

**RISHABH U. SHAH***Postdoctoral scientist*

Office of Chief Scientist  
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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	<b>High Meadows Postdoc Fellow, Atmospheric Science</b> <i>Office of Chief Scientist, Environmental Defense Fund</i> Hyperlocal air pollutant mapping and analysis to improve the effectiveness of regulatory efforts to reduce air pollution in urban areas.
Aug '19 - Mar '20	<b>Aerosol Mass Spectrometry Research Scientist</b> <i>Chemical Sciences Division, National Oceanic and Atmospheric Administration</i> 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	<b>Postdoctoral Research Associate</b> <i>Mechanical Engineering and Center for Atmospheric Particle Studies, CMU</i> Training new graduate students on the theory, unsupervised operation, calibration, maintenance, and troubleshooting of the aerosol mass spectrometer.
Sep '15 - June '19	<b>Graduate Research Assistant</b> <i>Mechanical Engineering and Center for Atmospheric Particle Studies, CMU</i> <ul style="list-style-type: none"> <li>mobile aerosol mass spectrometry to study the spatial and temporal variability of primary and potential aerosol mass at source-specific locations.</li> <li>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.</li> </ul>
Aug '16 - Dec '17	<b>Graduate Teaching Assistant</b> <i>Course: Engineering thermodynamics, Fall 2016 and Fall 2017 semesters, Mechanical Engineering, CMU</i>
May '14 - Aug '15	<b>Graduate Research Assistant</b> <i>Dept. of Civil and Environmental Engineering, UIUC</i> Laboratory experiments to characterize hygroscopic properties of emissions from biomass burning.
Jan - May '14	<b>Graduate Teaching Assistant</b> <i>Course: Environmental social science, Dept. of Natural Resources and Environmental Sciences, UIUC</i>

**Published works (*h-index* = 5; *total citations* = 64)**

- 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](https://doi.org/10.1021/acs.est.9b06531)
- 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](https://doi.org/10.4209/aaqr.2019.03.0124)
- Robinson, ES; Shah, RU; Messier, K; Gu, P; Li, HZ; Apte, JS; Robinson, AL; Presto, AA. Land-use regression modeling of source-resolved PM<sub>1</sub> sub-components from mobile sampling measurements. *Environmental Science and Technology* 2019, 53 (15), 8925-8937. DOI: [10.1021/acs.est.9b01897](https://doi.org/10.1021/acs.est.9b01897)
- 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](https://doi.org/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](https://doi.org/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](https://doi.org/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.

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*Manuscript(s) submitted or near submission*

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1. **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. In review, *Environmental Research Letters*.

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

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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. *10<sup>th</sup> 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.

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### *Leadership and outreach*

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- Oct '19     **Student poster judge**  
*American Association for Aerosol Research Conference*, Portland OR, 14-19 Oct 2019.
- Aug '17 -     **PhD qualifying examination mentor**  
Jan '19     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 -     **Student volunteer**  
Jun '12     Poverty alleviation outreach, *Yuva Unstoppable*

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### *Awards, honors, and certificates*

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- 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.*

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### *Peer-reviewer in scientific journals*

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- [Atmospheric Chemistry and Physics](#)
- [Atmospheric Measurement Techniques](#)
- [Environmental Pollution](#)
- [Aerosol and Air Quality Research](#)

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### *Software skills*

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[Igor Pro](#)     [MATLAB](#)     [QGIS](#)     [R](#)     [L<sup>A</sup>T<sub>E</sub>X](#)     [SOLIDWORKS](#)     [LabVIEW](#)     [MS Office and iWork](#)

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### *Coursework*

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

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### *Languages*

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English (proficient)     German (intermediate-level)     Hindi (proficient)     Gujarati (native)