

# Ellis Shipley Robinson

## Contact

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## Academic & Professional Appointments

- **University of Arizona**, Tucson, AZ  
Depts. of Chemical & Environmental Engineering (primary), Hydrology & Atmospheric Sciences (joint)  
Assistant Professor (Aug. 2024–present)
- **Johns Hopkins University**, Baltimore, MD  
Dept. of Environmental Health & Engineering  
Research Engineer/Scientist (June 2020–Aug. 2024)
- **Carnegie Mellon University**, Pittsburgh, PA  
Dean's Office, College of Engineering  
Research Communications Officer (May 2019–April 2020)
- **Carnegie Mellon University**, Pittsburgh, PA  
Dept. of Mechanical Engineering  
Postdoctoral Research Associate (Aug. 2016–May 2019)
- **National Oceanic & Atmospheric Administration**, Boulder, CO  
Chemical Sciences Division  
Research Scientist I (Jan. 2015–Aug. 2016)

## Education

- Ph.D. Chemical Engineering, Carnegie Mellon University, 2014
- B.S. Chemical & Biomolecular Engineering, The Ohio State University, 2009

## Awards

- American Association for the Advancement of Science, *Mass Media Fellowship*, 2014.
- Morris K. Udall and Stewart L. Udall Foundation, *Udall Undergraduate Scholarship*, 2008.

## Current Grant Funding

- Co-PI, Arizona Board of Regents: Ozone Analysis and Modeling for Maricopa County, \$1,000,000 (2025–2028)
- Co-PI, National Institutes of Health SBIR: Low-Cost Amperometric Ozone Monitor for Communities Affected by Wildfires., \$1,036,179 (2025–2027)
- PI, University of Arizona Earth Dynamics Observatory: The Southern Arizona Aerosol Climatology (SoAZ-AC) project, \$10,000 (2025–2026)

## Peer-reviewed Publications

### 2025

- 49 T. Ajayi, M. A. Mirrezaei, A. F. Arellano, **E. S. Robinson**, and A. Sorooshian, “A long-term (2001–2022) examination of surface ozone concentrations in Tucson, Arizona,” *Environmental Science: Atmospheres*, 2025. DOI: 10.1039/d5ea00072f.

- 48 A. A. Chiger, C. Gigot, **E. S. Robinson**, M. W. Tehrani, M. Claffin, E. Fortner, *et al.*, “Improving Methodologies for Cumulative Risk Assessment: A Case Study of Noncarcinogenic Health Risks from Volatile Organic Compounds in Fenceline Communities in Southeastern Pennsylvania,” *Environmental Health Perspectives*, vol. 133, p. 057004, 2025. DOI: 10.1289/ehp14696.
- 47 L. Forshee, A. L. Holen, J. Wu, K. C. d. Carvalho, V. Selimovic, **E. S. Robinson**, *et al.*, “Cooking Oil Mixed with Residential Wood Burning Particles: A Wintertime Indoor Air Quality Study,” *ACS ES&T Air*, vol. 2, pp. 2799–2813, 2025. DOI: 10.1021/acsestair.5c00156.
- 46 M. P. Fraser, A. F. Arellano, P. Herckes, **E. S. Robinson**, and A. Sorooshian, “Feeling the Heat: Ground Level Ozone Research (GLOR) Ramps up in Maricopa County,” *EM Magazine*, Sep. 2025.
- 45 A. L. Holen, J. Wu, L. Forshee, K. K. Dingilian, V. Selimovic, M. A. Battaglia, *et al.*, “Quantifying Contributions of Sulfate, Hydroxymethanesulfonate, and Additional S(IV) Compounds to Wintertime Aerosol Particles,” *ACS ES&T Air*, 2025. DOI: 10.1021/acsestair.5c00232.
- 44 D. T. Ketcherside, R. J. Yokelson, V. Selimovic, **E. S. Robinson**, M. Cesler-Maloney, A. L. Holen, *et al.*, “Wintertime Abundance and Sources of Key Trace Gas and Particle Species in Fairbanks, Alaska,” *Journal of Geophysical Research: Atmospheres*, vol. 130, 2025. DOI: 10.1029/2025jd043677.
- 43 L. Parakkat, M. R. A. Hilario, M. A. Mirrezaei, **E. S. Robinson**, A. Arellano, and A. Sorooshian, “Ozone concentrations and influential variables during heat waves over two desert cities in the Southwest U.S.,” *Environmental Research Communications*, vol. 7, p. 125008, 2025. DOI: 10.1088/2515-7620/ae238d.
- 42 **E. S. Robinson** and R. Dhammapala, “Analysis of Ambient Ethylene Oxide Mixing Ratios in the United States,” *ACS ES&T Air*, 2025. DOI: 10.1021/acsestair.5c00186.
- 41 **E. S. Robinson**, A. Yassine, S. Agarwal, M. W. Tehrani, S. N. Lupolt, A. A. Chiger, *et al.*, “Total cancer risk estimates from measured concentrations of volatile organic compounds in industrialized southeastern Louisiana,” *Proceedings of the National Academy of Sciences*, vol. 122, e2504770122, 2025. DOI: 10.1073/pnas.2504770122.
- 40 X. Tian, B. E. Cummings, M. S. Waring, M. F. Touchie, **E. S. Robinson**, B. A. Nault, and P. F. DeCarlo, “Predicting indoor concentrations and chemical composition of outdoor-originated particulate matter with a CONTAM building model,” *Aerosol Science and Technology*, vol. 59, pp. 1166–1179, 2025. DOI: 10.1080/02786826.2025.2521337.

