Nicholas Meskhidze
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Educational Background

Ph.D., Atmospheric Chemistry, December 2003, Georgia Institute of Technology
Thesis titled: "*Iron Mobilization in Mineral Dust and the Possible Effect of Asian Pollution on C-Uptake in North Pacific Ocean*" (Dr. William Chameides, advisor)
M.S., Environmental Management, 1996, Center for the Environmental Management, Tbilisi, Georgia
Diploma, Physics, 1993, Tbilisi State University, Tbilisi, Georgia

Professional Experience

Professor, North Carolina State University, 2017 - present
Associate Professor, North Carolina State University, 2012 - 2017
Assistant Professor, North Carolina State University, 2006 - 2012
Visiting Fellow, NASA Goddard Space Flight Center, 2006
Research Scientist II, Georgia Institute of Technology, 2005-2006
Postdoctoral Fellow, Georgia Institute of Technology, 2004

Current Fields of Interest

- Ambient measurements of size- and hygroscopicity-resolved particle fluxes
- Laboratory measurements and modeling of aerosol soluble iron deposition to the ocean
- Application of remotely sensed data for retrieval of surface $PM_{2.5}$ concentration and chemical composition
- Regional and global climate modeling

Honors, Awards, and Recognitions

2021 – Member of NASA Atmosphere Observing System (AOS) Modeling and Data Assimilation Working group
2018 – Member of SOLAS Ocean-Atmosphere Interaction Committee
2017 – Recipient of the NCSU "Thank a Teacher" award
2013 – NCSU Faculty Research & Professional Development Award
2007 – NCAR ECSA Advanced Study Program, Boulder, CO
2007 – Early career scientist, Gordon Conference on Biogenic Hydrocarbons & the Atmosphere, Ventura, CA
2006 – Goddard Visiting Fellowship, NASA Goddard Space Flight Center
2006 – DISCCRS II Symposium Member, Asilomar Conference Center, Pacific Grove, CA
2005 – ACCESS VIII Colloquium Member, Yellowstone National Park, WY
2005 – Graduate student travel support from NSF for International Conference Dynamic Planet 2005, Cairns, Australia
2004 – Best graduate journal publication award, Georgia Institute of Technology

2003 – The GRL, 2003 publication was selected as an "AGU Journal Highlight"

2000 – Graduate student travel support from AMS for 24th conference on Ag. and Forest Meteorology, Davis, California

1996 – Recognition for outstanding achievement and completion of the president's University Student Exchange (1000-1000) program funded by the United States Information Agency (USIA)

1995 – Presidential scholar, The University of Georgia

1995 – The University of Georgia fellowship from the United States Information Agency (USIA)

Invited Seminars/Talks

Invited speaker at SCOR Working Group meeting at ASLO Aquatic Sciences Meeting 2023, 4–9 June 2023, Palma de Mallorca, Spain.

Invited speaker at Brookhaven National Laboratory Environmental and Climate Sciences Departmental Seminar, March 24, 2022

Invited a series of 11 public lectures on the analysis of regional climate model results and remotely sensed data for the Southern Caucasus Black Sea region, July 9 – 11, 2018, Batumi, Georgia

Invited presentation at University of North Carolina Wilmington, Possible Effect of Atmospheric Organics on Aerosol Soluble Iron in Seawater, March 16, 2018, Wilmington, NC

Invited presentation at the frontiers in ocean-atmosphere exchange: Air-sea interface and fluxes of mass and energy, May 15-18, 2017, Cargèse, Corsica, France.

Invited speaker at 2017 Frontiers in Geoscience Colloquia at Los Alamos National Laboratory, April 3, 2017, Los Alamos, NM.

Invited presentation on International Conference "Science across observatory networks", May 9-2016, Zandvoort, Netherlands.

Invited speaker at the Abdus Salam International Centre for Theoretical Physics (ICTP), October 4, 2015, in Trieste, Italy

Invited speaker at NASA Langley Research Center seminar, July 23, 2015, Hampton, VA

Invited speaker at the Integrated Land-use Management Modelling of Black Sea Estuaries, 'Black Sea Basin 2007-2013', October 31, 2014, Batumi, Georgia

Invited speaker at the New Insights into Gas-Phase Atmospheric Chemistry, July 28 - August 1, 2014, Telluride, CO

Invited keynote speaker at the SOCRATES Workshop, University of Washington, March 18 -19, 2014, Seattle, WA

Invited speaker at the Sixth Symposium on Aerosol–Cloud–Climate Interactions, AMS Annual Meeting, 3 February 2–6, 2014, Atlanta, GA

Invited keynote speaker at the Open Sea Spray Aerosol Workshop, September 30 – October 1, 2013, Galway, Ireland

Invited speaker at the Biosphere-Atmosphere Exchange and Biosynthesis, AGU Fall conference, San Francisco, CA, December 9-13, 2013

Invited speaker at Chemistry Climate Working Group Meeting, NCAR, Boulder, CO, February 11-13, 2013

Invited presentation at the UCSD Scripps Institution of Oceanography, San Diego, CA, January 22, 2013

Invited speaker at the New Insights into Gas-Phase Atmospheric Chemistry, Telluride, CO, July 30 - August 3, 2012

Invited speaker at the International Workshop on Climate Change Projection and High-Performance Computing Climate 2012, March 12-15, 2012, Maui, Hawaii

Invited speaker, Duke University, Earth and Ocean Sciences Seminar Series, February 15, 2012, Durham, NC

Invited speaker, VII Annual International Conference of REC Caucasus "Climate Change Adaptation – Challenge and Opportunity for the Caucasus", November 10-11, 2011, Tbilisi, Georgia

Invited speaker, 242nd ACS National Meeting & Exposition, August 28-September 1, 2011, Denver, CO

Invited tutorial, the Abdus Salam International Centre for Theoretical Physics (ICTP), Workshop on Aerosol Impact in the Environment: from Air Pollution to Climate Change, Trieste, Italy, August 8 - 12, 2011

Invited seminar speaker, Dalhousie University – Seminar in Earth Science Modeling, Halifax, NS, Canada, March 17, 2011

Invited speaker, WMO SDS-WAS/GESAMP Expert Workshop on Modeling and Observing the Impacts of Dust Transport and Deposition on Marine Productivity, Sliema, Malta, March 6 - 9, 2011,

Invited seminar speaker, AEROCENTER Forum - NASA-Goddard Space Flight Center, Greenbelt, MD, February 21, 2011

Invited speaker, ACE Science Workshop - NASA Headquarters, Washington, DC, February 14, 2010

Invited speaker, U.S. CRDF – International Conference on Climate Change Curricula in Higher Education, Tbilisi, Georgia, June 7, 2010

Invited speaker, Meskhidze, American Geophysical Union (AGU) Fall Meeting, December 15-19, 2008

Invited speaker, IAMA - International Aerosol Modeling Algorithms Conference, December 10, 2009, Davis, CA

Invited tutorial speaker, AAAR- American Association for Aerosol Research, Annual Conference, Tutorial Session, Minneapolis, MN, October 26-30, 2009

Invited speaker, RTI-International – Global Climate Change Seminar, Durham, NC, April 24, 2008

Invited speaker, EPA - Research Triangle Park (RTP) Climate Dialogue, March 28, 2008, Durham, NC

Invited oral presentation, Multidisciplinary Workshop on South American Dust and its Role in Past and Present Climate, October 3-5, 2007, Puerto Madrin, Argentina

Invited speaker, CEMPD/UNC - Institute for the Environment, December 19, 2007, Chapel Hill, NC

Invited speaker, DUKE/UNC Oceanographic Consortium, November 16, 2007, Beaufort, NC

Invited speaker, EPA- Research Triangle Park (RTP) seminar series, October 6, 2006, Durham, NC

Invited seminar speaker, AEROCENTER Forum - NASA-Goddard Space Flight Center, August 29, 2006, Greenbelt, MD

Invited speaker, NASA-Goddard Space Flight Center, June 25, 2004, Greenbelt, MD

External Professional Activities

National and International Science Program Leadership

da Silva, A. M., Maring, H., Seidel, F., Behrenfeld, M., Ferrare, R., Mace G., et al., Aerosol, Cloud, Ecosystems (ACE) Final Study Report, National Aeronautics and Space Administration, 2020, https://gmao.gsfc.nasa.gov/pubs/docs/da%20Silva1247.pdf.

Lead guest editor Meskhidze, *Atmosphere*, Ocean Contributions to the Marine Boundary Layer Aerosol Budget, 2019

Meskhidze N., C. Hostetler, R. Ferrare, S. Burton, R. Moore, and S. Burrows, *Improved retrievals of cloud condensation nuclei (CCN) number concentration over the ocean to reduce indirect forcing uncertainties in climate models*, Submitted to 2017-2027 NRC Decadal Survey in Earth Science and Applications from Space, the Space Study Board of the U.S. National Academy of Sciences, ESAS 2017 Request for Information (RFI #2)

Hostetler C., S. Burton, R. Moore, R. Ferrare, J. Hair, Y. Hu, A. Nehrir, D. Winker, H. Chepfer, C. Trepte, T. Thorsen, P. Taylor, N. Meskhidze, O. Kalashnikova, *Cross-cutting Applications of Vertically Resolved Optical Properties to Reduce Uncertainties in Atmosphere and Ocean Earth System Processes*, Submitted to 2017-2027 NRC Decadal Survey in Earth Science and Applications from Space, the Space Study Board of the U.S. National Academy of Sciences, ESAS 2017 Request for Information (RFI #2)

Behrenfeld, M. and N. Meskhidze, *Response to the 2017 NRC Decadal Survey Request for Information regarding the Ocean Ecosystem and Ocean-aerosol Interactions components of the Aerosol, Cloud, and ocean Ecosystem (ACE) Mission*, Submitted to 2017-2027 NRC Decadal Survey in Earth Science and Applications from Space, the Space Study Board of the U.S. National Academy of Sciences, ESAS 2017 Request for Information (RFI #2)

Lead Author (27 Co-Authors) - Request to consider solicitation on improved marine aerosol characterization as part of the upcoming ROSES call, January 27, 2016

Lead Author (23 Co-Authors) - 2017-2027 NRC Decadal Survey in Earth Science and Applications from Space, the Space Study Board of the U.S. National Academy of Sciences, of white paper of "*Marine aerosol-cloud-climate interactions*", November 2, 2015

Contributing Author - The Southern Ocean Clouds, Radiation, Aerosol Transport Experimental Study (SOCRATES) white paper, April 2014

Contributing Author - Aerosol Cloud Ecosystems (ACE) 2009-2013 Progress Report and Future Outlook by the ACE Science Study Team, 2014

Contributing Author (Lead Authors Prof. Robert A. Duce and Prof. Peter Liss) - World Meteorological Organization Global Atmosphere Watch Joint Meeting of GESAMP Working Group 38 and the WMO Sand and Dust Storm Warning Advisory and Assessment System (SDS-WAS), 2012

Lead guest editor - Advances in Meteorology (AMET) - Special Issue on Marine Aerosol-Cloud-Climate Interaction, an editorial and 12 peer-reviewed publications, 2010

Member, AMS Committee on Atmospheric Chemistry (2010 - 2012)

Aerosol-Cloud-Ecosystem (ACE) working group member (2009 - current)

Educational Projects

Lead PI for Technical and Financial Program Development in Capacity Building and Establishing Bachelor Degree Programs in Georgia (co-PI Marian McCord). Funding from the US Millennium Challenge Corporation.

Lead PI for the development of a new MS program in meteorology-climatology that was launched at Ilia State University Tbilisi, Georgia on August 5, 2011 (co-PI Dr. Elizbarashvili). Funding provided by the U.S. Civilian Research and Development Foundation (CRDF). This is the first master's program in the Southern Caucasus that teaches physical principles and possible consequences of climate change.

