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Research Statement

My research group works to advance both fundamental and applied knowledge of atmospheric aerosol particles, energy production, greenhouse gases, and trace gases in the atmosphere. Our investigations are ultimately motivated by human health impacts of pollution, or by climate impacts of atmospheric constituents. We specialize in environmental simulation, and have used principles of environmental simulation to investigate indoor air quality during the COVID-19 pandemic, summertime and wintertime air pollution, and greenhouse gas emission and concentrations. We enjoy multi-phase systems and problems that combine transport, kinetic, and thermodynamic considerations. Experimental and field tools include oxidation flow reactors, and measurement and analysis of aerosol size distributions and aerosol concentrations. Simulation tools include simple and large-scale (WRF, CMAQ, WRF-Chem) models of atmospheric chemistry and transport. Study locations outside of Iowa City have included Mexico City (MILAGRO), West Branch Iowa (NOAA Global Monitoring Division greenhouse gas tall tower), Wisconsin (LADCO Winter Nitrate Study), Bondville Illinois, and Northern Illinois (Lake Michigan Ozone Study 2017).

Education

- 2003 **Ph.D.**, *Carnegie Mellon University*, Chemical Engineering
- 1998 **M.S.E.**, *Johns Hopkins University*, Environmental Engineering
- 1994 **B.S.E.**, *Princeton University*, Chemical Engineering

Professional, Industrial, and Academic Positions

- 2018 - **Professor**, *University of Iowa*, Iowa City, IA, Department of Chemical and Biochemical Engineering.
- 2018 - **Research Engineer**, *University of Iowa*, Iowa City, IA, IIHR Hydroscience and Engineering.
- 2012-2018 **Associate Professor**, *University of Iowa*, Iowa City, IA, Department of Chemical and Biochemical Engineering.
- 2012-2018 **Associate Research Engineer**, *University of Iowa*, Iowa City, IA, IIHR Hydroscience and Engineering.

- Fall 2013** **Visiting Associate Professor**, *University of Maryland*, College Park, MD, Department of Atmospheric and Oceanic Sciences
- 2004-2012** **Assistant Professor**, *University of Iowa*, Iowa City, IA, Department of Chemical and Biochemical Engineering.
- 2004-2012** **Assistant Research Engineer**, *University of Iowa*, Iowa City, IA, IIHR Hydroscience and Engineering.
- 2003-2004** **Postdoctoral Researcher**, *Carnegie Mellon University*, Pittsburgh, PA (supervisor Spyros Pandis)
- 1994-1999** **Environmental Engineer & Maintenance Supervisor**, *International Paper*, Decorative Products Division, Baltimore, MD

Doctoral Dissertation

Ultrafine Particles in the Atmosphere: Formation, Emissions, and Growth

Supervisor: Spyros N. Pandis

Honors, Awards, and Licenses

- 2020** **Fellow of the Big Ten Academic Leadership Program**, a professional development program of approximately 40 hours taught over 6 full-day sessions. (virtual due to COVID-19 pandemic)
- 2018** Recognition for **Excellence in Teaching** and Dedication to Student Success¹
- 2017** Recognition for **Excellence in Teaching** and Dedication to Student Success¹
- 2015** **Faculty Excellence Award for Service**. Awarded by the University of Iowa College of Engineering
- 2015** Recognition for **Excellence in Teaching** and Dedication to Student Success¹
- 2013** Recognition for **Excellence in Teaching** and Dedication to Student Success¹
- 2012** **Faculty Career Development Award**. Carries one semester of sabbatical support from the University of Iowa.
- 2012** Recognition for **Excellence in Teaching** and Dedication to Student Success¹
- 2008** **National Science Foundation CAREER Award**
- 2007** **Walter R. Rosenblith New Investigator Award** from the Health Effects Institute
- 2006** **Sheldon K. Friedlander Award**, from the American Association for Aerosol Research “in recognition of an outstanding dissertation”

¹ one faculty member in Chemical and Biochemical Engineering is selected for recognition by the graduating class

- 2002 Teresa Heinz Scholars for Environmental Research Award
- 2001 National Science Foundation Graduate Research Fellowship
- 2001 Air and Waste Management Association Scholarship Program Award
- 1999 Carnegie Mellon University McCabe Graduate Fellowship
- 1998 Professional Engineer – registration and certification have lapsed; was licensed as a PE in Environmental Engineering in Maryland
- 1998 International Paper Silver Excellence Award
- 1994 Michelle Goudie Senior Thesis Award for Environmental Research
- 1994 Election to Sigma Xi Scientific Research Society
- 1994 Princeton Environmental Resource Committee Environmental Stewardship Award

Research Group ---

Highlights

- Ph.D. Students Advised to completion: 8
- Postdoctoral Researchers Advised or Co-Advised: 3
- Thesis MS Students Advised: 1
- Non-Thesis MS Students Advised: 2
- Undergraduate Researchers Advised: 28
- High School Researchers Advised: 3

Ph.D. Students Advised

- Current **Megan Christiansen**, 2016 – (*expected 2021, co-advised with Gregory Carmichael*)
- Marisol Contreras**, 2017 – (*expected 2022, co-advised with Syed Mubeen*)
- Beiming Tang**, 2017 – (*expected 2022, co-advised with Gregory Carmichael*)
- Former **Nathan Janechek**, 2018 (*now postdoctoral researcher with Jun Wang at the University of Iowa*)
- Dissertation: Atmospheric Modeling and Experimental Characterization of Gas and Aerosol Phase Cyclic Volatile Methyl Siloxanes
- Can Dong**, 2018 (*now postdoctoral researcher with Likun Xue at Shandong University*)
- Dissertation: Modeling Study of Nucleation and Air Quality in the Midwestern United States
- Ashish Singh**, 2015 (*now a Research Associate in the Environment/Climate Science Division of the DOE's Brookhaven National Lab*)
- Dissertation: Measurement of the Physical Properties of Ultrafine Particles in the Rural Continental US

Robert Bullard, 2015 (*now at Sandia National Laboratory*)

Dissertation: Characterization of Nucleation & Ultrafine Particle Growth in Rural Continental Environments

Aditsuda Jamroensan, 2013 (*co-advised with Gregory Carmichael, now at Ubon Ratchathani University as a Faculty Member*)

Dissertation: Understanding Biosphere and Anthropogenic CO₂ over the Midwestern USA: A Combined Observation and Model-Based Analysis

Sinan Sousan, 2012 (*now an Assistant Professor at East Carolina University*)

Dissertation: Optimal Interpolation of Satellite and Model-Based Aerosol Data

Alicia Pettibone, 2009 (*now at Gryphon Shafer Corporation*)

Dissertation: Toward a Better Understanding of New Particle Formation

J. Elliott Campbell, 2007 (*co-advised with Gregory Carmichael, now Gliessman Presidential Chair in Water Resources and Food Sustainability, University of California, Santa Cruz*)

Dissertation: Optimal Recovery of Regional CO₂ Surface Fluxes by Data Assimilation of Anthropogenic and Biogenic Tracers

Ph.D. Student Awards

- 2021 **Megan Christiansen**, Ballard and Seashore Dissertation Fellowship, University of Iowa Graduate College (Fall 2021)
- 2021 **Beiming Tang**, Graduate College Post-Graduate Fellowship Award, University of Iowa Graduate College (Fall 2021)
- 2021 **Megan Christiansen**, James Osburn Award for Excellence in Teaching, Awarded by the University of Iowa Department of Chemical and Biochemical Engineering
- 2021 **Beiming Tang**, Summer Graduate Fellowship, University of Iowa Graduate College
- 2021 **Marisol Contreras**, Summer Graduate Fellowship, University of Iowa Graduate College
- 2021 **Megan Christiansen**, Summer Graduate Fellowship, University of Iowa Graduate College
- 2020 **Marisol Contreras**, Arthur Vetter Award for Excellence in Service, Awarded by the University of Iowa Department of Chemical and Biochemical Engineering
- 2020 **Marisol Contreras**, Associate Fellow of National GEM Consortium
- 2020 **Megan Christiansen**, Summer Graduate Fellowship, University of Iowa Graduate College

- 2019 **Nathan Janechek**, 2nd Place Winner of the 2019 AIChE Environmental Division Graduate Student Paper Award, for “Physical properties of secondary photochemical aerosol from OH oxidation of a cyclic siloxane.”
- 2019 **Beiming Tang**, selected in competitive process for the DOE Aerosol Summer School at PNNL.
- 2019 **Megan Christiansen**, Arthur Vetter Award for Excellence in Service, Awarded by the University of Iowa Department of Chemical and Biochemical Engineering
- 2019 **Beiming Tang**, Chinese American Chemical Society, Great Lakes Chapter, 2nd place in the Student Research Presentation Competition, Chicago IL, April 2019
- 2019 **Megan Christiansen**, Graduate College Post-Comprehensive Research Award
- 2019 **Beiming Tang**, Best Poster Award, CGRER Category, University of Iowa College of Engineering Research Open House
- 2019 **Marisol Contreras**, Best Poster Award, Green Chemical and Energy Technology Category, University of Iowa College of Engineering Research Open House
- 2018 **Can Dong**, James Osburn Award for Excellence in Teaching, Awarded by the University of Iowa Department of Chemical and Biochemical Engineering
- 2018 **Nate Janechek**, Best Poster Award, CGRER Category, University of Iowa College of Engineering Research Open House
- 2017 **Nate Janechek**, Karl Kammermeyer Award for Excellence in Research, Awarded by the University of Iowa Department of Chemical and Biochemical Engineering
- 2016 **Nate Janechek**, Graduate College Ballard and Seashore Dissertation Fellowship
- 2016 **Can Dong**, Graduate College Post-Comprehensive Research Award
- 2016 **Nate Janechek**, Vetter Service Award from the University of Iowa Department of Chemical and Biochemical Engineering
- 2016 **Nate Janechek**, Best Poster Award, CGRER Category, University of Iowa College of Engineering Research Open House
- 2015 **Nate Janechek**, Awarded a position in the NCAR/UCAR workshop IMAGE - Frontiers in Ensemble Data Assimilation for Geoscience Applications. Boulder, Colorado.
- 2015 **Ashish Singh**, AWMA Midwest Section Graduate Student Award
- 2012 **Robert Bullard**, Best Poster Award, CGRER Category, University of Iowa College of Engineering Research Open House

- 2011 **Robert Bullard**, Iowa Space Grant Consortium Fellowship
- 2010 **Robert Bullard**, Iowa Space Grant Consortium Fellowship
- 2009 **Sinan Sousan**, Graduate Student Poster Award, Annual Meeting of American Association for Aerosol Research
- 2008 **Alicia Kalafut-Pettibone**, Best Poster Award, CGRER Category, University of Iowa College of Engineering Research Open House
- 2007 **Sinan Sousan**, Fulbright Fellowship to Study at the University of Iowa
- 2007 **Alicia Kalafut-Pettibone**, Best Poster Award, CGRER Category, University of Iowa College of Engineering Research Open House
- 2006 **J. Elliott Campbell**, 2nd place, University of Iowa Sandra H. Barkan Mentor Award for mentoring of undergraduate researchers
- 2006 **J. Elliott Campbell**, Awarded a position in the NASA-NSF workshop on data assimilation, Berkeley, CA.
- 2006 **J. Elliott Campbell**, NASA Graduate Research Fellowship

Post-Doctoral Researchers Advised

Former **Jaemeen Baek**, 2009-2014

Sang Rin Lee, 2007-2011, *currently Manager, Boiler Product Line, Doosan Heavy Industries, Korea*

Juan Navea, 2006 – 2009, *(co-advised by Vicki Grassian, Mark Young) currently Assistant Professor of Chemistry, Skidmore College, New York*

Thesis M.S. Students Advised

Current **Austin Doak** 2021 – *(expected 2022, co-advised with HS Udaykumar)*

Non-Thesis M.S. Students Advised

Former **Kelsey (Counter)-Petrich** (2011, now at University of Iowa)

Adam Beranek-Collins (2010, now at Olin)

M.S. Student Awards

- 2010 **Kelsey (Coulter) Petrich**, Iowa Space Grant Consortium Scholarship
- 2010 **Kelsey (Coulter) Petrich**, Best Undergraduate Poster Award, Iowa College of Engineering Research Open House, CGRER Category
- 2010 **Adam Beranek-Collins**, Iowa Space Grant Consortium Scholarship

Undergraduate Students Advised

Current Nathan Massa (2021)

Olivia Dohm (2021)

Former Mayra Narvaez Cardenas (2021)

