

Marina E. Vance

Assistant Professor · Mechanical Engineering · Environmental Engineering (courtesy)
University of Colorado Boulder
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EDUCATION

- 2008 – 2012 **Ph.D. Virginia Tech**, Civil and Environmental Engineering.
“Assessing the potential for human exposure to emissions from silver nanotechnology consumer products”. Advisor: Linsey Marr
- 2007 – 2008 **M.S. Universidade Federal de Santa Catarina** (UFSC, Brazil), Environ. Engineering.
“Indoor air quality in hospital environments: chemical and microbiological parameters”.
Advisors: Henrique M. Lisboa and Vetúria L. Oliveira
- 1999 – 2004 **B.S. Universidade Federal de Santa Catarina**, Sanitation and Environmental Engineering.
“Odor evaluation in landfills and certification of a CEN jury for olfactometry”.
Advisors: Thierry Pagé and Henrique M. Lisboa

ACADEMIC APPOINTMENTS

- 2016 - pres **Assistant Professor**, Department of Mechanical Engineering, Univ of Colorado Boulder.
- 2014 – 2016 **Research Scientist**, Institute for Critical Science and Applied Technology, Virginia Tech.
- 2013 – 2014 **Postdoctoral Associate**, Institute for Critical Science and Applied Technology, V Tech.
- 2015 – 2016 **Deputy Director**, Virginia Tech National Center for Earth and Environmental Nanotechnology Infrastructure ([NanoEarth](#)), a node of the National Nanotechnology Coordinated Infrastructure (NNCI).
- 2013 – 2016 **Associate Director**, Virginia Tech Center for Sustainable Nanotechnology ([VTSuN](#)), funded by the VT Institute for Critical Science and Applied Technology for research and by the VT Graduate School.
- 2008 – 2012 **PhD Graduate Research Assistant**, Civil and Environmental Engineering, Virginia Tech.
- 2007 – 2008 **MS Graduate Research Assistant**, Environmental Engineering, Universidade Federal de Santa Catarina (UFSC, Brazil).
- 2001 – 2002 **Undergraduate Research Assistant**, Environmental Engineering, UFSC (Brazil).

HONORS

- 2019 McLagan Family Faculty Fellow, Dept of Mechanical Engineering, CU Boulder (2019 – 2022).
- 2019 Best of 2019 Paper: “Overview of HOMEChem: House Observations of Microbial and Environmental Chemistry”, ESPI, 2019
- 2018 Outstanding Young Alumni, Via Department of Civil and Environmental Engineering, Virginia Tech.
- 2018 Most accessed and cited paper: “Nanotechnology in the real world: Redeveloping the nanomaterial consumer products inventory” Beilstein Journal of Nanotechnology (2015 – 2018).
- 2017 Travel Award Winner. 1st Pan-American Congress of Nanotechnology.
- 2017 Top 10 paper: “Potentially Aerosolized Nanoparticles in road dust in Shanghai: identification, distribution and environmental implications” (Front cover paper). Environmental Science: Nano (Royal Society of Chemistry).
- 2016 US EPA Scientific and Technological Achievement Award (STAA), Level III.
- 2015 Michigan University NextProf Engineering Workshop Selected Attendee.
- 2015 Scholar of the Week. Virginia Tech Office of the Vice President for Research.
- 2013 Poster competition winner. 2nd Gordon Research Conference in Environmental Nanotechnology.
- 2013 Carl Storm Underrepresented Minority Fellowship. Gordon Research Conference in Environ. Nanotechnology.
- 2012 Academic Excellence and Leadership Honor Society of Graduate Students.
- 2012 Via Academic Prep Fellowship, VT Department of Civil and Environmental Engineering.
- 2011 Travel Award Winner. 30th AAAR Annual Conference.
- 2011 Interdisciplinary Research Honor Society, Founding Member.
- 2010 Poster Competition Winner. 29th AAAR Annual Conference.
- 2006 Volunteer of the Year. Broadview Green Bay, WI YMCA.
- 2003 Outstanding Undergraduate Student Researcher. Universidade Federal de Santa Catarina, Brazil.

RESEARCH AND TEACHING INTERESTS

Quantitative and qualitative characterization of human exposure to emerging environmental contaminants from everyday activities, especially aerosols.

PUBLICATIONS

(Vance group member, *corresponding)

Publication Metrics

[Google Scholar](#) h-index: 17

ORCID: 0000-0003-0940-0353

[Web of Science](#) h-index: 13

(Maiden name: **Marina E Quadros**)

Manuscripts Submitted and In Preparation

1. Boedicker, E, E Emerson, G McMeeking, S Patel, ME Vance, DK Farmer*. "Fates and spatial variations of submicron indoor particles during HOMEChem cooking events". Submitted and in review.
2. Patel, S*, D Rim, S Sankhyan, J Vanhanen, ME Vance*. "Dynamics Modeling and Estimation of Emission Rates sub-500 nm Particles During the HOMEChem Study." Submitted and in review.
3. Sankhyan, S, S Patel, ME Vance*. "Indoor black and brown carbon from cooking activities and outdoor penetration: Insights from the HOMEChem study." In prep.
4. Patel, S, S Sankhyan, A Carrasco, K Zabinski, ME Vance*. "Modeling particle formation and evolution during a 3D printer operation." In prep.

Peer-Reviewed Journal Publications (37 in total, 18 after joining CU Boulder)

Accepted and In Press

37. Hayes, A, J Osio-Norgaard, S Miller, M Vance*, G Whiting*. "Influence of Powder Type on Aerosol Emissions in Powder-Binder Jetting with Emphasis on Lunar Regolith for In-Situ Space Applications." *Environmental Science & Technology Engineering*. 2020, In Press.
doi.org/10.1021/acsestengg.0c00045
36. Tian, Y*, C Arata, E Boedicker, DM Lunderberg, S Patel, S Sankhyan, K Kristensen, PK Misztal, DK Farmer, ME Vance, A Novoselac, WW Nazaroff, AH Goldstein. "Indoor Emissions of Total and Fluorescent Supermicron Particles during HOMEChem." *Indoor Air*. 2020, In Press.
doi.org/10.1111/ina.12731
35. Brown, W*, Day, D, Stark, H, Pagonis, D, Krechmer, J, Liu, X, Price, D, Katz, E, DeCarlo, PF, Masoud, C, Wang, D, Hildebrandt Ruiz, L, Arata, C, Lunderberg, D, Goldstein, A, Farmer, DK, Vance, ME, Jimenez, JL*. "Real-time organic aerosol chemical speciation in the indoor environment using extractive electrospray ionization mass spectrometry." *Indoor Air*. 2020, In Press.
doi.org/10.1111/ina.12721

Published in 2020

34. Wang, C, B Bottorff, E Reidy, C Rosales, D Collins, A Novoselac, DK Farmer, ME Vance, P Stevens, J Abbatt*. "Cooking, bleach cleaning and air conditioning strongly impact levels of HONO in a house." *Environmental Science & Technology*. 2020, 54(21): 13488-13497.
doi.org/10.1021/acs.est.0c05356
33. Ault, AP*, VH Grassian*, N Carslaw, DB Collins, H Destailats, DJ Donaldson, DK Farmer, JL Jimenez, VF McNeill, GC Morrison, RE O'Brien, M Shiraiwa, ME Vance, JR Wells, W Xiong. "Indoor Surface Chemistry: Developing a Molecular Picture of Reactions on Indoor Interfaces." *Chem*. 2020, 6(12): 3203-3218. doi.org/10.1016/j.chempr.2020.08.023
32. Or, VW, M Wade, S Patel, MR Alves, D Kim, S Schwab, H Przelomski, R O'Brien, D Rim, RL Corsi, ME Vance, DK Farmer, VH Grassian* "Glass Surface Evolution Following Gas Adsorption and Particle Deposition from Indoor Cooking Events as Probed by Microspectroscopic Imaging and Characterization." *Environmental Science: Processes and Impacts*. 2020, 22: 1698-1709.
doi.org/10.1039/D0EM00156B
31. Patel, S, S Sankhyan, EK Boedicker, PF DeCarlo, DK Farmer, AH Goldstein, EF Katz, WW Nazaroff, Y Tian, J Vanhanen, ME Vance* "Indoor aerosol emissions during the HOMEChem study: sources, evolution, and estimated exposure." *Environmental Science & Technology*. 2020, 54(12): 7107-7116. doi.org/10.1021/acs.est.0c00740