Scientific Conferences and Meetings Organized

Organizer of the workshop "Iron at the Air-sea Interface", 26-30 July 2021, Asheville, NC

Organizer of the workshop "Identifying and Characterizing the Processes Controlling Iron Speciation and Residence Time at the Atmosphere-Ocean Interface", 30 July 2018 – 3 August 2018, Telluride, CO

Chair of the AGU Fall 2017 Meeting session "Ocean-Atmosphere Exchange: Links with Marine Biology, Clouds, and Climate", Co-Chairs Cassandra J Gaston, University of Miami; Ernie R Lewis, BNL; Kostas Tsigaridis, Columbia University, NASA/GISS.

Organizer of the "South Caucasus-Black Sea Regional Climate Conference ", October 3-5, 2017, Batumi, Georgia. Co-Organizer Fabien Solmon, ICTP, Italy.

Chair of the Goldschmidt2017 meeting session "Atmosphere-Land-Ocean-(Sea)Ice Interaction: links with biology, clouds, and climate", co-Chairs Markus Frey, Martin King, Akinori Ito, Yves Balkanski, Paul Ginoux, Adi Torfstein, Sophie Bonnet, Eyal Rahav, William Landing

Chair of the AGU Fall 2016 Meeting session "Marine aerosols and trace gases", Co-Chairs Cassandra J Gaston, University of Miami; Ernie R Lewis, BNL; Kostas Tsigaridis, Columbia University, NASA/GISS.

Chair of the AGU Fall 2015 Meeting session "Marine aerosols and trace gases", Co-Chairs Susannah Burrows, PNNL, Lynn Russell Scripps, UC San Diego, Timothy Bertram, UC San Diego

Chair of AMS 2015 Annual Meeting, 17th Conference on Conference on Atmospheric Chemistry, session "Marine Aerosols: Sources, Chemistry, Clouds and Climate, Co-Chair Phil Rausch, PNNL

Chair of the International workshop "Extreme Weather and Climate Events in the Southern Caucasus - Black Sea Region", Jun 3-7, 2013, Tbilisi, Georgia. Co-Chair Fabien Solmon, ICTP, Italy.

Chair of the international workshop "Production mechanism, number concentration, size distribution, chemical composition, and optical properties of sea spray aerosols", June 4 to 6, 2012, Raleigh, NC. Co-Chairs, Markus Petters, NCSU and Kostas Tsigaridis, NASA GISS.

Chair of the AGU Fall 2013 Meeting session "Marine Trace Gases and Aerosols", Co-Chair Rainer Volkamer, Univ. of Colorado, Boulder, CO

Chair of the Goldschmidt 2012 Meeting session "Biogeochemical cycling of aerosols and their effects in the evolving Earth's climate", Co-Chair Ina Tegen, Institute for Tropospheric Research, Leipzig, Germany

Chair of the AGU Fall 2012 Meeting session "Sources, Properties, and the Budget of Ocean-Derived CCN", Co-Chairs Timothy S Bates, NOAA PMEL, William C Keene, University of Virginia, Kostas Tsigaridis, NASA GISS

Chair of the AGU Fall 2011 Meeting session "Aerosols and Trace Gases over Marine Environment: Their Production Mechanisms, Abundance, Optical Properties, Biogeochemical Cycling and Climatic Effects", Co-Chairs Markus Petters, NCSU, Alexander Smirnov, NASA/GSFC, Cristina Facchini, ISAC-CNR, Bologna, Italy

Chair of the Goldschmidt 2010 Meeting session "Connecting Oceanic Emissions, Aerosols, and Maritime Clouds: What do we know and where will we go?" Co-Chair Maria Cristina Facchini, ISAC-CNR, Bologna, Italy

Chair of the AGU Fall 2010 Meeting session "Marine Aerosols: Production Mechanisms, Chemical Composition, and Representation in Regional and Global Models", Co-Chairs Markus Petters, NCSU and Lynn Russell, Scripps Institution of Oceanography

Chair of the AGU Spring 2010 Meeting session "Ocean-Aerosol Interactions", Co-Chairs Santiago Gassó, NASA/GSFC and Norman Nelson, UC Santa Barbara

Chair of the AGU Fall 2009 Meeting session "Marine Biogeochemical Cycles: A Second Look at Aerosol-Cloud-Climate Feedbacks", Co-Chairs Markus Petters, NCSU and Santiago Gassó, NASA/GSFC

Editorial Service

Oceans, Editorial Board Member 2019 – present

Sci, Advisory Board Member 2018 - present

Advances in Meteorology, Editorial Board Member 2015 – 2019

Journal of Marine Science: Research & Development, Editorial Board Member 2013 – 2015

Atmospheric and Climate Sciences, Editorial Board Member 2012 – 2014

Reviewer

Journal of Geophysical Research (AGU), Earth Interactions (AMS), Geochemistry, Geophysics, Geosystems (AGU), Geobiology (AGU), Atmospheric Environment (ELSEVIER), Atmospheric Chemistry and Physics (EGU), Nature, Nature Geosciences, Environmental Science and Technology (ACS), Journal of Atmospheric Sciences (AMS), Proceedings of the National Academy of Sciences

Panel participant at EPA, NSF, NOAA, NASA, &NERC

Field Experience

Chief Scientist, Fall 2020 field campaign at the DOE ARM Southern Great Plains (SGP) site in Lamont, OK. The study - Turbulent Flux Measurements of the Residual Layer Nucleation Particles - was performed from October 15 – Nov 16, 2020. Co-Chief Scientist Markus Petters.

In charge of size- and hygroscopicity-resolved sea spray flux measurement using relaxed eddy accumulation (REA) technique on board of NOAA Ship *Hi'ialakai* during WHOTS-13*,* June 25, 2016 – July 3, 2016 cruise north of the Hawaiian island of O'ahu. Person in charge Albert Plueddemann.

Chief Scientist, Spring 2016 field campaign at the US Army Corps of Engineers' Field Research Facility in Duck, NC. The study was performed from April 24 – May 16, 2016. Co-Chief Scientists Markus Petters and Robert Reed.

Chief Scientist, fall 2015 field campaign at the US Army Corps of Engineers' Field Research Facility in Duck, NC. The study was performed from Nov 3 - 22, 2015. Co-Chief Scientists Markus Petters and Robert Reed.

Chief Scientist, spring 2015 field campaign at the US Army Corps of Engineers' Field Research Facility in Duck, NC. The study was performed from April 27th - May 10th, 2015. Co-Chief Scientists Markus Petters and Robert Reed.

Chief Scientist, field-testing of the size-resolved sub-micron sea-salt particle flux measuring instrument at North Carolina State University's Center for Marine Science Technology (CMAST) in Moorehead City, NC. The measurements were conducted from November 22 to 30, 2014. Co-Chief Scientists Markus Petters and Robert Reed.

In charge of study of turbulent fluxes over the tall, artificial pine tree forest canopy; SF_6 Purposeful Tracer Release Experiment, at Gainesville, FL during December - January 1998. Person in charge Monique Leclerc.

In charge of study of turbulent fluxes over the peach tree canopy; SF6 Purposeful Tracer Release Experiment, at Hollonville, GA during July - September 1998. Person in charge Monique Leclerc.

Teaching and Mentoring

Undergraduate Student Research Advisor/Co-Advisor: Adele Igel (2008-2009), Matthew Igel (2008-2009), David Hurley (2013-2014), Zach Fair (2014 – 2015), Michael Mugrage (2016 – 2017), Kyle Tanner (2019-2020)

Graduate Student Advisor/co-advisor: Joshua Hemperly (M.S., 2009), Brett Gantt (M.S., 2009; Ph.D. 2012), Matthew Johnson (M.S., 2009; Ph.D. 2012), Alyssa Sabolis (M.S., 2009), Jon Trueblood (M.S., 2014), Sarah Suda (Ph.D. 2015), Kyle Dawson (M.S. 2013; 2015 – 2017), Brittany Phillips (2015 – 2017), Taylor Royalty (2015 - 2017), Rachael Coons (2017 – 2018), Ling Xinyi (2017 – current), Alyssa Zimmerman (2018 – current), Bethany Sutherland (2019 – current), Ajmal Rasheeda Satheesh (2021 – current)

Postdoctoral Advisor/co-advisor:

Jun Xu (2008 – 2011), J. C. Jaimes-Correa (2019), Maksim Islam (2021 – 2022)

Thesis Committee Member (other than as advisor/co-advisor):

Kristen Olsen (M.S., 2009), Kai Wang (Ph.D., 2011), Ying Pan (Ph.D., 2011), Yang Jean (Ph.D., 2013), Tim Wright (Ph.D., 2013), Tim Glotfelty (P.D., 2016), Yijia Zhao (Ph.D., 2020), Bin Cheng (Ph.D. 2020)

Visiting Graduate Research Advisor:

Mariam Elizbarashvili (Tbilisi State University, Georgia, May-June, 2012)

Visiting Scientists:

Fabien Solmon (International Centre for Theoretical Physics, April, 2011; May, 2014); Kiliyanpilakkil Praju (2017 – 2018)

Other: Matt Wilbanks (2010), Kiliyanpilakkil Praju (2011), Sean States (2010)

Membership in Professional and Honor Societies

American Geophysical Union (AGU)
European Geophysical Union (EGU)
American Meteorological Society (AMS)

Patents

The software disclosure #18006 titled "Creating Aerosol Types from Chemistry (CATCH)" has been patented through the Office of Technology Commercialization and New Ventures at NC State University.

Refereed Publications

- ORCID ID https://orcid.org/0000-0001-5628-8777
- Google Scholar: h-index 34, i10-index 50, Citations 4,230

In review

[1] Sutherland, B.*, and **N. Meskhidze**, High Spectral Resolution Lidar Type-Specific Optical Properties Show Promising Potential for Assessment of Aerosol Direct Radiative Effect, submitted to JGR-Atmosphere, 2023.

[2] Rasheeda Satheesh*, A., M.D., Petters, and **N. Meskhidze**, Aerosol Vertical Turbulent Mass Flux Retrievals Through Novel Remote Sensing Algorithm, submitted to JGR-Atmosphere, 2023.

Published

[59] Petters, M. D., Pujiastuti, T., Rasheeda Satheesh, A., Kasparoglu, S., Sutherland, B., and **Meskhidze, N.** (2024), Wind-driven emissions of coarse-mode particles in an urban environment, Atmos. Chem. Phys., 24, 745–762, https://doi.org/10.5194/acp-24-745-2024.

[58] Sutherland, B., S. Burton, C. A. Hostetler, R. A. Ferrare, J. Hair, R. J. Park, Y. J. Oak, and **N. Meskhidze**, Application of DIAL/HSRL and CATCH algorithm-based methodologies for surface $PM_{2.5}$ concentrations during the KORUS-AQ campaign, *Atmospheric Environment*, in review.

[57] Kasparoglu, S., Islam, M. M., **Meskhidze, N**., & Petters, M. D. (2022). Characterization of a modified printed optical particle spectrometer for high-frequency and high-precision laboratory and field measurements. *Atmospheric Measurement Techniques*, *15*(17), 5007–5018. https://doi.org/10.5194/amt-15-5007-2022

[56] Al-Abadleh, H. A., Kubicki, J. D., & **Meskhidze, N**. (2022). A perspective on iron (Fe) in the atmosphere: air quality, climate, and the ocean. *Environmental Science: Processes & Impacts*, 10.1039.D2EM00176D. https://doi.org/10.1039/D2EM00176D

[55] Islam, M. M., **Meskhidze, N**., Rasheeda Satheesh, A., & Petters, M. D. (2022). Turbulent Flux Measurements of the Near-Surface and Residual-Layer Small Particle Events. *Journal of Geophysical Research: Atmospheres*, *127*(17). https://doi.org/10.1029/2021JD036289

[54] Cheng, B., L. Wang-Li, **N. Meskhidze**, J. Classen, P. Bloomfield (2021), Partitioning of NH_3-NH_4^+ in the southeastern U.S., Atmosphere, 2(12):1681. https://doi.org/10.3390/atmos12121681.

