

SAM (SUMIT) SANKHYAN

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EDUCATION

UNIVERSITY OF COLORADO BOULDER

Ph.D., Paul M. Rady Department of Mechanical Engineering

Dissertation: Aerosol Science and Engineering Research for Mitigating Human Exposure and Improving Indoor Air Quality

Advisor: Dr. Marina Vance

August 2022

UNIVERSITY OF COLORADO BOULDER

Master of Science, Paul M. Rady Department of Mechanical Engineering

Dissertation: Indoor Black and Brown Carbon from Cooking Activities and Outdoor Penetration: Insights from the HOMEChem Study

Advisor: Dr. Marina Vance

May 2019

VIT UNIVERSITY

Bachelor of Technology, Mechanical Engineering

May 2017

ACADEMIC APPOINTMENTS AND PROFESSIONAL EXPERIENCE

Research Faculty

March 2023-Present

CU Boulder, Paul M. Rady Department of Mechanical Engineering

Advisor: Dr. Shelly Miller

Adjunct Instructor

August 2023-December 2023

CU Boulder, Paul M. Rady Department of Mechanical Engineering

Postdoctoral Research Fellow

September 2022-March 2023

Purdue University, Lyles School of Civil Engineering

Graduate Research Assistant

May 2022-August 2022

CU Boulder, Paul M. Rady Department of Mechanical Engineering

Teaching Assistant

September 2019-May 2022

CU Boulder, Paul M. Rady Department of Mechanical Engineering

Graduate Research Assistant

June 2018-August 2021

CU Boulder, Paul M. Rady Department of Mechanical Engineering

PUBLICATIONS

h-index: 7, Total citations: 403

1. O'Brien, R.; Heery, E.; Shirilla, C.; **Sankhyan, S.**; Fowler, A.; Vance, M. E. (2024). Contributions of Cleaning Solution Residues to Indoor Organic Surface Films. ACS ES&T Air, Submitted, in review.
2. **Sankhyan, S.**, Clements, N., Heckman, A., Hollo, A. K., Gonzalez-Beltran, D., Aumann, J., ... & Miller, S. L. (2023). Optimization of a Do-It-Yourself Air Cleaner Design to Reduce Residential Air Pollution Exposure for a Community Experiencing Environmental Injustices. Atmosphere, 14(12), 1734. doi.org/10.3390/atmos14121734
3. **Sankhyan, S.**, Zabinski, K., O'Brien, R. E., Coyan, S., Patel, S., & Vance, M. E. (2022). Aerosol emissions and their volatility from heating different cooking oils at multiple temperatures. Environmental Science: Atmospheres, 2(6), 1364-1375. doi.org/10.1039/D2EA00099G
4. **Sankhyan, S.**, Witteman, J. K., Coyan, S., Patel, S., & Vance, M. E. (2022). Assessment of PM 2.5 concentrations, transport, and mitigation in indoor environments using low-cost air quality monitors and a portable air cleaner. Environmental Science: Atmospheres, 2(4), 647-658. doi.org/10.1039/D2EA00025C **Part of ES: Atmospheres Best Papers 2022.**
5. **Sankhyan, S.**, Patel, S., Katz, E. F., DeCarlo, P. F., Farmer, D. K., Nazaroff, W. W., & Vance, M. E. (2021). Indoor black carbon and brown carbon concentrations from cooking and outdoor penetration: insights from the HOMEChem study. Environmental Science: Processes & Impacts, 23(10), 1476-1487. doi.org/10.1039/D1EM00283J **Part of ESPI Recent HOT Articles.**
6. **Sankhyan, S.**, Heinselmann, K. N., Ciesielski, P. N., Barnes, T., Himmel, M. E., Teed, H., ... & Vance, M. E. (2021). Filtration performance of layering masks and face coverings and the reusability of cotton masks after repeated washing and drying. Aerosol and Air Quality Research, 21(11), 210117. doi.org/10.4209/aaqr.210117
7. Patel, S., Rim, D., **Sankhyan, S.**, Novoselac, A., & Vance, M. E. (2021). Aerosol dynamics modeling of sub-500 nm particles during the HOMEChem study. Environmental Science: Processes & Impacts, 23(11), 1706-1717. doi.org/10.1039/D1EM00259G
8. Tian, Y., Arata, C., Boedicker, E., Lunderberg, D. M., Patel, S., **Sankhyan, S.**, ... & Goldstein, A. H. (2021). Indoor emissions of total and fluorescent supermicron particles during HOMEChem. Indoor Air, 31(1), 88-98. doi.org/10.1111/ina.12731
9. Patel, S., **Sankhyan, S.**, Boedicker, E. K., DeCarlo, P. F., Farmer, D. K., Goldstein, A. H., ... & Vance, M. E. (2020). Indoor particulate matter during HOMEChem: Concentrations, size distributions, and exposures. Environmental science & technology, 54(12), 7107-7116. doi.org/10.1021/acs.est.0c00740

10. Farmer, D. K., Vance, M. E., Abbatt, J. P., Abeleira, A., Alves, M. R., Arata, C., ... **Sankhyan, S.**, ... & Zhou, Y. (2019). Overview of HOMEChem: House observations of microbial and environmental chemistry. *Environmental Science: Processes & Impacts*, 21(8), 1280-1300. doi.org/10.1039/C9EM00228F **Part of ESPI Recent HOT Articles; Part of ESPI Best Papers 2019.**

