IWP (EPA) News

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

Television Interviews: MIT Faculty Forum, Science for the Public

Publications:

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

\*\*denotes MIT News Highlight

76. 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, submitted to Tellus B (2018).

\*75. Roesch, C., Roesch, M., Wolf, M. J., Zawadowicz, M. A., AlAloula, R., Al-awwad, Z., and Cziczo, D. J., The Formation of Water Droplets and Ice Crystals by Middle Eastern Mineral Dust, submitted to Atmosphere (2018).

\*74. Zawadowicz, M. A. [7 authors] and Cziczo, D. J., Atmospheric Bioaerosol Abundance Agreement Between Measurements and Models, under review at Nat. Com. (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. Disc. (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. Leaitch, 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. Freidman, 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 NH<sub>4</sub>HSO<sub>4</sub>, NH<sub>4</sub>NO<sub>3</sub>, and H<sub>2</sub>SO<sub>4</sub> 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, NH<sub>4</sub>HSO<sub>4</sub>, MgCl<sub>2</sub>, NH<sub>4</sub>HSO<sub>4</sub>, and NH<sub>4</sub>NO<sub>3</sub> 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 (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> 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).

Peer-Reviewed Book Chapters:

Ice Formation and Evolution in Clouds and Precipitation: Measurement and Modeling Challenges (2017), AMS Monographs, Chapter 8 (Measurements of Ice Nucleating Particles and Ice Residuals) lead author; Chapter 1 (Introduction) and 2 (Cirrus) contributing author.

D. J. Cziczo, *Encyclopedia of Mass Spectrometry*, Chapter VI: Inorganic Laser Desorption and Laser Ionization of Atmospheric Aerosols (2010).

Other Publications (not peer reviewed):

D. J. Cziczo, Up in the Clouds, *Nature Geosciences*, 2 E7, doi:10.1038/ngeo507 (2009).

P. Spichtinger and D. J. Cziczo, Aerosol Cloud Interactions – A Challenge for Measurements and Modeling at the Cutting Edge of Cloud-Climate Interactions, *Environmental Research Letters*, Introduction to Special Issue on Aerosols, Clouds, and Climate, 3, 1 (2008).

D. J. Cziczo, A Nice Place To Ski, But How About To Study Clouds?, *Particle Distributions* (2007).

D. J. Cziczo, S. Gallavardin, and U. Lohmann, The Past, Present, and Future of Laser Desorption Ionization Mass Spectrometry, 1<sup>st</sup> European Workshop on Aerosol Mass Spectrometry Conference Proceedings (2006).

D. J. Cziczo, R. Posselt, U. Lohmann, and D. M. Murphy, Indirect Effects of Aerosols on Climate: A report from the IGAC Specialty Conference, *IGAC Newsletter*, Issue No. 32 (2005).

D. J. Cziczo, D. M. Murphy, D. S. Thomson, C. Dobson, B. Ellison, A. Tuck, and V. Vaida, Meteoritic and Organic Material in the Atmosphere, *Amer. Chem. Soc. Abstracts*, 221, U543 (2001).

D. J. Cziczo, D. S. Thomson, and D. M. Murphy, In situ Measurements and Laboratory Studies of Meteoritic Material in Stratospheric Aerosols, *Meteor. Plan. Sci., Suppl. S*, A46 (2000).

Invited Presentations (since joining MIT, earlier upon request):

“Better Understanding Climate, Precipitation and Atmospheric Chemistry by Understanding the Formation of Mixed Phase Clouds”, Washington University CASE Seminar, St. Louis, MO, November, 2017.

“Better Understanding Climate, Precipitation and Atmospheric Chemistry by Understanding the Formation of Mixed Phase Clouds”, Woods Hole Oceanographic Institute Seminar, Woods Hole, MA, October, 2017.

“Climate and health impacts of coal fly ash : a new concept for co-benefits?”, NOAA Chemical Sciences Division Seminar, Boulder, CO, October, 2017.