Austin Doak (2020)
Jonah Marks (2020)
Ping He (2020)
Joe A'Hearn (2019)
Kathleen Wade (2020)
Jessica (Bella) Larson (2018)
Bjorn Blomquist (2018)
Brad Olsen (2018)
Fahad Alokla (2018)
Nathan Bryngelson (2017)
Kyle Wersinger (2020)
Jeff Hamilton (2017)
John Mauk (2018)
Matt Johnson (2016)
Nathan White (2016)
Zach Behrendt
Allaa Hassanein (2014)
Andrew Hesselink (2013)
Caitlin Andersen (2013)
Benjamin Behrendt (2012)
Jessica Carlson (2012)
Patrick Saylor (2011)
Andrew Myers (2012)
Taylor Malott (2013)
Kelsey (Counter)-Petrich (2010)
Jameson Schoenfelder (2012)
Tim Rohlf (2011)
Nick Petrich (2012)
Alex Bender (2016)
Michael Toraason
Adam Beranek-Collins (2009)
Andrew Hirsch (2009)
Kyle Lilly (2008)
Jay Raife (2009)
Zach Rodenburg (2009)
Chris Miller (2008)
Jessica Cowart (2008)
Tyler Gunn (2009)

Undergraduate Student Awards

- 2020 **Austin Doak**, Best Poster Award, CGRER Category, University of Iowa
College of Engineering Research Open House
- 2019 **Austin Doak**, Best Poster Award, CGRER Category, University of Iowa
College of Engineering Research Open House

- 2018 **Kathleen Wade**, ICRU Summer Fellowship, awarded by the Iowa Center for Research by Undergraduates
- 2018 **Austin Doak**, Best Poster Award, CGRER Category, University of Iowa College of Engineering Research Open House
- 2017 **Jeff Hamilton**, Iowa Space Grant Consortium Scholarship

High School Students Advised

former Jojo Hayes (2020), Vendana Venkatesh (2017), Hannah Humes (2016)

Research Publications

Highlights:

- 54 peer reviewed scientific articles and one peer-reviewed special edition introduction.
- Additional works include 1 peer-reviewed Health Effects Institute Report, and several technical reports, project websites, and datasets.
- 5000+ citations and google scholar H-index of 33 (as of Apr 2021)
- Google Scholar: <https://scholar.google.com/citations?user=CKRhPGIAAAAJ&hl=en>
- ORCID id: 0000-0001-9924-0853

Peer-Reviewed Journal Publications

In each publication entry, Stanier is double underlined, and group members are underlined. Corresponding author(s) in boldtype.

- [55] Doak, A.G., **Christiansen**, M.B., Alwe, H.D., Bertram, T.H., Carmichael, G.C., Cleary, P., Czarnetzki, A.C., Dickens, A.F., Janssen, M., Kenski, D., Millet, D.B., Novak, G., Pierce, R.B., Stone, E.A., Long, R., Vermeuel, M., Wagner, T.J., Valin, L., Stanier, C.O. Characterization of ground-based atmospheric pollution and meteorology sampling stations during the Lake Michigan Ozone Study 2017. In press at *Journal of Air and Waste Management*, <https://doi.org/10.1080/10962247.2021.1900000>, 2021.
- [54] **Park, R.J.**, Oak, Y.J., Emmons, L.K., Kim, C.-H., Pfister, G.G., Carmichael, G.R., Saide, P.E., Cho, S.-Y., Kim, S., Woo, J.-H., Crawford, J.H., Gaubert, B., Lee, H.-J., Park, S.-Y., Jo, Y.-J., Gao, M., Tang, B., Stanier, C.O., Shin, S.S., Park, H.Y., Bae, C., Kim, E. "Multi-model inter-comparisons of air quality simulations for the KORUS-AQ campaign." *Elementa*, 9 (1): 00139. <https://doi.org/10.1525/elementa.2021.00139>, 2021.
- [53] Hughes, D.D., Christiansen, M., Milani, A., Vermeuel, M.P., Novak, G.A., Alwe, H.D., Dickens, A.F., Pierce, R.B., Millet, D.B., Bertram, T.H., Stanier, C.O., **Stone**, E.A. "PM2.5 chemistry, organosulfates, and SOA formation during the 2017 Lake Michigan Ozone Study." *Atmospheric Environment*, 244, 117939, <https://doi.org/10.1016/j.atmosenv.2020.117939>, 2021.

- [52] Zhao, S., Russell, M., **Hakami**, A., Capps, A., Turner, M., Henze, D., Percell, P., Resler, J., Shen, H., Russell, A., Nenes, A., Pappin, A., Napelenok, A., Bash, J., Fahey, K., Carmichael, G., Stanier, C., and Chai, T. "A Multiphase CMAQ Version 5.0 Adjoint." *Geosci. Model Dev.*, 13, 2925–2944, <https://doi.org/10.5194/gmd-13-2925-2020>, 2020.
- [51] **Abdi-Oskouei**, M., Carmichael, G.R., Christiansen, M., Ferrada, G., Roozitalab, B., Sobhani, N., Wade, K., Czarnetzki, A., Pierce, R.B., Wagner, T., and C.O. Stanier. "Sensitivity of meteorological skill to selection of WRF-Chem physical parameterizations and impact on ozone prediction during the Lake Michigan Ozone Study (LMOS)." *J. Geophys. Res. Atmos.*, <https://doi.org/10.1029/2019JD031971>, 2020.
- [50] King, B.M., Janecek, N.J., Bryngelson, N., Adamcakova-Dodd, A., Lersch, T., Bunker, K., Casuccio, G., Thorne, P., Stanier, C.O., and J. **Fiegel**. "Lung cell exposure to secondary photochemical aerosols generated from OH oxidation of cyclic siloxanes." *Chemosphere*, **241**, 125126, <https://doi.org/10.1016/j.chemosphere.2019.125126>, 2020.
- [49] Vermeuel, M. P., G. A. Novak, H. D. Alwe, D. D. Hughes, R. Kaleel, A. F. Dickens, D. Kenski, A. Czarnetzki, E. A. Stone, C. O. Stanier, R. B. Pierce, D. B. Millet and T. H. **Bertram**. "Sensitivity of Ozone Production to NO_x and VOC along the Lake Michigan Coastline." *J. Geophys. Res. Atmos.*, **124**, 20, pp. 10989-11006, <https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2019JD030842>, 2019.
- [48] Janecek, N., Marek, R.F., Bryngelson, N., Singh, A., Bullard, R.L., Brune, W.H., and Stanier, C.O. "Physical Properties of Secondary Photochemical Aerosol from OH Oxidation of a Cyclic Siloxane," *Atmos. Chem. Phys.*, **19**, 1649-1664, <https://doi.org/10.5194/acp-19-1649-2019>, 2019
- [47] Dong, C., Matsui, H., Spak, S., Kalafut-Pettibone, A., Stanier, C.O. "Impacts of new particle formation on short-term meteorology and air quality as determined by NPF-explicit WRF-Chem in the Midwestern United States." *Aerosol and Air Quality Research*, **19**, 204-220, <https://doi:10.4209/aaqr.2018.05.0163>, 2019.
- [46] Li, X., Dallmann, T.R., May, A.A., Stanier, C.O., Grieshop, A.P., Lipsky, E.M., Robinson, A.L., **Presto**, A.A. "Size distribution of vehicle emitted primary particles measured in a traffic tunnel." *Atmos. Environ.*, <https://doi.org/10.1016/j.atmosenv.2018.07.052>, 2018.
- [45] Janecek, N., Hansen, K. M., and Stanier, C. O. "Comprehensive atmospheric modeling of reactive cyclic siloxanes and their oxidation products." *Atmos. Chem. Phys.*, **17**, 8357-8370, <https://doi.org/10.5194/acp-17-8357-2017>, 2017.
- [44] Bullard, R.L., Singh, A., Anderson, S.M., Lehmann, C.M.B., and Stanier, C.O. "10-Month Characterization of the Aerosol Number Size Distribution and Related Air Quality and Meteorology at the Bondville, IL Midwestern

Background Site." *Atmos. Environ.*, **154**, 348-361,
doi:10.1016/j.atmosenv.2016.12.055, 2017.

- [43] **Fahey**, K. M., Carlton, A. G., Pye, H. O. T., **Baek**, J., Hutzell, W. T., **Stanier**, C. O., Baker, K. R., Appel, K. W., Jaoui, M., and Offenberg, J. H. "A framework for expanding aqueous chemistry in the Community Multiscale Air Quality (CMAQ) model version 5.1." *Geosci. Model Dev.*, **10**, 1587-1605, doi:10.5194/gmd-10-1587-2017, 2017.
- [42] **Turner**, M., Henze, D., Hakami, A., Capps, S., Zhao, S.-L., Resler, J., Carmichael, G.R., **Stanier**, C.O., **Baek**, J., Sandu, A., Russell, A., Nenes, A., Pinder, R., Napelenok, S., Bash, J., Percell, P., Chai, T. "Premature deaths attributed to source-specific BC emissions in six urban US regions." *Environ. Res. Lett.*, **10**(11), 114014, doi:10.1088/1748-9326/10/11/114014, 2015.
- [41] **Papanicalaou**, A.N. (Thanos), Wacha, K.M., Abban, B.K., Wilson, C.G., Hatfield, J., **Stanier**, C.O., Filley, T. "From Soils to Landscapes: A Landscape-oriented Approach to Simulate Soil Organic Carbon Dynamics in Intensely Managed Landscapes." *J. Geophys. Res. Biogeosci.*, **120**, 2375–2401, doi:10.1002/2015JG003078, 2015.
- [40] **Turner**, M.D., Henze, D.K., Hakami, A., Zhao, A., Resler, J., Carmichael, G.R., **Stanier**, C.O., **Baek**, J., Sandu, A., Russell, A.G., Nenes, A., Jeong, G.-R., Capps, S.L., Percell, P.B., Pinder, R.W., Napelenok, S.L., Bash, J.O., Chai, T. "Differences between magnitudes and health impacts of BC emissions across the United States using 12 km scale seasonal source apportionment." *Environ. Sci. Technol.* **49**(7), pp. 4362-4371, doi 10.1021/es505968b, 2015.
- [39] **Gao**, M., Guttikunda, S.K., Carmichael, G.R., Wang, Y., Liu, Z., **Stanier**, C.O. "Health Impacts and Economic Loss Assessment of the 2013 Severe Haze Event in Beijing." *Sci. Total Environ.* **511**, pp. 553-561, doi 10.1016/j.scitotenv.2015.01.005, 2015.
- [38] Downard, J., **Singh**, A., **Bullard**, R.L., Jayarathne, R. Rathnayake, C., Simmons, D.L., Wels, B.R., Spak, S.N., Peters, T., Beardsley, D., **Stanier**, C.O., **Stone**, E.A. "Uncontrolled combustion of shredded tires in a landfill - Part 1: Characterization of gaseous and particulate emissions." *Atmos. Environ.* **104**, pp. 195-204, doi 10.1016.j.atmosenv.2014.12.059, 2015.
- [37] **Singh**, A., Spak, S.N., Stone, E.A., Downard, J., **Bullard**, R.L., Pooley, M., Kostle, P.A., Mainprize, M.W., Wichman, M.D., Peters, T., Beardsley, D., **Stanier**, C.O. "Uncontrolled combustion of shredded tires in a landfill - Part 2: Population Exposure, Public Health Response, and an Air Quality Index for Urban Fires." *Atmos. Environ.*, **104**, pp. 273–283, doi: 10.1016/j.atmosenv.2015.01.002, 2015.
- [36] Porter, A.T., **Oleson**, J.J., **Stanier**, C.O. "On the Spatio-Temporal Relationship Between MODIS AOD and PM2.5 Particulate Matter Measurements." *J. Data Sci.*, **12**, pp. 255–275, 2014.