30. Lunderberg, DM, K Kristensen, Y Tian, C Arata, PK Misztal, Y Liu, N Kreisberg, EF Katz, PF DeCarlo, S Patel, ME Vance, WW Nazaroff, AH Goldstein* "Surface emissions modulate indoor SVOC concentrations through volatility-dependent partitioning." *Environmental Science & Technology*. 2020, 54(11): 6751-6760. doi.org/10.1021/acs.est.0c00966
29. Toth, S*, M Hannigan, M Vance, ME, M Deceglie "Predicting photovoltaic soiling from air quality measurements." *IEEE Journal of Photovoltaics*. 2020, 10(4): 1142-1147. doi.org/10.1109/JPHOTOV.2020.2983990
28. Mattila, J, P Lakey, M Shiraiwa, C Wang, J Abbatt, C Arata, AH Goldstein, L Ampollini, E Katz, P DeCarlo, S Zhou, TF Kahan, F Cardoso Saldaña, L Hildebrandt Ruiz, A Abeleira, E Boedicker, ME Vance, DK Farmer* "Multiphase chemistry controls inorganic chlorinated and nitrogenated compounds in indoor air during bleach cleaning." *Environmental Science & Technology*. 2020, 54(3): 1730-1739. doi.org/10.1021/acs.est.9b05767
27. Wang, C, DB Collins, C Arata, AH Goldstein, JM Mattila, DK Farmer, A Novoselac, ME Vance, WW Nazaroff, JPD Abbatt* "Surface reservoirs dominate dynamic gas-surface partitioning of many indoor air constituents." *Science Advances*. 2020, 6(8): eaay8973. Online cover. doi.org/10.1126/sciadv.aay8973
26. Geitner, NK, CO Hendren, G Cornelis, R Kaegi, JR Lead, GV Lowry, I Lynch, B Nowack, E Petersen, E Bernhardt, S Brown, W Chen, C Garidel-Thoron, J Hanson, SL Harper, K Jones, F Von der Kammer, A Kennedy, J Kidd, CW Matson, C. Metcalf, JA Pedersen, WJGM. Peijnenburg, JTK Quik, SM Rodrigues, J Rose, P Sayre, M Simonin, C Svendsen, RL Tanguay, N Tufenkji, T van Teunenbroek, G Thies, Y Tian, J Rice, A Turner, J Liu, J Unrine, ME Vance, JC White, MR Wiesner* "Harmonizing Across Environmental Nanomaterial Testing Media for Increased Comparability of Nanomaterial Datasets." *Environmental Science: Nano*. 2020, 7: 13-36. doi.org/10.1039/C9EN00448C

Published in 2019

25. Farmer, DK*, ME Vance, J Abbatt, A Abeleira, MR Alves, C Arata, E Boedicker, S Bourne, F Cardoso-Saldaña, R Corsi, PF DeCarlo, AH Goldstein, VH Grassian, L Hildebrandt Ruiz, JL Jimenez, TF Kahan, EF Katz, J Mattila, W Nazaroff, A Novoselac, VW Or, RE O'Brien, S Patel, S Sankhyan, PS Stevens, Y Tian, C Wang, S Zhou, Y Zhou (2019) "Overview of HOMEChem: House Observations of Microbial and Environmental Chemistry." *Environmental Science: Processes Impacts*. 21: 1280-1300. doi.org/10.1039/C9EM00228F Part of ESPI Recent HOT Articles; Part of ESPI Best Papers 2019.
24. Garcia, EB, C Alms, AW Hinman, C Kelly, A Smith, ME Vance, J Loncarek, LC Marr, D Cimini* "Single-cell analysis reveals that silver nanoparticle exposure induces cell division defects in non-transformed human epithelial cells." *International Journal of Environmental Research and Public Health*. 2019, 16(11): 2061. doi.org/10.3390/ijerph16112061

Published in 2018

23. Adawi, HI, MA Newbold, J Reed, ME Vance, I Feitshans, LR Bickford, NA Lewinski* "Nano-Enabled Personal Care Products: Current Developments in Consumer Safety." *NanoImpact*. 2018, 11: 170 - 179. doi.org/10.1016/j.impact.2018.08.002

Published in 2017

22. Vance, ME*, V Pegues, W Leng, S VanMonfrans, LC Marr "Aerosol emissions from fuse-deposition modeling 3D printers in a chamber and in real indoor environments." *Environmental Science & Technology*. 2017, 51 (17): 9516-9523. doi.org/10.1021/acs.est.7b01546
21. Pourzahedi, L, ME Vance, MJ Eckelman* "Life Cycle Assessment and Release Studies for 15 Nanosilver-enabled Consumer Products: Investigating Hotspots and Patterns of Contribution." *Environmental Science & Technology*. 2017, 51 (12): 7148-7158. doi.org/10.1021/acs.est.6b05923
20. Dale, JG*, SS Cox, ME Vance, LC Marr, M Hochella "Transformation of cerium oxide nanoparticles from a diesel fuel additive during combustion in a diesel engine." *Environmental Science & Technology*. 2017, 51 (4): 1973-1980. doi.org/10.1021/acs.est.6b03173

Before joining CU Boulder:

19. Yang, Y, ME Vance, F Tou, A Tiwari, M Hochella* "Potentially Aerosolized Nanoparticles in road dust in Shanghai: identification, distribution and environmental implications." *Environmental*

- Science: Nano*. 2016, 534 (3): 534-544 doi.org/10.1039/c6en00056h Front Cover; Part of Top-10 most read papers in 2016.
18. Baalousha, M*, Y Yang*, ME Vance, B Coleman, J Xu, J Blaszczyk, S McNeal, M Steele, E Bernhardt, MF Hochella "Outdoor urban nanomaterials: The emergence of a new, integrated, and critical field of study." *Science of the Total Environment*. 2016, 557: 740-753. doi.org/10.1016/j.scitotenv.2016.03.132
 17. Vance, ME*, E Vejerano, T Kuiken, S McGinnis, M Hochella, M Hull "Nanotechnology in the real world: Redeveloping the nanomaterial consumer products inventory." *Beilstein Journal of Nanotechnology*. 2015, 6: 1769-1780. doi.org/10.3762/bjnano.6.181 Most accessed paper per year 2015-2018; Most cited paper 2015-2019.
 16. Tolve, NS*, AB Stefaniak, ME Vance, K Rogers, S Mwilu, RF LeBouf, D Schwegler-Berry, R Willis, TA Thomas, LC Marr "Characterization of silver nanoparticles in consumer products used by or near children or found in the home to predict children's potential exposure." *International Journal of Hygiene and Environmental Health*. 2015, 218(3): 345-357. doi.org/10.1016/j.ijheh.2015.02.002
 15. Vance, ME, LC Marr*. "Exposure to airborne engineered nanoparticles in the indoor environment." *Atmospheric Environment*. 2015, 106: 503-509. doi.org/10.1016/j.atmosenv.2014.12.056
 14. Quadros, ME*, R Pierson IV, N Tolve, R Willis, K Rogers, T Thomas, LC Marr "Release of silver from nanotechnology-based consumer products for children." *Environmental Science & Technology*. 2013, 47(15): 8894-8901. doi.org/10.1021/es4015844
 13. Shores, CA, ME Klappmeyer, ME Quadros, LC Marr* "Sources and transport of black carbon at the California-Mexico border." *Atmospheric Environment*. 2013, 70: 490-499. doi.org/10.1016/j.atmosenv.2012.04.031
 12. Quadros, ME, LC Marr* "Silver nanoparticles and total aerosols emitted by nanotechnology-related consumer spray products." *Environmental Science & Technology*. 2011, 45(24): 10713-10719. doi.org/10.1021/es202770m
 11. Quadros, ME, LC Marr* "Environmental and human health risks of aerosolized silver nanoparticles." *Journal of the Air & Waste Management Association*. 2010, 60(7): 770-781. doi.org/10.3155/1047-3289.60.7.770
 10. Carmo Junior, GN, P Belli Filho, HM Lisboa, WN Schirmer*, ME Quadros "Odor assessment tools and odor emissions in industrial processes." *Acta Scientiarum Technology*. 2010, 32(3): 287-293. doi.org/10.4025/actascitechnol.v32i3.4778
 9. Schirmer, WN* and ME Quadros "Compostos orgânicos voláteis biogênicos emitidos a partir de vegetação e seu papel no ozônio troposférico urbano" (Biogenic volatile organic compounds from vegetation and their role in the urban tropospheric ozone). *Revista da Sociedade Brasileira de Arborização Urbana*. 2010, 5 (1): 25-42. doi.org/10.5380/revsbau.v5i1.66235
 8. Quadros, ME*, HM Lisboa, P Belli Filho "Efficiency evaluation of gas treatment equipment in terms of odor removal using dynamic olfactometry." *Water Practice & Technology*. 2009, 2(4): 1-6. doi.org/10.2166/wpt.2009.031
 7. Quadros, ME*, HM Lisboa, et al. "Qualidade do ar interno em ambientes hospitalares" (Indoor air quality in hospitals). *Revista Tecnologia*. 2009, 30(1): 32-52.
 6. Quadros, ME*, HM Lisboa, et al. "Qualidade do ar em ambientes internos hospitalares: estudo de caso e análise crítica dos padrões atuais" (Indoor air quality in hospitals: a case study and a critical review of the current standards). *Revista Engenharia Sanitária e Ambiental*. 2009, 14(3): 431-437. doi.org/10.1590/S1413-41522009000300017
 5. Quadros, ME*, WN Schirmer, HM Lisboa "A olfatométrica como ferramenta na verificação da eficácia de neutralizador de odor industrial" (Olfactometry as a tool for the efficiency verification of industrial odor neutralizer). *Ambiência*. 2008, 4(3): 367-382.
 4. Quadros, ME* and WN Schirmer "O uso da fotocatalise para a desinfecção e desodorização do ar interno" (Photocatalysis and its uses for indoor air deodorization and disinfection). *Ambiência*. 2008, 4(2): 309-325.
 3. Schirmer, WN*, ME Quadros, HM Lisboa et al. "Avaliação da força de retenção de compostos orgânicos (COV) em nanoestruturas de carbono 'cup stacked'" (Retention of air-phase VOCs in cupstacked carbon nanostructures). *Tecno-lógica*. 2008, 12(2): 31-36.