[53] **N. Meskhidze**., B. Sutherland, X. Ling, K. Dawson, M. S. Johnson, B. Henderson, C. A. Hostetler, and R. A. Ferrare (2021), Improving Estimates of PM2.5 Concentration and Chemical Composition by Application of High Spectral Resolution Lidar (HSRL) and Creating Aerosol Types from Chemistry (CATCH) Algorithm, *Atmospheric Environment*, https://doi.org/10.1016/j.atmosenv.2021.118250

[52] Sellegri, K., Nicosia, A., Freney, E., Uitz, J., Thyssen, M., Grégori, G., Enge, A., Zäncker, B., Haëntjens, N., Mas, S., Picard, D., Saint-Macary, A., Peltola, M., Rose, C., Trueblood, J., Lefevre, D., D'Anna, B., Desboeuf, K., **Meskhidze**, **N.**, Guieu C., and Law C. S. (2020), Surface ocean microbiota determine cloud precursors, *Scientific Reports*, https://doi.org/10.1038/s41598-020-78097-5.

[51] Cheng, B., L. Wang-Li, J. Classen, **N. Meskhidze**., P. Bloomfield (2021), Spatial and Temporal Variations of Atmospheric Chemical Condition in the Southeastern U.S., *Atmospheric Research*, https://doi.org/10.1016/j.atmosres.2020.105190

[50] Zimmerman, A. M. D. Petters, **N. Meskhidze** (2020), Observations of new particle formation, modal growth rates, and direct emissions of sub-10 nm particles in an urban environment, *Atmospheric Research*, https://doi.org/10.1016/j.atmosenv.2020.117835

[49] **Meskhidze, N**., J. C. Jaimes-Correa, M. D. Petters, T. M. Royalty, B. N. Phillips, A. Zimmerman, R. Reed (2019), Possible Wintertime Sources of Fine Particles in an Urban Environment, *Journal of Geophysical Research,* https://doi.org/10.1029/2019JD031367.

[48] **Meskhidze, N**., C. Völker, H. A. Al-Abadleh, K. Barbeau, M. Bressac, C. Buck, R. M. Bundy, P. Croot, Y. Feng, A. Ito, A. M. Johansen, W. M. Landing, J. Mao, S. Myriokefalitakis, D. Ohnemus, B. Pasquier, Y. Ye (2019), Identifying and Characterizing the Processes Controlling Iron Speciation and Residence Time at the Atmosphere-Ocean Interface, *Mar. Chem.*, https://doi.org/10.1016/j.marchem.2019.103704.

[47] Cheng, B. L. Wang-Li, **N. Meskhidze**, J. Classen, P. Bloomfield (2019), Spatial and temporal variations of PM2.5 mass closure and inorganic PM2.5 in the Southeastern U.S., Environmental Science and Pollution Research, https://doi.org/10.1007/s11356-019-06437-8

[46] Ito, A., S. Myriokefalitakis, M. Kanakidou, N. Mahowald, R. A. Scanza, D. S. Hamilton, A. R. Baker, T. Jickells, M. Sarin, B. Srinivas, Y. Gao, R. U. Shelley, C. S. Buck, W. M. Landing, A. R. Bowie, M. M. G. Perron, C. Guieu, **N. Meskhidze**, M. S. Johnson, Y. Feng, J. F. Kok, A. Nenes, R. Duce, (2019), Constraints on attribution of labile iron in aerosols to combustion and mineral dust sources from observations and models, *Science Advances, 5, eaau7671, DOI: 10.1126/sciadv.aau7671*.

[45] Myriokefalitakis, S., Ito, A., Kanakidou, M., Nenes, A., Krol, M. C., Mahowald, N. M., Scanza, R. A., Hamilton, D. S., Johnson, M. S., **Meskhidze, N.**, Kok, J. F., Guieu, C., Baker, A. R., Jickells, T. D., Sarin, M. M., Bikkina, S., Perron, M. M. G., and Duce, R. A. (2018), The GESAMP atmospheric iron deposition model intercomparison study, *Biogeosciences*., 15, 6659–6684, https://doi.org/10.5194/bg-2018-285.

[44] Elliott, S., Burrows, S., Cameron-Smith, P., Hoffman, F., Hunke, E., Jeffery, N., Liu, Y., Maltrud, M., Ogunro, O., Van Roekel, L., Wang, S., Brunke, M., Deal, C., Jin, M., Letscher, R., **Meskhidze,**

N., Russell, L., Simpson, I., Stokes, D., Wingenter, O. (2018), Does Marine Surface Tension Have Global Biogeography? Addition for the OCEANFILMS Package, *Atmosphere*, DOI: 10.20944/preprints201710.0167.v1.

[43] Phillips, B.N., T. M. Royalty, K. W. Dawson, R. Reed, M. D. Petters, and **N. Meskhidze** (2018), Hygroscopicity- and size-resolved measurements of submicron aerosol on the East Coast of the United States, submitted to *J. Geophys. Res*. *Atmos*. DOI: 10.1002/2017JD027702.

[42] **Meskhidze**, **N.**, T. M. Royalty, B. N. Phillips, K. W. Dawson, M. D. Petters, R. Reeds, J. P. Weinstein, D.A. Hook, and R. W. Wiener (2018), Continuous flow Hygroscopicity-Resolved Relaxed Eddy Accumulation (Hy-Res REA) method of measuring size-resolved sea-salt particle fluxes, *Aerosol. Sci. Tech*., Aerosol Science and Technology, DOI: 10.1080/02786826.2017.1423174.

[41] Dawson, K., W. **N. Meskhidze**, S. P. Burton, M. S. Johnson, M. S. Kacenelenbogen, C. A. Hostetler, and Y. Hu (2017), Creating Aerosol Types from CHemistry (CATCH): a new algorithm to extend the link between remote sensing and models, *J. Geophys. Res*. *Atmos*. 122, DOI: 10.1002/2017JD026913.

[40] Royalty, T. M., B. N. Phillips, K. W. Dawson, R. Reed, **N. Meskhidze**, and M. D. Petters (2017), Aerosol Properties Observed in the Subtropical North Pacific Boundary Layer, *J. Geophys. Res*. *Atmos*., 122, DOI: 10.1002/2017JD026897.

[39] **Meskhidze, N.,** D Hurley, T.M. Royalty, and M.S. Johnson (2017), Potential effect of atmospheric organics on the bioavailable iron pool in the oceans, *Mar. Chem.* 94, 124-132, https://doi.org/10.1016/j.marchem.2017.05.011.

[38] Dawson, K. W., M. D. Petters, **N. Meskhidze**, S. Suda Petters, and S. M. Kreidenweis (2016) Hygroscopic growth and cloud droplet activation of marine hydrogels, *J. Geophys. Res*. *Atmos*.,121, doi:10.1002/2016JD025143.

[37] **N. Meskhidze**, M. S. Johnson, D. Hurley, and K. Dawson (2016), Influence of measurement uncertainties on soluble aerosol iron over the oceans, *Aeolian Res.*, 22, 85-92, http://dx.doi.org/10.1016/j.aeolia.2016.07.002.

[36] Ito, T., A. Nenes, M. S. Johnson, **N. Meskhidze**, and C. Deutsch (2016), Recent deoxygenation of the tropical Pacific enhanced by the pollution of aerosols, *Nature Geosciences*, 9, 443–447, doi:10.1038/ngeo2717.

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Meetings and Symposia

(Note **only** those presentations in which Meskhidze was the first author or Meskhidze's post-D or student were the first authors are included)

[154] Rasheeda Satheesh, A. M. D. Petters, and **N. Meskhidze** Boundary layer profiles of particle turbulent mass fluxes at the Southern Great Plains site, Platform presentation at AAAR 41st Annual Conference, Portland, OR, 2 -6 October 2023.

[153] **Meskhidze N.**, A.Rasheeda Satheesh, and M. D. Petters, Challenges in measurement and interpretation of the lidar-retrieved aerosol vertical turbulent mass fluxes, Poster presentation at AAAR 41st Annual Conference, Portland, OR, 2 -6 October 2023.

[152] Petters, M.D., T. Pujiastuti, A. Rasheeda Satheesh, S. Kasparoglu, B. Sutherland, **N. Meskhidze**, Wind-driven emissions of coarse mode particles in an urban environment, Platform presentation at AAAR 41st Annual Conference, Portland, OR, 2 -6 October 2023.

[151] Sutherland, N. and **N. Meskhidze**, Determination of the instantaneous aerosol-radiation interactions (direct effects) using High Spectral Resolution Lidar (HSRL)-derived aerosol type-specific optical properties and CATCH algorithm, Platform presentation at AAAR 41st Annual Conference, Portland, OR, 2 -6 October 2023.

[150] **Meskhidze N**., A. Rasheeda Satheesh, T. Pujiastuti, S. Kasparoglu, B. Sutherland, and M. D. Petters, Challenges in Measurement and Interpretation of the Lidar-retrieved Aerosol Vertical

Turbulent Fluxes, Poster presentation at Gordon Research Conference (GRC) in Atmospheric Chemistry, Newry, ME, 30 July – 4 August, 2023,

[149] Petters M D, T. Pujiastuti, A. Rasheeda Satheesh, S. Kasparoglu, B. Sutherland, **N. Meskhidze**, Wind-Driven Emissions of Coarse Mode Particles in an Urban Environment, Poster presentation at 2023 ARM-ASR Joint Facility PI Meeting, Bethesda, MD, 7 – 10 August, 2023.

[148] **Meskhidze**, N., F. Yu, and M. D. Petters, Improved Understanding of the Parameters Involved in Near-surface and Residual-layer NPF Events and Their Representations in Models, Platform presentation at 2023 ARM-ASR Joint Facility PI Meeting, Bethesda, MD, 7 – 10 August, 2023.

[147] **Meskhidze**, N., Dust iron-organic interaction at the ocean surface, SCOR Working Group meeting at ASLO Aquatic Sciences Meeting 2023, Palma de Mallorca, Spain, 4–9 June 2023.

[146] Sutherland, B., **N. Meskhidze**, S. P Burton, J. W Hair, C. A Hostetler, and R. A. Ferrare, Chemical Speciation from High Spectral Resolution Lidar (HSRL)-Based Methods for Estimating $PM_{2.5}$ During the DISCOVER-AQ and KORUS-AQ Campaigns, Platform presentation at AGU Fall 2022 Conference, Chicago, IL, December 11 to 15, 2022.

[145] Rasheeda Satheesh, A., B. Sutherland, S, Kasparoglu, **N. Meskhidze**, and M. Petters, Particle Turbulent Mass Flux Retrievals Through Novel Remote Sensing Methodology, Poster presentation at AGU Fall 2022 Conference, Chicago, IL, December 11 to 15, 2022.

[144] **Meskhidze, N**., A. Rasheeda Satheesh, S. Kasparoglu, M. Islam, B. Sutherland, Turbulent Flux Measurements and Transfer Velocity Estimates of Sub-10 nm Sized Particles, Poster presentation at AGU Fall 2022 Conference, Chicago, IL, December 11 to 15, 2022.