- [35] Kim, Y.J., Spak, S.N., Carmichael, G.R., Riemer, N., **Stanier**, C.O. "Modeled aerosol nitrate formation pathways during wintertime in the Great Lakes region of North America." *J. Geophys. Res.*, **119**(21), pp. 12420–12445, doi: 10.1002/2014JD022320, 2014.
- [34] Bzdek, B.R., Horan, A.J., Pennington, M.R., Janecek, N.J., Baek, J., **Stanier**, C.O., **Johnston**, M.V. "Silicon is a Frequent Component of Atmospheric Nanoparticles." *Environ. Sci. Technol.* **48**(19), pp. 11137–11145, doi: 10.1021/es5026933, 2014.
- [33] **Andrews**, A.E., Kofler, J.D., Trudeau, M.E., Williams, J.C., Neff, D.H., Masarie, K.A., Chao, D.Y., Kitzis, D.R., Novelli, P.C., Zhao, C.L., Dlugokencky, E.J., Lang, P.M., Crotwell, M.J., Fischer, M.L., Parker, M.J., Lee, J.T., Baumann, D.D., Desai, A.R., **Stanier**, C.O., de Wekker, S.F.J., Wolfe, D.E., Munger, J.W., Tans, P.P. "CO₂, CO and CH₄ Measurements from tall towers in the NOAA Earth System Research Laboratory's Global Greenhouse Gas Reference Network: Instrumentation, Uncertainty Analysis and Recommendations for Future High-Accuracy Greenhouse Gas Monitoring Efforts." *Atmos. Meas. Tech.* **7**, 647-687, doi:10.5194/amt-7-647-2014, 2014.
- [32] Yucuis, R., **Stanier**, C.O., **Hornbuckle**, K. "Cyclic Siloxanes in Air, Including Identification of High Levels in Chicago and Distinct Diurnal Variation." *Chemosphere*. **92**(8), pp. 905–910. 2013.
- [31] **Stanier**, C.O., Singh, A., Adamski, W., Baek, J., Caughey, M., Carmichael, G.R., Edgerton, E., Kenski, D., Koerber, M., Oleson, J., Rohlf, T., Lee, S.R., Riemer, N., Shaw, S., Sousan, S., Spak, S.N. "Overview of the LADCO Winter Nitrate Study: Hourly Ammonia, Nitric Acid and PM_{2.5} Composition at an Urban and Rural Site Pair During PM_{2.5} Episodes in the U.S. Great Lakes Region." *Atmos. Chem. Phys.* **12**, pp. 1-12. doi:10.5194/acp-12-1-2012, 2012.
- [30] Chen, H., **Stanier**, C.O., **Young**, M.A., **Grassian**, V.H. "A Kinetic Study of Ozone Decomposition on Illuminated Oxide Surfaces." *J. Phys. Chem. A.* **115**(43), pp. 11979-11987, 2011.
- [29] Navea, J., Young, M., Xu, S., Grassian, V., **Stanier**, C. "The atmospheric lifetimes and concentrations of cyclic methylsiloxanes octamethylcyclotetrasiloxane (D4) and decamethylcyclopentasiloxane (D5) and the influence of heterogeneous uptake." *Atmos. Environ.* **45**(18), pp. 3181-3191, doi.org/10.1016/j.atmosenv.2011.02.038, 2011.
- [28] Kalafut-Pettibone, A.J., Wang, J., Eichinger, W.E., Clarke, A., Vay, S.A., Blake, D.R., **Stanier**, C.O. "Size-resolved aerosol emission factors and new particle formation/growth activity occurring in Mexico City during the MILAGRO 2006 Campaign." *Atmos. Chem. Phys.* **11**, pp. 8861–8881, doi:10.5194/acpd-11-6651-2011, 2011.
- [27] Rubasinghege, G., Spak, S.N., **Stanier**, C.O., Carmichael, G.R., **Grassian**, V.H. "Abiotic Mechanism for the Formation of Atmospheric Nitrous Oxide from

Ammonium Nitrate." *Environ. Sci. Technol.*, **45**(7), pp 2691–2697, doi: 10.1021/es103295v, 2011.

- [26] Navea, J., Xu, S., Stanier, C., **Young**, M., **Grassian**, V. "Heterogeneous uptake of octamethylcyclotetrasiloxane (D4) and decamethylcyclopentasiloxane (D5) onto mineral dust aerosol under variable RH conditions." *Atmos. Environ.*, **43**(26), pp. 4060-4069, 2009.
- [25] Navea, J., Xu, S., Stanier, C., **Young**, M., **Grassian**, V. "Effect of Ozone and Relative Humidity on the Heterogeneous Uptake of Octamethylcyclotetrasiloxane and Decamethylcyclopentasiloxane on Model Mineral Dust Aerosol Components." *J. Phys. Chem. A*, **113**(25), pp. 7030-7038, 2009.
- [24] Stanier, C.O., Donahue, N.M., Pandis, S.N. "Parameterization of Secondary Organic Aerosol Mass Fractions from Smog Chamber Data", *Atmos. Environ.* **42**, pp. 2276-2299, 2008.
- [23] Campbell, J.E., Carmichael, G.R., Chai, T., Mena-Carrasco, M., Tang, Y., Blake, D.R., Blake, N.J., Vay, S.A., Collatz, G.J., Baker, I., Berry, J.A., Montzka, S.A., Sweeney, C., Schnoor, J.L., Stanier, C.O. "Photosynthetic Control of Atmospheric Carbonyl Sulfide During the Growing Season." *Science*, **322**, pp. 1085-1088, 2008.
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² Article is peer-reviewed but it is not a full research article. It is a preface to the special section of the issue; it is two pages long. It was written by Paul Solomon and me because of our roles as guest editors to the special edition.

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Submitted Manuscripts

Wagner, T.J., Czarnetzki, A.C., Christiansen, M., Pierce, R.B., Stanier, C.O., Eloranta, E.W. Observations of the Development and Vertical Structure of Lake Michigan Lake Breezes. Being revised after reviewer feedback for *Journal of Atmospheric Sciences*, Apr 2021.

Stanier, C.O., Pierce, R.B., Abdioskouei, M., Adelman, Z.E., Al-Saadi, J., Alwe, H.D., Bertram, T.H., Carmichael, G.R., Christiansen, M.B., Cleary, P.A., Czarnetzki, A.C., Dickens, A.F., Fuoco, M.A., Hughes, D.D., Hupy, J.P., Janz, S.J., Judd, L.M., Kenski, D., Kowalewski, M.G., Long, R.W., Millet, D.B., Novak, G., Roozitalab, B., Shaw, S.L., Stone, E.A., Szykman, J., Valin, L., Vermeuel, M., Wagner, T.J., Whitehill, A.R., 2020. Overview of the Lake Michigan Ozone Study 2017. In review at the *Bulletin of the American Meteorological Society*, Apr 2021.

Peer-Reviewed Technical Reports

- [1] Stanier, C.O., Lee, S.R. "Development and Application of an Aerosol Screening Model for Size-Resolved Urban Aerosols." Walter A. Rosenblith New Investigator Award Research Report. Health Effects Institute Report Number 179, 2014.

Publicly-Released Datasets

- [5] Lake Michigan Ozone Study 2017 Team. "LMOS 2017 Public Data Archive." *NASA Airborne Science Data for Atmospheric Composition*, <https://www-air.larc.nasa.gov/cgi-bin/ArcView/lmos>, 2018.
- [4] Janecek, N., Stanier, C., Hansen, K. "Data in support of Comprehensive Atmospheric Modeling of Reactive Cyclic Siloxanes and Their Oxidation Products." *Harvard Dataverse*, doi:10.7910/DVN/68FO9B, 2017.
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Publicly-Released Code

- [2] Sample code and documentation for Python in Chemical Engineering Process Controls and Thermodynamics. https://github.com/charles-stan/learn_python_Stanier/. Released Fall 2020.
- [1] Sample code and documentation for MATLAB in Chemical Engineering Process Controls. https://github.com/charles-stan/learn_MATLAB_Stanier/. Released Fall 2020.

Other Significant Technical Writings, Not Formally Peer-Reviewed (Technical Reports, Dissertations, Magazine Articles, White Papers, etc.)

- [15] Adelman, Zachariah E., Pierce, R. Bradley, Stanier, Charles O., and Kenski, Donna M. "LMOS: 2017 Lake Michigan Ozone Study," *em, The Magazine for Environmental Managers*, by the Air and Waste Management Association, pp. 23-27, Oct 2020.
- [14] Stanier, C.O. "Considering Air Quality and Climate Co-Benefits During Climate Mitigation and Adaptation in the Mississippi River Watershed," in Passe, Ulrike, Janette Thompson, and Kimberly Zarecor, eds. *SUS-RURI: Proceedings of a workshop on developing a convergence sustainable urban systems agenda for redesigning the urban-rural interface along the Mississippi River watershed held in Ames, Iowa, August 12–13, 2019*. Ames,

- Iowa: Iowa State University Digital Press. <https://doi.org/10.31274/isudp.35>, 2020.
- [13] Lake Michigan Ozone Study 2017 Team. "2017 Lake Michigan Ozone Study (LMOS) Preliminary Finding Report," https://www.ladco.org/wp-content/uploads/Research/LMOS2017/LMOS_LADCO_report_revision_apr2019_final.pdf, 2019.
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- [11] Neal, T., Herder, S., Malek, A., Miller, Z., Spak, S., and Stanier, C. "Iowa 8th Grade Science Bundles," <https://tinyurl.com/uiowa8sci>, with video introduction at <https://www.youtube.com/watch?v=KgDKFCBhzOI>, 2018.
- [10] Pierce, B., Al-Saadi, J., Bertram, T., Dickens, A., Kaleel, R., Kenski, D., Stanier, C. "Open letter to parties interested in the 2017 Lake Michigan Ozone Study." https://www-air.larc.nasa.gov/missions/lmos/docs/update_statement_mar21_final.pdf, 2017.
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- [7] Stanier, C. "Data analysis and thermodynamic sensitivity analysis of Ashland, WI and Cassville, WI filter data (July 1, 2010 – June 30, 2011)." Technical memorandum to the Lake Michigan Air Directors Consortium (LADCO). Rosemont, IL, 2012.
- [6] Spak, S., Baek, J., Carlson, J., Carmichael, G., Kim, Y.J., Riemer, N., Stanier, C.O. "Episodic Air Pollution in Wisconsin (LADCO Winter Nitrate Study) and Georgia (SEARCH Network) During Jan-Mar 2009. Phase II Report: Three Dimensional Modeling, Process Analysis and Emissions Sensitivity." Lake Michigan Air Directors Consortium, http://www.ladco.org/reports/pm25/winter_nitrate/index.php, 2012.
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- [4] Stanier, C., Schoenfelder, J., Yarker (Brown), M. "Evaluation of the Vaisala CL31 ceilometer as a tool for boundary layer characterization within carbon

cycle studies.” Report to the NOAA Global Monitoring Division and Vaisala, 2009.

- [3] Bender, A., Carmichael, G., Beranek-Collins, A., Brown, M., Holloway, T., Jamroensan, A., Lee, S.-R., Marrapu, P., Pettibone, A., Sousan, S., Spak, S., Stanier, C. “Understanding Episodes of High Airborne Particulate Matter in Iowa.” A report commissioned by the Bi-State State Regional Commission, 2009.
- [2] Stanier, C. “Ultrafine Particles in the Atmosphere: Emissions, Formation, and Growth”, Ph.D. Thesis, Carnegie Mellon University Department of Chemical Engineering, 2003.
- [1] Stanier, C., “Work-Driven Adsorption Refrigeration: Theory, Model, and Prototype”, Undergraduate Senior Thesis, Princeton University Department of Chemical Engineering, 1994.

Lectures and Conferences

Highlights (all within last 5 years):

- Departmental Seminars at the University of Michigan, University of Pittsburgh, and University of Maryland
- Specialty Visiting Seminar at Carnegie Mellon University
- Invited presentations at conferences and workshops (past 5 years): Growing Sustainable Communities Conference, SUS-RURI workshop on developing a convergence sustainable urban systems agenda for redesigning the urban-rural interface along the Mississippi River watershed.
- Students regularly contribute to the annual meetings of the American Association of Aerosol Research (AAAR), American Geophysical Union (AGU), and American Meteorological Society (AMS) meetings.

Invited Seminars, Presentations, Workshops and Short Courses

(* indicates a conference with an archived or published program or abstract book)

- [72] Stanier, C.O. “Graduate School vs. Working with Your Bachelor’s Degree: Perspectives from the University of Iowa,” Presented (remotely) to the *University of Wisconsin Eau Claire* Student Chapter of the American Chemical Society, Eau Claire WI. Oct 2020.
- [71] Stanier, C.O. “Viruses in air: COVID-19 transmission as a case study,” Presented (remotely) as part of the *University of Iowa College of Public Health Science Café* series. Fairfield Public Library, Fairfield IA. Sept 2020.
- [70] Harry Hoffman, H., Schwalje, A., Stanier, C.O., Walker, T. “Assessment of buildings, ventilation, and SARS-CoV-2 transmission,” Presented (remotely) to the bi-weekly meeting of the *National Association of Music Executives at State Universities*. Aug 2020.
- [69] Stanier, C.O. “Assessment of buildings, ventilation, and SARS-CoV-2 transmission,” Presented (remotely) to the Faculty of the University of Iowa School of Music. Iowa City IA. Aug 2020.