PRESENTATIONS

Conference Platform Presentations

1. Sankhyan, S, N Clements, A Heckman, AK Hollo, D Gonzalez-Beltran, J Aumann, C Morency, L Leiden, SL Miller. Optimization of a Do-It-Yourself Air Cleaner Design to Reduce Residential Air Pollution Exposure for a Community Experiencing Environmental Injustices. Platform presentation, AAAR 41st Annual Conference, Portland, OR. 2023
2. Sankhyan S, K Heinselman, P Ciesielski, H Teed, T Barnes, S Patel, ME Vance. Filtration efficiency and inhalation resistance of cloth mask combinations and the effects of washing and drying on performance. Platform presentation, AAAR 39th Annual Conference, Held Virtually, 2021
3. Sankhyan S, J Witteman, S Coyan, S Patel, ME Vance. Assessment of PM_{2.5} concentration and transport in indoor environments using low-cost sensors. Platform presentation, AAAR 39th Annual Conference, Held Virtually, 2021
4. Sankhyan S, J Witteman, 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
5. Sankhyan S, ME Vance. 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
6. Sankhyan S, ME Vance. 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
7. Sankhyan S, S Patel, DK Farmer, ME Vance. Indoor Black and Brown Carbon from Cooking Activities and Outdoor Penetration. Platform presentation, AAAR 37th Annual Conference. Portland, OR. 2019

Conference Poster Presentations

1. O'Brien, R. E., Legaard, E., Hrdina, A., **Sankhyan, S.**, Mayer, K., Poppendieck, D., ... & Vance, M. (2022, December). Chemical Characteristics of Indoor Aerosol Particles and Surface Films. Poster presentation, AGU Fall Meeting Abstracts (Vol. 2022, pp. A36C-08)

2. Sankhyan S, K Zabinski, S Patel, ME Vance. Investigating aerosol emissions and their volatility from the use of different cooking oils. Poster presentation, AAAR 38th Annual Conference, Held Virtually, 2020
3. Sankhyan S, H Teed, S Patel, ME Vance. Investigating the filtration efficiencies of non-standard fabric filters. Poster presentation, AAAR 38th Annual Conference, Held Virtually, 2020
4. Sankhyan S, S Patel, ME Vance. Investigating Aerosol Emissions from Cooking Oils. AAAR 37th Annual Conference. Portland, OR. 2019
5. Sankhyan S, S Patel, ME Vance. Relationships between indoor and outdoor black and brown carbon emissions during HOMEChem study. Research Week Symposium, Boulder, CO. 2018
6. Sankhyan S, S Patel, I Beltran, ME Vance. Investigating Aerosol Emissions from Cooking Oils through a Controlled Chamber Experiment. 10th International Aerosol Conference, St. Louis, MO. 2018

TEACHING AND MENTORING EXPERIENCE

Adjunct Instructor

MCEN 4141/5141: Indoor Air Pollution (3 credits)
Fall 2023, Paul M. Rady Department of Mechanical Engineering
University of Colorado Boulder.

Teaching Assistant

MCEN 3047: Data Analysis and Experimental Methods (4 credits)
Instructor: Dr. Keith Regner
Spring 2022, Paul M. Rady Department of Mechanical Engineering
University of Colorado Boulder.

Teaching Assistant

MCEN 3047: Data Analysis and Experimental Methods (4 credits)
Instructor: Dr. Marina Vance
Fall 2021, Paul M. Rady Department of Mechanical Engineering
University of Colorado Boulder.

STUDENTS MENTORED

Graduate Students

2024 Dulce Gonzalez-beltran, MS Candidate, Paul M. Rady Department of Mechanical Engineering, CU Boulder.

2023 Aniya Khalili, Ph.D. Candidate, Paul M. Rady Department of Mechanical Engineering, CU Boulder.

2023 Andrew Martin, MS Candidate, Paul M. Rady Department of Mechanical Engineering, CU Boulder.

2022 Jinglin Jiang, Ph.D. Candidate, Lyles School of Civil Engineering, Purdue University.

2022 Chunxu Huang, Ph.D. Student, Lyles School of Civil Engineering, Purdue University.

Undergraduate Students

2021 – 2022 Ashley Fowler, Discovery Learn Apprentice (DLA), CU Boulder.

2021 Steven Coyan, CU Summer Program for Undergraduate Research (SPUR).

2020 – 2021 Andrew Martin, Discovery Learn Apprentice (DLA), CU Boulder.

2020 Hannah Teed, student researcher, CU Boulder.

2019 Kayley Zabinski, CU Summer Program for Undergraduate Research (SPUR).

2019 Alan Carrasco, Summer Research Experience, CU Boulder / Colorado Mesa University.

2018 – 2020 Julia Witteman, Discovery Learn Apprentice (DLA), CU Boulder.

High school students

2019 Suvir Wadhwa, CU STEM Summer Research Experience.

2019 Nate Spillman, CU STEM Summer Research Experience.

PROFESSIONAL SERVICE

2021 **39th American Association for Aerosol Research (AAAR) Annual Conference**, platform session chair: Indoor Aerosols I, Virtual.

2019 **Graduate Engineering Annual Research and Recruitment Symposium (GEARRS)**, Committee member, Boulder, CO.

AWARDS AND HONORS

Dean's Graduate Innovation Assistantship, University of Colorado Boulder, 2019
Grants up to four years of guaranteed funding for graduate student in the mechanical engineering department.