[143] **Meskhidze, N.,** A. Rasheeda Satheesh, S, Kasparoglu, M. Maksimul Islam, B. Sutherland, and M. Petters, Turbulent Flux Measurements and Transfer Velocity Estimates of Nucleation-sized Particles, Platform presentation at AAAR 40th Annual Conference, Raleigh, NC, 3-7 October, 2022.

[142] Sutherland, B., **N. Meskhidze**, S. P. Burton, J. Hair, C. Hostetler, R, Ferrare, Application of High Spectral Resolution Lidar (HSRL)-based Methods for Estimating $PM_{2.5}$ during the KORUS-AQ Campaign, Poster presentation at AAAR 40th Annual Conference, Raleigh, NC, 3-7 October, 2022.

[141] Rasheeda Satheesh, A., S. Kasparoglu, B. Sutherland, **N. Meskhidze**, and M. Petters, Particle Turbulent Mass Flux Retrievals through Novel Remote Sensing Methodology, Poster presentation at AAAR 40th Annual Conference, Raleigh, NC, 3-7 October, 2022.

[140] Kasparoglu, S., M. M. Islam, **N. Meskhidze**, M. Petters, Characterization of an Augmented Version of the Printed Optical Particle Spectrometer for Integration into Multi-Instrument Aerosol Sampling Systems, Platform presentation at AAAR 40th Annual Conference, Raleigh, NC, 3-7 October, 2022.

[139] **Meskhidze, N**., B. Sutherland, C. Hostetler, R. Ferrare, S. Burton, J. Hair, Application of the CMAQ-HSRL-CH and HSRL-CH methodologies for improving estimates of $PM_{2.5}$ concentration to data from the KORUS-AQ campaign, Platform presentation at AGU Fall 2021 Conference, December 13 to 17, 2021.

[138] Sutherland, B. and **N. Meskhidze**, Estimation of Aerosol Direct Radiative Effect Through CATCH-derived Aerosol Types, Poster presentation at AGU Fall 2021 Conference, December 13 to 17, 2022.

[137] **Meskhidze, N**., M. D. Petters, M. Islam, Turbulent Flux Measurements of the Near-surface and Residual-layer Nucleation Particles, Virtual presentation at AAAR 39th Annual Conference, October 18 to 22, 2021.

[136] Sutherland, B. and **N. Meskhidze**, Estimation of Aerosol Direct Radiative Effect through CATCH-derived Aerosol Types, Virtual presentation at AAAR 39th Annual Conference, October 18 to 22, 2021.

[135] Islam, M., **N. Meskhidze**, and M. D. Petters, Turbulent Flux Measurements of the Near-surface and Residual-layer Nucleation Particles, Virtual poster presentation at 2021 ARM/ASR PI Meeting, June 21-24, 2021. , 2021.

[134] Sutherland, B., **N. Meskhidze**, X. Ling, K. Dawson, M. S. Johnson, B. Henderson, C. A. Hostetler, and R. A. Ferrare, Improving Estimates of PM2.5 Concentration and Chemical Composition by Application of High Spectral Resolution Lidar (HSRL) and Creating Aerosol Types from Chemistry (CATCH) Algorithm, AAAR 38th Annual Conference, October 5 to 9, 2020.

[133] **Meskhidze, N**., Zimmerman, A., and M. D. Petters, Observations of new particle formation, modal growth rates, and direct emissions of sub-10 nm particles in an urban environment, AAAR 38th Annual Conference, October 5 to 9, 2020.

[132] Ling, X., **N. Meskhidze**, K. Dawson, M. S. Johnson, B. Henderson, S. P. Burton, C. A. Hostetler, and R. A. Ferrare, Improving Estimates of Ground-Level $PM_{2.5}$ by Application of High Spectral Resolution Lidar, a poster presentation at AAAR 37th Annual Conference October 14-18, 2019, Portland, OR.

[131] Zimmerman, A., N. Meskhidze, J. C. Jaimes-Correa, M. D. Petters, T. M. Royalty, B. N. Phillips, R. Reed, Exploring the Role of Planetary Boundary Layer Dynamics on the Ground Level Ultrafine Particle Number Concentration, a poster presentation at AAAR 37th Annual Conference October 14-18, 2019, Portland, OR.

[130] Meskhidze, N., Using Global Aerosol Types For Improved Assessment Of Aerosol Direct Radiative Effect, poster presentation at Radiation and Climate Gordon Research Conference, July 21 - July 26, 2019, Lewiston, ME

[129] **Meskhidze, N**., X. Ling, K. Dawson, B. Henderson, M. Johnson, S. Burton, C. Hostetler, R. Ferrare, New methodology for deriving $PM_{2.5}$ chemical composition using GEOS-Chem & High Spectral Resolution Lidar, oral presentation at the 9th International GEOS-Chem Meeting (IGC9), May 6-9, 2019, Harvard, MA.

[128] Ling, X., **Meskhidze, N.**, K. Dawson, B. Henderson, M. Johnson, S. Burton, C. Hostetler, R. Ferrare, , Improved representation of surface $PM_{2.5}$ using High Spectral Resolution Lidar retrievals and GEOS-Chem-derived aerosol types, poster presentation at the 9th International GEOS-Chem Meeting (IGC9), May 6-9, 2019, Harvard, MA.

[127] Xinyi Ling, **N. Meskhidze**, K. Dawson, M. S. Johnson, B. Henderson, S. P. Burton, C. A. Hostetler, R. A. Ferrare, A novel approach to improving the accuracy of ground-level $PM_{2.5}$ concentration estimates by application of High Spectral Resolution Lidar, a poster presentation at the 17th annual CMAS conference, October 22 – 24, 2018, Chapel Hill, NC.

[126] **Meskhidze, N.**, Using global aerosol types for improved assessment of aerosol direct radiative effect, oral presentation at the 17th AeroCom workshop 6th AeroSAT workshop October 15 – 19, 2018, NOAA, College Park, MD.

[125] **Meskhidze, N.,** Possible Effect of Atmospheric Organics on Aerosol Soluble Iron in Seawater, Workshop on Identifying and Characterizing the Processes Controlling Iron Speciation and Residence Time at the Atmosphere-Ocean Interface, July 30 - August 3, Telluride, CO.

[124] **Meskhidze, N**., T. M. Royalty, B. N. Phillips, K. Dawson, M. D. Petters, R. Reed, J. P. Weinstein, D. A. Hook, R. Wiener, Continuous Flow Hygroscopicity-Resolved Relaxed Eddy Accumulation (Hy-Res REA) Method of Measuring Size-Resolved Sea-Salt Particle Fluxes, AGU Fall meeting, December 11 - 15, 2017, New Orleans, LA.

[123] **Meskhidze, N**., T. M. Royalty, B. N. Phillips, K. Dawson, M. D. Petters, R. Reed, J. P. Weinstein, D. A. Hook, R. Wiener, Continuous Flow Hygroscopicity-Resolved Relaxed Eddy Accumulation (Hy-Res REA) Method of Measuring Size-Resolved Sea-Salt Particle Fluxes, 36th AAAR Annual Conference, October 16 - 20, 2017, Raleigh NC.

[122] **Meskhidze, N**., Contribution of Natural Aerosols to Uncertainty in Anthropogenic Climate Change, South Caucasus-Black Sea Regional Climate Workshop, October 3-5, Batumi, Georgia.

[121] Dawson, K.W., **N. Meskhidze**, S. Burton, M. S. Johnson, M. Kacenelenbogen, C. Hostetler, and Y. Hu, New algorithm for Creating Aerosol Types from CHemistry (CATCH), Goldschmidt2017, August 13 - 18, 2017, Paris, France.

[120] **Meskhidze, N.,** T. M. Royalty, T. M., B. N. Phillips, K. W. Dawson, M. D. Petters, R. Reed, J. P. Weinstein, D.A. Hook, and R. W. Wiener, Continuous Flow Hygroscopicity-resolved Relaxed Eddy Accumulation (Hy-res REA) Method of Measuring Size-resolved Sea-salt Particle Fluxes, Goldschmidt2017, August 13 - 18, 2017, Paris, France.

[119] **Meskhidze, N**., D Hurley, T. Royalty, and M. S. Johnson, Potential Effect of Atmospheric Organics on Aerosol Soluble Iron in Seawater, Goldschmidt2017, August 13 - 18, 2017, Paris, France.

[118] **Meskhidze, N.,** Constraining sea spray contribution to the marine boundary layer aerosol number concentration, invited keynote presentation at the frontiers in ocean-atmosphere exchange: Air sea interface and fluxes of mass and energy, May 15-18, 2017, Cargèse, Corsica, France.

[117] **Meskhidze, N.**, K. W. Dawson, S. P. Burton, M. S. Johnson, M. S. Kacenelenbogen, C. A. Hostetler, Y. Hu, Creating Aerosol Types from CHemistry (CATCH): a new algorithm to extend the link between remote sensing and models, poster presentation at the 8th International GEOS-Chem Meeting (IGC8), May 1-4, 2017, Cambridge, MA.

[116] **Meskhidze, N.,** Atmospheric Organics and Aerosol Soluble Iron in Seawater, invited presentation at 2017 Frontiers in Geoscience Colloquia at Los Alamos National Laboratory (LANL), April 3, 2017, Los Alamos, NM

[115] **Meskhidze, N**., D. Hurley, T. Royalty, and M. S. Johnson, Effect of Atmospheric Organics on Aerosol Soluble Iron in Seawater, Oral presentation, ASLO2017, Mountains to the Sea, Feb 26 – Mar 3, 2017, Honolulu, Hawaii.

[114] Mugrage, M. and **N. Meskhidze**, Central American Biomass Burning Aerosols and Their Impact on Southeastern United States Tornado Events, poster presentation, 97th AMS Annual Meeting, January 22-26, 2017, Seattle, WA.

[113] **Meskhidze, N**., D. Hurley, T. Royalty and M. S. Johnson, Effect of atmospheric organics on bioavailable Fe lifetime in the oceans, oral presentation, AGU Fall meeting, December 12 – 16, 2016, San Francisco, CA.

[112] Dawson, K., M. Kacenlenbogen, M. S. Johnson, S. Burton, C. A. Hostetler, and **N. Meskhidze**, Linking remotely sensed aerosol types to their chemical composition, poster presentation, AGU Fall meeting, December 12 – 16, 2016, San Francisco, CA.

[111] Royalty, T., B. Phillips, K. Dawson, R. Reed and **N. Meskhidze**, Shipborne measurements of aerosol number size distribution and hygroscopicity over the North Pacific Ocean, poster presentation, AGU Fall meeting, December 12 – 16, 2016, San Francisco, CA.

[110] Phillips, B., K. Dawson, T. Royalty, R. Reed, M. D. Petters, and **N. Meskhidze**, Measurements of Hygroscopicity- and Size-Resolved Sea Spray Aerosol, April 8, 2016, Raleigh, NC.

[109] **Meskhidze, N.,** M. D. Petters, R. Reed, K. Dawson, B. Phillips, and T. Royalty, New Instrument for Measuring Size-resolved Submicron Sea Spray Particle Production From Ocean, December 14 – 18, 2015, San Francisco, CA.

[108] Phillips, B., K. Dawson, T. Royalty, R. Reed, M. D. Petters, and **N. Meskhidze,** Measurements of Hygroscopicity- and Size-Resolved Sea Spray Aerosol, December 14 – 18, 2015, San Francisco, CA.

[107] Royalty, T., M. D. Petters, A. Grieshop, **N. Meskhidze,** R. Reed, B. Phillips, and K. Dawson, Aerosol Size, CCN, and Black Carbon Properties at a Coastal Site in the Eastern U.S., December 14 – 18, 2015, San Francisco, CA.

