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RISHABH U. SHAH

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Education

Degree	Field	Institution	Conferral
Ph.D 3.6/4 Doctor of Philosophy	Mechanical Engineering	Carnegie Mellon University (CMU) Pittsburgh, Pennsylvania, USA	June 2019
M.S. 3.88/4 Master of Science	Environmental Engineering	University of Illinois at Urbana–Champaign (UIUC), Urbana, Illinois, USA	August 2015
B.E. 8.44/10 Bachelor of Engineering	Environmental Engineering	Gujarat Technological University Ahmedabad, Gujarat, India	May 2013

Research and work experience

Mar '20 – now
High Meadows Postdoc Fellow, Atmospheric Science
Office of Chief Scientist, Environmental Defense Fund
Hyperlocal air pollutant mapping and analysis to improve the effectiveness of regulatory efforts to reduce air pollution in urban areas.

Aug '19 – Mar '20
Aerosol Mass Spectrometry Research Scientist
Chemical Sciences Division, National Oceanic and Atmospheric Administration
Instrument development for external calibration of aerosol mass spectrometry used for quantitative characterization of total carbon and total nitrogen content of particulate matter.

July '19
Postdoctoral Research Associate
Mechanical Engineering and *Center for Atmospheric Particle Studies, CMU*
Training new graduate students on the theory, unsupervised operation, calibration, maintenance, and troubleshooting of the aerosol mass spectrometer.

Sep '15 – June '19
Graduate Research Assistant
Mechanical Engineering and *Center for Atmospheric Particle Studies, CMU*
- mobile aerosol mass spectrometry to study the spatial and temporal variability of primary and potential aerosol mass at source–specific locations.
- design and characterization of an oxidation flow reactor (OFR) to simulate the atmospheric photo–oxidative formation of secondary organic aerosols from anthropogenic primary gaseous emissions.

Aug '16 – Dec '17
Graduate Teaching Assistant
Course: Engineering thermodynamics, Fall 2016 and Fall 2017 semesters, Mechanical Engineering, CMU

May '14 – Aug '15
Graduate Research Assistant
Dept. of Civil and Environmental Engineering, UIUC
Laboratory experiments to characterize hygroscopic properties of emissions from biomass burning.

Jan – May '14
Graduate Teaching Assistant
Course: Environmental social science, Dept. of Natural Resources and Environmental Sciences, UIUC

Published works (h–index = 5; total citations = 74)

9. **Shah, RU**; Robinson, ES; Gu, P; Apte, JS; Marshall, JD; Robinson, AL; Presto, AA. Socio–economic disparities in exposure to urban restaurant emissions are larger than for traffic. Accepted, *Environmental Research Letters*. DOI: 10.1088/1748–9326/abbc92.

8. **Shah, RU**; Coggon, MM; Gkatzelis, GI; McDonald, BC; Tasoglou, A; Huber, H; Gilman, J; Warneke, C; Robinson, AL; Presto, AA. Urban oxidation flow reactor measurements reveal significant secondary organic aerosol contributions from volatile emissions of emerging importance. *Environmental Science and Technology* 2020, 54 (2), 714–725. DOI: 10.1021/acs.est.9b06531

7. Zimmerman, N; Li, HZ; Ellis, E; Hauryliuk, A; Robinson, ES; Gu, P; **Shah, RU**; Ye, Q; Snell, L; Subramanian, R; Robinson, AL; Apte, JS; Presto, AA. Improving Correlations between Land Use and Air Pollutant Concentrations Using Wavelet Analysis: Insights from a Low-cost Sensor Network. *Aerosol and Air Quality Research* 2020, 20, 314–328. DOI: 10.4209/aaqr.2019.03.0124

6. Robinson, ES; **Shah, RU**; Messier, K; Gu, P; Li, HZ; Apte, JS; Robinson, AL; Presto, AA. Land-use regression modeling of source-resolved PM_1 sub-components from mobile sampling measurements. *Environmental Science and Technology* 2019, 53 (15), 8925–8937. DOI: 10.1021/acs.est.9b01897

5. **Shah, RU.** Pre-existing and potential particulate pollution patterns in populous places: probing pollution parity for the poor and the prosperous. PhD Thesis, Carnegie Mellon University, 2019.

4. **Shah, RU**; Robinson, ES; Gu, P; Robinson, AL; Apte, JS; Presto, AA. High-spatial-resolution mapping and source apportionment of aerosol composition in Oakland, California using mobile aerosol mass spectrometry. *Atmospheric Chemistry and Physics* 2018, 18 (22), 16325–16344. DOI: 10.5194/acp-18-16325-2018

3. Robinson, ES; Gu, P; Ye, Q; Li, HZ; **Shah, RU**; Apte, JS; Robinson, AL; Presto, AA. Restaurant Impacts on Outdoor Air Quality: Elevated Organic Aerosol Mass from Restaurant Cooking with Neighborhood-Scale Plume Extents. *Environmental Science and Technology* 2018, 52 (16), 9285–9294. DOI: 10.1021/acs.est.8b02654

2. Saha, PK; Robinson, ES; **Shah, RU**; Zimmerman, N; Apte, JS; Robinson, AL; Presto, AA. Reduced Ultrafine Particle Concentration in Urban Air: Changes in Nucleation and Anthropogenic Emissions. *Environmental Science and Technology* 2018, 52 (12), 6798–6806. DOI: 10.1021/acs.est.8b00910

1. **Shah, RU.** Hygroscopic growth and cloud condensation nuclei activity of fresh and chemically-aged biomass-pyrolyzed organic aerosol. Master's Thesis, University of Illinois at Urbana-Champaign, 2015.