2. Schirmer, WN*, ME Quadros, HM Lisboa et al. "Análises olfatométricas para determinação das características do odor no manguezal do Itacuribi, município de Florianópolis, Santa Catarina" (Odor characterization of a wetland area in Florianópolis, Brazil through olfactometric analyses). *Revista Brasileira de Ciências Ambientais*. 2008, 2(1): 57-72. doi.org/10.18316/128
1. Schirmer, WN*, ME Quadros, HM Lisboa et al. "Características, natureza e métodos de amostragem/ análise de gases odorantes emitidos em processos industriais: Caso das lagoas de tratamento de efluentes" (Characteristics, nature and sampling/analysis methods for odorous gases from industrial processes: A case study on petrochemical wastewater treatment ponds). *Revista Brasileira de Ciências Ambientais*. 2007, 1(1): 35-52. doi.org/10.18316/168

Book chapters (4)

1. Kuiken, T*, ME Quadros, S McGinnis, MS Hull "Public's understanding, perceptions, and acceptance of nanotechnology through the lens of consumer products". In: *Nanoengineering: Global Approaches to Health and Safety Issues*, 2015, 1 ed.; Dolez, P., Ed. Elsevier: Oxford; pp 151-171. ISBN 0444627456, 9780444627452
2. Hull, MS*, ME Quadros, R Born, J Provo, VK Lohani, RL Mahajan "Sustainable nanotechnology: A regional perspective". In: *Nanotechnology Environmental Health and Safety: Risks, Regulation, and Management*, 2014, 2 ed.; M Hull, D Bowman. Eds. Elsevier: Oxford, 2014; pp 395 - 426. doi.org/10.1016/B978-1-4557-3188-6.00016-5
3. Quadros, ME, HM Lisboa "Qualidade do ar interno" (Indoor Air Quality) and "Metodologias olfatométricas para avaliação do impacto odorante" (Olfactometric methodology for odor impact assessment). In: *Controle da Poluição Atmosférica* (Atmospheric Pollution Control) 2010, Online textbook. ISBN 978-85-913483-0-5
4. Quadros, ME, D Paludo, FSP Sant'Anna "Gestão Ambiental: o reúso de águas na indústria hoteleira" (Environmental Management: Water Reuse in the Hotel Industry). In: *Gestão Ambiental Urbana e Industrial* (Urban and Industrial Environmental Management) 2003, CLC Frankenberg, MT Raya-Rodrigues, M Cantelli. Porto Alegre, EDIPUCRS, in Portuguese.

Journal Editorials, Reports, Magazine Articles, other non-refereed publications (5)

1. Farmer, DF, ME Vance "Indoor air: sources, chemistry and health effects". Special issue editorial. *Environ. Sci.: Processes & Impacts*. 2019, 21, 1227-1228. doi.org/10.1039/c9em90035g
2. Vance, ME, KC Scott "Consumer Exposure Studies I: General Products Consumer Exposure Studies I: General Products. In: Consumer Product Safety Commission (CPSC), National Nanotechnology Initiative (NNI). *Workshop Report: Quantifying Exposure to Engineered Nanomaterials (QEEN) from Manufactured Products*. 2016, Arlington, VA. Available at: http://www.nano.gov/sites/default/files/pub_resource/qeen_workshop_report_2016.pdf
3. Tolve, ST, R Willis, K Rogers, ME Quadros, LC Marr "A Preliminary Assessment of the Potential for Exposure to Silver Nanoparticles in Children's Consumer Products" (EPA and CPSC Interagency Agreement: EPA- IA-RW-61-92317001-0). *Final Report to the Consumer Product Safety Commission*. 2011, 168p.
4. Quadros, ME, LC Marr "Exposure Assessment of Silver Nanoparticles in Select Children's Consumer Products" (RFQ-RT-10-00249). *Final Project Report to the Environmental Protection Agency*. 2011, 118p.
5. Quadros, ME "Assessing Realistic Emissions of Airborne Nanomaterials from Consumer Products". *ICTAS Connection Newsletter*. 2011, (10): 6-7.

PRESENTATIONS

Invited Talks, Seminars, and Lectures (36 in total, 27 after joining CU Boulder)

- p.1 "Indoor aerosol dynamics during cooking and cleaning activities: Insights from the HOMEChem study". Invited talk, Atmospheric Chemical Mechanisms Conference. Virtual event. 16-Nov-2020.
- p.2 "Filtration and inhalation resistance behavior of respirators and masks". Invited talk, The Aerosol Society. Webinar. 30-Sep-2020.

- P.3 "Air quality in a home environment: Insights from the HOMEChem Study". Invited seminar, Department of Chemistry, College of Wooster. Webinar. 15-Sep-2020.
- P.4 "HOMEChem: House Observations of Microbial and Environmental Chemistry – Key results to date". Invited seminar, California Department of Toxic Substances Control. Webinar. 31-Aug-2020.
- P.5 "Filtration performance of masks, respirators, and alternative materials: Background and preliminary results". Presentation to the Collaborative of Air Quality Research (CAQR), Department of Mechanical Engineering, CU Boulder, 29-Jul-2020
- P.6 "Indoor aerosol dynamics during cooking and cleaning activities: Insights from the HOMEChem study". Invited seminar, NCAR. Boulder, CO. 23-Sep-2019. Recording: <https://youtu.be/YSIDXK-2jzc>
- P.7 "HOMEChem: a collaborative study on the chemistry of the home environment". Invited talk, AAAS Chemistry in Indoor Environments Symposium. Washington, DC. 19-Sep-2019. youtu.be/8ljPT3-krtg
- P.8 "HOMEChem: A study on the chemistry of a home environment". Invited talk, Public Congressional Briefing hosted by AAAS: "Safe to Breathe? New Discoveries About Indoor Air". Washington, DC. 18-Sep-2019. Recording: <https://youtu.be/LZyrDFvGZxw>
- P.9 "Early results from HOMEChem, a collaborative field campaign on indoor chemistry." Invited seminar, Energy Technologies Area Seminar, Lawrence Berkeley National Lab. Berkeley, CA. 20-May-2019
Recording: vimeo.com/340472368
- P.10 "Indoor air quality and chemistry in our home environments". Invited Talk. Café Scientifique, Denver, CO. 23-May-2019
- P.11 "Quantifying human exposure to everyday particulate matter: A study on emissions from 3D printers". Invited Seminar, Mechanical Engineering, University of Wisconsin Stout. Menomonie, WI. 26-Apr-2019
- P.12 "HOMEChem: A collaborative indoor chemistry study". Invited talk, AAAS Annual Meeting. Special Symposium: "Homes at the Center of Chemical Exposure: Uniting Chemists, Engineers, and Health Scientists". Washington, DC. 17-Feb-2019.
- P.13 "Investigating domestic indoor sources of air pollutants through the HOMEChem study". Invited talk, NSF Workshop "Evolutions in Urban Chemistry: Growing Influence of Non-Traditional Emission Sources". Boulder, CO. 16-Jan-2019.
- P.14 "Particulate matter emissions during HOMEChem". Invited talk, 2018 Chemistry of Indoor Environment Science Meeting. Boulder, CO. 26-Oct-2018.
- P.15 "Everyday indoor activities as sources of nanoscale particles and processes". Invited talk, Workshop: Workshop on the NanoChemistry of Indoor Environments (NanoCIE). New York, NY. 12-Jul-2018.
- P.16 "HOMEChem, a collaborative field study investigating the chemistry of indoor environments". Marina Vance and Delphine Farmer. HOMEChem Open house event to over 50 external visitors. Austin, TX. 22-Jun-2018.
- P.17 "Building a community through HOMEChem, a collaborative field study investigating the chemistry of indoor environments". Invited talk, Workshop: Molecular Insights into Chemical Reactions on Indoor Surfaces. Ann Arbor, MI. 8-May-2018.
- P.18 "Investigating incidental nanoparticles emissions from everyday activities: A study on 3D printers". Invited seminar, Virginia Tech Center for Sustainable Nanotechnology. Institute for Critical Technology and Applied Science. Virginia Tech. 19-Apr-2018.
- P.19 "Incidental nanoparticle emissions from everyday activities: A study on 3D printers". Seminar, Center for Environmental Nanoscience and Risk. Arnold School of Public Health. University of South Carolina. Simultaneously broadcast to Clemson University. 28-Feb-2018.

- P.20 “Investigating emissions of ultrafine aerosols from consumer products: A study on 3D printers”. Seminar, Analytical & Environmental Chemistry Division and Atmospheric Chemistry Program Seminar (Jointly sponsored by the Department of Chemistry and Biochemistry and CIRES). University of Colorado Boulder. 11-Sep-2017.
- P.21 “Experiências em qualidade do ar e nanotecnologia ambiental”. Seminar, Department of Environment Engineering, Universidade Federal de Santa Catarina, Florianópolis, Brazil. 10-Aug-2017.
- P.22 “Investigating emissions of ultrafine aerosols from everyday consumer products”. Seminar, Department of Chemistry, University of Denver. Denver, CO. 25-May-2017.
- P.23 “Oh, the places you – and air pollution – will go”. Keynote speech, Weld County High School Air Quality Research Symposium. Greeley, CO. 8-Mar-2017.
- P.24 “Understanding people’s exposure to ultrafine aerosols”. Seminar, Environmental Engineering Program. University of Colorado Boulder. 27-Jan-2017.
- P.25 “Nanotechnology: Causing or solving environmental problems?” Departmental seminar, department of Mechanical Engineering. University of Colorado Boulder. 13-Oct-2016.
- P.26 “Exposure to Aerosol Emissions from Desktop 3D Printers”. Invited presentation, AIHA-RMS/ASSE Fall Technical Conference. Arvada, CO. 21-Sep-2016
- P.27 “Quantifying people’s exposure to nanoscale pollutants”. Seminar to the Mechanical Engineering Strategic Advisory Board. University of Colorado Boulder. 10-Sep-2016.