[106] B. Phillips, K. Dawson, T. Royalty, R. Reed, M. D. Petters, and **N. Meskhidze,** A novel instrument to measure hygroscopicity- and size-resolved particle fluxes, Community Modeling and Analysis System (CMAS), October 5–7, 2015, Chapel Hill, NC

[105] **Meskhidze, N**., M. D. Petters, R. E. Reed, K. Dawson, and B. Phillips, New instrument for measuring size-resolved submicron sea-salt particle production from ocean, 95th AMS Annual Meeting, 4–8 January 2015, Phoenix, AZ.

[104] Dawson, K., M. D. Petters, and **N. Meskhidze**, Hygroscopic growth and cloud droplet activation of marine hydrogels, oral presentation, 95th AMS Annual Meeting, 4–8 January 2015, Phoenix, AZ.

[103] **Meskhidze, N.**, K. Dawson, S. Suda, M. Petters, New Insights For Marine Source Organics: Laboratory Measurements, Remote Sensing & Model Results, invited presentation at the New Insights into Gas-Phase Atmospheric Chemistry conference, July 28-August 1, 2014, Telluride, CO.

[102] **Meskhidze, N.,** Workshop on Clouds, Aerosols, Radiation and Air-Sea Interface of the Southern Ocean: Establishing Directions for Future Research, March 18-19, 2014, Seattle, WA.

[101] **Meskhidze, N.**, Climatic Effects of Sea Spray Aerosols, 94th AMS Annual Meeting, 2-6 February, 2014, Atlanta, GA.

[100] **Meskhidze, N**., M. S. Johnson, Effect of atmospheric organics on iron bioavailability, poster presentation, AGU Fall Meeting, December 9 – 13, 2013, San Francisco, CA.

[99] **Meskhidze, N**., B. Gantt, The Impacts of Marine Organic Emissions on Atmospheric Chemistry and Climate, invited talk, AGU Fall Meeting, December 9 – 13, 2013, San Francisco, CA.

[98] Dawson, K., **N. Meskhidze**, Y. Hu, Anomalies in Sea Spray Aerosol Optical Properties Detected by NASA High Spectral Resolution Lidar, poster presentation, AGU Fall Meeting, December 9 – 13, 2013, San Francisco, CA.

[97] **Meskhidze, N**., Sea spray aerosol and climate assessments: Model results and remotely sensed data, Open Sea Spray Aerosol Workshop, Galway, Ireland, September 30 – October 1, 2013.

[96] Gantt, B., T. Glotfelty, N. Meskhidze, and Y. Zhang, Simulating the Impacts of Marine Organic Emissions on Global Atmospheric Chemistry and Climate using an Online-Coupled Meteorology and Chemistry Model, poster presentation, October 28-30, 2013, Chapel Hill, NC.

[95] **Meskhidze, N**. and K. Dawson, Sea spray aerosol and climate assessments: Model results and remotely sensed data, oral presentation, AGU meeting of the Americas, May 14-17, 2013, Cancun, Mexico.

[94] Hurley, D., **N. Meskhidze**, and M. D. Petters, Effect of atmospheric organics on iron bioavailability, poster presentation, AGU meeting of the Americas, May 14-17, 2013, Cancun, Mexico.

[93] **Meskhidze, N**., and M.S. Johnson, Updated dust-iron dissolution mechanism in GEOS-Chem, poster presentation, 6th International GEOS-Chem User's meeting, May 6-10, 2013, Harvard University, MA.

[92] Johnson, M.S. and **N. Meskhidze**, Atmospheric input of soluble iron to the ocean: GEOS-Chem investigation of the role of oxalate and photochemistry, oral presentation, 6th International GEOS-Chem User's meeting, May 6-10, 2013, Harvard University, MA.

[91] Gantt, B., M. S. Johnson, and **N. Meskhidze**, GEOS-Chem evaluation of marine primary organic aerosol emission schemes, oral presentation, 6th International GEOS-Chem User's meeting, May 6-10, 2013, Harvard University, MA.

[90] **Meskhidze, N**., Marine organic aerosols in CAM5-MAM, oral presentation at *Chemistry Climate Working Group Meeting* at NCAR, February 11-13, 2013, Boulder, CO.

[89] Dawson, K., **N. Meskhidze**, B. Gantt, M. S. Johnson and S. Gassó, *Reducing the uncertainty in background marine aerosol radiative properties using CAM5 model results and CALIPSO-retrievals*, poster presentation, American Geophysical Union (AGU) Fall Meeting, December 3 – 7, 2011, San Francisco, CA.

[88] Johnson, M.S. and **N. Meskhidze**, *Updated dust-iron dissolution mechanism in GEOS-Chem*, poster presentation, American Geophysical Union (AGU) Fall Meeting, December 3 – 7, 2011, San Francisco, CA.

[87] Gantt, B. and **N. Meskhidze**, *Model implementation of marine organc aerosols*, poster presentation, American Geophysical Union (AGU) Fall Meeting, December 3 – 7, 2011, San Francisco, CA.

[86] Trueblood, J. and **N. Meskhidze**, *A Novel Formation Mechanism of Atmospheric Low-Molecular Weight Carbonyls over Marine Regions*, poster presentation at the 12th Annual CMAS Conference, October 28-30, 2013, Chapel Hill, NC.

[85] Johnson, M. S. and **N. Meskhidze**, Updated dust-nutrient dissolution mechanism: Effects of organic acids, photolysis, and dust mineralogy, poster presentation at *Goldschmidt2012*, June 24-29, 2012, Montréal, Canada.

[84] **N. Meskhidze**, and M. S., Johnson, Improved representation of dust-nutrient deposition to the ocean for the Earth System Models, oral presentation at Goldschmidt2012, June 24-29, 2012, Montréal, Canada.

[83] **Meskhidze, N.**, *Ocean-Atmosphere Interaction of Organic Compounds*, oral presentation at New Insights Into Gas-Phase Atmospheric Chemistry, July 30 - August 3, 2012, Telluride, CO.

[82] Elizbarashvili, M., **N. Meskhidze**, B. Gantt, D. Mikava, Model simulation study of temperature and precipitation extremes in Georgia, The 12th International Multidisciplinary Scientific GeoConference SGEM 2012, June 17 - 23 June, 2012, Bulgaria.

[81] Johnson, M.S., and **N. Meskhidze**, *Updated mineral dust-nutrient dissolution mechanism: Effects of organic acids, photolysis, and mineralogy*, poster presentation Surface Ocean-Lower Atmosphere Study (SOLAS) Open Science Conference, May 7 - 10, 2012, Cle Elum, WA.

[80] **Meskhidze, N.** and B. Gantt, *The role of sea spray aerosols in climate assessments*, poster presentation Surface Ocean-Lower Atmosphere Study (SOLAS) Open Science Conference, May 7 - 10, 2012, Cle Elum, WA.

[79] Elizbarashvili, M., **N. Meskhidze**, B. Gantt, N. Kutaladze, *Extreme Precipitation and Temperature Events in Georgia Using Regional Climate Model*, poster presentation at Sixth ICTP Workshop on the Theory and Use of Regional Climate Models, May 7 – 18, Trieste, Italy.

[78] **Meskhidze, N.,** B. Gantt, M. S. Johnson, *Sea Spray Aerosols and Climate Assessment*s, Oral presentation at American Meteorological Society (AMS) 92nd annual meeting, January 22 - 26, 2012, New Orleans, LA.

[77] **Meskhidze, N.,** B. Gantt, Jun Xu, *Evaluating the potential impact of marine organic aerosols on climate assessments,* poster presentation, American Geophysical Union (AGU) Fall Meeting, December 5 – 9, 2011, San Francisco, CA.

[76] Johnson, M. S and **N. Meskhidze**, Updated dust-iron dissolution mechanism: Effects of organic acids, photolysis, and dust mineralogy, poster presentation, American Geophysical Union (AGU) Fall Meeting, December 5 – 9, 2011, San Francisco, CA.

[75] **Meskhidze, N.,** and M. S. Johnson, *Updated dust-iron dissolution mechanism: effects of organic acids, photolysis, and dust mineralogy*, oral presentation at the First International Workshop on the Long-Range Transport and Impacts of African Dust on the Americas, October 6-7, 2011, San Juan, Puerto Rico.

[74] Johnson, M. S., **N. Meskhidze**, V. P. Kiliyanpilakkil, *African Dust Evaluation: Comparison between GEOS-Chem and Remotely-Sensed Observations*, poster presentation at the First International Workshop on the Long-Range Transport and Impacts of African Dust on the Americas, October 6-7, 2011, San Juan, Puerto Rico.

[73] **Meskhidze, N**., B. Gantt, M. Wilbanks, *Evaluating the impact of marine carbonaceous aerosols on clouds and climate assessments*, invited oral presentation, 242nd ACS National Meeting & Exposition, August 28-September 1, 2011, Denver, Colorado.

[72] Johnson, M., and **N. Meskhidze**, *Updated dust-iron dissolution mechanism: Effects of organic acids, photolysis, and dust mineralogy*, oral presentation at Goldschmidt2011, August 14-19, 2011, Prague, Czech Republic.

[71] Gantt, B., M. Johnson, and **N. Meskhidze**, *Evaluation of marine Primary Organic Aerosol Emission Schemes*, poster presentation at Goldschmidt2011, August 14-19, 2011, Prague, Czech Republic.

[70] **Meskhidze, N**., J, Xu and B. Gantt, *Evaluating the Impact of Marine Organic Aerosols on Climate*, oral presentation at Goldschmidt2011, August 14-19, 2011, Prague, Czech Republic.

[69] Johnson, M., **N. Meskhidze**, V. P. Kiliyanpilakkil, *Evaluating GEOS-Chem predicted mineral dust optical depth using A-Train satellites*, oral presentation at 5th GEOS-Chem User's meeting, May 2-5, 2011, Harvard University, MA.

[68] Kiliyanpilakkil, V.P., **N. Meskhidze**, *A comparison of CALIPSO clean marine and GEOS-Chem sea salt aerosol optical depth*, poster presentation at 5th GEOS-Chem User's meeting, May 2-5, 2011, Harvard University, MA.

[67] **Meskhidze**, **N.,** and B. Gantt, *Modeling of marine primary and secondary organic aerosols*, poster presentation at 5th GEOS-Chem User's meeting, May 2-5, 2011, Harvard University, MA.

[66] **Meskhidze, N.**, B. Gantt, M. Wilbanks, and J., Xu, *Effect of Marine Biogenic Aerosols on Clouds: A Community Atmosphere Model (CAM) Study*, poster presentation at DOE ASR meeting, March 28-April 1, 2011, San Antonio, Texas.

[65] **Meskhidze, N.,** *Modeling of Atmospheric Transport and Deposition of Mineral Iron to the Oceans*, invited seminar at Dalhousie University – Seminar in Earth Science Modeling, March 17, 2011, Halifax, NS, Canada.

[64] **Meskhidze, N.**, *Modeling of Atmospheric Transport and Deposition of Soluble Iron to the Oceans*, invited oral presentation at WMO SDS-WAS/GESAMP Expert Workshop on Modelling and Observing the Impacts of Dust Transport and Deposition on Marine Productivity, March 7-9, 2011, Malta.

[63] **Meskhidze, N.,** *Marine Primary and Secondary Organic Aerosol: Their Emission Rates and Potential Effects on Cloud Microphysical Properties*, invited seminar at AEROCENTER Forum - NASA-Goddard Space Flight Center, February 21,2011, Greenbelt, MD.

[62] **Meskhidze, N**., B. Gantt, J. Xu, A. Sabolis, E. Morris, M. Petters, *Marine Primary and Secondary Organic Aerosols and Their Effect on Indirect Radiative Forcing*, 91st Annual Meeting, January 23-27, 2011, Seattle, WA.