## 2024

- 39 J. R. Campbell, M. B. Jr., K. K. Dingilian, M. Cesler-Maloney, W. R. Simpson, **E. S. Robinson**, *et al.*, “Enhanced aqueous formation and neutralization of fine atmospheric particles driven by extreme cold,” *Science Advances*, vol. 10, eado4373, 2024. DOI: 10.1126/sciadv.ado4373.
- 38 S. Kapur, K. C. Edwards, T. Fang, M. Schervish, P. S. J. Lakey, Y. Yang, *et al.*, “Reactive oxygen species, environmentally persistent free radicals, and oxidative potential of outdoor and indoor particulate matter in Wintertime Fairbanks, Alaska,” *Aerosol Science and Technology*, vol. ahead-of-print, pp. 1–18, 2024. DOI: 10.1080/02786826.2024.2433656.
- 37 J. Mao, K. Bali, J. R. Campbell, **E. S. Robinson**, P. F. DeCarlo, A. Ijaz, *et al.*, “Multiphase sulfur chemistry facilitates particle growth in a cold and dark urban environment,” *Faraday Discussions*, 2024. DOI: 10.1039/d4fd00170b.
- 36 W. R. Simpson, J. Mao, G. J. Fochesatto, K. S. Law, P. F. DeCarlo, J. Schmale, *et al.*, “Overview of the Alaskan Layered Pollution and Chemical Analysis (ALPACA) Field Experiment,” *ACS ES&T Air*, vol. 1, pp. 200–222, 2024. DOI: 10.1021/acsestair.3c00076.
- 35 **E. S. Robinson** and P. F. DeCarlo, “Transmission and Distribution Pipeline Leak Identification and Characterization by Walking Survey and Soil Flux Measurements,” *ACS ES&T Air*, 2024. DOI: 10.1021/acsestair.4c00109.
- 34 **E. S. Robinson**, M. B. Jr., J. R. Campbell, M. Cesler-Maloney, W. Simpson, J. Mao, R. J. Weber, and P. F. DeCarlo, “Multi-year, high-time resolution aerosol chemical composition and mass measurements from Fairbanks, Alaska,” *Environmental Science: Atmospheres*, vol. 4, pp. 685–698, 2024. DOI: 10.1039/d4ea00008k.
- 33 **E. S. Robinson**, M. W. Tehrani, A. Yassine, S. Agarwal, B. A. Nault, C. Gigot, *et al.*, “Ethylene Oxide in Southeastern Louisiana’s Petrochemical Corridor: High Spatial Resolution Mobile Monitoring during HAP-MAP,” *Environmental Science & Technology*, 2024. DOI: 10.1021/acs.est.3c10579.
- 32 Y. Yang, M. A. Battaglia, M. K. Mohan, **E. S. Robinson**, P. F. DeCarlo, K. C. Edwards, *et al.*, “Assessing the Oxidative Potential of Outdoor PM<sub>2.5</sub> in Wintertime Fairbanks, Alaska,” *ACS ES&T Air*, vol. 1, pp. 175–187, 2024. DOI: 10.1021/acsestair.3c00066.
- 31 Y. Yang, M. A. Battaglia, **E. S. Robinson**, P. F. DeCarlo, K. C. Edwards, T. Fang, *et al.*, “Indoor–Outdoor Oxidative Potential of PM<sub>2.5</sub> in Wintertime Fairbanks, Alaska: Impact of Air Infiltration and Indoor Activities,” *ACS ES&T Air*, vol. 1, pp. 188–199, 2024. DOI: 10.1021/acsestair.3c00067.