Before joining CU Boulder:

- P.28 “Quantifying people’s everyday exposure to ultrafine atmospheric pollutants”. Departmental seminar, Department of Mechanical Engineering. University of Colorado Boulder. 25-Feb-2016.
- P.29 “Investigating people’s everyday exposure to ultrafine atmospheric pollutants”. Departmental seminar, Department of Civil, Environmental, and Construction Engineering. University of Central Florida. 18-Feb-2016.
- P.30 “Nanotechnology: The good, the bad, and the tiny”. TEDx Virginia Tech. 19-Nov-2015. Recording available at <https://youtu.be/Z8fWHZ9M2wA>
- P.31 “Microbe-mineral interactions and why we care about environmental nanotechnology”. Invited lecture to 26 high school students participating at Virginia Tech’s NanoCamp. 5-Aug-2015
- P.32 “Data visualization”. Invited seminar to the VTSuN Group, Virginia Tech. 6-Apr-2015
- P.33 “Potential exposure to nanomaterials from nanotechnology-enabled consumer products”. Invited seminar to the CDC NCEH/ATSDR Nanotechnology Interest Group. 5-Mar-2015
- P.34 “An inventory of nanotechnology in consumer products”. Invited lecture for Nanoscience and the Environment (NANO3124). Virginia Tech. 4-Mar-2015
- P.35 “Nanotechnology in consumer products”. Invited webinar for the National Nanotechnology Applications and Career Knowledge (NACK) network. 31-Oct-2014
Webinar recording available at: <http://goo.gl/Ft6xVT> Slides at: <http://goo.gl/HynbRZ>
- P.36 “Flujos de Emisiones, Carbón Negro, y Nanopartículas”. Invited Public Lecture, Universidad Tecnológica de Tijuana, Mexico. 3-Jun-2010

Conference Abstracts Submitted

([Vance group member](#), *presenter)

- P.37 [Martin, A*](#), [ME Vance](#). DIY Air Cleaning: A simplified method for measuring the clean air delivery rate of do-it-yourself portable air filters
- P.38 Kumar, AL*, T Stockman, S Miller, [S Patel](#), DW Toohey, [ME Vance](#), J Hertzberg. Aerosols in performance. Aerosols in Performance. American Physical Society Division of Fluid Dynamics meeting, Held Virtually, 2020. *Accepted for oral presentation*
- P.39 C Wang, Brandon Bottorff, Emily Reidy, Colleen Marciel F. Rosales, Douglas B. Collins, Atila Novoselac, Delphine K. Farmer, Marina E. Vance, Philip S. Stevens, Jonathan P.D. Abbatt.

Behavior of nitrous acid (HONO) and isocyanic acid (HNCO) in a test house. American Geophysical Union Fall Meeting, Held Virtually, 2020 *Submitted*

Conference Platform Presentations (37 in total, 23 after joining CU Boulder)

- P.1 Katz, EF, H Guo, P Campuzano-Jost, DA Day, WL Brown, E Boedicker, M Pothier, DM Lunderberg, K Patel, S Patel, L Hildebrandt Ruiz, ME Vance, DK Farmer, AH Goldstein, JL Jimenez, PF DeCarlo. Indoor source characterization and quantification of cooking organic aerosol contributes to more accurate ambient source apportionment with aerosol mass spectrometers. American Geophysical Union Fall Meeting, Held Virtually, 2020
- P.2 Hodshire, A, A Abeleira, L Ampollini, C Arata, J Mattila, MA Pothier, C Wang, J Abbatt, E Carter, P DeCarlo, AH Goldstein, WW Nazaroff, ME Vance, DK Farmer. Now we're cooking: How do activities in the home impact exposure? AGU Fall Meeting, Held Virtually, 2020
- P.3 Sankhyan, S., J Witterman, S Patel, ME Vance. Assessment of PM_{2.5} concentration and transport in indoor environments using low-cost sensors. Platform presentation, AAAR 38th Annual Conference, Held Virtually, 2020
- P.4 Patel, S., Sankhyan, S., Rim, Donghyun, Novoselac, A., Farmer, D.K., Vance, M.E. Modeling indoor aerosol dynamics during HOMEChem. Platform presentation, AAAR 38th Annual Conference, Held Virtually, 2020
- P.5 Patel, S.*, Vance, M.E. Release of aerosols from fuse-deposition modeling 3D printers and associated human exposure. Invited talk, Society of Toxicology 59th Annual Meeting. Special Workshop: "Society of Toxicology Toxicological, Exposure and Risk Assessment of Emissions from 3D Printers". Meeting Held Virtually, 2020
- P.6 Sankhyan, S.*, Vance, M.E. Indoor black and brown carbon from cooking activities. Platform presentation, Graduate Engineering Annual Research and Recruitment Symposium (GEARRS). Department of Mechanical Engineering, University of Colorado, Boulder, CO. 2020
- P.7 Sankhyan, S.*, Vance, M.E. Indoor black and brown carbon from cooking activities and outdoor penetration. Platform presentation, 9th Annual Young Scientist Symposium on Atmospheric Research. Fort Collins, CO. 2019
- P.8 Sankhyan, S.*, Patel, S., Farmer, D.K., Vance, M.E. Indoor Black and Brown Carbon from Cooking Activities and Outdoor Penetration. Platform presentation, AAAR 37th Annual Conference. Portland, OR. 2019
- P.9 Patel, S.*, Sankhyan, S., Tian, Y., Goldstein, A., Farmer, D.K., Vance, M.E. Insights on Aerosol Emissions during HOMEChem. Platform presentation, AAAR 37th Annual Conference. Portland, OR. 2019
- P.10 DeCarlo, P., Avery, A., Katz, E., Waring, M., Vance, M., Farmer, D.K. Outside-In and Other Sources of Aerosols in the Indoor Environment. Platform presentation, AAAR 37th Annual Conference. Portland, OR. 2019
- P.11 Boedicker, E.K., Farmer, D.K., Vance, M.E. Spatial Distribution of Indoor Aerosol during HOMEChem Cooking Events. Platform presentation, AAAR 37th Annual Conference. Portland, OR. 2019
- P.12 Gingrich, J., Patel, S., Graham, E., Boedicker, E.K., Farmer, D.K., Corsi, R., Vance, M.E. Evaluation of Low-Cost Particulate Matter Sensors in a Test House. Platform presentation, AAAR 37th Annual Conference. Portland, OR. 2019
- P.13 Vance, M.E., Patel, S., Sankhyan, S., Tian Y., Farmer, D.K., Goldstein, A. H., Vanhanen J. House Observations of Microbial and Environmental Chemistry (HOMEChem): Insights into Particulate Matter Concentrations and Exposure. Platform presentation, ISES-ISIAQ (International Societies of Exposure Science and Indoor Air Quality and Climate) Joint Conference. Kaunas, Lithuania. 2019
- P.14 Vance, M.E. "Estimating the release of - and exposure to - silver from nanotechnology-based consumer products for children". Invited talk, Society of Toxicology 58th Annual Meeting. Special

Workshop: "Risk Assessment of Consumer Products and Articles: Critical Considerations and Case Studies for Characterizing and Quantifying Consumer-Relevant Exposures to Chemicals and Nanomaterials". Baltimore, MD. 13-Mar-2019