[61] Sabolis, A., **N. Meskhidze**, D. Kamykowski, and R. Reed, *Quantifying Marine Emissions of Biogenic Volatile Organic Compounds Using Laboratory Measurements of Plankton Monocultures and Field Samples*, poster presentation, American Geophysical Union (AGU) Fall Meeting, December 13 – 17, 2010, San Francisco, CA.

[60] Gantt, B., E. Morris, M. Petters, **N. Meskhidze**, *Isolating factors that determine the organic enrichment of sea spray aerosols*, oral presentation at American Geophysical Union (AGU) Fall Meeting, December 13 – 17, 2010, San Francisco, CA.

[59] **Meskhidze, N**. and B. Gantt, *New insights into an organic mass fraction of sea spray aerosol*, poster presentation, American Geophysical Union (AGU) Fall Meeting, December 13 – 17, 2010, San Francisco, CA.

[58] Kiliyanpilakkil, V. P. and **N. Meskhidze**, Deriving a relationship between wind speed and clean marine aerosol optical depth using CALIPSO and AMSR-E data, poster presentation, American Geophysical Union (AGU) Fall Meeting, December 13 – 17, 2010, San Francisco, CA.

[57] Johnson, M.S., and **N. Meskhidze**, *Understanding the Transport of Patagonian Dust and its Influence on Marine Biological Activity in the South Atlantic Ocean carbon cycle*, oral presentation at International Symposium on the A-Train Satellite Constellation, October 25-28, 2010, New Orleans, LA.

[56] Gantt., B and **N. Meskhidze**, *Using A-train satellites to better understand the connection between marine aerosols and ocean biology atmospheric composition and chemistry*, poster presentation, International Symposium on the A-Train Satellite Constellation, October 25-28, 2010, New Orleans, LA.

[55] **Meskhidze, N**. and B. Gantt, *A Novel Parameterization of the Marine Primary Organic Aerosol Emission for Regional and Global Models*, poster presentation at 9th Annual CMAS Conference, October 11-13, 2010, Chapel Hill, NC.

[54] Gantt, B., **N. Meskhidze**, A. M. Carlton, *The Contribution of Marine Organic Emissions to Coastal Air Quality*, oral presentation at 9th Annual CMAS Conference, October 11-13, 2010, Chapel Hill, NC.

[53] **Meskhidze, N**, J. Xu, J. and B. Gantt, *The Impact of Marine Organic Emissions on Global Climate*, poster presentation at Goldschmidt 2010, Earth Energy and the environment, June 13 – 18, 2010, Knoxville, TN.

[52] Gantt, B. and **N. Meskhidze**, *Rethinking the Organic Sea Spray Function*, poster presentation at Goldschmidt 2010, Earth Energy and the environment, June 13 – 18, 2010, Knoxville, TN.

[51] Sabolis, A. and **N. Meskhidze**, *Quantifying Marine Emissions of Volatile Organic Compounds Using Laboratory and Field Measurements from North Carolina Estuarine System*, poster presentation at Goldschmidt 2010, Earth Energy and the environment, June 13 – 18, 2010, Knoxville, TN.

[50] **Meskhidze, N.,** *Climate Change and Recommended Curriculum Guide*, invited oral presentation on Constraining Climatic Effects of Anthropogenic Aerosols by Improving Marine Emissions, at International Conference on Climate Change Curricula in Higher Education, June 7-9, 2010, Tbilisi, Georgia.

[49] **Meskhidze, N.,** *Constraining Climatic Effects of Anthropogenic Aerosols by Improving Marine Emissions*, invited oral presentation at Ilia State University, Jun 5, 2010, Tbilisi, Georgia.

[48] Gantt, B. and **N. Meskhidze**, *Measuring and modeling marine biogenic volatile organic compounds*, invited oral presentation in the early career session at 5th Biogenic Hydrocarbons & The Atmosphere Gordon Research Conference, May 23-28, 2010, Les Diablerets, Switzerland.

[47] **Meskhidze, N.**, J. Xu, Y. Zhang, B. Gantt, A. Carlton, S. Ghan, A. Nenes, X. Liu, R. Easter, and R. Zaveri, *The Impact of Marine Organic Emissions on Global Climate and Coastal Air Quality*, poster presentation at DOE ASR meeting, March 15 – 18, Washington, DC.

[46] **Meskhidze**, **N.**, J. Xu, Y. Zhang, B. Gantt, A. G. Carlton, S. J. Ghan, A. Nenes, X. Liu, R. C. Easter, R. A. Zaveri, *The Impact of Marine Organic Emissions on Coastal Air Quality and Climate*, poster presentation at American geophysical Union (AGU) Ocean Sciences Meeting, February 22-26, 2010, Portland, OR.

[45] Sabolis, A. W., **N. Meskhidze,** D. Kamykowski, and R. E. Reed, *Quantifying Marine Emissions of Biogenic Volatile Organic Compounds Using Laboratory and Field Measurements from North Carolina Estuarine System*, poster presentation at American geophysical Union (AGU) Ocean Sciences Meeting, February 22-26, 2010, Portland, OR.

[44] Gantt, B., **N. Meskhidze**, A. G., Carlton, *The Impact of Marine Organic Emissions on Coastal Air Quality of the Western US*., poster presentation at American geophysical Union (AGU) Fall Meeting, December 14 – 18, 2009, San Francisco, CA.

[43] Johnson, M. S., **N. Meskhidze**, S. Gassó, F. Solmon, *Quantifying the Impact of Mineral Dust and Dissolved Iron Deposition on Marine Biological Activity*, poster presentation at American geophysical Union (AGU) Fall Meeting, December 14 – 18, 2009, San Francisco, CA.

[42] Xu, J., **N. Meskhidze**, Y. Zhang, B. Gantt, S. J. Ghan, A. Nenes, X. Liu, R. C. Easter, R. A. Zaveri, *Climatic Effects of Marine Organic Aerosols,* poster presentation at American geophysical Union (AGU) Fall Meeting, December 14 – 18, 2009, San Francisco, CA.

[41] **Meskhidze, N.**, J. Xu, B. Gantt, *Connecting Oceanic Emissions, Aerosols, and Maritime Clouds: What do we know and where do we go?*, oral presentation at American geophysical Union (AGU) Fall Meeting, December 14 – 18, 2009, San Francisco, CA.

[40] **Meskhidze, N.**, *Connecting Oceanic Emissions of Trace Gases, Aerosols, and Maritime Clouds*, invited oral presentation at International Aerosol Modeling Algorithms (IAMA) Conference, December 9 – 11, 2009, UC Davis, CA.

[39] **Meskhidze, N**., *The effect of ocean biogeochemistry on aerosol, clouds and climate*, tutorial session presented at American Association for Aerosol Research (AAAR) 28th Annual Conference, October 26, 2009, Minneapolis, MN.

[38] Xu, J., **N. Meskhidze**, Y. Zhang, B. Gantt, S. Ghan, A. Nenes, X. Liu, R. Easter, & R. Zaveri, *The effect of marine biogenic organic aerosols on stratiform clouds: A 10-year global simulation with coupled GCM-aerosol model, poster presentation*, American Association for Aerosol Research (AAAR) 28th Annual Conference, October 26 - 30, 2009, Minneapolis, MN.

[37] Gantt, B., **N. Meskhidze**, A-M. Carlton, *The Impact of Marine Organic Aerosols on Coastal Air Quality of the Western US, oral presentation*, American Association for Aerosol Research (AAAR) 28th Annual Conference, October 26 - 30, 2009, Minneapolis, MN.

[36] Sotiropoulou, R.E.P., **N. Meskhidze** , J. Kouatchou, L. Oreopoulos, J. M. Rodriguez and A. Nenes, *Sensitivity of indirect effects to cloud formation parameterizations and meteorological fields*, 18th International Conference on Nucleation and Atmospheric Aerosols (ICNAA), August 10-14, 2009, Prague, Czech Republic.

[35] Johnson, M., **N. Meskhidze**, *Modeling mineral dust and dissolved iron deposition, poster presentation*, Goldschmidt2009, June 21 – 26, 2009, Davos, Switzerland.

[34] **Meskhidze**, **N.**, J. Xu, Y. Zhang, B. Gant, S. Ghan, A. Nenes, X.Liu, R. Easter, & R. Zaveri, *Effect of marine biogenic organic aerosols on cloud properties: Modeling study*, oral presentation, Goldschmidt2009, June 21 – 26, 2009, Davos, Switzerland.

[33] Johnson, M., **N. Meskhidze**, F. Solmon, D. Fairlie, S. Gasso, D. Gaiero, *Modeling dust and dissolved iron deposition to the Southern Ocean using GEOS-Chem*, oral presentation, 4th GEOS-Chem User's meeting, April 7-10, 2009, Harvard University, MA.

[32] **Meskhidze, N**., C. McClain, P. Bontempi, P. Matrai, E. Saltzman, N. Mahowald, J. Propero, Y. Gao, S. Gassó, L. Remer, S. Bauer, M. Behrenfeld, J. Chowdhary, B. Miller, *ACE Ocean - Aerosol Working Group*, oral presentation at Aerosol/Cloud/Ecosystems Mission (ACE) Workshop, March 10-12, 2009 Oxnard, CA.

[31] **Meskhidze, N.**, J. Xu, Y. Zhang, B. Gantt, S. Ghan, A. Nenes, X. Liu, R. Easter & R. Zaveri, *Effect of Marine Biogenic Organic Aerosols on Clouds*, oral presentation at Annual Science Team Meeting of the Atmospheric Science Program (ASP), February 25-27, 2009, Santa Fe, NM.

[30] **Meskhidze, N.,** J. Xu, Y. Zhang, B. Gantt, S. Ghan, A. Nenes, X. Liu, R. Easter & R. Zaveri, *Effect of Marine Biogenic Organic Aerosols on Cloud Properties: Community Atmosphere Model (CAM)*

Study, poster presentation, Annual Science Team Meeting of the Atmospheric Science Program (ASP), February 25-27, 2009, Santa Fe, NM.

[29] Gantt, B., J. Xu, D. Kamykowski, **N. Meskhidze**, *A New Physically-based Quantification of Marine Isoprene and Primary Organic Aerosol Emissions*, poster presentation, Annual Science Team Meeting of the Atmospheric Science Program (ASP), February 25-27, 2009, Santa Fe, NM.

[28] Sotiropoulou, R.E.P., J. Kouatchou, L. Oreopoulos, **N. Meskhidze**, J. M. Rodriguez and A. Nenes, Sensitivity of indirect effects to cloud formation parameterization and meteorological fields, American Geophysical Union (AGU), Fall Meeting, December 15 – 19, San Francisco, CA.

[27] **Meskhidze, N.,** *Modeling of Atmospheric Transport and Deposition of Soluble Iron to the Oceans*, Invited oral presentation at American Geophysical Union (AGU) Fall Meeting, December 15 – 19, 2008, San Francisco, CA.

[26] Johnson, M., **N. Meskhidze**, F. Solmon, D. Fairlie, S. Gasso, D. Gaiero, *Modeling Patagonian Dust Fluxes and Depositions to the Sothern Ocean Using GEOS-Chem*, NC Space Grant presentations, Appalachian State University, November 22, 2008, Boone, NC.

[25] Gantt, B., **N. Meskhidze**, and D. Kamykowski, *Oceanic Trace Gases: Quantification and Climate Impact*, poster presentation at American Association for Aerosol Research (AAAR) 27th Annual Conference, 20 - 24 October, 2008, Orlando, FL.

[24] **Meskhidze, N**., L. A. Remer, S. Platnick, R. Negrón Juárez, A. M. Lichtenberger and A. R. Aiyyer, *Exploring the Differences in Aerosol and Cloud Properties Observed by the MODIS Twin Sensors,* poster presentation at American Association for Aerosol Research (AAAR) 27th Annual Conference, 20 - 24 October, 2008, Orlando, FL.