## 2023

- 30 M. W. Tehrani, E. C. Fortner, **E. S. Robinson**, A. A. Chiger, R. Sheu, B. S. Werden, *et al.*, “Characterizing metals in particulate pollution in communities at the fenceline of heavy industry: combining

mobile monitoring and size-resolved filter measurements,” *Environmental Science: Processes & Impacts*, vol. 25, pp. 1491–1504, 2023. DOI: 10.1039/d3em00142c.

- 29 **E. S. Robinson**, M. Cesler-Maloney, X. Tan, J. Mao, W. Simpson, and P. F. DeCarlo, “Winter-time spatial patterns of particulate matter in Fairbanks, AK during ALPACA 2022,” *Environmental Science: Atmospheres*, vol. 3, pp. 568–580, 2023. DOI: 10.1039/d2ea00140c.

## 2022

- 28 J. R. Campbell, M. Battaglia, K. Dingilian, M. Cesler-Maloney, J. M. S. Clair, T. F. Hanisco, *et al.*, “Source and Chemistry of Hydroxymethanesulfonate (HMS) in Fairbanks, Alaska,” *Environmental Science & Technology*, vol. 56, pp. 7657–7667, 2022. DOI: 10.1021/acs.est.2c00410.

## 2021

- 27 R. H. H. Janssen, C. L. Heald, A. L. Steiner, A. E. Perring, J. A. Huffman, **E. S. Robinson**, C. H. Twohy, and L. D. Ziemba, “Drivers of the fungal spore bioaerosol budget: observational analysis and global modeling,” *Atmospheric Chemistry and Physics*, vol. 21, pp. 4381–4401, 2021. DOI: 10.5194/acp-21-4381-2021.

## 2020

- 26 R. U. Shah, E. S. Robinson, P. Gu, J. S. Apte, J. D. Marshall, A. L. Robinson, and A. A. Presto, “Socio-economic disparities in exposure to urban restaurant emissions are larger than for traffic,” *Environmental Research Letters*, vol. 15, p. 114039, 2020. DOI: 10.1088/1748-9326/abbc92.
- 25 Q. Ye, H. Z. Li, P. Gu, **E. S. Robinson**, J. S. Apte, R. C. Sullivan, *et al.*, “Moving beyond Fine Particle Mass: High-Spatial Resolution Exposure to Source-Resolved Atmospheric Particle Number and Chemical Mixing State,” *Environmental Health Perspectives*, vol. 128, p. 017009, 2020. DOI: 10.1289/ehp5311.

## 2019

- 24 A. T. Ahern, **E. S. Robinson**, D. S. Tkacik, R. Saleh, L. E. Hatch, K. C. Barsanti, *et al.*, “Production of Secondary Organic Aerosol During Aging of Biomass Burning Smoke From Fresh Fuels and Its Relationship to VOC Precursors,” *Journal of Geophysical Research: Atmospheres*, vol. 124, pp. 3583–3606, 2019. DOI: 10.1029/2018jd029068.
- 23 V. Dufлот, P. Tulet, O. Flores, C. Barthe, A. Colomb, L. Deguillaume, *et al.*, “Preliminary results from the FARCE 2015 campaign: multidisciplinary study of the forest–gas–aerosol–cloud system on the tropical island of La Réunion,” *Atmospheric Chemistry and Physics*, vol. 19, pp. 10591–10618, 2019. DOI: 10.5194/acp-19-10591-2019.
- 22 H. Z. Li, P. Gu, Q. Ye, N. Zimmerman, **E. S. Robinson**, R. Subramanian, *et al.*, “Spatially dense air pollutant sampling: Implications of spatial variability on the representativeness of stationary air pollutant monitors,” *Atmospheric Environment: X*, vol. 2, p. 100012, 2019. DOI: 10.1016/j.aeaoa.2019.100012.
- 21 **E. S. Robinson**, R. U. Shah, K. Messier, P. Gu, H. Z. Li, J. S. Apte, A. L. Robinson, and A. A. Presto, “Land-Use Regression Modeling of Source-Resolved Fine Particulate Matter Components from Mobile Sampling,” *Environmental Science & Technology*, vol. 53, pp. 8925–8937, 2019. DOI: 10.1021/acs.est.9b01897.