- [68] Stanier, C.O. "Update on Lake Michigan Ozone Study LMOS 2017," Presented remotely to the *Interagency Air Quality Research Seminars and Discussion Program*, <https://www.esrl.noaa.gov/csd/aqrs/>. Remote presentation, November 2019.
- [67] Stanier, C.O. "Considering Air Quality and Climate Co-Benefits During Climate Mitigation and Adaptation in the Mississippi River Watershed," Presented at the *SUS-RURI workshop on developing a convergence sustainable urban systems agenda for redesigning the urban-rural interface along the Mississippi River watershed*. Ames, Iowa, August 2019.
- [66] Stanier, C.O. "An update on the Lake Michigan Ozone Study (2017)" Climate Change Science and Impacts of Climate Change." Presented remotely during LADCO Webinar *May 2019 Update on the Lake Michigan Ozone Study*. Chicago, IL. May 2019.
- [65] Stanier, C.O. "Clean Air for the Upper Midwest." Presented at the *Johnson County Department of Public Health seminar series*. Iowa City, IA. Apr 2019.
- [64] Stanier, C.O. "Clean Energy in Iowa." Presented as part of the *University of Iowa College of Public Health Science Café series*. Fairfield Public Library, Fairfield IA. Apr 2019.
- [63] Stanier, C.O. and Spak, S.N. "Climate Change Science and Impacts of Climate Change." Presented during the *8th Grade Phenomena Bundle Professional Development Workshop*. University of Iowa. Iowa City IA. Oct 2017.
- [62] Stanier, C.O. "Gas and Aerosol Pollutants in the Midwestern US. Insights from models and measurements." Seminar at *University of Wisconsin – Eau Claire Department of Chemistry*. Eau Claire WI. Oct 2017.
- [61] Stanier, C.O. "Graduate School vs. Working with your Bachelor's Degree: Perspectives from the University of Iowa." Informational Seminar at *University of Wisconsin – Eau Claire Department of Chemistry*. Eau Claire WI. Oct 2017.
- [60] Stanier, C.O. "Critical Issues in Climate Science and Advocacy." Presented at the *Sustainable Living Coalition*. Fairfield IA. Oct 2017.
- [59] Stanier, C.O. "Review of LMOS Science Objectives." Presentation at *LMOS 2017 Data Workshop*. Chicago IL. Sept 2017.
- [58] Stanier, C.O., Givens, B. "Graduate School vs. Working with your STEM BS Degree: Perspectives from the University of Iowa." Undergraduate Seminar at *Pitt Department of Chemical Engineering*. Pittsburgh PA. Nov 2016.
- [57] Stanier, C.O. "Fine and Ultrafine Particles in the Midwestern U.S." Seminar at *Carnegie Mellon University Center for Atmospheric Particle Studies (CAPS)*. Pittsburgh PA. Nov 2016.
- [56] Stanier, C.O., Frommelt, J., Corrigan, M.R., Schultz, P., Dong, C. "Teaching and Learning about Air Quality by Citizen Science." Workshop (1-h) at the *Growing Sustainable Communities Conference*. Dubuque IA, Oct 2016.*
- [55] Stanier, C.O. "Leadership and Innovation Award in Climate Smart Agriculture." *Coalition for Agricultural Greenhouse Gases (C-AGG) Meeting*. Denver CO, Jul 2016.*
- [54] Stanier, C.O. "Fine and Ultrafine Particles in the Atmosphere: Aerosol-Cloud Interactions and Midwestern Haze." *Department of Atmospheric Science Seminar, University of Michigan*. Ann Arbor MI, Feb 2016.

- [53] Stanier, C.O., Spak, S.N., Kim, Y.J., Carmichael, G., Dong, C. "Great Lakes Air Quality." Presented at *Meteorology And Climate - Modeling for Air Quality (MAC-MAQ)*. Sacramento CA, Sept 2015.*
- [52] Stanier, C.O. "Fundamentals of Air Pollution." 4-h workshop given for the *IEEE "SusTech" Conference on Technologies for Sustainability*. Ogden UT, Aug 2015.*
- [51] Stanier, C.O. "Two Perspectives on Ultrafine Particles." Seminar given for the *Southern Ontario Centre for Atmospheric Aerosol Research (SOCAAR) at the University of Toronto*. Toronto, Ontario, Canada, Dec 2014.
- [50] Stanier, C.O. "New Particle Formation and Growth." Invited 2-h Tutorial at the *32nd Annual American Association for Aerosol Research Conference*. Orlando FL, Oct 2014.*
- [49] Stanier, C.O. "Aerosol and Air Pollution Studies in the Midwestern United States." Departmental Seminar for *Civil and Environmental Engineering Department at the University of Illinois*. Champaign-Urbana IL, Oct 2014.
- [48] Stanier, C.O. "A Story of Midwestern Air Quality." Departmental Seminar for *Energy, Environmental, and Chemical Engineering Department at Washington University*. St. Louis MO, Sept 2014.
- [47] Stanier, C.O. "The Earth's Energy Budget: The Physical Basis Underlying Predictions of Climate Change." Presented at the *2014 Iowa Climate Festival*. Iowa City IA, April 2014.
- [46] Stanier, C.O. "Elevated Winter Nitrate in the Upper Midwest." Presented at *2014 Midwest and Central States Air Quality Workshop*. St. Louis MO, Apr 2014.
- [45] Stanier, C.O. "Understanding Climate Change." Presented at the *Sustainability Circle Meeting of Eastern Iowa*, led by True Market Solutions. Cedar Rapids IA, February 2014.
- [44] Stanier, C.O. "Particle Nucleation, Growth, and Number Concentration in the Midwestern U.S.: Results from Long Term Fixed Site Monitoring, Intensive Fixed Site Monitoring, and Aircraft Profiles." Presented at *Kent State University College of Public Health*, Kent OH, Dec 2013.
- [43] Stanier, C.O. "Applying CMAQ, MODIS, and Surface Observations to Air Quality Applications in the United States." Presented at *NASA Goddard*, College Park MD, Nov 2013.
- [42] Stanier, C.O. "Volatile Methyl Siloxanes: Regional chemical transport modeling, field observations, and laboratory reaction kinetics." Presented at the *University of Maryland Department of Chemical Engineering*, College Park MD, Nov 2013.
- [41] Stanier, C.O. "Applying Data Assimilation and Adjoint Sensitivity to Epidemiological and Policy Studies of Airborne Particulate Matter." Presented at *EPA STAR Program Progress Update*. Triangle Park NC, Nov 2013.
- [40] Stanier, C.O. "Carbon Footprints and Sustainable Energy Choices." *Interdisciplinary Dialogue on Climate Change (IDCC) Lecture at Dickinson College*. Carlisle PA, Nov 2013.
- [39] Stanier, C.O. "Wintertime Ammonium Nitrate Haze Episodes in the Midwest: Observation, Modeling, and Sensitivity to Emission." Presented at *University of Maryland Atmospheric and Oceanic Sciences Department, Atmospheric Chemistry Series*. College Park MD, Oct 2013.

- [38] Stanier, C.O. "LADCO Winter Nitrate Study." Presented at *EPA Regional/State/Local Modelers Workshop*. Chicago IL, May 2012.
- [37] Stanier, C.O. "Aerosol Screening Model (ASM) for Size Resolved Urban Aerosols." Poster presented at *Annual Meeting of the Health Effects Institute*. Chicago IL, Apr 2012.*
- [36] Stanier, C.O. "Applying Data Assimilation and Adjoint Sensitivity to Epidemiological and Policy Studies of Airborne Particulate Matter." Presented at *EPA STAR Program Progress Update*. Research Triangle Park NC, Mar, 2012.
- [35] Stanier, C.O. "Air Quality Modeling and Data Assimilation – Applications to Air Pollution Epidemiology." Presented in the *University of Iowa Environmental Health Sciences Research Center Seminar Series*. Iowa City IA, January, 2012.
- [34] Stanier, C.O. "Air Quality Modeling and Data Assimilation." Presented in *University of Ottawa Department of Epidemiology and Community Medicine Seminar*. Ottawa, Canada, January, 2012.
- [33] Stanier, C.O. "Personal Exposure Aerosol Screening Model (PEASM) for Size Resolved Urban Aerosols." Poster presented at *Annual Meeting of the Health Effects Institute*. Boston, MA, May 2011.*
- [32] Stanier, C.O. Panelist participant in "Air Quality Science: An Essential Ingredient for Successful Air Pollution Health Studies." *Community Modeling and Analysis System (CMAS) Conference*, Research Triangle Park NC, Oct 2010.*
- [31] Stanier, C.O. "Update on the LADCO Winter Nitrate Study." Presented remotely to the Area Sources Subcommittee of the *PM2.5 Implementation Workgroup of the Iowa Department of Natural Resources*. Windsor Heights IA, September 2010.
- [30] Stanier, C.O. "Wintertime Nitrate Formation in the Midwest." Presented remotely to the *Air Quality Model Development Meeting of the Electric Power Research Institute*. Palo Alto CA, July 2010.
- [29] Stanier, C.O. "PM2.5 Chemistry and Episodes." Presented to the *PM2.5 Implementation Workgroup of the Iowa Department of Natural Resources*. Windsor Heights IA, June 2010.
- [28] Stanier, C.O. "Personal Exposure Aerosol Screening Model (PEASM) for Size Resolved Urban Aerosols." Poster presented at *Annual Meeting of the Health Effects Institute*. Alexandria VA, May 2010.*
- [27] Stanier, C.O. "Understanding the aerosol pollution of the upper Midwest using chemical thermodynamics." *University of Wisconsin Department of Chemical and Biological Engineering Departmental Seminar*. Madison WI, Jan 2010.
- [26] Stanier, C.O. "Understanding Episodes of High Airborne Particulate Matter in Iowa." *University of Northern Iowa Department of Earth Sciences Departmental Seminar*. Cedar Falls IA, December 2009.
- [25] Stanier, C.O. "Ultrafine Aerosols and Boundary Layer Processes." Presented at the *44th Annual Midwest Regional Meeting of the ACS*. Iowa City IA, Oct 2009.*
- [24] Stanier, C.O. "Understanding Episodes of High Airborne Particulate Matter in Iowa." Presented at the *Iowa Business Development Conference*, Des Moines IA, Sept 2009.
- [23] Stanier, C.O. "Understanding Climate Change." Presented at the *Iowa Renewable Energy Association Expo*. Norway IA, Sept 2009.

- [22] Weatherhead, E., and Stanier, C.O. "Academic Contributions to Renewable Energy." Presented by coauthor and session chair Elizabeth Weatherhead at the *AMS Summer Community Meeting*. Norman OK, Aug 2009.*
- [21] Stanier, C.O. "Understanding Episodes of High Airborne Particulate Matter in Iowa." Presented remotely to the *Meeting of the Lake Michigan Air Directors Consortium and the Midwest Regional (Air Pollution) Planning Organization*. Chicago IL, July 2009.
- [20] Stanier, C.O. "Applying Data Assimilation and Adjoint Sensitivity to Epidemiological and Policy Studies of Airborne Particulate Matter." Presented at the *EPA STAR Program Kickoff*. Research Triangle Park NC, June 2009.
- [19] Stanier, C., Lee, S.R., Sioutas, C., Moore, K., Riemer, N. "Development and a Personal Exposure Aerosol Screening Model (PEASM) for Size Resolved Urban Aerosols: Part II: The description of PEASM modules and evaluation." Poster presented at *Annual Meeting of the Health Effects Institute*, Portland OR, May 2009.*
- [18] Stanier, C., Carmichael, G.R. "Understanding Episodes of High Airborne Particulate Matter in Iowa." Presented at the *Bistate Regional Commission's Local Government Legislative Forum*. Davenport IA, Apr 2009.
- [17] Stanier, C.O. "Evaluation of the Vaisala CL31 ceilometer as a tool for boundary layer characterization within carbon cycle studies." Presented remotely to the *Vaisala CL31 Workshop*. Boulder CO, Apr 2009.
- [16] Stanier, C., Carmichael, G.R. "Understanding Episodes of High Airborne Particulate Matter in Iowa." Presented at the *Bistate Regional Commission meeting*. Rock Island IL, Jan 2009.
- [15] Stanier, C.O. "Understanding Climate Change." Presented at the *Iowa Renewable Energy Association Expo*. Cedar Falls IA, Sept. 2008.
- [14] Stanier, C.O. "Atmospheric New Particle Formation and Growth." Presented at the *Pacific Northwest National Laboratory Environmental and Molecular Sciences Laboratory (EMSL) Chamber Workshop*. Richland WA, June 2008.
- [13] Stanier, C.O., Pettibone, A., Lee, S.R., Raife, J. "Measurements and Modeling of Ultrafine Particles." Presented at the *University of California Riverside, Department of Chemical and Environmental Engineering, Atmospheric Chemistry and Engineering Seminar Series*. Riverside CA, May 2008.
- [12] Lee, S.R., Raife, J., Stanier, C. "Development and Application of a Personal Exposure Screening Model for Size Resolved Urban Aerosol: Model Description and Study Objectives." Presented at the *Annual Meeting of the Health Effects Institute*. Philadelphia PA, May 2008.*
- [11] Stanier, C.O. "Understanding Climate Change." Presented at *Iowa Renewable Energy Association Expo*. Solon IA, Sept. 2007.
- [10] Pettibone, A., Stanier, C.O. "Atmospheric Processes." Presented at the *Data Analysts Meeting of LADCO / MRPO (Lake Michigan Air Directors Consortium and the Midwest Regional (Air Pollution) Planning Organization)*. Chicago IL, Oct 2006.
- [9] Pettibone, A., Eichinger, W., Pandis, S.N., Stanier, C.O. "Measurements and Modeling of New Particle Formation." Presented at the *Special Symposium on Formation and Growth of Atmospheric Aerosols* (sponsored by DOE-NSF-ACCENT-BACCI-iLEAPS-IGAC-SOLAS). Otsego MN, Sept 2006.