[23] Gantt, B., **N. Meskhidze**, Y. Zhang, J. Xu, and D. Kamykowski, *The Effect of Oceanic Isoprene Emissions on Secondary Organic Aerosol Formation in the Coastal United States*, poster presentation at the 7th Annual CMAS Conference, 6 - 8 October, 2008, Chapel Hill, NC.

[22] Hemperly, J., X.-Y Wen, **N. Meskhidze**, and Y. Zhang, *Application and Evaluation of the Global Weather Research and Forecasting (GWRF) Model*, oral presentation at the 7th Annual CMAS Conference, 6 - 8 October, 2008, Chapel Hill, NC.

[21] Johnson, *M.,* **N. Meskhidze**, F. Solmon, D. Fairlie, S. Gasso, D. Gaiero, *Modeling Patagonian Dust and Soluble Iron Deposition to the Southern Ocean: Application of GEOS-Chem*, poster presentation at the 7th Annual CMAS Conference, 6 - 8 October, 2008, Chapel Hill, NC.

[20] Sotiropoulou, R.E.P., **N. Meskhidze**, J. Kouatchou, L. Oreopoulos, J. M. Rodriguez and A. Nenes, *Aerosol - cloud interactions in the NASA GMI: Sensitivity of indirect effects to cloud formation parameterization and meteorological fields*, European Aerosol Conference (EAC'2008), August 24-29, 2008,Thessaloniki, Greece.

[19] **Meskhidze**, **N.,** Y. Zhang, B. Gantt, J. Hemperly, D. Kamykowski, & X.-Y. Wen, *Effect of Terrestrial and Marine Organic Aerosol on Regional and Global Climate: Work Plan and Some Preliminary Results,* oral presentation at the Department of Energy Atmospheric Science Program FY 2008 Science Team Meeting, February 25 – 27, 2008, Annapolis, MD.

[18] **Meskhidze**, **N.,** *Spatial and temporal differences in AOD observed by MODIS twin sensors*, oral presentation at the International Workshop: Aerosols in the Amazon - Changes and their Consequences from Past and Future Human Activities, February 18-22, 2008, Manaus, Amazônia, Brazil,

[17] Igel., M., and **N. Meskhidze**, *Effects of Aerosol on Shallow Marine Clouds in Bay of Bengal*, oral presentation at American Meteorological Society (AMS) annual meeting, January 11-15, 2008, New Orleans, LA.

[16] Sotiropoulou, R.E.P., **N. Meskhidze**, and A. Nenes, Aerosol – cloud interactions using the NASA Global Modeling Initiative (GMI), American Geophysical Union (AGU), Fall Meeting, December 10 – 14, 2007, San Francisco, CA.

[15] **Meskhidze, N.,** R. Negrón Juárez, L. A. Remer, S. Platnick, and A. Aiyyer, *Exploring the differences in aerosol and cloud properties observed by the MODIS twin sensors*, oral presentation at American Geophysical Union (AGU) Fall Meeting, December 10 – 14, 2007, San Francisco, CA.

[14] **Meskhidze, N**., *Iron Biogeochemistry in the Southern Ocean and the Possible Role of Patagonian Dust in Ocean Fertilization*, oral presentation at Multidisciplinary Workshop on Southern South American Dust, October 3-5, 2007, Puerto Madrin, Argentina.

[13] Sotiropoulou, R.E.P., **N. Meskhidze**, and A. Nenes, *Aerosol – cloud interactions: sensitivity of indirect effects to cloud formation parameterization, meteorological fields, and emission scenario*, 25th Annual Conference, American Association for Aerosol Research (AAAR2007), September 24-28, 2007, Reno, NV.

[12] Sotiropoulou, R.E.P., **N. Meskhidze**, and A. Nenes, *Sensitivity of aerosol indirect forcing and autoconversion to cloud formation parameterization, meteorological field and emission scenarios: An assessment with the NASA Global Modeling Initiative (GMI)*, Geophysical Research Abstracts, Vol. 9, 00981, European Geophysical union (EGU), April 15-20, 2007, Vienna, Austria.

[11] **Meskhidze, N.** and A. Nenes, *The effect of phytoplankton on clouds in the Southern Ocean: A natural "shiptrack" or "smog chamber"?* poster presentation at Gordon Conference on Biogenic Hydrocarbons & the Atmosphere, February 25- April 2, 2007, Ventura, CA.

[10] Sotiropoulou, R.E.P., **N. Meskhidze** and A. Nenes, *Sensitivity of aerosol indirect forcing and autoconversion to cloud droplet parameterization: an assessment with the NASA Global Modeling Initiative*, American Geophysical Union (AGU), Fall Meeting, December 11-15, 2006, San Francisco, CA.

[9] **Meskhidze, N.** and A. Nenes, *Phytoplankton and Cloudiness in the Southern Ocean*, oral presentation at American Geophysical Union (AGU) Fall Meeting, December 11-15, 2006, San Francisco, CA.

[8] **Meskhidze, N**., A. Nenes, B. N. Duncan and J. M. Rodriguez, *Aerosol Indirect Forcing from the NASA Global Modeling Initiative: Sensitivity to Meteorology, Emission Scenarios and Aerosol Microphysics*, oral presentation at American Association for Aerosol Research (AAAR) International Aerosol Conference 2006, September 10-15, 2006, St. Paul, MN.

[7] **Meskhidze, N.** and A. Nenes, *Aerosol Indirect Climatic Effect Assessments using the NASA Global Modeling Initiative*, American Geophysical Union (AGU) fall meeting, 5–9 December, 2005, San Francisco, CA.

[6] **Meskhidze, N.,** *The Possible Role of Air Pollution in Dust - Fe Mobilization and its Implications to Global C-cycle*, ACCESS VIII Colloquium, Yellowstone National Park, Wyoming, September 1-4, 2005 and Gordon Research Conference, September 4 - 9, 2005, Big Sky, MT.

[5] **Meskhidze, N.,** *Southern Ocean Productivity: Fertilization From Above or Below?* Oral presentation at Dynamic Planet 2005, August 22 -26, 2005, Cairns, Australia.

[4] **Meskhidze, N**., A. Nenes, W. Conant, and J. Seinfeld, *Evaluation of a new Cloud Droplet Activation Parameterization with In Situ Data from NASA CRYSTAL-FACE and CSTRIPE*, oral presentation at American Association for Aerosol Research (AAAR) Annual Conference, October 4-8, 2004, Atlanta, GA.

[3] **Meskhidze, N**, W. L. Chameides and A. Nenes, *Episodic Dust Passage and Phytoplankton Blooms in North Pacific Ocean*, poster presentation at American Geophysical union (AGU) fall meeting, 8-12 December, 2003, San Francisco, CA.

[2] **Meskhidze, N**, W. L. Chameides, *Modeling the Influence of Different Processes on Iron Solubilization in Mineral Aerosols: From the Gobi Desert to the North Pacific Ocean*, poster presentation at American Geophysical union (AGU) fall meeting, December 6-10, 2002, San Francisco, CA.

[1] **Meskhidze, N**, *Tracer Measurements and Modeling of Flux Footprint above a Rough Canopy*, 23rd Conference on Agricultural and Forest Meteorology, 1998, Albuquerque, New Mexico.

In the News

Telluride Science Presents: As atmospheric scientists look to the future, they often make models to predict what the climate will look like. These models take into account the transfer of energy and materials throughout the atmosphere and ocean. However, North Carolina State University Professor of Marine, Earth and Atmospheric Sciences Nicholas Meskhidze has discovered that these climate models are neglecting the air-sea transfer of one element: iron. In 2018, Meskhidze co-organized a Telluride Science workshop with Christopher Völker to do just that. Titled "Identifying and Characterizing the Processes Controlling Iron Speciation and Residence Time at the Atmosphere-Ocean Interface," the workshop engaged ocean and atmospheric scientists from all over the world. At the workshop, the group came up with an idea for a perspective paper on the iron atmosphere-ocean biogeochemical cycle and where future research should be directed, which was published the next year. To Meskhidze, the collaboration between different disciplines was especially important to understanding the mechanism(s) of iron transfer. See the full story (Telluride Daily Planet, 2021)

Lone visitors: The SGP study was born out of the North Carolina State team's surprising discovery of new particle formation from a rooftop in Raleigh, North Carolina. Considering the starting size of the particles (10–15 nanometers) and the length of the event (over eight hours), the team thought that the formation happened in the residual layer and the particles came down during turbulent daytime mixing. But for direct evidence, says Meskhidze, the team needed to measure fluxes, and "it worked beautifully" at the SGP. Originally planned for May 2020, the campaign moved to mid-October and ran for a month. Meskhidze towed a trailer from North Carolina to the Central Facility near Lamont, Oklahoma—almost 1,300 miles one way. The SGP staff provided a parking space, power, high-speed internet, and help setting up equipment, including a 10-meter (33-foot) tower with a box at the top to hold particle counters. See the full story (DOE ARM news and events, 2021)

Dust, pollution, and decreasing oxygen in the tropical Pacific: For the past several decades, researchers have been tracking the decline in dissolved oxygen in the tropical Pacific Ocean. Less dissolved oxygen means that fewer aquatic creatures can survive there, which is bad news for that region's ecosystem. But while they could agree on the decline, researchers had trouble deciphering the cause. Now a new theory, put forth by scientists at Georgia Tech, NASA, NC State and the University of Washington and based on computer modeling, may provide part of the answer – air pollution. Air pollution doesn't just sink into the ocean and disrupt the environment. Instead, there's a chain of events that begins with dust and ends with decomposition and oxygen use. See the full story. (NC State News Center, May 16, 2016)

Polluted Dust Can Impact Ocean Life Thousands of Miles Away, Study Says: As climatologists closely monitor the impact of human activity on the world's oceans, researchers at the Georgia Institute of Technology have found yet another worrying trend impacting the health of the Pacific Ocean. A new modeling study conducted by researchers in Georgia Tech's School of Earth and Atmospheric Sciences shows that for decades, air pollution drifting from East Asia out over the world's largest ocean has kicked off a chain reaction that contributed to oxygen levels falling in tropical waters thousands of miles away. "There's a growing awareness that oxygen levels in the ocean may be changing over time," said Taka Ito, an associate professor at Georgia Tech. "One reason for that is the warming environment – warm water holds less gas. But in the tropical Pacific, the oxygen level has been falling at a much faster rate than the temperature change can explain." See the full story. (Georgia Tech News Center, May 16, 2016)

A biogeochemist is keen to find out whether oceanic plankton can help to keep our planet cool: For years I have been fascinated by the idea that oceanic plankton can play a significant part in controlling climate. This concept is, of course, at the heart of gaian ideas of the Earth as a self-regulating system, proposed by James Lovelock. It was given expression through the CLAW hypothesis (published two decades ago by R. Charlson, J. Lovelock, M. Andreae & S. Warren), which supposes that the gas dimethyl sulphide produced by marine plankton influences cloud formation and hence albedo and climate. However, direct evidence for a link between plankton and clouds has been slow to emerge. A recent paper (N. Meskhidze & A. Nenes *Science* **314**, 1419–1423; 2006) shows a tantalizing seasonal and spatial association between sea-surface chlorophyll (an indicator of biological

activity) and atmospheric properties for a six-year period over a substantial area of the Southern Ocean. See the full story. (*Nature* 447, 356-357 (24 May 2007) | doi:10.1038/447356a)

Atmospheric science: Plant food from pollution: Iron is an essential nutrient for phytoplankton, the tiny aquatic plants that carry out almost half of all photosynthesis on Earth. Dust storms in northern China and Mongolia carry iron from the soil of the Gobi desert to the northern Pacific Ocean. But the iron in desert dust is in a mineral form that has low solubility in seawater and so is not readily available to phytoplankton. Nicholas Meskhidze and colleagues have found that sulphur dioxide pollution from industrial plants in China can acidify the dust, which converts iron to a more soluble form. See the full story. (*Nature* 433, 818 (24 February 2005) | doi:10.1038/433818a)

Dust Storm Surprise: Pollution Can Convert Airborne Iron into Soluble Form Required for Phytoplankton Growth: A surprising link may exist between ocean fertility and air pollution over land, according to Georgia Institute of Technology research reported in the Feb. 16 issue of the Journal of Geophysical Research - Atmospheres. The work provides new insight into the role that ocean fertility plays in the complex cycle involving carbon dioxide and other greenhouse gases in global warming. See the full story. (Research news & publications office, Georgia Institute of Technology, February 10, 2005)

Pollution Can Convert Airborne Iron Into Soluble Form Required For Phytoplankton Growth: A surprising link may exist between ocean fertility and air pollution over land, according to Georgia Institute of Technology research reported in the Feb. 16 issue of the Journal of Geophysical Research — Atmospheres. The work provides new insight into the role that ocean fertility plays in the complex cycle involving carbon dioxide and other greenhouse gases in global warming. See the full story. (ScienceDaily, February 17, 2005).

