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### Summary

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Based in the Chemical and Biochemical Engineering Department at the University of Iowa, my research group works on energy transition, air pollution, aerosol chemistry, and greenhouse gases with applications to human health and climate change. Some of the lab's methods include oxidation flow reactors; measurement and analysis of aerosol size distributions; and large-scale (WRF, CMAQ, WRF-Chem) models of atmospheric chemistry and transport. My research group has participated in a number of field campaigns, particularly in the Midwestern US – that have informed model development and air quality management regarding fine particulate and ozone pollution. I am a passionate educator. Through shared governance, I have worked to improve curriculum and policies at the University of Iowa. Together with students and many of my colleagues, we have improved knowledge about climate change solutions, and fostered reductions in environmental footprints at the University of Iowa and beyond.

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## Education

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- 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

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- 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

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Ultrafine Particles in the Atmosphere: Formation, Emissions, and Growth  
Supervisor: Spyros N. Pandis

## Honors, Awards, and Licenses

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- 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 Success<sup>1</sup>

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

- 2017 Recognition for **Excellence in Teaching** and Dedication to Student Success<sup>1</sup>
- 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 Success<sup>1</sup>
- 2013 Recognition for **Excellence in Teaching** and Dedication to Student Success<sup>1</sup>
- 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 Success<sup>1</sup>
- 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”
- 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

## Research Group ---

### Highlights

- Ph.D. Students Advised to completion: 9
- 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 **Marisol Contreras**, 2017 – (*expected 2023, co-advised with Syed Mubeen*)
- Beiming Tang**, 2017 – (*expected 2023, co-advised with Gregory Carmichael*)
- Saeideh Mohammadi**, 2022 – (*expected 2026*)
- Former **Megan Christiansen**, 2022 (*now postdoctoral research scholar in the Atmospheric and Environmental Research Lab of Jun Wang, University of Iowa*)
- Dissertation: Observation, Modeling, and Analysis of Air Quality at the Urban Regional Interface

**Nathan Janechek**, 2018 (*now System/Dataflow Analyst with IBSS, International Business Sales and Services Corporation, working on NOAA Forecast and Data Assimilation Products*)

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*)

Dissertation: Understanding Biosphere and Anthropogenic CO<sub>2</sub> 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 CO<sub>2</sub> Surface Fluxes by Data Assimilation of Anthropogenic and Biogenic Tracers

### **Ph.D. Student Awards**

2022 **Beiming Tang**, Ballard and Seashore Dissertation Fellowship, University of Iowa Graduate College (Fall 2022)

2022 **Marisol Contreras**, Ballard and Seashore Dissertation Fellowship, University of Iowa Graduate College (Fall 2022)

2022 **Megan Christiansen**, Best Poster Award, CGRER Category, University of Iowa College of Engineering Research Open House

- 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**, **Fulbright Fellowship for Study in Germany** (with Petra Zapp, Jülich, Institute for Energy and Climate Research)
- 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 Janecek**, 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**, 2<sup>nd</sup> 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 *Adjunct Assistant Professor, Graduate school of Environmental Public Health, Seoul National University*

**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 none

### Non-Thesis M.S. Students Advised

Former **Austin Doak** (2022, now Associate Process Automation Engineer, Experitex Inc.)

**Kelsey (Counter)-Petrich** (2011, now at Principle Asset Management)

**Adam Beranek-Collins** (2010)

### 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 Benjamin McMillan (2022, 2023)  
Carlos Gutierrez (2023)

Chandra Colby (2023)

Former Nathan Massa (2021, 2022)  
Mayra Narvaez Cardenas (2021)  
Jonah Marks (2020)  
Joe A'Hearn (2019)  
Jessica (Bella) Larson (2018)  
Brad Olsen (2018)  
Nathan Bryngelson (2017)  
Jeff Hamilton (2017)  
Matt Johnson (2016)  
Zach Behrendt  
Andrew Hesselink (2013)  
Benjamin Behrendt (2012)  
Patrick Saylor (2011)  
Taylor Malott (2013)  
Jameson Schoenfelder (2012)  
Nick Petrich (2012)  
Michael Toraason  
Andrew Hirsch (2009)  
Jay Raife (2009)  
Chris Miller (2008)  
Tyler Gunn (2009)