## 2018

- 20 P. Gu, H. Z. Li, Q. Ye, **E. S. Robinson**, J. S. Apte, A. L. Robinson, and A. A. Presto, “Intracity Variability of Particulate Matter Exposure Is Driven by Carbonaceous Sources and Correlated with Land-Use Variables,” *Environmental Science & Technology*, vol. 52, pp. 11545–11554, 2018. DOI: 10.1021/acs.est.8b03833.
- 19 P. K. Saha, **E. S. Robinson**, R. U. Shah, N. Zimmerman, J. S. Apte, A. L. Robinson, and A. A. Presto, “Reduced Ultrafine Particle Concentration in Urban Air: Changes in Nucleation and Anthropogenic Emissions,” *Environmental Science & Technology*, vol. 52, pp. 6798–6806, 2018. DOI: 10.1021/acs.est.8b00910.
- 18 R. U. Shah, **E. S. Robinson**, P. Gu, A. L. Robinson, J. S. Apte, and A. A. Presto, “High-spatial-resolution mapping and source apportionment of aerosol composition in Oakland, California, using mobile aerosol mass spectrometry,” *Atmospheric Chemistry and Physics*, vol. 18, pp. 16325–16344, 2018. DOI: 10.5194/acp-18-16325-2018.
- 17 A. Sinha, R. Saleh, **E. S. Robinson**, A. T. Ahern, D. S. Tkacik, A. A. Presto, *et al.*, “Mass accommodation coefficients of fresh and aged biomass-burning emissions,” *Aerosol Science and Technology*, vol. 52, pp. 300–309, 2018. DOI: 10.1080/02786826.2017.1413488.

- 16 **E. S. Robinson**, P. Gu, Q. Ye, H. Z. Li, R. U. Shah, J. S. Apte, A. L. Robinson, and A. A. Presto, "Restaurant Impacts on Outdoor Air Quality: Elevated Organic Aerosol Mass from Restaurant Cooking with Neighborhood-Scale Plume Extents," *Environmental Science & Technology*, vol. 52, pp. 9285–9294, 2018. DOI: 10.1021/acs.est.8b02654.
- 15 Q. Ye, P. Gu, H. Z. Li, **E. S. Robinson**, E. Lipsky, C. Kaltsonoudis, *et al.*, "Spatial Variability of Sources and Mixing State of Atmospheric Particles in a Metropolitan Area," *Environmental Science & Technology*, vol. 52, pp. 6807–6815, 2018. DOI: 10.1021/acs.est.8b01011.
- 14 Q. Ye, M. A. Upshur, **E. S. Robinson**, F. M. Geiger, R. C. Sullivan, R. J. Thomson, and N. M. Donahue, "Following Particle-Particle Mixing in Atmospheric Secondary Organic Aerosols by Using Isotopically Labeled Terpenes," *Chem*, vol. 4, pp. 318–333, 2018. DOI: 10.1016/j.chempr.2017.12.008.