Pollution May Feed Plankton: A surprising chain of events and chemical reactions link a rise in air pollution over land to a decrease in a common greenhouse gas over the sea, announced researchers at the Georgia Institute of Technology on Thursday. The chain includes the participation of dust storms in the Gobi Desert, the buildup of harmful sulfur dioxide over coastal industrial zones, and a burst in the population of tiny plants in the sea known as phytoplankton, said the researchers. The end result is a decrease in atmospheric carbon dioxide, they said. Carbon dioxide contributes to global warming by preventing heat from escaping the atmosphere, the way the walls of a greenhouse prevent heat from escaping an enclosed space. See the full story. (Wired news, February, 11, 2005)

Atmospheric chemistry: Iron injection: Sulphur dioxide, a gas emitted by industrial processes and implicated in acid rain, may be a cloud with a silver lining, according to N. Meskhidze and colleagues. They propose that SO_2 converts iron in mineral dust into a form that can be assimilated as a nutrient by phytoplankton, encouraging primary production in the oceans. As this process 'fixes' atmospheric carbon dioxide in biological tissues, it alleviates global warming. The limited availability of iron restricts primary production in some regions of the oceans: atmospheric dust is considered to be the main source. But iron in the dust from arid lands is mostly in the form of Fe(III), which is poorly soluble in sea water and thus has low bioavailability. It can be made soluble by acid, and Meskhidze and colleagues think that a prime source of such acid is the SO_2 that dust plumes encounter over urban areas. They confirm that mineral dust transported from the Gobi desert to the Yellow Sea shows a fingerprint of pollutant gases from China. This doesn't necessarily mean, however, that SO_2 is good on balance for the global climate: the molecules also become oxidized to form sulphate aerosol particles, which have complex effects on the Earth's radiation budget and cloud cover. See the full story. (*Nature* 426, 242 (20 November 2003) | doi:10.1038/426242a)

Pollution may alter ocean photosynthesis: Sulfur emitted from industrial and power plants can affect oceanic CO_2 uptake [*Geophys. Res. Lett.*, **30**, 2085 (2003)]. Earth and atmospheric sciences graduate student Nicholas Meskhidze and coworkers at Georgia Institute of Technology, Atlanta, and NASA Langley Research Center, Hampton, Va., knew that large dust storms from the Gobi deserts of northern China could carry iron to

phytoplankton in remote regions of the North Pacific Ocean, facilitating photosynthesis and CO_2 uptake. See the full story. (Science concentrates, Chemical & Engineering News, 81, No48, p.33, 2003)

Research Grants and Contracts (2006 –)

Research Grants and Contracts		
Source	**Project Title**	**Period**
NASA	Exploring the Interactions between Ocean Productivity, Cloud Properties and Climate (Meskhidze - sole PI)	08/16/06 – 12/31/07
DOE	Effect of Terrestrial and Marine Organic Aerosol on Regional and Global Climate: Model Development, Application, and Verification with Satellite Data (Meskhidze – PI, co-PIs Zhang and Kamykowski)	10/01/07 – 10/31/10
UNC - UNC Wilmington	Initiation of an Inter-Institutional Environmental Observation Network System For North Carolina (NC-EONS) (Meskhidze Co-PI)	12/02/2007 – 05/22/2009
EPA	EPA National Network for Environmental Management Studies Fellowship Program (Meskhidze – sole PI)	05/21/08 - 08/20/08
NSF	Atmospheric Transport and Photo-chemical Transformation of Iron: Model Development, Application and Verification with the Surface and Satellite Data (Meskhidze – sole PI)	07/01/08- 06/30/12
NCSU NC Space Grant Consortium	Defining the Roles of Dust Mineralogy and Biogenic Ligands in the Marine Iron Mobilization (Meskhidze – Co-PI, PI-Duckworth, NCSU)	07/01/09 - 06/30/10
NASA	Defining the Role of Ocean Biology and Dissolved Organic Carbon in the Surface Layer to Marine Cloud Properties and Global Climate (Meskhidze – sole PI)	09/01/10 – 08/31/13
U.S. CRDF	Development of a new MS program: Climate Change and Sustainable Development with the Emphasis on the Southern Caucasus (Meskhidze –PI, co-PI Elizbarashvili, TSU)	02/15/11 – 08/15/11
NASA	Quantitative Assessments of Radiative and Optical Properties of Marine Biogenic Aerosol (Meskhidze – sole PI)	08/15/11 – 08/14/12
NSF	Production mechanism, number concentration, size distribution, chemical composition, and optical properties of sea spray aerosols (Meskhidze –PI, co-PIs Petters, Tsigaridis NASA GISS)	06/01/12- 05/31/14
NOAA	Production mechanism, number concentration, size distribution, chemical composition, and optical properties of sea spray aerosols (Meskhidze –PI, co-PIs Petters, Tsigaridis)	06/01/12- 05/31/14
NASA	Production mechanism, number concentration, size distribution, chemical composition, and optical properties of sea spray aerosols (Meskhidze –PI, co-PIs Petters, Tsigaridis)	06/01/12- 05/31/14
DOE	Production mechanism, number concentration, size distribution, chemical composition, and optical properties of sea spray aerosols (Meskhidze –PI, co-PIs Petters, Tsigaridis)	06/01/12- 05/31/14
NCSU Faculty Research & Professional Development	Quantifying the Effects of Anthropogenic Emissions on Bioavailable Iron Production in Mineral Dust Particles (Meskhidze –PI, co-PI Petters)	07/01/12- 06/30/13
Shota Rustaveli National Science Foundation	Frequency, Duration and Intensity of Extreme Weather and Climate Events Over Georgia: Past, Current and Future Scenarios (Meskhidze -PI, co-PI Elizbarashvili) (Grant was partially returned to the agency)	12/20/12 - 12/19/15

International Centre for Theoretical Physics (ICTP)	International workshop entitled "Extreme Weather and Climate Events in the Southern Caucasus - Black Sea Region", hosted in Tbilisi, Georgia (Meskhidze PI, co-PI Solmon, ICTP)	05/01/13 – 04/30/14
Shota Rustaveli National Science Foundation	International workshop entitled "Extreme Weather and Climate Events in the Southern Caucasus - Black Sea Region", hosted in Tbilisi, Georgia (Meskhidze – PI, co-PI Elizbarashvili, TSU)	05/01/13 – 04/30/14
Millennium Challenge Corporation (MCC)	US-Georgia Higher Education Alliance (Meskhidze PI, co-PI McCord, NCSU)	06/01/13-12/31/15
NSF	New Constraints on Size-resolved Submicron Sea-salt Particle Production from Ocean Breaking Waves (Meskhidze - PI, co-PIs Petters, Reed)	08/15/13-08/14/17
NASA	Analysis of HSRL Marine Aerosol and Phytoplankton Backscatter Data Collected over the Azores and Future Field Campaigns, and Comparisons with CALIPSO Data (Meskhidze – sole PI)	06/01/14-05/31/15
NASA	Analysis of HSRL Marine Aerosol and Phytoplankton Backscatter Data Collected during SABOR and Future Field Campaigns (Meskhidze – sole PI)	07/31/15 – 06/30/18
NSF	New constraints on size-resolved submicron sea-salt particle production from ocean breaking waves (Meskhidze – PI, co-PIs Petters, Reed)	06/30/16 – 05/31/17
International Centre for Theoretical Physics (ICTP)	Regional Climate Conference for South Caucasus-Black Sea (Meskhidze PI, co-PI Solmon, ICTP)	03/06/17 – 07/06/17
NSF	Identifying and Characterizing the Processes Controlling Iron Speciation and Residence Time at the Atmosphere-Ocean Interface (Meskhidze sole PI)	01/01/18 – 12/31/18
DOE	Identifying and Characterizing the Processes Controlling Iron Speciation and Residence Time at the Atmosphere-Ocean Interface (Meskhidze sole PI)	01/01/18 – 12/31/18
NASA	Improving the accuracy of ground-level fine aerosol concentration estimates by using novel remote sensing techniques (Meskhidze sole PI)	09/15/18-09/14/22
NSF-EGER	Exploring the ground-level and elevated sources of new particle formation using aerosol size- and hygroscopicity-resolved turbulent flux measurement technique (Meskhidze PI, co-PI Petters)	09/15/19-09/15/21
DOE	AFC07015 - Turbulent Flux Measurements of the Residual Layer Nucleation Particles at the Southern Great Plains (SGP) site in Oklahoma	05/01/20 – 05/31/20
NC Space Grant	Quantification of the direct radiative effect of aerosols using HSRL and model-derived aerosol types	05/20/20 – 05/19/22
DOE	Size-resolved Eddy-Covariance Particle Flux Measurement during the TRACER Campaign (Petters – PI, Meskhidze – co-PI)	07/01/20 – 06/31/22
DOE	Iron at the Air-Sea Interface (Meskhidze – PI)	1/1/2021-12/31/2022
NASA	Development of a New Methodology for Particle Turbulent Flux Retrievals using Remote Sensing Techniques (Meskhidze – PI, Petters – co-PI)	11/2021 - 10/2022

NC State University	Investigation of the Toxicity of Sub-10 Nanometer Particles on Bacterial Cells from Airborne Samples at Low Mass Concentration (Petters – PI, Meskhidze – co-PI)	12/2020 - 03/2021
US EPA	Mapping Urban Emissions of Sub-10 nm Particles using a Mobile Platform (Petters – PI, Meskhidze – co-PI)	03/2022-02/2025
NCSU NC Space Grant Consortium	Particle Turbulent Flux Retrievals through Novel Remotely Sensing Methodology (Meskhidze – PI)	06/01/22-05/31/24
NASA FINESST21	Estimates of $PM_{2.5}$ concentration and chemical composition by application of KORUS-AQ High Spectral Resolution Lidar retrievals and CATCH algorithm (Meskhidze – PI)	09/01/22-08/32/24
NSF	Toward an improved understanding of particle dry deposition velocity (Meskhidze – PI, Petters – co-PI)	07/2023 – 06/2026
NASA	Atmospheric nourishment of global ocean ecosystems on a changing planet (Hamilton – PI, Meskhidze – Co-PI)	06/2023 – 05/2026
DOE	Application of High-Resolution Large Eddy Simulations Toward an Improved Understanding of Aerosol Flux Measurements (Petters – PI, Meskhidze – Co-PI)	01/2024 – 12/2027