Olivia Dohm (2021, 2022)  
Austin Doak (2020)  
Ping He (2020)  
Kathleen Wade (2020)  
Bjorn Blomquist (2018)  
Fahad Alokla (2018)  
Kyle Wersinger (2020)  
John Mauk (2018)  
Nathan White (2016)  
Allaa Hassanein (2014)  
Caitlin Andersen (2013)  
Jessica Carlson (2012)  
Andrew Myers (2012)  
Kelsey (Counter)-Petrich (2010)  
Tim Rohlf (2011)  
Alex Bender (2016)  
Adam Beranek-Collins (2009)  
Kyle Lilly (2008)  
Zach Rodenburg (2009)  
Jessica Cowart (2008)

## 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

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### Highlights:

- 63 peer reviewed articles.
- Additional works include 1 peer-reviewed Health Effects Institute Report, and several technical reports, project websites, and datasets.
- 6000+ citations and google scholar H-index of 36 (as of Mar 2023)
- 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.

- [63] **Baker, K.R.**, Liljegren, J., Valin, L., Judd, L., Szykman, J., Millet, D., Czarnetzki, A., Whitehill, A., Murphy, B., and Stanier, C. Photochemical Model Representation of Ozone and Precursors During the 2017 Lake Michigan Ozone Study (LMOS). *Atmospheric Environment*, <https://doi.org/10.1016/j.atmosenv.2022.119465>, 2022.
- [62] Jensen, M.G., O'Shaughnessy, P.T., Shaffer, M., Yu, S., Choi, Y.Y., Christiansen, M., Stanier, C.O., Hartley, M., Bibby, K., Myung, N.V., **Cwiertny, D.M.** Simple Fabrication of an Electrospun Polystyrene Microfiber Filter that Meets N95 FFR Filtration and Breathability Standards. *Journal of Applied Polymer Science*, <https://onlinelibrary.wiley.com/doi/10.1002/app.53406>, 2022.
- [61] **Abdi-Oskouei, M.**, Roozitalab, B., Stanier, C.O., Christiansen, M., Pfister, G., Pierce, R.B., McDonald, B., Adelman, Z., Janssen, M., Dickens, A., and Carmichael, G.R. The Impact of Volatile Chemical Products, Other VOCs, and NO<sub>x</sub> on Peak Ozone in the Lake Michigan Region. *Journal of Geophysical Research – Atmospheres*, <http://dx.doi.org/10.1029/2022JD037042>, 2022.

- [60] **Doak, A., Stanier, C.O.,** Anthony, J., Udaykumar, H.S. Can heat-pumps provide routes to decarbonization of building thermal control in the US Midwest? *Energy Science & Engineering*, <https://onlinelibrary.wiley.com/doi/10.1002/ese3.1159>, 2022.
- [59] **Peters, T., Rabbidoux, D., Stanier, C.O.,** Anthony, T.R. Assessment of University Classroom Ventilation during the COVID-19 Pandemic. *Journal of Occupational and Environmental Hygiene*, <https://doi.org/10.1080/15459624.2022.2053142>, 2022.
- [58] **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. *Journal of Atmospheric Sciences*, <https://doi.org/10.1175/JAS-D-20-0297.1>, 2022.
- [57] **Cleary, P.A., Dickens, A., McIlquham, M.,** Sanchez, M., Geib, K., Hedberg, C., Hupy, J., Watson, M.W., Fuoco, M., Olson, E.R., Pierce, R.B., **Stanier, C.O.,** Long, R., Valin, L., Conley, S., Smith, M. "Impacts of lake breeze meteorology on ozone gradient observations along Lake Michigan shorelines in Wisconsin." *Atmospheric Environment*, 269, 118834, <https://doi.org/10.1016/j.atmosenv.2021.118834>, 2022.
- [56] **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. Overview of the Lake Michigan Ozone Study 2017. *Bulletin of the American Meteorological Society*, <https://doi.org/10.1175/BAMS-D-20-0061.1>, 2021.
- [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." *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. Fiegl. "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<sub>x</sub> 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, <http://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] Papanicalau, 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.
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### Book Chapters

Stanier, C.O. Climate change, global implications. Chapter in *Tending Iowa's Land: Pathways to a Sustainable Future*, edited book by Connie Mutel. 2022. University of Iowa Press.  
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### Submitted and In-Preparation Manuscripts

Tang, B., Saide, P.E., Gao, M., Carmichael, G.R., Stanier, C.O. WRF-Chem quantification of transport events and emissions sensitivity in Korea during KORUS-AQ. Resubmitted with revisions and under review at *Elementa*, Nov 2022.