“Better Understanding Climate, Precipitation and Atmospheric Chemistry by Understanding the Formation of Mixed Phase Clouds”, University of Colorado Chemistry Seminar, Boulder, CO, October, 2017.

“Better Understanding Climate, Precipitation and Atmospheric Chemistry by Understanding the Formation of Mixed Phase Clouds”, PAOC Colloquium, MIT, Cambridge, MA, September, 2017.

“The Effect of Particles and Clouds on Atmospheric Chemistry”, University of Illinois Atmospheric Chemistry Series, Champaign/Urbana, IL, September, 2017.

“Uncertainties In Particle and Cloud Measurements”, ICNAA Conference, Helsinki, Finland, June, 2017.

“Uncertainties In the Abundance of Biological Aerosols in the Atmosphere”, Atmospheric Sciences Seminar, Gothenburg, Sweden, June, 2017.

“Atmospheric Effects and Climate Change”, MIT’s “Short Program” on “Agriculture, Innovation and the Environment”, Cambridge, MA, June, 2017 (host: M. Buehler).

“How Uncertainties In Particle and Cloud Measurements Impacts Our Understanding Of Climate”, Purdue University Earth, Atmospheric and Planetary Sciences Seminar, West Lafayette, IN, April, 2017.

“Understanding Ice Formation: From the Earth to Mars and Beyond”, ASU School of Earth and Space Exploration, Tempe, AZ, April, 2017.

“Understanding Ice Formation: From the Earth to Mars and Beyond”, UCLA Planetary Sciences Seminar, Los Angeles, CA, February, 2017.

“How Uncertainties In Particle and Cloud Measurements Impacts Our Understanding Of Climate”, UCLA Atmospheric and Oceanic Sciences Seminar, Los Angeles, CA, February, 2017.

“How Uncertainties In Particle and Cloud Measurements Impacts Our Understanding Of Climate”, University of Minnesota Atmospheric Sciences Seminar, Minneapolis, MN, January, 2017.

“How Uncertainties In Particle and Cloud Measurements Impacts Our Understanding Of Climate”, Aerodyne Research Seminar, Billerica, MA, December, 2016.

“How Uncertainties In Particle and Cloud Measurements Impacts Our Understanding Of Climate”, University of Wisconsin Department of Atmospheric and Oceanic Sciences, Madison, WI, November, 2016.

“Aircraft CFDC studies, measurements of ice clouds, and ice residual analysis”, INUIT Summer School on Ice Nucleation, Gras-Ellenbach, Germany, September, 2016.

“Clouds, Chemistry, and Climate Change: Why our current climate”, MIT’s The Science and Engineering Program for Teachers, Cambridge, MA, June, 2016.

“Atmospheric Effects and Climate Change”, MIT’s “Short Program” on “Agriculture, Innovation and the Environment”, Cambridge, MA, June, 2016 (host: M. Buehler).

“The Importance of Ice Nucleation : From the Earth to Mars”, Northwestern University, Evanston, IL, April, 2016.

“Ice Nucleation : From the Earth to Mars and places in between”, American Museum of Natural History, New York, NY, March, 2016.

“The Complexity and Cloud Formation Potential of Atmospheric Mineral Dust”, Lamont-Doherty Earth Observatory - Columbia University, New York, NY, March, 2016.

“Greenhouse Gases vs. Clouds : Why our current climate is what it is”, MIT Climate Symposium, Cambridge, MA, 2016 (<https://www.youtube.com/watch?v=7JsCkPddBRY>)

“The Complexity and Cloud Formation Potential of Atmospheric Mineral Dust”, AMS, New Orleans, LA, January, 2016.

“Advances in Understanding the Role of Aerosols in Cirrus Formation from the Fifth International Ice Nucleation (FIN) Workshop”, AMS, New Orleans, LA, January, 2016.

“Lessons Learned From the Fifth Ice Nucleation Intercomparison Workshop”, AGU, San Francisco, CA, December, 2015.