- [8] Stanier, C.O. "Atmospheric Formation of Ultrafine Particles." Presented at the *Ultrafine Particle Conference, The Science, Technology, and Policy Issues*. Los Angeles CA, May 2006.
- [7] Stanier, C.O. "Atmospheric New Particle Formation." Presented at the *Departmental Seminar of Civil and Environmental Engineering at the University of Iowa*. Iowa City IA, Oct 2005.
- [6] Stanier, C.O. "Atmospheric Ultrafine Particles – Field Sampling and Predictive Modeling." Presented at the *Illinois State Water Survey*. Champaign Urbana IL, Mar 2005.
- [5] Stanier, C.O. "Atmospheric Ultrafine Particles – Field Sampling and Predictive Modeling." Presented at the *Departmental Seminar of Mechanical Engineering at the University of Iowa*. Iowa City IA, Mar 2005.
- [4] Stanier, C.O. "Atmospheric Ultrafine Particles – Insights into Formation and Properties." Presented at the *Departmental Seminar of IIHR Hydroscience and Engineering at the University of Iowa*. Iowa City IA, Oct 2004.
- [3] Stanier, C.O. "Atmospheric Ultrafine Particles – Insights into Formation and Properties." Presented at the *Departmental Seminar of Occupational and Environmental Health at the University of Iowa*. Iowa City IA, Sept 2004.
- [2] Stanier, C.O., Gaydos, T.M., Khlystov, A.Y., Pandis, S.N. "New Particle Formation During the Pittsburgh Air Quality Study: Frequency, Meteorology, Particle Growth, and Chemistry." Presented at the *ACCESS VII Colloquium on Atmospheric Chemistry*. Yellowstone National Park WY, Sept 2003.
- [1] Stanier, C.O., Gaydos, T.M., Khlystov, A.Y., Pandis, S.N. "New Particle Formation During the Pittsburgh Air Quality Study: Frequency, Meteorology, Particle Growth, and Chemistry." Presented at the *Gordon Conference on Atmospheric Chemistry* (poster presentation), Big Sky MT, Sept 2003.

Conference Presentations and Posters

(Presenting Author is Marked with an Asterisk; Stanier Group Members are Underlined; All conference entries listed for past 5 years, and prior to that only presentation with Stanier as the lead and presenting author)

- [206] Christiansen, M., * Stanier, C., Doak, A., Carmichael, G., Pierce, R.B., Bertram, T., Stanier, E.A., Abdi-Oskouei, M., Roozitalab, B., Hughes, D.D., Ferrada, G. "The Lake Michigan Ozone Study (LMOS 2017) Field Campaign and Ozone Control Strategy from It," Fall 2020 Meeting of AICHE. Virtual, Nov 2020. <https://plan.core-apps.com/aiche2020/event/74d8cf75e00c20cd8f09bd3f0e5236d2>
- [205] Christiansen, M., * Doak, A., Bertram, T., Stone, E.A., Ferrada, G., Hughes, D.D., Stanier, C.O., Carmichael, G.R. "Overview of Meteorology and Chemistry of Ozone Episodes during the Lake Michigan Ozone Study 2017," 101st Meeting of the American Meteorological Association. Virtual, Jan 2021. https://eventpower-res.cloudinary.com/video/upload/v1/media/American%20Meteorological%20S/21ams/session_recording/Overview%20of%20Meteorology%20a/ywilzoswuwjdfjoagnvu
- [204] Abdi-Oskouei, M., * Carmichael, G.R., Christiansen, M., Czarnetzki, A.C., Ferrada, G., Pierce, R.B., Roozitalab, B., Sobhani, N., Stanier, C.O. "WRF-Chem Modeling of Lake Michigan Summertime Ozone Air Quality: Optimization of Meteorology and Its Impact on Air Quality Forecast," ACOM Seminar Series (monthly series of the Atmospheric Chemistry Observations &

Modeling Laboratory of the National Center for Atmospheric Research), Boulder CO, Aug 2020 (virtual).

- [203] Abdi-Oskouei, M.,* Carmichael, G.R., Christiansen, M., Czarnetzki, A.C., Ferrada, G., Pierce, R.B., Roozitalab, B., Sobhani, N., Stanier, C.O. "WRF-Chem Modeling of Lake Michigan Summertime Ozone Air Quality: Optimization of Meteorology and Its Impact on Air Quality Forecasts," *100th Meeting of the American Meteorological Association*. Boston MA, Jan 2020.
- [202] Tang, B.,* Gao, M., Stanier, C.O., Carmichael, G. "Evaluation of high resolution WRF-Chem model with observations during KORUS-AQ using updated emission estimates," *Fall Meeting of the American Geophysical Union*. San Francisco CA, Dec 2019.
- [201] Christiansen, M.,* Doak, A., Hughes, D., Stanier, C., Stone, E., Millet, D., Alwe, H. "Using Highly Time-resolved Data to Improve the Lake Michigan Ozone Study: Particle Size Distributions and VOCs at a Coastal Site," *38th Annual American Association for Aerosol Research Conference*, Portland OR, Oct 2019.
- [200] Hughes, D.,* Milani, A., Christiansen, M., Millet, D., Bertram, T., Stanier, C., Stone, E., "Chemical Composition of PM_{2.5} in Zion, IL during the 2017 Lake Michigan Ozone Study (LMOS)," *38th Annual American Association for Aerosol Research Conference*, Portland OR, Oct 2019.
- [199] Contreras, M.,* Mubeen, S., Stanier, C. "Technoeconomic analysis of photoelectrochemical hydrogen production from waste brine," Presented at the *American Chemical Society Meeting*, 2019.
- [198] Doak, A.,* Christiansen, M., Stanier, C.O. "Local Source Characterization Using Positive Matrix Factorization." *2019 Mid-America Student Regional Conference of the American Institute of Chemical Engineers*. Missouri State University, Rolla, MO, Apr 2019.
- [197] Carmichael, G.,* Abdioskouei, M., Alwe, H.D., Christiansen, M., Millet, D.B., Pierce, R.B., Roozitalab, B., Sobhani, N., and Stanier, C.O. "Impact of Anthropogenic and Biogenic Emissions on High Ozone Episodes Along the Lake Michigan Shoreline" (abstract A53C-05). *Fall Meeting of the American Geophysical Union*. Washington DC, Dec 2018.
- [196] Pierce, R.B.* Stanier, C.O., Dickens, A.F., Szykman, J., Bertram, T., Stone, E.A., Al-Saadi, J.A., Czarnetzki, A., Millet, D.B., Alwe, H.D., Judd, L.M., Abdioskouei, M., Valin, L., Cleary, P.A., Fuoco, M., Gregory, G., Christiansen, M., Harkey, M., Kenski, D.M., Adelman, Z., and Wagner, T.J. "Overview of the 2017 Lake Michigan Ozone Study" (abstract A53C-04). *Fall Meeting of the American Geophysical Union*. Washington DC, Dec 2018.
- [195] Christiansen, M.,* Stanier, C.O., Pierce, R.B., Szykman, J., Hughes, D., Stone, E.A., Doak, A., Elzey, S. "Aerosol measurements during the Lake Michigan Ozone Study (LMOS 2017)" (abstract A51N-0148). Poster at the *Fall Meeting of the American Geophysical Union*. Washington DC, Dec 2018.
- [194] Contreras, M.,* Mubeen, S., Stanier, C.O., and Rassoolkhani, A. "A Technoeconomic Analysis of Hydrogen Production from Brine using PEC Technology." Poster at the *Americas International Meeting on Electrochemistry and Solid State Science*. Cancun, Mexico, Oct 2018.
- [193] Dong, C., Bullard, R., Singh, A., Spak, S.N., Matsui, H. Stanier, C.O.* "Physical and Model-based Characterization of NPF Events and Sensitivity of CN and CCN to Changes in Anthropogenic Emissions in the Midwestern United States.." *International Aerosol Conference*. St. Louis, MO, Sept 2018.
- [192] Hughes, D.,* Milani, A., Christiansen, M., Millet, D., Bertram, T., Stanier, C.O., Stone, E. "Chemical Composition of PM_{2.5} in Zion, IL during the 2017 Lake Michigan Ozone Study." Poster at *2018 International Aerosol Conference*. St. Louis, MO, Sept 2018.
- [191] Christiansen, M.,* Stanier, C.O., Elzey, S., Janecek, N.J., Bryngelson, N., Havlicek, M., Tiwari, A. "Comparison of the TSI 1-nm and Standard Scanning Mobility Particle Sizers during the Lake Michigan Ozone Study." Poster at *2018 International Aerosol Conference*. St. Louis, MO, Sept 2018.
- [191] Janecek, N.J., King, B., Marek, R., Adamcakova-Dodd, A., Lersch, T., Bunker, K., Casuccio, G., Hansen, K., Brune, W., Thorne, P., Hornbuckle, K., Fiegel, J., Stanier,* C.O. "Cyclic Siloxane Oxidation over North America: Quantifying the Strength, Properties, and Lung Cytotoxicity of

Widespread Silicon from Personal Care Products." *2018 International Aerosol Conference*. St. Louis, MO, Sept 2018.