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### 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

- [6] Abdi-Oskouei, M., Roozitalab, B., Stanier, C.O., Carmichael, G.R.. WRF-Chem model outputs to study the impact of Volatile Chemical Products, Other VOCs, and NO<sub>x</sub> on Peak Ozone in the Lake Michigan Region during June 2017, *Iowa Research Online*, doi: 10.25820/data.006193, <https://iro.uiowa.edu/esploro/outputs/dataset/9984304533602771> , 2022.
- [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.

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- [2] Sample code and documentation for Python in Chemical Engineering Process Controls and Thermodynamics. [https://github.com/charles-stan/learn\\_python\\_Stanier/](https://github.com/charles-stan/learn_python_Stanier/). Released Fall 2020.
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### Other Significant Technical Writings, Not Formally Peer-Reviewed (Preprints, Technical Reports, Dissertations, Magazine Articles, White Papers, etc.)

- [16] Christiansen, M., Stanier, C.O., Pierce, R.B., Hughes, D.D., Stone, E.A., and Elzey, S. Size Resolved Aerosol Characterization and In-field Comparative Evaluation of TSI 1 nm SMPS at Lake Michigan Coastal Station. EarthArXiv Preprint Server. <https://doi.org/10.31223/X5J65B>, 2023.
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- [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](http://www.ladco.org/reports/pm25/winter_nitrate/index.php), 2012.
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- [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

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### Highlights (within last 5 years):

- Invited presentations at conferences and workshops (past 5 years): Expert Workshop of the Global Silicones Council 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

(last 10 years; \* indicates a conference with archived or published program or abstract book)

- [79] Mutel, C., Schnoor, J., Stanier, C.O., and Thicke, F. Tending Iowa's Land Anthology Reading. Prairie Lights Bookstore, Feb 2023.
- [78] Stanier, C.O. "Decarb 2040 – Positioning Iowa as an energy exporter in the coming era of deep decarbonization," Presented at Workshop on Climate Change and Health. University of Iowa, Jan 2023.
- [77] Stanier, C.O. Panelist and presenter during Carbon Pipelines Across Iowa: A Panel Discussion. University of Iowa College of Law, Nov 2022.
- [76] Stanier, C.O. Panelist and presenter during Carbon Dioxide Pipelines: Do they have a public benefit? Iowa Ideas 2023 (virtual) Conference by the Cedar Rapids Gazette, <https://www.iowaideas.com/replays>, Oct 2022.
- [75] Stanier, C.O. "The air quality-energy-climate-water-agriculture nexus in the upper Midwest: Status, trends, and research needs," presented as part of the Climate / Atmospheric Science & Engineering (CASE) Colloquium series at the University of Iowa (virtual), <https://iti.uiowa.edu/articles/2022/02/charles-stanier-air-quality-energy-climate-water-agriculture-nexus-upper-midwest>, Feb 2022.
- [74] Stanier, C.O. "Secondary Aerosol Formation from Volatile Siloxanes," Presented (remotely) to Expert Workshop to Review Potential Mechanisms of Degradation of Siloxanes/Silanols in the Atmosphere, convened by the Global Silicones Council, Aug 2021.
- [73] Stanier, C.O., Abdi-Oskouei, M., Carmichael, G., Christiansen, M., Roozitalab, B. Update to the LADCO Ozone Technical Working Group, presented remotely to the LADCO Ozone Technical Working Group. Apr 2021.
- [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.

## Conference Presentations and Posters

(Presenting Author is Marked with an Asterisk; Stanier Group Members are Underlined; All conference entries listed for past 5 years; selected presentations listed for up to 10 years)