- P.15 Farmer, D.K.*; Vance, M.E., et al., "The perils of housecleaning and other tales from the mop" Platform presentation, European Geosciences Union (EGU) General Assembly, Vienna, Austria. 2019
- P.16 Toth, S*, M Hannigan, ME Vance, M Deceglie. Investigating the use of low-cost particulate matter sensors to inform photovoltaic soiling. Platform presentation, Graduate Engineering Annual Research and Recruitment Symposium (GEARRS). Department of Mechanical Engineering, University of Colorado, Boulder, CO. 2019
- P.17 Tiwari, A.*; Vance, M.E. "Particulate Emissions from 3D Printing" Platform presentation, AIHA UMS Fall 2018 Professional Development Conference, Roseville, MN. 2018
- P.18 Toth, S*, M Hannigan, ME Vance, M Deceglie, L Micheli, M Muller. *Exploring the use of PM Sensors to Understand PV Soiling*. Platform presentation, NREL 2018 International PV Soiling Workshop, Golden, CO. 2018
- P.19 Toth, S*, M Hannigan, ME Vance, M Deceglie, L Micheli, MA Muller. *A preliminary exploration of the use of PM sensors to understand PV soiling*. Platform presentation, American Solar Energy Society (ASES) 2018 Conference, Boulder, CO. 2018
- P.20 Vance, M.E.*; Farmer, D.K., Novoselac, A., Corsi, R., Hildebrandt Ruiz, L., Abbatt, J., DeCarlo, P.F., Stevens, P., Kahan, T.F., Goldstein, A.H., Nazaroff, W.W., Jimenez, J.L., Ziemann, P.J, Knight, R., Dorrestein, P.C., *An overview and early results from the HOMEChem Indoor Air Chemistry Field Campaign*. Platform presentation, IndoorAir Conference, Philadelphia, PA. 2018
- P.21 Vance, M.E.*; Linden, Z., Beltran, I. Nanoparticle-surface interactions: *Implications for nanoscale dust deposition and resuspension*. Platform presentation, 1st Pan-American Congress of Nanotechnology (Pannano). Guarujá, Brazil. 2017
- P.22 Vance, M.E.*; Linden, Z., Pfothhauer, D., Hannigan, M. *Investigations into the Composition of Aerosols Emitted by 3D Printing Process*. Platform presentation, 36th Annual Conference of the American Association for Aerosol Research (AAAR), Raleigh, NC. 2017
- P.23 Vance, M.E.*; Pegues, V.; Leng, W.; Marr, L.C.; Van Montfrans, S. *Quantifying the exposure to aerosol emissions from desktop 3D printers*. Platform presentation, Association of Environmental Engineering & Science Professors (AEESP) Research and Education Conference, Ann Arbor, MI. 2017
- P.24 Hochella Jr., M.F.*; Yang, Y.; Vance, M.E.; Tiwari, A.J. *Nanoparticles in road dust from impervious urban surfaces: Distribution, identification, and environmental implications in a first study of its type*. Platform presentation, Geological Society of America Annual Meeting, Denver, CO. GSA Abstracts with Programs Vol. 48, No. 7. 2016

Before joining CU Boulder:

- P.25 Vance, M.E.*; Yang, Y.; Tiwari, A.J.; Tou, F.; Hochella, M.F. *Identification of potentially aerosolized nanoparticles in road dust from Shanghai*. Platform presentation, 251st ACS National Meeting, San Diego, CA. 2016
- P.26 Vance, M.E.*; Tolve, N. S.; Willis, R.; Rogers, K.; Thomas, T.A.; Marr, L.C. *Quantifying the release of silver from nanotechnology-based consumer products for children*. Platform presentation, Quantifying Exposure to Engineered Nanomaterials (QEEN) from Manufactured Products Workshop, Arlington, VA. 2015
- P.27 Vance, M.E.*; Pegues, V.; Page, J.; Prussin, A.J.; Marr, L.C. *Aerosol emissions from desktop 3D printers*. Platform presentation, Association of Environmental Engineering & Science Professors Research and Education Conference, New Haven, CT. 2015
- P.28 Vance, M.E.*; Hochella, M.F. *Nanotechnology in the real world: Redeveloping the nanotechnology-based consumer products inventory*. Platform presentation, CEINT Annual Meeting, Durham, NC. 2015

- P.29 Quadros, M. E.; Kuiken, T.*; McGinnis, S. P.; Hull, M. S.; Hochella, M. F. *Keeping track of nanotechnology in the real world: Consumer Products Inventory 2.0*. Platform presentation, 247th ACS National Meeting, Dallas, TX. 2014
- P.30 Quadros, M.E.*, Kuiken, T. McGinnis, S. *Reinventing the Inventory of Nanotechnology Consumer Products*. Platform presentation, 2nd Sustainable Nanotechnology Organization Conference, Santa Barbara, CA. 2013
- P.31 Quadros, M. E.*, Marr, L.C. *Aerosol emissions from silver nanotechnology consumer products*. Platform presentation, 30th Annual Conference of the American Association for Aerosol Research (AAAR), Orlando, FL. 2011
- P.32 Quadros, M. E.*, Marr, L.C. *Aerosol emissions from silver nanotechnology consumer products*. Platform presentation, 3rd International Conference on the Environmental Implications of Nanotechnology, Durham, NC. 2011
- P.33 Quadros, M. E.*, Marr, L.C. *Emission of airborne nanoparticles from silver nanotechnology consumer products*. Platform presentation, 2nd International Conference on the Environmental Implications of Nanotechnology, Los Angeles, CA. 2010
- P.34 Quadros, M.E., Belli Filho, P., Lisboa, H.M.* Efficiency evaluation of gas treatment equipment in terms of odor removal using dynamic olfactometry. Platform presentation, 3rd IWA Odour and VOCs Conference: Measurement, Regulation and Control Techniques, Barcelona. 2008
- P.35 Quadros, M.E.*, Schirmer, W.N.*, Miranda G.R.* *Minicurso: Mudanças Climáticas Globais, Créditos de Carbono e Energias Renováveis* (short course in World Climate Change, Carbon Credits, and Renewable Energy Sources). Platform presentation, 6^a Semana de Ensino, Pesquisa e Extensão - SEPEX, UFSC. 2007
- P.36 Quadros, M.E.*, Lisboa, H.M., Filho, P.B., Miranda, G.R., Schirmer, W.N. *Determinação da eficiência de lavador de gases para remoção de odores via avaliações físico-químicas e olfatométricas*. Platform presentation, 24^o Congresso Brasileiro de Engenharia Sanitária e Ambiental, Belo Horizonte, Brazil. 2007
- P.37 Quadros, M.E.*, Moura, T.F.F., Lisboa, H.M. *Análise de correlação entre o fluxo de odor e o fluxo de COV em uma instalação com processo de compostagem de bio-sólidos*. Platform presentation, 24^o Congresso Brasileiro de Engenharia Sanitária e Ambiental, Belo Horizonte, Brazil. 2007
- P.38 Quadros, M.E.*, Lisboa, H.M., Schirmer, W.N., Miranda, G.R. *Uso do metano como parâmetro indicador da concentração de odor emitida por aterros sanitários*. Platform presentation, IV Simpósio de Engenharia Ambiental, Ribeirão Preto, Brazil. 2004

Conference Posters (35 in total, 20 after joining CU Boulder)

- P.39 Sankhyan, S., Zabinski, K., Patel, S., Vance, M.E. Investigating aerosol emissions and their volatility from the use of different cooking oils. Poster presentation, AAAR 38th Annual Conference, Held Virtually, 2020
- P.40 Sankhyan, S., Teed, H., Patel, S., Vance, M.E. Investigating the filtration efficiencies of non-standard fabric filters. Poster presentation, AAAR 38th Annual Conference, Held Virtually, 2020
- P.41 Wittman, J, Sankhyan, S, Patel, S, Vance, ME. Using low-cost sensors to assess PM2.5 concentrations, pollutant transport, and air cleaning efficiency in home environments. Council on Undergraduate Research's Virtual Undergraduate Research Week. LinkedIn, 2020
- P.42 Toth, S, Hannigan, M., Vance, M., Deceglie, M. Predicting daily photovoltaic soiling from air quality measurements. Photovoltaic Reliability Workshop (PVRW). Lakewood, CO. 2020. **Second place, student poster competition.**
- P.43 Lunderberg, DM, K Kristensen, C Arata, Y Tian, PK Misztal, EF Katz, PF DeCarlo, S Patel, ME Vance, WW Nazaroff, AH Goldstein. Indoor abundances of airborne semi volatile organic compounds (SVOCs) are modulated by volatility-dependent partitioning processes. Berkeley Atmospheric Sciences Center (BASC) Symposium. Berkeley, CA. 2020

- P.44 Patel, S., Sankhyan, S., Vance, M.E. Insights on Particulate Matter Formation and Evolution during a 3D Printer Operation. AAAR 37th Annual Conference. Portland, OR. 2019
- P.45 Katz, E., DeCarlo P., Novoselac, A., Jimenez, J.L., Brown, W., O'Brien, R., Farmer, D.K., Vance, M.E. An Overview of Aerosol Sources and Chemistry from the HOMEChem Field Campaign. AAAR 37th Annual Conference. Portland, OR. 2019
- P.46 Lin, E., Vance, M.E., Farmer, D.K., Pollitt, K.G. Characterisation of SVOCs Derived from Indoor Cooking and Cleaning Activities. AAAR 37th Annual Conference. Portland, OR. 2019
- P.47 Sankhyan, S., Patel, S., Vance, M.E. Investigating Aerosol Emissions from Cooking Oils. AAAR 37th Annual Conference. Portland, OR. 2019
- P.48 Toth, S., Hannigan, M., Vance, M., Deceglie, M. Enhanced photovoltaic soiling in an urban environment. Proceedings of the 46th Photovoltaic Specialists Conference (PVSC). Chicago, IL. 2019
- P.49 Katz, E.*, Lunderberg, D., Tian, Y., Goldstein, A., Vance, M., Farmer, D., DeCarlo, P. HOMEChem (House Observations of Microbial and Environmental Chemistry) preliminary high-resolution aerosol mass spectrometry results from an indoor air field measurement campaign. Eastern Analytical Symposium. Princeton, NJ. 2018
- P.50 Sankhyan, S.*, Patel, S., Vance, M.E., Relationships *between indoor activities and light absorbing aerosol emissions*. 2018 Sloan CIE Science Meeting, Boulder, CO. 2018
- P.51 Bakker-Arkema, J., Vance, M. *Building a Community through Science Writing and Social Media*. 2018 Sloan CIE Science Meeting, Boulder, CO. 2018
- P.52 Gingrich, J., Patel, S., Graham, E., Shafer, J., Corsi, R., Vance, M. *Evaluation of low-cost air quality monitors during the HOMEChem campaign*. 2018 Sloan CIE Science Meeting, Boulder, CO. 2018
- P.53 Sankhyan, S.*, Patel, S., Vance, M.E., *Relationships between indoor and outdoor black and brown carbon emissions during HOMEChem study*. Research Week Symposium, Boulder, CO. 2018
- P.54 Alamri, F.*, Vance, M. *The Impacts of Urban Air Pollution and Rainfall on The Light Transmissivity of Solar Panel Coverings*. NREL 2018 International PV Soiling Workshop, Golden, CO. 2018
- P.55 Alamri, F.*, Vance, M. *Investigating the Impacts of Urban Air Pollution and Rainfall on The Light Transmissivity of Solar Panel Coverings*. Community Building Colorado-Style Conference, Boulder, CO. 2018
- P.56 Toth, S.*, Hannigan, M., Vance, M.E. Deceglie, M., Micheli, L., Muller, M. *Using Low-Cost Particulate Matter Sensors to Monitor Photovoltaic Panel Soiling*. 10th International Aerosol Conference, St. Louis, MO. 2018
- P.57 Sankhyan, S., Patel, S., Beltran, I., Vance, M.E.*. *Investigating Aerosol Emissions from Cooking Oils through a Controlled Chamber Experiment*. 10th International Aerosol Conference, St. Louis, MO. 2018
- P.58 Vance, M.E.*, Pegues, V., Van Montfrans, S., Tiwari, A.J., Marr, L.C. *Aerosol Emissions of 3d Printers in a Chamber Study and Real Indoor Environments*. 35th Annual Conference of the American Association for Aerosol Research (AAAR), Portland, OR. 2016