Research Presentations *(⋆ = invited / funded by host)*

12. TALK. Presto, AA; Humes, M; Tanzer-Gruener, R; **Shah, RU**; Robinson, AL; Donahue, NM. Temporal Evolution of Secondary Organic Aerosol Production from Volatile Chemical Products *American Association for Aerosol Research Conference*, Virtual, 6 Oct 2020. Also at: *American Geophysical Union Annual Meeting*, Virtual, 15 Dec 2020.

11. TALK. **Shah, RU**; Coggon, MM; Gkatzelis, GI; McDonald, BC; Tasoglou, A; Huber, H; Gilman, J; Warneke, C; Robinson, AL; Presto, AA. SOA Potential of Urban Volatile Chemical Product (VCP) Emissions Explored Using In-Situ Oxidation Flow Reactor. *American Association for Aerosol Research Conference*, Portland OR, 15 Oct 2019.

10. TALK. **Shah, RU**; Robinson, ES; Gu, P; Robinson, AL; Apte, JS; Presto, AA. Near-source spatial extents and socio-economic disparity in urban air pollution exposure. *American Association for Aerosol Research Conference*, Portland OR, 16 Oct 2019.

9. ⋆ TALK. **Shah, RU**. Pre-existing and potential particulate pollution patterns in populous places. *Pacific Northwest National Laboratory*, Richland WA, 8 Mar 2019.

8. ⋆ TALK. **Shah, RU**. Pre-existing and potential particulate pollution patterns in populous places. *National Oceanic and Atmospheric Administration*, Boulder CO, 7 Feb 2019.

7. POSTER. **Shah, RU**; Presto, AA. Potential particulates in populous and pristine places. *Atmospheric Chemical Mechanisms Conference*, Davis CA, 5–8 Dec 2018.

6. TALK. **Shah, RU**; Robinson, ES; Gu, P; Robinson, AL; Apte, JS; Presto, AA. Mapping particulate matter in Oakland, California using mobile aerosol mass spectrometry. *10th International Aerosol Conference*, St. Louis MO, 6 Sept 2018.

5. TALK. Presto, AA; Robinson, ES; **Shah, RU**; Gu, P; Li, HZ; Apte, JS; Robinson, AL. Long-term exposure to ambient air pollution and cognitive function in older U.S. adults: The multi-ethnic study of atherosclerosis and air pollution Joint annual meeting: Int'l Society of Exposure Science, Int'l Society for Environmental Epidemiology, Ottawa, Canada, 26–30 Aug 2018.

4. TALK. Presto, AA; Li, HZ; Robinson, ES; Gu, P; Saha, PK; **Shah, RU**; Apte, JS; Robinson, AL. Spatial patterns of exposures to nontraditional pollutants: source resolved organic aerosol and ultrafine particles Joint annual meeting: Int'l Society of Exposure Science, Int'l Society for Environmental Epidemiology, Ottawa, Canada, 26–30 Aug 2018.

3. ⋆ POSTER. **Shah, RU**; Robinson, ES; Gu, P; Presto, AA. Gradients in concentration and composition of fine particulates in a coastal city: downtown dominates a large area emission source in Port of Oakland CA. *Health Effects Institute Annual Conference*, Chicago IL, 1 May 2018.

2. POSTER. **Shah, RU**; Florou, K; Presto, AA. Aging atmospheric aerosols on an island in the Mediterranean Sea. *American Association for Aerosol Research* conference, Raleigh NC, 10 Oct 2017.

1. POSTER. **Shah, RU**; Emamipour, H; Brem, BT; Bond, TC; Rood, MJ. Hygroscopicity and CCN activity of biomass–burning aerosol. *US Department of Energy: Atmospheric System Research meeting*, Vienna VA, Mar 2015.

Leadership and outreach

Oct '19	**Student poster judge** *American Association for Aerosol Research Conference*, Portland OR, 14–19 Oct 2019.
Aug '17 – Jan '19	**PhD qualifying examination mentor** Mechanical Engineering Graduate Student Organization (MEGSO), *CMU*
Jun '15	**Graduate student instructor** Girls' Adventures in Mathematics, Engineering and Science (G.A.M.E.S.) outreach, *UIUC*
Jun '10 – Jun '12	**Student volunteer** Poverty alleviation outreach, *Yuva Unstoppable*

Awards, honors, and certificates

May '18	**Student travel award** Health Effects Institute annual conference, Chicago IL
Mar '17	**Milton Shaw PhD student travel award** Mechanical Engineering graduate student research symposium, *CMU*
Mar '15	**Ivan Racheff student travel grant** *Civil and Environmental Engineering, UIUC*
Jan '15	**Certified Associate Developer in LabVIEW software** *National Instruments, Inc.*

Peer–reviewer in scientific journals

- Atmospheric Chemistry and Physics
- Atmospheric Measurement Techniques
- Environmental Pollution
- Aerosol and Air Quality Research

Software skills

R QGIS SQL Igor Pro MATLAB LaTeX SOLIDWORKS LabVIEW MS Office and iWork

Coursework

- Air Quality Engineering
- Air Quality Modeling
- Air Pollutant Sensor Design
- Air Quality Control
- Physical Meteorology of the Atmosphere
- Fundamental and Advanced Statistical Thermodynamics
- Advanced Fluid Dynamics
- Numerical Methods in Engineering
- Physical and Chemical Principles of Environmental Engineering

Languages

English (proficient) German (elementary level) Hindi (proficient) Gujarati (native)