- [190] Stanier, C.O.,* Janecek, N., Bryngelson, N., Christiansen, M. "Determination of the Size-Resolved Sampling Efficiency for a Commodity (AirBeam) PM2.5 Ambient Aerosol Sensor at a Background U.S. Continental Site." *2018 International Aerosol Conference*. St. Louis, MO, Sept 2018.
- [189] Abdi-Oskouei, M., Carmichael, G.R., Christiansen, M., Sobhani, N., Roozitalab, B., Wade, K., Stanier, C.O. "Meteorological air quality forecasting using the WRF-Chem model during the Lake Michigan Ozone Study (LMOS-2017) field campaign." *NASA H-AQAST Meeting*. Madison, WI, July 2018.
- [188] Doak, A.,* Christiansen, M., Stanier, C.O. "Investigating Pollution Around Lake Michigan Using Continuous Emission Monitoring Systems." *2018 Mid-America Student Regional Conference of the American Institute of Chemical Engineers*. Oklahoma State University, Stillwater, OK, Apr 2018.
- [187] Hughes, D.D.,* Milani, A., Christiansen, M., Millet, D.B., Bertram, T., Stanier, C.O., Stone, E.A. "Chemical Composition of PM2.5 in Zion, IL during the 2017 Lake Michigan Ozone Study (LMOS)." *130th Annual Meeting of the Iowa Academy of Science*. Buena Vista, IA, Apr 2018.
- [186] Christiansen, M.,* Stanier, C.O., Dagen, D.D., Stone, E.A., Janecek, N., Bryngelson, N. "What can we learn from rapid particle measurements during the Lake Michigan Ozone Study 2017 (LMOS 2017)." *130th Annual Meeting of the Iowa Academy of Science*. Buena Vista, IA, Apr 2018.
- [185] Christiansen, M.,* Stanier, C.O., Dagen, D.D., Stone, E.A., Janecek, N., Bryngelson, N. "What can we learn from rapid particle measurements during the Lake Michigan Ozone Study 2017 (LMOS 2017)." *20th Annual Jakobsen Memorial Conference*. Iowa City, IA, Mar 2018.
- [184] Judd, L.,* Al-Saadi, J., Janz, S., Kowalewski, M., Szykman, J., Swap, R., Abuhassan, N., Cede, A., Valin, L., Williams, D., Stanier, C. "High Resolution mapping of NO2 column densities along the western shore of Lake Michigan and the Los Angeles Basin during May/June 2017." Abstract 288565, Session A002. *Fall Meeting of the American Geophysical Union*. New Orleans LA, Dec 2017.
- [183] Stanier, C.,* Dong, C., Janecek, N., Bryngelson, N., Schultz, P., Heimbinder, M. "Challenges and Opportunities for Using Crowd-Sourced Air Pollution Measurements for Education and Outreach." Abstract 299866, Session ED030. *Fall Meeting of the American Geophysical Union*. New Orleans LA, Dec 2017.
- [182] Spak, S.,* Stanier, C., Neal, T., Herder, S., Malek, A., Miller, Z. "The Iowa K-12 Climate Science Education Initiative: a comprehensive approach to meeting in-service teachers' stated needs for teaching climate literacy with NGSS." Abstract 295201, Session ED007. *Fall Meeting of the American Geophysical Union*. New Orleans LA, Dec 2017.
- [181] Stanier, C.,* Abdioskouei, M., Carmichael, G.R., Christiansen, M., Sobhani, N. "Meteorological air quality forecasting using the WRFChem model during the LMOS2017 field campaign." Abstract 298957, Session A082. *Fall Meeting of the American Geophysical Union*. New Orleans LA, Dec 2017.
- [180] Janecek, N.,* Bryngelson, N., Marek, R., Lersch, T., Bunker, K., Casuccio, G., Brune, W., Hornbuckle, K., Stanier, C. "Experimental Characterization and Lung Cytotoxicity of Secondary Aerosol from D5 Cyclic Siloxane Oxidation." Abstract 283913, Session A052. *Fall Meeting of the American Geophysical Union*. New Orleans LA, Dec 2017.
- [179] Dong, C.,* Matsui, H., Spak, S., Stanier, C. "Impacts of New Particle Formation on Short-term Midwestern Meteorology and Air Quality as Determined by the NPF-explicit WRF-Chem." Presentation at *36th Annual American Association for Aerosol Research Conference*. Raleigh NC, Oct 2017.
- [178] Dong, C.,* Bullard, R., Singh, A., Cui, Y., Hodzic, A., Stanier, C. "Physical and Model-based Characterization of Ultrafine Particle Size Distributions, Nucleation, and Particle Growth in the Central US." Poster at *36th Annual American Association for Aerosol Research Conference*. Raleigh NC, Oct 2017.
- [177] Zhao, S.,* Hakami, A., Turner, M., Henze, D., Capps, S., Percell, P., Resler, J., Bash, J., Napelenok, S., Fahey, K., Pinder, R., Russell, A.G., Nenes, A., Baek, J., Carmichael, G., Stanier, C., Sandu, A.,

- Chai, T., Byun, D. "Development of a CMAQ Adjoint Model with Aerosol Capabilities." Poster at *36th Annual American Association for Aerosol Research Conference*. Raleigh NC, Oct 2017.
- [176] Janecek, N.,* Spak, S., Hornbuckle, K., Stanier, C. "Expanding the Modeling of Semivolatile Aerosols within the CMAQ Framework: Development and Application to Oxidized Cyclic Siloxanes and Polychlorinated Biphenyl Compounds." Poster at *36th Annual American Association for Aerosol Research Conference*. Raleigh NC, Oct 2017.
- [175] Janecek, N.,* Hansen, K., Stanier, C. "Comprehensive Atmospheric Modeling of Gas-phase Cyclic Volatile Methyl Siloxanes and Their Oxidation Products." Poster at *36th Annual American Association for Aerosol Research Conference*. Raleigh NC, Oct 2017.
- [174] Christiansen, M.,* Abdioskouei, M., Sobhani, N., Stanier, C., Carmichael, G., Dong, C. "Nitrogen Oxide Emissions Perturbation and its Effects on the WRF-Chem Forecast." Poster at *36th Annual American Association for Aerosol Research Conference*. Raleigh NC, Oct 2017.
- [173] Christiansen, M.,* Abuhassan, N., Al-Saadi, J., Bertram, T., Carmichael, G., Stanier, C., Conley, S., Czarnetzki, A., Dickens, A., Fuoco, M., Janz, S., Judd, L., Kaleel, R., Kenski, D., Kowalewski, M., Long, R., Millet, D., Pierce, B., Shaw, S., Stone, E., Szykman, J. "Overview of Lake Michigan Ozone Study (LMOS 2017)." Poster at *36th Annual American Association for Aerosol Research Conference*. Raleigh NC, Oct 2017.
- [172] Stanier, C.,* Dong, C., Janecek, N., Bryngelson, N., A'Hearn, J., Christiansen, M. "Using Low-cost PM2.5 Sensors for Air Quality Education Outreach." Poster at *36th Annual American Association for Aerosol Research Conference*. Raleigh NC, Oct 2017.
- [171] Pappin, A.,* Zhao, S., Soltanzadeh, M., Oztaner, B.Y., Hakami, A., Naseri, M., Szyszkowicz, M., Burnett, R., Turner, M., Capps, S., Henze, D., Percell, P., Resler, J., Bash, J., Napelenok, S., Fahey, D., Pinder, R., Russell, A.G., Nenes, A., Baek, J., Carmichael, G., Stanier, C., Sandu, A., Chai, T., Byun, D. "Estimation for Location-specific Marginal Benefits for Primary and Precursor PM2.5 Emissions using the Adjoint of CMAQ." Presentation at *36th Annual American Association for Aerosol Research Conference*. Raleigh NC, Oct 2017.
- [170] Oztaner, B.Y., Soltanzadeh, M., Zhao, S., Hakami, A.,* Turner, M., Henze, D., Capps, S., Percell, P., Resler, J., Bash, J., Napelenok, S., Fahey, K., Pinder, R., Russell, A.G., Nenes, A., Baek, J., Carmichael, G., Stanier, C., Sandu, A., Chai, T., Byun, D. "Quantifying PM2.5 Health Benefits of Coal Power Plant Phase-out in Ontario and Alberta: an Adjoint Sensitivity Analysis." Presentation at *36th Annual American Association for Aerosol Research Conference*. Raleigh NC, Oct 2017.
- [169] Dong, C.,* Spak, S., Bullard, R., Stone, E., Stanier, C., "Air quality impact of a power plant in the Midwest: High resolution CMAQ-ISAM modeling and policy applications." Poster at *36th Annual American Association for Aerosol Research Conference*. Raleigh NC, Oct 2017.
- [168] Janecek, N.,* King, B., Bryngelson, N., Marek, R., Adamcakova-Dodd, A., Lersch, T., Bunker, K., Casuccio, G., Brune, W., Thorne, P., Hornbuckle, K., Fiegel, J., Stanier, C. "Experimental Characterization and Lung Cytotoxicity of Secondary Aerosol from D5 Cyclic Siloxane Oxidation." Poster at *36th Annual American Association for Aerosol Research Conference*. Raleigh NC, Oct 2017.
- [167] Christiansen, M.,* Abdi-Oskouei, M., Carmichael, G., Sobhani, N., Stanier, C. "Overview of WRF-Chem Model Evaluation During LMOS 2017." Presentation at *LMOS 2017 Data Workshop*. Chicago IL, Sept 2017.
- [166] Christiansen, M.,* Janecek, N., Bryngelson, N., Stanier, C. "Overview of Time-Resolved Aerosol Measurements at Zion." Presentation at *LMOS 2017 Data Workshop*. Chicago IL, Sept 2017.
- [165] Abdi-Oskouei, M.,* Carmichael, G., Christiansen, M., Sobhani, N., Stanier, C. "Meteorological and air quality forecasting using WRF-CHEM model during the LMOS 2017 field campaign." Presentation at *Meteorology and Climate - Modeling for Air Quality (MAC-MAQ)*. Davis CA, Sept 2017.
- [164] Dong, C.,* Spak, S., Bullard, R., Stone, E., Stanier, C., "Air quality impact of a power plant in the Midwest: High resolution CMAQ-ISAM modeling and policy applications." Poster at *Meteorology and Climate - Modeling for Air Quality (MAC-MAQ)*. Davis CA, Sept 2017.

- [163] Dong, C.*, Stanier, C., Bullard, R., Singh, A., "Impacts of New Particle Formation on Midwestern Climate and Air Quality as Determined by the NPF-explicit WRF-Chem." Poster at *19th Conference on Atmospheric Chemistry*. Seattle WA, Jan 2017.
- [162] Dong, C.*, Stanier, C., Bullard, A., Singh, A. "Impacts of New Particle Formation on Midwestern Climate and Air Quality as Determined by the NPF-explicit WRF-Chem." Poster at *American Geophysical Union Fall Meeting*. San Francisco CA, Dec 2016.
- [161] Janecek, N.*, Bryngelson, N., Lersch, T., Bunker, K., Casuccio, G., Brune, W., Stanier, C.O. "Experimental Characterization of Secondary Aerosol from D5 Cyclic Siloxane Oxidation." Poster at *35th Annual American Association for Aerosol Research Conference*. Portland OR, Oct 2016.
- [160] Janecek, N.*, Stanier, C.O. "Atmospheric Modeling of Cyclic Volatile Methyl Siloxanes." Poster at *35th Annual American Association for Aerosol Research Conference*. Portland OR, Oct 2016.
- [156] Stanier, C.O.*, Bullard, R.L., Dong, C., Singh, A. "Physical Characterization and Modeling of Particle Nucleation and Particle Growth in the Central U.S." Presentation at *34th Annual American Association for Aerosol Research Conference*. Minneapolis MN, Oct 2015.
- [155] Stanier, C.O.* "Teaching Green Chemical and Energy Technologies." Presentation at the *Iowa Climate Science Educators Forum*. Des Moines IA, Oct 2015.
- [133] Stanier, C.O.*, Spak, S., Kim, Y.J., Carlson, J., Baek, J., Carmichael, G., Fontaine, A., Janssen, M., Koerber, M., Riemer, N., Shaw, S. "LADCO Winter Nitrate Study – Sensitivity of 2009 Winter PM_{2.5} to Modeled Reductions in NO_x and Ammonia." Presentation at the *30th Annual American Association for Aerosol Research Conference*. Minneapolis MN, Oct 2012.
- [111] Stanier, C.*, Spak, S., Baek, J., Caughey, M., Carmichael, G., Edgerton, E., Fontaine, A., Janssen, M., Kenski, D., Kim, Y., Koerber, M., Lee, S.R., Majewski, M., Riemer, N., Rohlf, T., Shaw, S., Singh, A., Sousan, S. "Overview of the LADCO Winter Nitrate Study -- Modeling and Measurement of Hourly Gas Aerosol Concentrations and Meteorology During Nitrate Episodes." Platform at *29th Annual American Association for Aerosol Research Conference*. Orlando FL, Oct 2011.
- [87] Stanier, C.O.*, Jamroensan, A., Andrews, A.E., Schoenfelder, J., Kofler, J., Williams, J.C., Vaughn, B., Neff, D., Tans, P.P., Sweeney, C., Dlugokencky, E., Montzka, S., Eichinger, W., Lewandowski, P., Pettibone, A., Carmichael, G. "Modeled and measured carbon gas concentrations in Eastern Iowa." Presented at the *Annual Meeting of the American Institute of Chemical Engineers*. Nashville TN, Nov 2009.
- [85] Stanier, C.*, Bender, A., Carmichael, G., Beranek-Collins, A., Yarker, M.B., Holloway, T., Lee, S.R., Pettibone, A., Spak, S., Sousan, S. "Understanding Episodes of High Airborne Particulate Matter in the Upper Midwest." *Annual American Association for Aerosol Research Conference*. Minneapolis MN, Oct 2009.
- [71] Stanier, C.O., Donahue, N., Pandis, S.N. "Atmospheric Secondary Organic Aerosol Yields: Parameter Estimation from Smog Chamber Yields." Presented at the *Annual Meeting of the American Institute of Chemical Engineers*. Salt Lake City NV, Nov 2007.
- [65] Stanier, C.O., Donahue, N., Pandis, S.N. "Atmospheric Secondary Organic Aerosol Yields: Parameter Estimation from Smog Chamber Results." Presented at the *International Aerosol Conference*. St. Paul MN, Sept 2006.
- [54] Stanier, C.*, Gaydos, T., Khystov, A., Zhang, Q., Jimenez, J.-L., Caragaratna, M., Jayne, J., Worsnop, D., Pandis, S.N. "Synthesis of Research on New Particle Formation and Growth at The Pittsburgh Air Quality Study." Presentation at *Particulate Matter Supersites Program and Related Studies International Specialty Conference*. Atlanta GA, Feb 2005.
- [53] Stanier, C.*, Khlystov, A., Pandis, S.N. "Ambient Aerosol Size Distributions and Number Concentrations Measured During the Pittsburgh Air Quality Study." Poster at *Particulate Matter Supersites Program and Related Studies International Specialty Conference*. Atlanta GA, Feb 2005.
- [52] Stanier, C.*, Khlystov, A., Pandis, S.N. "A Method For The In Situ Measurement Of Fine Aerosol Water Content Of Ambient Aerosols: The Dry-Ambient Aerosol Size Spectrometer (DAASS)." Poster at *Particulate Matter Supersites Program and Related Studies International Specialty Conference*. Atlanta GA, Feb 2005.