Before joining CU Boulder:

- P.59 Vance, M.E.*; Vikesland, P.J.; Michel, F.M.; Leng, W.; Hull, M.; Reynolds, W.; Murayama, M.; Marr, L.C.; Pruden, A.; Hochella, M.F. NNCI: *The Virginia Tech National Center for Earth and Environmental Nanotechnology Infrastructure, NCE²NI*. NSF Nanoscale Science and Engineering Grantees Conference, Arlington, VA. 2015
- P.60 Vance, M.E.*; Pegues, V.; Page, J.; Prussin, A.J.; Marr, L.C. *Incidental nanoparticle emissions from desktop 3D printers*. 3rd Gordon Research Conference in Environmental Nanotechnology, West Dover, VT. 2015

- P.61 Pourzahedi, L.*; Vance, M.E., Eckelman, M. J. *Environmental LCA of Nanosilver-enabled Products* . 3rd Gordon Research Conference in Environmental Nanotechnology, West Dover, VT. 2015
- P.62 Vance, M.E.*, Marr, L.C. *Potential exposure to engineered nanoparticles in domestic environments* . 1st Gordon Research Seminar in Environmental Nanotechnology, West Dover, VT. 2015
- P.63 Vance, M.E.*, Marr, L.C. Quantifying human exposure to ultrafine aerosols emitted from consumer products in indoor environments . ASCE Department Heads Conference, Blacksburg, VA. 2015
- P.64 Page, J.M.* , Marr, L.C., Prussin II, A.J., Vance, M.E. *Nanoparticle emissions from three-dimensional printers* . Annual Biomedical Research Conference for Minority Students, San Antonio, TX. 2014
- P.65 Tolve, N.* , Rogers, K., Willis, R., Quadros, M.E., Marr, L.C. *Potential exposure to silver nanoparticles in children's consumer products* . 1st ISES-ISEE-ISIAQ 2013 joint conference on Environment and Health, Basel, Switzerland. 2013
- P.66 Quadros, M.E.*, Tolve, N., Willis, R., Rogers, K., Marr, L.C. *Release of silver from children's consumer products enhanced with nanoparticles* . 2nd Gordon Research Conference in Environmental Nanotechnology, Stowe, VT. 2013. **Winner, student poster competition.**
- P.67 Quadros, M.E., Hall, S., Telionis, D.* *Frequency Response of Sensors for CO₂ Flux Measurements* . 9th International Carbon Dioxide Conference, Beijing, China. 2013
- P.68 Quadros, M. E.*, Marr, L.C. *Exposure assessment of aerosols emitted by nanotechnology consumer products* . 29th Annual Conference of the American Association for Aerosol Research (AAAR), Portland, OR. 2010. **Winner, student poster competition.**
- P.69 Quadros, M. E.*, Marr, L.C. *Emission of airborne nanoparticles from silver nanotechnology consumer products* . 26th Annual GSA Research Symposium, Blacksburg, VA. 2010
- P.70 Quadros, M. E.*, Marr, L.C. Emission of airborne nanoparticles from silver nanotechnology consumer products . 1st ICTAS Research Day, Blacksburg, VA. 2010
- P.71 Quadros, M. E.*, Faria, C.T., Marr, L.C. *A thermophoretic sampler for collecting airborne nanoparticles* . 1st International Conference on the Environmental Implications of Nanotechnology, Washington, DC. 2009
- P.72 Quadros, M.E.*, Lisboa, H.M. *Estudo em túnel viário para realização do inventário de emissões de poluentes atmosféricos por fonte veicular* . 24^o Congresso Brasileiro de Engenharia Sanitária e Ambiental, Belo Horizonte, Brazil. 2007
- P.73 Quadros, M.E., Belli Filho, P.* , Schirmer, W.N., Lisboa, H.M. *Utilização da olfatometria dinâmica na verificação da eficácia de neutralizador de odor industrial* . XXX Congresso Asociación Interamericana de Ingeniería Sanitaria y Ambiental, Montevideo, Uruguay. 2006
- P.74 Schirmer, W.N., Quadros, M.E., Belli Filho, P.* , Lisboa, H.M. Verificação da eficiência de neutralizador de odor de uso industrial por cromatografia gasosa /espectrometria de massa . XXX Congresso Asociación Interamericana de Ingeniería Sanitaria y Ambiental, Montevideo, Uruguay. 2006
- P.75 Quadros, M.E.*, Sant'Anna, F.S.P. Dimensionamento de reservatório para utilização de água da chuva . XII Seminário de Iniciação Científica da UFSC, Florianópolis, Brazil. 2002
Winner, student poster competition.

SPONSORED RESEARCH**TOTAL: \$3.25 M****As Principal Investigator (Total: \$2M, CU Boulder share: \$1.2M)**

2020 – 2021 **Department of Energy - National Renewable Energy Laboratory (NREL).**
Performance of mask filter materials for filtration and inhalation resistance. \$83,287. PI: Vance.

- 2019 – 2020 **The Alfred P. Sloan Foundation.** *To continue the development of community building and data infrastructure for the Chemistry of the Indoor Environments (CIE) program.* \$375,000 (Total to CU: \$99,240). PI: Vance. Co-PI: D.K. Farmer (Colorado State University).
- 2018 – 2021 **Department of Energy - National Renewable Energy Laboratory (NREL).** *Reducing Uncertainty of Fielded Photovoltaic Performance “PV Powerplant Soiling”* \$234,607. PI: Vance. Co-PI: M. P. Hannigan.
- 2018 – 2018 **NNCI NanoEarth MUNI User Support Grant.** *Investigating the impacts of rainfall and air pollution on the efficiency of photovoltaic systems.* \$1,500 in travel, laboratory analyses and technical support. PI: Vance.
- 2018 – 2018 **CU Boulder CEAS Water-Energy Nexus IRT.** *Investigating the impacts of rainfall and air pollution on the efficiency of photovoltaic systems.* \$2,500. PI: Vance. Co-PI: M.P. Hannigan.
- 2017 – 2019 **The Alfred P. Sloan Foundation.** *Initiating the development of community building and data infrastructure for the Chemistry of Indoor Environments program through HOMEChem, an interdisciplinary collaborative field experiment.* \$1,251,611 (Total to CU: \$700,902). PI: Vance. Co-PI: D.K. Farmer (Colorado State University).
- 2016 - 2016 **Alfred P. Sloan Foundation.** *Building a Science Community in the field of Chemistry of Indoor Environments.* \$50,000. PI: Vance.
- 2016 - 2016 **CU Boulder Engineering Excellence Fund (EEF).** *Team-Based Learning for Engineering Education.* \$840. PI: Vance.