- [216] Christiansen, M.,\* Carmichael, G.R., Tang, B., Stanier, C.O., Blount, R. "Multi-pollutant high resolution exposure assessment in Vietnam, in support of tuberculosis research (A43A-06)," American Geophysical Union Fall Meeting, Chicago, IL, Dec 2022.
- [215] Tang, B.,\* Carmichael, G., Stanier, C.O., Saide, P., Gao, M. "WRF-Chem Quantification of Transport Events and Emissions Sensitivity in Korea during KORUS-AQ (A45B-09)," American Geophysical Union Fall Meeting, Chicago, IL, Dec 2022.
- [214] Tang, B.,\* Carmichael, G., Stanier, C.O., Gao, M. "1-km-resolution, multi-species (PM2.5, NO2, O3, black carbon) surface air pollution by machine learning data fusion: effects of surface observation sparsity, and inclusion of GEMS geostationary satellite fields over Korea. (A53A-07)," American Geophysical Union Fall Meeting, Chicago, IL, Dec 2022.
- [213] Mohammadi, S.,\* McMillan, B., Massa, N., Meepage, J., Welker, J., Stone, E.A., Marek, M., Brunet, C., Hornbuckle, K., Stanier, C. "Experimental characterization of cyclic siloxane oxidation with hydroxyl radicals, Oxidation Flow Reactor (OFR) results," American Geophysical Union Fall Meeting, Chicago, IL, Dec 2022.
- [212] McMillan, B.,\* Mohammadi, S., Stanier, C.O. "Utilizing a Permeation System with an Oxidation Flow Reactor," poster at the Annual Meeting of AIChE, Phoenix, AZ, Nov 2022.
- [211] Doak, A.,\* Stanier, C., Anthony, J., & Udaykumar, H. S. "Can heat-pumps provide routes to decarbonization of building thermal control in the US Midwest?" American Society of Mechanical Engineers 16th International Conference on Energy Sustainability. Philadelphia, PA, July 2022.
- [210] Tang, B.,\* Saide, P., Gao, M., Stanier, C.O., Carmichael, G. "Modeling analysis to advance understanding of air pollution in South Korea during KORUS-AQ," American Meteorological Society Meeting, virtual, Jan 2022.
- [209] Stanier, C.O.,\* Doak, A., Mubeen, S., Anthony, J., Udaykumar, H.S. "The status of decarbonization in Iowa, and how heat pumps, electrification, hydrogen, and/or biofuels will displace natural gas and propane," Iowa Energy Summit, Altoona, IA, Nov 2022.
- [208] Wang, J.,\* Stanier, C., Gomes, J. "Teaching Big Data Science and Analytical Tools to Undergraduate Students in the University of Iowa," Fall 2021 Meeting of AIChE, Boston MA, Nov 2021.
- [207] Christiansen, M.,\* Abdi-Oskouei, M., Stanier, C., Carmichael, Hughes, D.D., Stone, E.A. "WRF-Chem modeling of PM2.5 and AOD of Summertime Air Quality around Lake Michigan," *Meteorology and Climate - Modeling for Air Quality (MAC-MAQ)*. Davis CA, Sept 2021 (virtual).
- [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," 101<sup>st</sup> 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/ywilzoswuwydjoagnvu](https://eventpower-res.cloudinary.com/video/upload/v1/media/American%20Meteorological%20S/21ams/session_recording/Overview%20of%20Meteorology%20a/ywilzoswuwydjoagnvu)
- [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," *100<sup>th</sup> 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<sub>2.5</sub> 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<sub>2.5</sub> 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)." *130<sup>th</sup> 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)." *130<sup>th</sup> 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)." *20<sup>th</sup> Annual Jakobsen Memorial Conference*. Iowa City, IA, Mar 2018.
- [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.
- [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 *36<sup>th</sup> 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 *36<sup>th</sup> 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 *36<sup>th</sup> 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 *36<sup>th</sup> 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 *36<sup>th</sup> 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 *36<sup>th</sup> 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.
- [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.
- [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.
- [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 PM2.5 to Modeled Reductions in NOx and Ammonia." Presentation at the *30th Annual American Association for Aerosol Research Conference*. Minneapolis MN, Oct 2012.

## Leadership

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### Leadership Philosophy

Whether leading my research group, a committee or task force, my lab, or a classroom, I view my role as facilitating success for all those on the team. My goal is to enable the team to meet its objectives and for each member of the team to realize their individual aspirations. As a leader, it is my responsibility to maintain a positive, diverse, healthy, and welcoming environment for team members. End goals are important. But so is the path we travel – I try to do my part to make it empowering and fun.

My leadership style is founded on two core strengths: values and organization. In terms of values, I strive to build a shared sense of commitment toward a positive outcome. I try to do this by raising the team's "work process" (responsibilities, delegation, communication, mutual support, accountability) to a high level, and I try to ground the team's work in my values of fairness, hard work, empathy, and mutual respect. In terms of organization, I seek to manage time effectively, delegate, and use measurement metrics and deadlines. While value-based leadership and organization are the tools I'm most comfortable with, I also appreciate, use, and continue to develop many other critical aspects of academic leadership, including listening, problem solving,

relationship building, making (and communicating) hard decisions, persuasion, crisis management, budget management, and navigating institutional politics.