- [45] Stanier, C.*, Pandis, S. "Improving Organic Aerosol Models by Combining Traditional and Temperature Ramped Smog Chamber Experiments: Alpha Pinene Ozonolysis Case Study." Presented at the *23rd Annual American Association for Aerosol Research Conference*. Atlanta GA, Oct 2004.
- [40] Stanier, C.*, Gaydos, T.M., Zhang, Q., Caragaratna, M., Worsnop, D., Jimenez, J.L., Pandis, S. "Atmospheric New Particle Formation in the Eastern United States: Mass Spectrometry and Predictive Modeling." Presented at the *16th International Conference on Nucleation and Atmospheric Aerosols*. Kyoto Japan, Jul 2004.
- [38] Stanier, C.*, Gaydos, T., Khlystov, A., Pandis, S. "Explaining the In-situ Formation of Ultrafine Particles in the Northeast U.S." *Supersites Principal Investigator Meeting*. Las Vegas NV, Feb 2004.
- [37] Stanier, C., Pandis, S. "Rethinking the Determination and Parameterization of Atmospheric Secondary Organic Aerosol Yields." Presented at the *Annual Meeting of the American Institute of Chemical Engineers*. San Francisco CA, Nov 2003.
- [36] Stanier, C., Gaydos, T.M., Khlystov, A.Y., Pandis, S. "Synthesis of Research on In-situ Particle Nucleation in Western Pennsylvania", Presented at the *Annual Meeting of the American Institute of Chemical Engineers*. San Francisco CA, Nov 2003.
- [35] Stanier, C.O.*, Gaydos, T.M., Khlystov, A.Y., Zhang, Q., Caragaratna, M., Jayne, J.T., Worsnop, J.T., Jimenez, J.L., Millet, D.M., Goldstein, A.H., Bein, K., Zhao, Y., Wexler, A.S., Pandis, S.N. "Synthesis Of Research on In-situ Particle Nucleation in Western Pennsylvania: Which Hypotheses for Nuclei Formation and Growth Are Consistent with Field Observations, Mass Spectrometry & Modeling?" Presented at the *22nd Annual American Association for Aerosol Research Conference*. Anaheim CA, Oct 2003.
- [34] Stanier, C.O.*, Khlystov, A.Y., Lipsky, E., Robinson, A., Pandis, S.N. "Ultrafine Particles from Vehicles during the Pittsburgh Air Quality Study: Linking Near Source (Traffic Tunnel) and Ambient Size Distributions." Poster at the *22nd Annual American Association for Aerosol Research Conference*. Anaheim CA, Oct 2003.
- [28] Stanier, C., Khlystov, A., Pandis, S. "In-Situ Particle Nucleation Observations in Western Pennsylvania: Frequency, Meteorology, Spatial Scale, and Chemistry." *European Geophysical Society - American Geophysical Union - European Union of Geosciences: Joint Assembly*. Nice France, Apr 2003.
- [27] Stanier, C.*, Khlystov, A., Pandis, S. "Diurnal and Seasonal Trends In Outdoor Particle Size Distributions Measured at Urban and Rural Locations during the Pittsburgh Air Quality Study." Poster at the *Particulate Matter: Atmospheric Sciences, Exposure and the Fourth Colloquium on PM and Human Health*. Pittsburgh PA, Apr 2003.
- [21] Stanier, C.*, Khlystov, A.Y., Pandis, S.N., Zhou, Y., Bein, K., Wexler, A.S., Misra, C., Sioutas, C. "In-Situ Formation of Ultrafine Aerosols in an Urban Area." Presented at the *Annual Meeting of the American Institute of Chemical Engineers*. Indianapolis IN, Nov 2002.
- [20] Stanier, C.*, Pandis, S.N. "Secondary Organic Aerosols: Laboratory Results for Gas-Aerosol Partitioning and Its Dependence on Temperature." Presented at the *Annual American Association for Aerosol Research Conference*. Charlotte NC, Oct 2002.
- [19] Stanier, C.*, Khlystov, A.Y., Wittig, B., Zhou, Y., Bein, K., Zhang, Q., Jimenez, J.L., Caragaratna, M., Worsnop, D., Sioutas, C., Wexler, A.S., Pandis, S.N. "Investigation of Nucleation Bursts during the Pittsburgh Air Quality Study." Presented at the *Annual American Association for Aerosol Research Conference*. Charlotte NC, Oct 2002.
- [14] Stanier, C.*, Khlystov, A.Y., Pandis, S.N., Zhou, Y., Wexler, A.S., Misra, C., Sioutas, C. "Investigation of Nucleation Bursts in the Northeastern United States." Poster at the *7th Scientific Conference of the International Global Atmospheric Chemistry Project (IGAC)*. Crete Greece, Sept 2002.
- [2] Stanier, C.*, Pandis, S.N. "Partitioning of Secondary Organic Aerosol Between the Gas and Aerosol Phases." Presented at the *20th Annual American Association for Aerosol Research Conference*. Portland OR, Oct 2001.

Service

Current National Service

2017 - Member, Membership Committee of UCAR/NCAR, University Center for Atmospheric Research

Current Service to Iowa Communities, Schools, and Local & State Government

2013 - Center for Global and Regional Environmental Research, Executive Committee Member

Current Service to the University of Iowa

2020 - Informal Consultant, COVID Ventilation Safety, UI School of Music, and the UI Center for the Book

efforts recognized in part in acknowledgement in an article on COVID protections in the College of Medicine: Hoffman et al., Laser plume containment during flexible transnasal laryngoscopy, in *Laryngoscope Investigative Otolaryngology* (2021) <https://onlinelibrary.wiley.com/doi/full/10.1002/lio2.526>

2020 - Member, 2030 UI Sustainability Goal Setting Task Force

2018 - Certified to display the LGBTQ Safe Zone placard through the University of Iowa Safe Zone Project of the University's Diversity, Equity and Inclusion efforts

Current Service to the University of Iowa College of Engineering

2006 - Course Coordinator, Engineering Fundamentals -- Thermodynamics

Current Service to the Department of Chemical and Biochemical Engineering

2020 - Chair, CBE Task Force on Department Research & Name

2020 - Chair, DCG for Joe Gomes

2018 - Departmental Website Committee, co-chair

Relevant Community Involvement

2020 Informal Consultant, COVID Ventilation Safety, Preucil School of Music, Home Ec (local business in Iowa City)

2009 - Trinity Episcopal Church Budget and Finance Committee, Member since 2009; Chair 2011 – 2013 & 2015 – 2018.

Past³ National and International Service

2018 Session co-convenor and co-chair, American Geophysical Union session A078: Observations and Modeling of Air Quality at Land-Water Boundaries <https://agu.confex.com/agu/fm18/prelim.cgi/Session/51995>

³ Includes all service from past 5 years and notable service contributions prior to that

- 2014 - 2017 Awards Committee of the American Association for Aerosol Research, Member 2014-2016; Chair 2016-2017
- 2016 Member (appointed by the Secretary of Agriculture) USDA Agricultural Air Quality Task Force
- 2010 - 2012 Board of Directors, American Association of Aerosol Research (elected)
- 2005 - 2009 Board of Directors, Environmental Division of the American Institute of Chemical Engineers (elected)

Past Service to Iowa Communities, Schools, and Local & State Government

- 2016 - 2018 Faculty Advisor to the Iowa K-12 Climate Science Education Initiative, a joint project between the Center for Global and Regional Environmental Research and the University of Department of Science Education
- 2017 - 2018 Member, City of Iowa City Climate Action Steering Committee
- 2015 - 2018 Project Director for CLEAn Air in the River Valley (CLE4R), a collaborative air quality education project with Dubuque area stakeholders. <http://www.ihr.uiowa.edu/clear4/>
- 2017 “Air Sampling” course for middle school summer students, as part of a weeklong Engineering and Health Science Institute, a program of the Belin Blank Center for Education at the University of Iowa.
- 2012 Iowa City Landfill Fire -- Assisted with air sampling, emergency response planning, and “lessons learned” analysis.
- 2011 Developed and implemented a summer workshop for middle school science teachers. Hosted 21 participants for 07E:340:WKB Advanced Topics in Teaching and Learning: Inquiry Approaches to Climate Weather and Energy in the 6-9 Classroom.
- 2009 - 2011 Speaker on air pollution to multiple non-technical and local/state government audiences in Iowa, including presentations to Iowa Department of Natural Resources PM2.5 Implementation Workgroup, and to audiences in Windsor Heights, Des Moines, Norway IA, Davenport, and Rock Island IL.

Past Service to the University of Iowa

- 2020 Member, Ventilation Subcommittee of the COVID recovery Safety Committee
- 2019 Search Committee for Dean of University of Iowa College of Engineering
- 2017 Research advisor and mentor to a student (high school junior) as part of the Iowa Secondary Science Training Program (SSTP)
- 2016 Research advisor and mentor to a student (high school senior) as part of the Iowa Secondary Science Training Program (SSTP)

- 2006 - 2010 Nanoscience and Nanotechnology Institute at UI, Executive Committee Member
- 2006 - 2009 Member Representative to the University Corporation for Atmospheric Research (UCAR)

Past Service to the University of Iowa College of Engineering

- 2020 Chair, EFC Task Force on Engineering Core Curriculum
- 2020 Chair, Faculty Perception of Administrator formative evaluation for Allan Guymon, Chairperson of Chemical and Biochemical Engineering Dept.
- 2017 - 2020 Engineering Faculty Council (EFC) (elected). Member 2017-2020; Chair 2018 – 2019.
- 2007 - 2018 Member, Graduate Research Advisory Committee (advises the Associate Dean for Research)
- 2016 Represented the College at the National GEM Consortium Annual Conference, Miami Beach FL

Past Service to the Department of Chemical and Biochemical Engineering

- 2016 - 2020 Graduate Education Subcommittee
- 2019 Created the Computational Chemical and Biochemical Engineering Elective Focus Area
- 2007 - 2018 Graduate Admissions Committee
- 2007 - 2018 Graduate Examination Committee
- 2007 - 2018 Director of Graduate Studies
- 2018 Led creation of shared tools for teamwork and team-based learning in the classroom (team formation, team processes, team evaluation, mentoring, etc.)
- 2016 Facilitated Creation of Advanced Controls Course
- 2015 - 2016 Search committee chair for chemical engineering informatics position (led to hire of Jun Wang)

Member of Ph.D. Committees (Department is CBE unless otherwise noted)

- Jim Kacer (in progress, Occupational and Environmental Health)
- Behrooz Roozitalab (in progress)
- Jacob Jahnke (in progress, Civil and Environmental Engineering)
- Gonzalo Ferrada (in progress)
- Sepehr Roudini (in progress)
- Dagen Hughes (in progress, Chemistry)
- Nathan Quarderer (2020, Science Education)
- Yi Wang (2019, Interdisciplinary Geoinformatics Program)