As Co-Principal Investigator or Senior Personnel (Total since 2016: \$1.25M, CU Boulder share: \$0.4M)

- 2020 – 2020 **National Federation of High School Associations.** *Aerosol generation from playing band instruments and risk of infectious disease transmission.* \$118,326. PI: Shelly Miller. Co-PIs: Marina Vance, Jean Hertzberg, Darin Toohey.
- 2020 – 2023 **The Alfred P. Sloan Foundation.** *To advance community building and data infrastructure needs of the CIE program through the collaborative Chemical Assessment of Surfaces and Air (CASA) Experiment.* \$1,050,000 (Total to CU: \$280,000). PI: Delphine K. Farmer (CSU). Co-PI: Marina Vance.
- 2020 – 2023 **The Alfred P. Sloan Foundation.** *To measure the levels of poly-fluoroalkyl substances (PFAS) in indoor facilities and examine their rates of transformation under conditions commonly found in indoor facilities.* PI: Kyle Doudrick (Notre Dame). \$50,000 (Total to CU: materials and supplies, shipping costs). Co-PIs: Graham Peaslee (Notre Dame), Marina Vance.
- 2018 – 2018 **The Alfred P. Sloan Foundation.** *Workshop on the NanoChemistry of Indoor Environments (NanoCIE).* \$30,746 (Total to CU: travel support). PI: Rein Ulijin (CUNY). Co-PIs: Vicki Grassian (UCSD), Kyle Doudrick (Notre Dame), Marina Vance (CU).
- Before joining CU Boulder:
- 2015 – 2020 **National Science Foundation.** The Virginia Tech National Center for Earth and Environmental Nanotechnology Infrastructure (NanoEarth). \$2,596,055.00 (Vance share: 15%). PI: Michael F. Hochella. Co-PIs: L. Marr, F. Michel, A. Pruden, P. Vikesland. Vance role: Senior Personnel. Assisted PI Hochella in writing this proposal and became the NanoEarth Deputy Director.
- 2010 – 2012 **Environmental Protection Agency.** *Exposure Assessment of Silver Nanoparticles in Select Children’s Consumer Products.* \$69,653.00. PI: L. Marr. Vance role: Co-wrote this proposal with PI Marr and was the sole PhD student to carry out the work.

STUDENTS ADVISED AND *SUPERVISED

PhD students

- 2019 – present **Sumit Sankhyan**, Mechanical Engineering.
- 2017 – present **Sarah Toth**, Environmental Engineering (co-advised with M. Hannigan).
- 2019 – present ***Austin Hayes**, Mechanical Engineering (advised by Gregory Whiting).
- 2017 – 2020 **Julia Bakker-Arkema***, PhD student in the department of Chemistry, CU Boulder (supervised for 20% of her time in science communication efforts for IndoorChem).

MS students

- 2018 – 2019 **Sumit Sankhyan**, Mechanical Engineering. “Indoor black and brown carbon from cooking activities and outdoor penetration: Insights from the HOMEChem study.” MS Thesis, Apr, 2019.
- 2017 – 2018 **Itza Beltran**, Mechanical Engineering. Worked in our laboratory for 1 year and later completed a coursework MS. May, 2019.
- 2017 – 2018 **Faisal Alamri**, Mechanical Engineering. “Chemical characterization of natural soiling on solar panel glass covers in an urban environment”. MS Thesis, Nov, 2018.
- 2017 – 2018 **Zachary Linden**, Environmental Engineering. “Characterization of aerosol and VOC emissions from 3D printing processes in a controlled chamber environment”. MS Report, Nov, 2018.

Before joining CU Boulder:

- 2015 – 2016 **Valerie Pegues***, Master of Public Health, Virginia Tech.

Undergraduate students

- 2020 – present **Andrew Martin**, Discovery Learn Apprentice.
- 2020 – present **Hannah Teed**, student researcher.
- 2019 **Kayley Zabinski**, CU Summer Program for Undergraduate Research.
- 2019 **Alan Carrasco**, Summer Research Experience, CU Boulder / Colorado Mesa University.
- 2018 – 2020 **Julia Witteman**, Discovery Learn Apprentice, CU Boulder.
- 2019 **Devin Lindsey**, Earn-Learn Apprentice, CU Boulder.
- 2018 – 2019 **Gage Van Natta**, Discovery Learn Apprentice, CU Boulder.
- 2017 **Kwasi Kyeremeh-Dapaah**, Summer Research Experience, CU Boulder / Colorado Mesa University.

Before joining CU Boulder:

- 2014 **Julian Page***, Summer Research Experience for Undergraduates, Virginia Tech.
- 2011 **Raymond Pierson***, Summer Research Experience for Undergraduates, Virginia Tech.
- 2007 **Fabrcio J. Vieira**, Undergraduate Honor’s Thesis, UFSC.
- 2007 **Magnun M. Vieira**, Undergraduate Honor’s Thesis, UFSC.
- 2007 – 2008 **Valéria Vidal de Oliveira***, Undergraduate Researcher, UFSC.
- 2007 – 2008 **Isabel M. Moreira***, Undergraduate Researcher, UFSC.
- 2006 – 2007 **Priscila B. de Campos***, Undergraduate Researcher, UFSC.

Committee member

- 2017 – 2019 **Aaron Lamplugh, PhD**, Mechanical Engineering, CU Boulder. “Volatile Organic Compounds: Exposure and Mitigation in Colorado Nail Salons” Adviser: L. Montoya.
- 2017 – 2018 **Ashley Collier, PhD**, Mechanical Engineering, CU Boulder. “Enabling Community-based Air Quality Science through the Development of Sensor Systems, Resources, and Partnerships”. Adviser: M. Hannigan.
- 2016 – 2018 **Preateek Man Shrestha, PhD**, Mechanical Engineering, CU Boulder. “Impacts of Energy-Efficiency Retrofits on Ventilation and Indoor Air Quality in Low-INcome Households”. Adviser: S. Miller.
- 2016 – 2018 **Samantha McNeal, PhD Student**, Environmental Health Sciences, Center for Environmental Nanoscience and Risk (CENR), Arnold School of Public Health University of South Carolina. Adviser: J. Lead.
- 2017 – 2018 **Ryan Militello-Hourigan, MS**, Mechanical Engineering, CU Boulder. “The impacts of cooking and an assessment of indoor air quality in Colorado passive and tightly constructed homes”. Adviser: S. Miller.
- 2016 – 2017 **Joanna Gordon Casey, PhD**, Mechanical Engineering, CU Boulder. “Improving Low-Cost Measurement Techniques to Investigate the Connections Between Fossil Fuels and Air Quality: From Oil and Gas Production to Home Heating”. Adviser: M. Hannigan.
- 2016 – 2016 **Ricardo Piedrahita, PhD**, Mechanical Engineering, CU Boulder. “On the assessment of air pollution and behavior within a cookstove intervention study in Northern Ghana and development of improved measurement techniques”. Adviser: M. Hannigan.

Before joining CU Boulder:

- 2007 **Magnun M. Vieira, B.S.**, Environmental Engineering, UFSC. “Efficiency evaluation of a wet scrubber for the treatment of a Florianopolis restaurant’s gas effluents”.

- 2007 **Caroline C. Dalago, B.S.**, Environmental Engineering, UFSC. "Tetrahydrothiophene removal from natural gas using activated carbon".
- 2006 **Cristian Marquezi, B.S.** in Environmental Engineering, UFSC. "Using the HYSPLIT model to identify the origin of acid rain on the coast of Santa Catarina (Brazil)".

TEACHING EXPERIENCE

Graduate:

MCEN 5228-019: Nanotechnology for Environmental Sustainability (3 credits). Mechanical Engineering, University of Colorado Boulder. Graduate technical elective course. Taught: Spring 2017 (12 students), Spring 2018 (9 students).

Undergraduate:

MCEN 3047: Data Analysis and Experimental Methods (4 credits). Mechanical Engineering, University of Colorado Boulder. Responsible for two lab sections and, in some years, lecture section.

Taught: Fall 2018 (75 students), Fall 2019 (72 students), Fall 2020 (105 students)

MCEN-4045: Mechanical Engineering Design Project 1 (3 credits). Department of Mechanical Engineering, University of Colorado Boulder. Director to 3 senior design teams. Taught: Fall 2016 (23 students), Fall 2017 (20 students), Fall 2018 (20 students).

MCEN-4085: Mechanical Engineering Design Project 2 (3-4 credits). Mechanical Engineering, University of Colorado Boulder. Director to 3 senior design teams. Taught: Spring 2017 (23 students), Spring 2018 (20 students), Spring 2019 (20 students).

Before joining CU Boulder:

CEE-4144: Air Resources Engineering (3 credits). Civil and Environmental Engineering, Virginia Tech. Instructor, Via Academic Prep Fellow. This was a competitive teaching experience awarded to students in the department who are committed to becoming faculty members. Spring 2012.

23 students. Student evaluations: Completion of course objectives: 95/100

ENS-3126: Atmospheric Pollution Control (3 credits). Environmental Engineering, Universidade Federal de Santa Catarina, Brazil. Lecturer for 1/3 of the semester (covering industrial ventilation), also responsible for developing, assigning, and grading all homework, quizzes, and the exam for this section of the course. Taught: Spring 2007, Fall 2007. 40 students.

Course Development

Spring 2017 **MCEN 5228-019 Nanotechnology for Environmental Sustainability**, Graduate Course.
Created a new multidisciplinary graduate course with students enrolled coming from the mechanical, material science, and environmental engineering programs. The course provides (1) an overview of traditional and emerging nanomaterials, their synthesis and applications and (2) an overview of sustainability principles and challenges. The class was developed using the **Team-Based Learning** concept—in which the students prepare before each class by reading chapters and papers and watching videos, in order to spend the class period performing individual and team-based teaching and learning assessment activities. The course includes 3 individual student presentations and a research proposal-style final project.

ENGINEERING AND OTHER WORK EXPERIENCE

- 2011 **Engineering Consultant**, Aeroprobe Corp. Blacksburg, VA.
NASA-funded project to measure the frequency response of two small-scale CO₂ sensors inside a wind tunnel. These sensors are to be assembled inside a probe at the nose of an unmanned aerial vehicle.
- 2004 – 2007 **Lead Engineering Consultant**, Laboratório de Controle da Qualidade do Ar, Brazil.
I was a leading engineer on 14 air quality and odor impact assessment contracts with a wide variety of industries.