### **Leadership Positions**

- 2021-2022 PI of Jumpstart: Decarb 2040, positioning Iowa as an energy exporter in the coming era of deep decarbonization; a grant with six others Co-I's and collaborators.
- 2018-2019 Chair, Engineering Faculty Council (EFC). Led reorganization of the EFC to include a member from each department and to include teaching faculty in addition to tenure-track faculty.
- 2016-2021 One of the organizing PI's behind the Lake Michigan Ozone Study (2017), which ultimately became a collaborative study involving NASA, NOAA, USEPA, Universities, the Electric Power Research Institute, and several state governments.
- 2007-2018 Director of Graduate Studies, Department of Chemical and Biochemical Engineering
- 2014 Organizing Co-PI of a large EPA Center proposal, EPA ACE Air Climate & Energy (\$10M, three institutions). Scored highly / not funded.
- 1994-1999 Maintenance Supervisor, International Paper. Led a team of union hourly workers at a manufacturing facility.

### **Committees and Task Forces Chaired or Co-Chaired, past 5-years**

- 2022- Chair of Gomes DCG; Co-chair of CBE DEI Council.
- 2021 Chair of (i) Gomes DCG, (ii) CBE Task Force on Department Research & Name. Co-chair of (i) CBE DEI Council, (ii) CBE Website Committee.
- 2020 Chair of (i) Gomes DCG, (ii) CBE Task Force on Department Research & Name, (iii) EFC Task Force on Engineering Core Curriculum, and (iv) Faculty Perception of Administrator formative evaluation for Allan Guymon. Co-chair of CBE Website Committee.
- 2019 Chair of Engineering Faculty Council. Co-chair of CBE Website Committee.
- 2018 Chair of Engineering Faculty Council. Co-chair of CBE Website Committee. Chair of Trinity Episcopal Church Budget and Finance Committee.
- 2017 Chair of the Awards Committee of the American Association for Aerosol Research. Chair of Trinity Episcopal Church Budget and Finance Committee.

### **Leadership Training**

- 2020 - 2021 Fellow of the Big Ten Academic Leadership Program, a 40-hour professional development program taught over six full-day sessions. (virtual due to COVID-19 pandemic)

## Service

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### Current National Service

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

### Service as a Journal and Proposal Reviewer

During the past five years, I have reviewed for the following journals:

Atmospheric & Air Quality Research	Atmospheric Chemistry & Physics
Atmospheric Environment	Atmospheric Pollution Research
J. Occupational & Environmental Hygiene	Chemosphere
Environmental Policy	Environmental Research Letters
Environmental Science and Technology	Great Lakes Research
Environmental Science and Technology Letters	Journal of Aerosol Science
Environmental Science Atmospheres	Nature Sustainability
J. Air and Waste Management Association	Remote Sensing
J. Geophysical Research – Atmospheres	National Science Review

And the following funding agencies: National Science Foundation, Austrian Science Fund, Alfred P. Sloan Foundation

As well as the following publishers: CRC Press Taylor and Francis

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

- 2022 Conceived of and held the Hawkeye Decarbonization Summit. Co-chaired and co-organized the summit with Jerry Anthony (Urban and Regional Planning)
- 2013 - Center for Global and Regional Environmental Research, Executive Committee Member

### Current Service to the University of Iowa

- 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

- 2021 - Representative of the CBE Department to the College of Engineering DEI Council (shared role with Jennifer Fiegel)
- 2006 - Course Coordinator, Engineering Fundamentals -- Thermodynamics

### Current Service to the Department of Chemical and Biochemical Engineering

- 2020 - Chair, DCG for Joe Gomes
- 2018 - 2021 Co-chair, CBE DEI Council

### **Past<sup>3</sup> National and International Service**

- 2018 Session co-convener 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>
- 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**

- 2021 Member, Carbon Energy Workgroup, Advising the Governor's Carbon Sequestration Task Force (State of Iowa, Appointed by Governor Kim Reynolds) <https://www.iowaeda.com/carbon-sequestration/>
- 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.iuhr.uiowa.edu/clear4/>
- 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**

- 2022 Attended the Energy Data Hub meeting by Engie and Ohio State University, reporting back to the University of Iowa Office of Sustainability and Environment, and to UI Facilities. (Aug 2022).