“How We’re Advancing Our Understanding of Ice Clouds Through Intercomparisons and Field Studies”, University of Illinois Department of Atmospheric Sciences Seminar, IL, November, 2015.

“A Better Understanding of Climate Through Studies of Ice Clouds”, Center for Sustainability and the Global Environment, University of Wisconsin – Madison, WI, October, 2015.

“Fifth Ice Nucleation Workshop Overview”, FIN Data Meeting, Colorado State University, Ft. Collins, CO, September, 2015.

“Single Particle Time of Flight Mass Spectrometry Utilizing a Femtosecond Desorption and Ionization Laser”, American Chemical Society Fall Meeting, Boston, MA, August, 2015.

“The Fourth Ice Nucleation (FIN) Intercomparison”, Cal Tech Chemical Engineering Seminar, Pasadena, CA, June, 2015.

“Combining Field and Laboratory Studies to Understand the Dominant Sources and Mechanisms of Cirrus Cloud Formation”, Penn State Department of Meteorology Seminar, State College, PA, April, 2015.

“Combining Field and Laboratory Studies to Understand the Dominant Sources and Mechanisms of Cirrus Cloud Formation”, Juelich Research Center Atmospheric Science Seminar, Juelich, Germany, December, 2014.

“Understanding Cloud Formation Using Single Particle Mass Spectrometry”, ETH-Zurich Institute for Atmospheric and Climate Science Atmospheric Chemistry Seminar, Zurich, Switzerland, December, 2014.

“Combining Field and Laboratory Studies to Understand the Dominant Sources and Mechanisms of Cirrus Cloud Formation”, ETH-Zurich Institute for Atmospheric and Climate Science Colloquium, Zurich, Switzerland, December, 2014.

“Understanding Cloud Formation Using Single Particle Mass Spectrometry ”, Karlsruhe Institute of Technology Atmospheric Science Seminar, Karlsruhe, Germany, November, 2014.

“Combining Field and Laboratory Studies to Understand the Dominant Sources and Mechanisms of Cirrus Cloud Formation”, Telluride Science Research Center, Telluride, CO, August, 2014.

“Combining Field and Laboratory Studies to Understand the Dominant Sources and Mechanisms of Cirrus Cloud Formation”, American Chemical Society Annual Meeting, San Francisco, CA, July, 2014.

“Combining Field and Laboratory Studies to Understand the Dominant Sources and Mechanisms of Cirrus Cloud Formation”, Yale University Department of Geophysics Seminar, April, 2014.

“Engineering Challenges Sampling Cirrus Clouds”, Clarkson University Department of Aerospace Engineering Seminar, April, 2014.

“Combining Field and Laboratory Studies to Understand the Dominant Sources and Mechanisms of Cirrus Cloud Formation”, University of New Hampshire Department of Chemistry Seminar, March, 2014.

“The Role of Clouds in Climate Change”, American Physical Society Meeting, Denver, CO, March, 2014 (INVITED).

“Combining Field and Laboratory Studies to Understand the Dominant Sources and Mechanisms of Cirrus Cloud Formation”, University of Frankfurt Seminar, Frankfurt, Germany, January, 2014.

“Combining Field and Laboratory Studies to Understand the Dominant Sources and Mechanisms of Cirrus Cloud Formation”, University of Colorado Chemistry Seminar, Boulder, CO, October, 2013.

“Combining Field and Laboratory Studies to Understand the Dominant Sources and Mechanisms of Cirrus Cloud Formation”, American Association of Aerosol Research Annual Meeting, Portland, OR, October, 2013.

“Clarifying the dominant sources and mechanisms of cirrus cloud formation”, MASS Seminar Series, Cambridge, MA, May, 2013.

"The Atmosphere as an Intersection ... With Space", MIT EAPS IAP Seminar Series, Cambridge, MA, January, 2013.

"The Composition of Cirrus Forming Aerosol Particles: Lesson Learned From The MACPEX Field Study", AGU Fall Meeting, San Francisco, CA, December, 2012.