Yunyi Shi (2019, Mechanical Engineering)
Benjamin King (2018)
Maryam Abdi (2018, Environmental Engineering)
Nick Herkert (2018, Environmental Engineering)
Changie Cai (2017, Occupational and Environmental Health)
Yunyi Shi (2017, Mechanical Engineering)
Negin Sobhani (2017)
Maryam Abdi (2017, Environmental Engineering)
Gao, Meng (2015)
Sawvel, Eric (2014, Occupational and Environmental Health)
Yu, Man (2014)
Yarker, Morgan (2013, Science Education)
Anderson, Kim (2013, Occupational and Environmental Health)
Marrapu, Pallavi (2012)
Chen, Haihan (2012)
Huang, Min (2012)
Nilausen, Akim (na)
Benus, Matthew (2011, Science Education)
Wei, Chao (2010)
Elzey, Sherry (2010)
Kulkarni, Sarika (2009)
Lewandowski, Piot (2009, Environmental Engineering)
Pettibone, John (2009)
Obaci, Ozan (2009, Civil Engineering)
Huang, Yun (2008, Mechanical Engineering)
Schmoll, Linda (2008, Occupational & Environmental Health)
Adhikary, Bhupesh (2008, Environmental Engineering)
Zhang, Taiying (2007)
Mena, Marcelo (2007, Environmental Engineering)
Mogili, Praveen (2007, Chemistry)
Pan, Li (2006)
Hashim Al-Hosney (2005, Chemistry)

Member of Thesis M.S. Committees (Department is CBE unless otherwise noted)

Du, Lingyun (Esther) (2017)
Lennartson, Elizabeth (2017)
Grandquist, Josh (2015)
Downard, Jared (2014, Chemistry)
Yucuis, Rachel (2013, Environmental Engineering)

Courses Taught

Summary list of courses taught:

- Large Lecture Courses
 - Fundamentals of Engineering: Thermodynamics
- Undergraduate Courses
 - Chemical Engineering Thermodynamics
 - Engineering Flow and Heat Exchange
 - Process Dynamics and Control in Design
 - Green Chemical and Energy Technologies
- Graduate Courses
 - Atmospheric Chemistry and Physics
 - Transport Phenomenon
 - Intermediate Thermodynamics
- Seminars and Workshops
 - Graduate Professional Development Seminar
 - Advanced Topics in Teaching and Learning: Inquiry Approaches to Climate Weather and Energy in the 6-9 Classroom
 - Graduate Seminar in Chemical and Biochemical Engineering

Significant content or course developments are discussed in italicized type. Teaching awards listed on page 2.

Current and Recent Courses

Process Dynamics and Control in Design (CBE:4105). Taught F2020, primarily for 4th year students in Chemical and Biochemical Engineering. Theory and application of process dynamics to the design of chemical process control systems; mathematical models of unit operations, transfer functions, feedback and feed-forward control, instrumentation, computer methods, including simulation and commercial software use; laboratory focus on process equipment and control. *The laboratory experiments were significantly expanded, upgraded, and integrated into the curriculum starting in 2009. The Portable Temperature Control Lab Arduino system was integrated into the course as well in 2018 (<http://apmonitor.com/pdcl/index.php/Main/ArduinoTemperatureControl>).* Python was introduced as the primary language for numerical methods in F2019. *In F2020, the course was delivered in a hybrid mode due to the pandemic.*

Also taught in F2019, F2018, F2017, F2016, F2015, F2014, F2012, F2011, F2010, F2009.

Fundamentals of Engineering Thermodynamics (ENGR:2130). F2020. Worked with co-instructors Kamran Samani and Greg Carmichael to deliver remote instruction core thermodynamics to 250+ students in two sections.

Green Chemical and Energy Technologies (CBE:5405). S2021. Strategies for pollution prevention and greenhouse gas footprint minimization for chemical

processes and energy production studied at the macroscale (industrial sector), the mesoscale (unit operations), and the microscale (molecular level); case studies. Targeted to juniors, seniors, and graduate students in engineering. Also taught S2019, S2015 (co-instructed), S2013, S2011, S2009, S2007, F2004. *The course was first taught on the model initially developed by Greg Carmichael, and this it was expanded to include climate, energy, and carbon footprint accounting in addition to the original sustainable process design content.*

Atmospheric Chemistry and Physics (CBE:5425). Taught in S2020, for graduate students and advanced undergraduates. Principal chemical and physical processes affecting atmospheric trace gas and pollutant cycles; emphasis on atmospheric photochemistry, aerosol science, major sources and removal processes. *This was a new graduate course that I created. Delivered remotely after spring break 2020, due to the Pandemic.*

Also taught in S2018, S2016, S2014, S2012, S2010, S2008, S2006.

Prior Courses

Intermediate Thermodynamics (CBE:5405). Graduate chemical engineering thermodynamics with focus on mixture properties, vapor-liquid equilibrium, activity and fugacity models, and activity coefficients in ionic solutions. Introduced Python for complex solution of phase equilibrium problems. F2019.

Chemical Engineering Thermodynamics (CBE:3105). For 2nd year students in Chemical and Biochemical Engineering. Applications of thermodynamic principles to chemical and physical processes; prediction of material properties; phase and chemical equilibria applied to mixtures and reacting systems.

Engineering Flow and Heat Exchange (052:151).

Advanced Topics in Teaching and Learning: Inquiry Approaches to Climate Weather and Energy in the 6-9 Classroom (07E:340:WKB). Summer 2011: two s.h. professional development for in-service teachers, co-taught with Science Education Ph.D. candidate Morgan Yarker. *This was a new workshop designed, assembled, and delivered by Yarker and Stanier.*

Graduate Seminar in Chemical and Biochemical Engineering (052:191).

Transport Phenomenon (052:217). F2008 (co-taught with Greg Carmichael).

Courses with cross-functional exposure

Chemical Process Safety (CBE:3125). S2016. Assisted lead instructor David Murhammer in order to become cross-functional in the course material.

Literature Review and Proposal Writing (CBE:5104/5105). S2015. Co-instructed with faculty experienced in this course, in order to develop cross-functionality in this course material.

Professional Consulting

2021 COVID-19 safety plan for the Grant Park Music Festival (Chicago) – In collaboration with Adam Schwaljie, Otolaryngology

Media Coverage of Stanier Group Activities

National Coverage

2021

The University of Iowa's efforts to protect musicians in the School of Music during the pandemic, with mention of testing and simulations by Charles Stanier, will be coming out in the June 2021 edition of the Music Educators Journal. This is the Journal of the National Association for Music Education (NAfME).

2016

Kelleher, S. (2016, February 3) Conservation Farming Shown to Protect Carbon in Soil. *EOS Earth & Space Science News*. Retrieved from <https://eos.org/research-spotlights/conservation-farming-shown-to-protect-carbon-in-soil>

USDA Office of Communications (2016, January 27) USDA Renews Agricultural Air Quality Task Force, Appoints Members. Press Release No. 0026.16. Retrieved from <https://www.usda.gov/media/press-releases/2016/01/27/usda-renews-agricultural-air-quality-task-force-appoints-members>

2014

Lockwood, D. (2014, October 7) Some Atmospheric Nanoparticles Could Have Cosmetic Sources. *Chemical & Engineering News*. Retrieved from http://cen.acs.org/articles/92/web/2014/10/Atmospheric-Nanoparticles-Cosmetic-Sources.html?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+analytical_scene+%28Chemical+%26+Engineering+News%3A+Analytical+SCENE%29

2013

Ritter, S. (2013, October 28) Tire Inferno. *Chemical & Engineering News*. Retrieved from <http://cen.acs.org/articles/91/i43/Tire-Inferno.html>

Local, State and Regional Coverage

2020

Poulsen, L. (2020, Jul 16) UI researchers use aerosol-transmission calculator to assess classroom safety. Daily Iowan. Retrieved from <https://dailyiowan.com/2020/07/16/university-of-iowa-researchers-use-aerosol-transmission-calculator-assess-classroom-safety/>

2018

Poska, J. (2018, Oct 4) Localize Learning with the Iowa 8th Grade Science Phenomena Bundles. Center for Global and Regional Environmental Research – Research Focus. Retrieved from <https://www.youtube.com/watch?v=KgDKFCBhzOI>

DeWald, E. (2018, Sept 8) EnvIowa- Iowa City Climate Action Steering Committee. *Environmental Focus from the Center for Global and Regional Environmental Research*. Retrieved from <https://iowaenvironmentalfocus.org/2018/09/06/enviowa-iowa-city-climate-action-steering-committee/>

DiGiacomo, J. (2018, Apr 11) Perspectives on Senate File 2311: UI students and faculty involved with renewable energy are advocating against Senate File 2311, which would put caps on taxes towards energy efficiency programs. Daily Iowan. Retrieved from <http://daily-iowan.com/2018/04/11/perspectives-on-senate-file-2311/>

2017

Moon, L., and Kieffer, B. (2017, Nov 20) River-to-river radio program on climate change, with Stanier as one of two guests. *Iowa Public Radio*.

Dresser, K., and Ladd, J. (2017, Nov 3) Scientists and Iowa teachers work together to create 8th grade curriculum. *Environmental Focus from the Center for Global and Regional Environmental Research*. Retrieved from <https://iowaenvironmentalfocus.org/2017/11/03/ui-scientists-and-iowa-teachers-work-together-to-create-8th-grade-curriculum/>

Love, B. (2017, Oct 29) Teachers work together to better teach new science standards. *KCRG-TV9*. Retrieved from <http://www.kcrg.com/content/news/Teachers-work-together-to-better-teach-new-science-standards-453981773.html>

Shaffer, C. (2017, Aug 4) Study tracks air pollution along Lake Michigan shore. *Michigan Radio*. Retrieved from <http://michiganradio.org/post/study-tracks-air-pollution-along-lake-michigan-shore>

Davis, A. (2017, July 10) Iowa City offers grants for creative climate action collaborations. *Iowa City Press Citizen*. Retrieved from <http://www.press->

citizen.com/story/news/local/2017/07/10/iowa-city-offers-grants-creative-climate-action-collaborations/460531001/

Quirnbach, C. (2017, June 21) Ozone Study Along Lake Michigan Seeks Answers To Pollutant Drift: Scientists From Several Agencies Take To Air And Water. *Wisconsin Public Radio*. Retrieved from <https://www.wpr.org/ozone-study-along-lake-michigan-seeks-answers-pollutant-drift>

Arnold, M. (2017, May 7) Iowa City chooses climate committee members. *Cedar Rapids Gazette*. Retrieved from <http://www.thegazette.com/subject/news/government/news-track-iowa-city-chooses-climate-committee-members-20170507>

Husar, E. (2017, March 23) Going green: Iowa City Council takes steps to make city more environmentally-friendly. *Little Village*. Retrieved from <http://littlevillagemag.com/going-green-iowa-city-council-takes-steps-to-make-city-more-environmentally-friendly/>

Center for Global and Regional Environmental Research (2017, March 8) Lake Michigan Ozone Study 2017: Project Update. *CGRER Research Focus*. Retrieved from <https://www.youtube.com/watch?v=TQmaPax7jfU>

2016

Bergquist, L. (2016, December 25) Lakeshore counties to exceed new ozone limits. *Milwaukee Journal Sentinel*. Retrieved from <http://www.jsonline.com/story/news/politics/2016/12/25/lakeshore-counties-exceed-new-ozone-limits/95811458/>

Slobe, J. (2016, October 17) UI researchers take part in “Lake Michigan Ozone Study.” *Iowa Environmental Focus*. Retrieved from <https://iowaenvironmentalfocus.wordpress.com/2016/10/17/ui-researchers-take-part-in-lake-michigan-ozone-study/>

Saunders, F. (2016, July 3) Iowa scientists to measure air quality during fireworks display. *KCRG-TV9 Iowa City*. Retrieved from <http://www.kcrg.com/content/news/Iowa-scientists-to-measure-air-quality-during-fireworks-display-385383001.html>

Lake Michigan Ozone Study 2017: Collaborative field campaign will pursue sources and transport of ozone (2016, July 26) *University of Wisconsin Madison Space Science and Engineering Center News*. Retrieved from <http://www.ssec.wisc.edu/news/articles/9012>

Fetty, N. (2016, January 28) University of Iowa professor appointed to USDA task force. *Iowa Environmental Focus*. Retrieved from <https://iowaenvironmentalfocus.org/2016/01/28/university-of-iowa-professor-appointed-to-usda-task-force/>

Dawkins, M. (2016, January 21) Dubuque Organizations use Sensors to Measure Air Quality. *KCRG-TV9*. Retrieved from <http://www.kcrg.com/content/news/Dubuque-Organizations-use-Sensors-to-Measure-Air-Quality-366120721.html>