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<sup>3</sup> Includes all service from past 5 years and notable service contributions prior to that

2020 - 2022 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/liv.2.526>

2020 - 2022 Member, 2030 UI Sustainability Goal Setting Task Force

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)

### **Past Service to the Department of Chemical and Biochemical Engineering**

2021-2022 Member, Search Committee for Space Physics P3 Chemical and Biochemical Engineering Faculty Search

2020 - 2021 Chair, CBE Task Force on Department Research & Name

2018 - 2021 Departmental Website Committee, co-chair

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.)

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

Chuck Okafor (in progress, Mechanical Engineering)

Teresa Feldman (in progress, Chemistry)

Jim Kacer (in progress, Occupational and Environmental Health)

Behrooz Roozitalab (2022)

Jacob Jahnke (2021, Civil and Environmental Engineering)

Gonzalo Ferrada (2022)

Sepehr Roudini (2019)

Dagen Hughes (2021, 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)**

Rabidoux, David (2021, Occupational and Environmental Health)  
Du, Lingyun (Esther) (2017)  
Lennartson, Elizabeth (2017)  
Grandquist, Josh (2015)  
Downard, Jared (2014, Chemistry)  
Yucuis, Rachel (2013, Environmental Engineering)

## **Diversity, Equity, and Inclusion**

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I am committed to the success of all students at the University of Iowa. Unequal, unjust, and unnecessary barriers stand in the way of the success of some students. This is particularly serious in the case of students from historically underrepresented groups.

I have developed a much better understanding of these barriers as I have accumulated life experience, engaged in DEI trainings and efforts within and without the workplace, and grappled with events around Black Lives Matter (BLM), the wave of xenophobia in the U.S., and the effects of those events on international students, on students from immigrant families, and on students of color. I continue to grow in my acknowledgement of the negative role that implicit bias and historical exclusionary practices play in higher education.

To work toward improving student outcomes and departmental climate, I have taken several steps. (1) Participation in extensive DEI trainings. (2) I am the co-chair of the Chemical and Biochemical Engineering DEI Council, where I am working on TA training and on providing DEI service opportunities for our graduate and undergraduate ambassador volunteers. (3) Recruiting and mentoring from historically underrepresented groups. Of the 12 students I have advised or co-advised to completion at the Ph.D. or M.S. level, 42% have been female. Of the 47 undergraduates and high school students that I have advised, 30% have been female. My current graduate group is 67% female. (4) I have improved my skills at listening to and supporting individual students. (5) In my classes, I have made many changes, such as clearly stating our commitment to a welcoming and equitable learning environment in the syllabus, in class, and in my mentoring of teaching assistants. Many best practices are incorporated into my courses, such as providing learning supports in multiple formats, being accommodating for students with unusual scheduling challenges, avoiding wordy exam problems that are unnecessarily difficult for non-native English readers, using anonymous discussion boards, having student advisory groups, having structured small group work that encourages peer connections, and recognizing and responding to test anxiety. (6) I have participated in training on the role of implicit bias in the hiring process, once for the search committee for the Engineering Dean in 2019, and once for the CBE Space Physics search committee in 2021. (7) I completed the training requirements to display the University of Iowa LGBTQ Safe Zone placard on my office door. This is a sign of inclusivity in our department and a

reminder to me about the need to continue to grow as an effective ally with members of our LGBTQ campus community.

In 2020, I was inspired by the passion of minority students as they shared some of the challenges they face, in response to the national dialogue about BLM. When my lab group members needed a safe, supportive space for discussion, we opened up research group meetings to talk about issues including the campus climate. We also talked about the need to make a caring space for all group members, as they struggled with the pandemic, equitable policing, and the frustratingly slow progress in the decades-long struggle to end systemic racism.

That “opening up” of the group meetings has continued, and we have institutionalized regular discussion of DEI by beginning each meeting with a “DEI or Safety Minute.” One preselected student is asked to develop a short presentation on an issue of lab safety or DEI. This rotates from student-to-student.