- 2003 **Engineering Intern**, Odotech, Inc. Montreal, Canada.
Odotech is a French-speaking spin-off company of the Université de Montréal. I collected air samples in multiple industries and analyzed them for odor concentration using the Odile olfactometer to perform odor impact assessments.
- 2002 – 2003 **Engineering Intern**, Socioambiental Engenharia, Florianópolis, Brazil.
Part of the team responsible for the transition of environmental programs from the construction of the Cana Brava hydropower plant to its operational phase.
- 2002 – 2006 **Multilingual agent**, Portuguese/English/French/Spanish, Florianópolis, Brazil.
Part of the support team in over a dozen international conferences and corporate events.

PROFESSIONAL LEADERSHIP & SERVICE

Manuscript and book chapter reviewer

- Environmental Science & Technology
- Atmospheric Environment
- Aerosol Science & Technology
- Environmental Science: Nano
- Environmental Pollution
- Building and Environment
- International Journal of Nanomedicine
- Atmosphere
- Critical Reviews in Environ. Sci. and Technology
- NanolImpact
- Nanotoxicology

(2013 – present)

- Environmental Science and Pollution Research
- International J. of Occupational and Environmental Health
- International J. of Environ. Research and Public Health
- Journal of Physical Chemistry
- Nanotechnology for Environmental Engineering
- BioMed Research International
- Waste and Biomass Valorization
- Wiley Books

Proposal reviewer

- 2016 EPA STAR Graduate Fellowship.
2016 NSF Environmental Engineering (CBET) unsolicited proposals.

National and International Leadership

- 2020 - 2021 **National Academies. “Indoor Exposure to Fine Particulate Matter and Practical Mitigation Approaches – A Workshop.”** Committee Member.
- 2020 - present **ES&T Engineering (ACS Journal).** Early Career Board Member.
- 2020 **American Association for Aerosol Research (AAAR).** Chair of the Indoor Aerosols and Aerosol Exposure Working Group. Technical Committee Member. Internet Communications Committee Member.
- 2019 **37th American Association for Aerosol Research (AAAR).** Special Symposium co-organizer: “The air we breathe: indoor aerosol sources and chemistry”; Vice-Chair of the “Indoor Aerosols and Aerosol Exposure” working group.
- 2019 **ISES-ISIAQ joint meeting.** Poster judge.
- 2018-2019 **Environmental Science: Processes & Impacts (ESPI).** Special issue editor “Indoor air: sources, chemistry and health effects”. Issue 21, 2019. Seven of this issue’s 17 papers were included in the “Best Papers of 2019” collection from ESPI.
- 2018 **2018 Chemistry of Indoor Environments Science Meeting.** Chair. Organized the first meeting for the CIE network, a 102-participant, 3-day conference held in Boulder, CO in 24-26-Oct-2018. Co-chaired with Delphine Farmer, Colorado State University.
- 2018 **10th International Aerosols Conference (IAC).** Platform session chair and poster judge: “Indoor Aerosols”. St Louis, MO
- 2018 - 2020 **International Society for Indoor Air Quality and Climate (ISIAQ).** Elected Vice-chair of the Scientific and Technical Committee 12: Source, monitoring and evaluation: Aerosols.
- 2018 **IndoorAir 2018.** International scientific advisory committee; podium session chair.
- 2017 **Sloan Foundation NanoChemistry of Indoor Environments Workshop (NanoCIE).** Workshop organizer along with Prof. Rein Uljin (CUNY), Prof. Vicki Grassian (UCSD), Prof. Kyle Doudrick (Notre Dame). New York, NY. 12-Jul-2018.
- 2017 **1st Pan-American Congress of Nanotechnology,** poster judge, Guarujá, Brazil.

- 2017 **36th American Association for Aerosol Research (AAAR) Annual Conference**, platform session chair: Indoor Aerosols, poster judge, Raleigh, NC.
- 2016 **35th American Association for Aerosol Research (AAAR) Annual Conference**, platform session chair: Indoor Aerosols, Portland, OR.
- Before joining CU Boulder:
- 2015 **Consumer Product Safety Commission (CPSC) / National Nanotechnology Initiative (NNI) Quantifying Exposure to Engineered Nanomaterials from Manufactured Products Workshop (QEEN)**, platform session chair: Consumer Exposure Studies I - General Products. Arlington, VA.
- 2013 – 2016 **Center for the Environmental Implications of Nanotechnology (CEINT) Scholars Steering Committee**, Virginia Tech representative.
- 2011 **30th American Association for Aerosol Research (AAAR) Annual Conference**, poster session judge and student plenary assistant, Orlando, FL.
- 2010 **29th American Association for Aerosol Research (AAAR) Annual Conference**, student plenary assistant, Portland, OR.

Institutional Service

- 2020 – present **Environmental Engineering Program**, graduate education committee, member.
- 2020 – present **Department of Mechanical Engineering**, external relations committee, member.
- 2017 – 2019 **Department of Mechanical Engineering**, graduate education committee, member.
- 2016 – 2017 **College of Engineering**, inclusive excellence committee, member.
- 2016 – 2017 **Department of Mechanical Engineering**, faculty search committee, member.
- 2016 – 2017 **Environmental Engineering Program**, graduate education committee, member.
- 2016 – 2017 **Department of Mechanical Engineering**, external relations committee, member.
- Before joining CU Boulder:
- 2016 **Institute for Critical Technology and Applied Science (ICTAS)** junior faculty award proposal reviewer.
- 2011 – 2012 **Interdisciplinary Graduate Education Program (IGEP)**, advisory board member, student representative.
- 2012 **Graduate Student Assembly (GSA) Research Symposium**, committee member, abstract reviewer, poster judge.
- 2012 **CEE-EWR Open House** student host.
- 2012 **2nd Virginia Tech Interdisciplinary Research Symposium**, co-organizer, poster session chair.
- 2012 **2nd Interdisciplinary Research Day**, co-organizer, round-table moderator.
- 2011 **Graduate Student Assembly (GSA) Research Symposium**, abstract reviewer.
- 2011 **CEE-EWR Open House** student volunteer.
- 2011 **First Virginia Tech Interdisciplinary Research Symposium**, co-organizer.
- 2011 **First Interdisciplinary Research Day**, co-organizer.
- 2011 **CEE-EWR Open House** student host.
- 2010 – 2013 **Interdisciplinary Research Honor Society (IDR)**, co-founder and member. First Interdisciplinary Honor Society in the world. Along with building this organization from the ground up, I helped organize two annual events: IDR Day (120+ attendees) and Interdisciplinary Research Symposium (~300 attendees).
- 2009 – 2010 **Brazilian Association at Virginia Tech**, president.
- 2008 – 2013 **Brazilian Association at Virginia Tech**, board member.

OUTREACH & ENGAGEMENT

Media coverage

Interviewed for many news articles that can be found here: <http://www.colorado.edu/lab/vance/news-archive>

Web and social media

- 2017 - present Creator of the www.IndoorChem.org website, YouTube channel, and associated social media accounts.
- 2013 - 2016 Responsible for the [VTSuN](http://www.VTSuN.com) and [NanoEarth](http://www.NanoEarth.com) websites and associated social media accounts.

Blog writing

- 2014 - 2016 **Environmental Science: Nano Blog**, Royal Society of Chemistry, writer. Available at: <http://blogs.rsc.org/en/author/vancem-ext/>
- 2013 - 2016 **VTSuN Blog**, writer and editor, contributed in over 30 blog posts. Available at: <https://blogs.lt.vt.edu/sustainablenano>

Outreach Events

- 2019 **Café Scientifique**, Invited speaker at a science café in Denver, CO.
- 2016 **USA Science Festival**, Outreach booth for the Sustainable Nanotechnology Organization (SNO) and VTSuN at the largest science festival in the country. Washington, DC.
- 2015 **TEDx Virginia Tech**, invited speaker: The good, the bad, and the tiny. Blacksburg, VA.
- 2015 **EPA Ntl Sustainable Design Competition**, Outreach Booth, Washington, DC.
- 2015 **VT Nanocamp**. 3-day summer camp for 26 high school students. Blacksburg, VA.
- 2014, 2015 **Virginia Science Festival**, Sustain. Nano outreach booth for VTSuN. Blacksburg, VA.
- 2013, 2014 **TEDx Virginia Tech**, Sustain. Nanotech outreach booth for VTSuN. Blacksburg, VA.
- 2014 **Kid's Tech University**, ages 9 – 12, Virginia Tech. Blacksburg, VA.

PROFESSIONAL MEMBERSHIP

- 2017 - present International Society of Indoor Air Quality and Climate (ISIAQ)
- 2015 - present Association of Environmental Engineering & Science Professors (AEESP)
- 2013 - present Sustainable Nanotechnology Organization (SNO)
- 2012 - present American Chemical Society (ACS)
- 2010 - present American Association for Aerosol Research (AAAR)
- 2010 - present Iota Delta Rho (IDR), Interdisciplinary Research Honor Society (founding member)
- 2012 - present Academic Excellence and Leadership (AEL) Honor Society of Graduate Students

LANGUAGES

Portuguese (native), English (fluent), Spanish (intermediate, *rusty*), French (intermediate, *rusty*)