"How Can the Chemical Composition of Atmospheric Particles Affect Cloud Formation", The University of Washington, Department of Atmospheric Sciences, Seattle, WA, November, 2012.

"How Can the Chemical Composition of Atmospheric Particles Affect Cloud Formation?", The University of Wisconsin Department of Chemistry, Madison, WI, October, 2012.

"Using laboratory studies to understand in situ studies of ice nucleation", American Chemical Society Fall Meeting, Philadelphia, PA, August, 2012.

"The Composition of Cirrus Ice Residuals", Telluride Science Research Center, Telluride, CO, August, 2012.

"On the lack of bioaerosols in cirrus clouds", Bioaerosol Effects on Clouds, Steamboat Springs, CO, August, 2012.

"The Composition of Cirrus Ice Residuals", International Conference on Clouds and Precipitation, Leipzig, Germany, July, 2012.

"How can the chemical composition of atmospheric particles affect cirrus cloud formation?", University of Leeds, Leeds, UK, July, 2012.

"How can the chemical composition of atmospheric particles affect cirrus cloud formation?", Karlsruhe Institute of Technology, Karlsruhe, Germany, July, 2012.

"How can the chemical composition of atmospheric particles affect cirrus cloud formation?", Environmental Science and Engineering & Atmospheric Science Seminar Series, Harvard University, Cambridge, MA, April, 2012.

"How can atmospheric particles affect cirrus ice cloud formation?", Department of Chemistry Lecture Series, University of Vermont, Burlington, VT, March, 2011.

"How can atmospheric particles affect cirrus ice cloud formation?", School of Marine and Atmospheric Sciences Lecture Series, Stony Brook University, Stony Brook, NY, February, 2011.

"Ice nuclei in mid-latitude cirrus: Effect of aerosol properties on the formation of ice clouds determined by electron microscopy", MACPEX Science Team Meeting, Salt Lake City, UT, January, 2012.

"How can atmospheric particles affect cirrus ice cloud formation?", University of Illinois Atmospheric Science Seminar Series, Champaign-Urbana, IL, October, 2011.

"The Effect of Particle Composition on Hygroscopicity and Droplet Formation at CARES", American Association of Aerosol Research Annual Meeting, Orlando, FL, October, 2011.

“The Effect of Atmospheric Aerosols On Cirrus Cloud Formation’, PAOC Annual Retreat, Lincoln, NH, September, 2011

” Effects of aerosol properties on the formation of cirrus ice clouds”, Woods Hole Oceanographic Institute Seminar Series, WHOI, MA, September, 2011.

” Effects of aerosol properties on the formation of cirrus ice clouds”, Dalhousie University Atmospheric Science Seminar, Halifax Nova Scotia, September, 2011.

” Effects of aerosol properties on the formation of cirrus ice clouds”, American Chemical Society Conference, Denver, CO, August, 2011.

“Effects of aerosol properties on the formation of cirrus ice clouds”, Gordon Research Conference, Vermont, July, 2011.

“Inertial Separation of Ice Cloud Elements and Analysis Using Single Particle Mass Spectrometry”, International Workshop on Ice Nucleation in Tropospheric Clouds, Karlsruhe, Germany, May, 2011.

#### Outreach / MIT Alumni Lectures:

Belmont Public Library / Science for the Public Seminar Series, Belmont, MA, September, 2017

MIT Denver Alumni, Boulder, CO, October, 2013 and September,

2015 MIT School of Science Breakfast, Cambridge, MA, February,

2015 MIT Bay Area Alumni, Palo Alto, CA, July, 2014

Cardinal and Grey Society, Boston, MA, November, 2013

Telluride Town Hall, Telluride, CO, August, 2012

MIT Florida Alumni, Orland, FL, October, 2011

#### MIT Travel Hosted:

“Patagonian Frontiers: Argentina and Chile by Land and Sea”, November, 2017 (3 lectures)

“Machu Picchu and the Galapagos”, July, 2015 (3 lectures)

“Treasures of Southern Africa”, February, 2014 (3 lectures)