### **Selected DEI Activities & Accomplishments**

- 2021- Co-chair of Chemical and Biochemical Engineering DEI Council
- 2021- Representative of the CBE Department to the College of Engineering DEI Council (shared role with Jennifer Fiegel)
- 2007-2018 As Director of Graduate Studies, instituted many best practices for graduate education, such as universal peer and faculty mentoring of graduate students
- 2016 Represented the College at the National GEM Consortium Annual Conference, Miami Beach FL

## Selected DEI Training

- 2022 Cultivating Inclusive Communities (Online Course, 1-h, University of Iowa)
- 2020 - Current National Fellow of the Big Ten Academic Leadership Program, a 40-hour professional development program taught over six full-day sessions. DEI as a challenge and opportunity for academic leaders was a major component.
- 2021
- 2020 BUILD: Beyond The Numbers-Foundations For Diversity, Equity, & Inclusion
- 2019 BUILD: Creating Equitable Gateway Course Experiences
- 2017 LGTBQ Safe Zone: Phase II
- 2017 Safe Zone: Trans Awareness Workshop

## Courses Taught

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*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
  - Chemical Reaction Engineering / Separations Lab
- 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 F2022, primarily for 4<sup>th</sup> 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. 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 F2021, F2020, 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.

**Chemical Reaction Engineering / Separation Lab (CBE:3155).** F2022. Led a laboratory course with experiments and design scale-up for wiped-film evaporation, isothermal enzymatic kinetics in plug flow, isothermal CSTR reactors, distillation, and membrane gas separation.

**Green Chemical and Energy Technologies (CBE:5405).** S2023. 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 S2021, 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 S2022, 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.* Also taught in S2020, 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 2<sup>nd</sup> 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

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2021-2022 COVID-19 safety assessment services for the Nashville (TN) Symphony – In collaboration with Adam Schwaljie, Otolaryngology.

2021-2022 COVID-19 safety assessment services for the Louisville (KY) Symphony – In collaboration with Adam Schwaljie, Otolaryngology.

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

## Media Coverage of Stanier Group Activities

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### 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, in the article by Tammy Walker (Director of the Voxman School of Music), "Studying the Coronavirus to Help Teachers and Musicians Worldwide," in the June 2021 edition of the Music Educators Journal; this is the Journal of the National Association for Music Education (NAfME), DOI: 10.1177/00274321211021815.

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](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

### 2023

Jordan, E., and Mónica Cordero (2023, Feb 16) Despite national goals, agricultural greenhouse gases grow unchecked in many Midwest states. Retrieved from <https://www.thegazette.com/agriculture/despite-national-goals-agricultural-greenhouse-gases-grow-unchecked-in-many-midwest-states/>

### 2022

Morozov, A. (2022, Nov) From the Front Row - Student Podcast of the University of Iowa, College of Public Health. Climate Change Ep. 2: What can we do to fight climate change? <https://podcasts.apple.com/us/podcast/climate-change-ep-2-what-can-we-do-to-fight-climate-change/id1365191930?i=1000583333452>

Tran, L. (2022, Jan 6) Breeze Boost: What's the connection between breezy Lake Michigan days and high ozone levels? Great Lakes Now. Retrieved from <https://www.greatlakesnow.org/2022/01/lake-michigan-ozone-levels/>

Jordan, E. (2022, Oct 14) How much 'net' CO<sub>2</sub> would pipelines remove? Cedar Rapids Gazette. Retrieved from <https://www.thegazette.com/energy/how-much-net-co2-would-pipelines-remove/>

### 2021

Jordan, E. (2021, Dec 13) Researchers say carbon dioxide could be stored underground in Iowa. The Gazette. Retrieved from <https://www.thegazette.com/environment-nature/researchers-say-carbon-dioxide-could-be-stored-underground-in-iowa/>

Keicher, N. (2021, Nov 9) UI professor looks toward a carbon-free Iowa. Daily Iowan. Retrieved from <https://dailyiowan.com/2021/11/09/university-of-iowa-professor-looks-toward-a-carbon-free-iowa/>

Press Release from the Office of the Governor of Iowa (2021, Jul 30) Gov. Reynolds announces members of Carbon Sequestration Task Force Working Groups. <https://governor.iowa.gov/press-release/gov-reynolds%20announces-members-of%20carbon-sequestration-task-force-working-groups%20>

## 2020

Culbertson, G. (2020, Aug 24) Oboists, otolaryngologists, and engineers: School of Music's interdisciplinary research to ensure Voxman Music Building safety. University of Iowa news article. Retrieved from <https://clas.uiowa.edu/news/oboists-otolaryngologists-and-engineers-school-musics-interdisciplinary-research-ensure-voxman>

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/>