## 2017

- 13 R. Saleh, **E. S. Robinson**, A. T. Ahern, and N. M. Donahue, "Evaporation rate of particles in the vaporizer of the Aerodyne aerosol mass spectrometer," *Aerosol Science and Technology*, vol. 51, pp. 501–508, 2017. DOI: 10.1080/02786826.2016.1271109.
- 12 **E. S. Robinson**, R.-S. Gao, J. P. Schwarz, D. W. Fahey, and A. E. Perring, "Fluorescence calibration method for single-particle aerosol fluorescence instruments," *Atmospheric Measurement Techniques*, vol. 10, pp. 1755–1768, 2017. DOI: 10.5194/amt-10-1755-2017.
- 11 **E. S. Robinson**, T. B. Onasch, D. Worsnop, and N. M. Donahue, "Collection efficiency of  $\alpha$ -pinene secondary organic aerosol particles explored via light-scattering single-particle aerosol mass spectrometry," *Atmospheric Measurement Techniques*, vol. 10, pp. 1139–1154, 2017. DOI: 10.5194/amt-10-1139-2017.
- 10 D. S. Tkacik, **E. S. Robinson**, A. Ahern, R. Saleh, C. Stockwell, P. Veres, *et al.*, "A dual-chamber method for quantifying the effects of atmospheric perturbations on secondary organic aerosol formation from biomass burning emissions," *Journal of Geophysical Research: Atmospheres*, vol. 122, pp. 6043–6058, 2017. DOI: 10.1002/2016jd025784.
- 9 N. Zimmerman, A. A. Presto, S. P. N. Kumar, J. Gu, A. Hauriuk, **E. S. Robinson**, A. L. Robinson, and R. Subramanian, "A machine learning calibration model using random forests to improve sensor performance for lower-cost air quality monitoring," *Atmospheric Measurement Techniques*, vol. 11, pp. 291–313, 2017. DOI: 10.5194/amt-11-291-2018.

## 2016

- 8 **E. S. Robinson**, N. M. Donahue, A. T. Ahern, Q. Ye, and E. Lipsky, "Single-particle measurements of phase partitioning between primary and secondary organic aerosols," *Faraday Discussions*, vol. 189, pp. 31–49, 2016. DOI: 10.1039/c5fd00214a.
- 7 P. Ye, X. Ding, J. Hakala, V. Hofbauer, **E. S. Robinson**, and N. M. Donahue, "Vapor wall loss of semi-volatile organic compounds in a Teflon chamber," *Aerosol Science and Technology*, vol. 50, pp. 822–834, 2016. DOI: 10.1080/02786826.2016.1195905.
- 6 P. Ye, X. Ding, Q. Ye, **E. S. Robinson**, and N. M. Donahue, "Uptake of Semivolatile Secondary Organic Aerosol Formed from  $\alpha$ -Pinene into Nonvolatile Polyethylene Glycol Probe Particles," *The Journal of Physical Chemistry A*, vol. 120, pp. 1459–1467, 2016. DOI: 10.1021/acs.jpca.5b07435.
- 5 Q. Ye, **E. S. Robinson**, X. Ding, P. Ye, R. C. Sullivan, and N. M. Donahue, "Mixing of secondary organic aerosols versus relative humidity," *Proceedings of the National Academy of Sciences*, vol. 113, pp. 12649–12654, 2016. DOI: 10.1073/pnas.1604536113.

## 2015

- 4 **E. S. Robinson**, R. Saleh, and N. M. Donahue, "Probing the Evaporation Dynamics of Mixed SOA/Squalane Particles Using Size-Resolved Composition and Single-Particle Measurements," *Environmental Science & Technology*, vol. 49, pp. 9724–9732, 2015. DOI: 10.1021/acs.est.5b01692.

## 2014

- 3 R. Saleh, **E. S. Robinson**, D. S. Tkacik, A. T. Ahern, S. Liu, A. C. Aiken, *et al.*, "Brownness of organics in aerosols from biomass burning linked to their black carbon content," *Nature Geoscience*, vol. 7, pp. 647–650, 2014. DOI: 10.1038/ngeo2220.

## 2013

- 2 R. Saleh, C. J. Hennigan, G. R. McMeeking, W. K. Chuang, **E. S. Robinson**, H. Coe, N. M. Donahue, and A. L. Robinson, "Absorptivity of brown carbon in fresh and photo-chemically aged biomass-burning emissions," *Atmospheric Chemistry and Physics*, vol. 13, pp. 7683–7693, 2013. DOI: 10.5194/acp-13-7683-2013.

- 1 **E. S. Robinson**, R. Saleh, and N. M. Donahue, “Organic Aerosol Mixing Observed by Single-Particle Mass Spectrometry,” *The Journal of Physical Chemistry A*, vol. 117, pp. 13 935–13 945, 2013. DOI: 10.1021/jp405789t.

## Seminars and Talks (Invited)

### 2025

- 7 Division seminar, *Ethylene oxide mobile measurements + Total cancer risk estimates from measured concentrations of volatile organic compounds in industrialized southeastern Louisiana*, Colorado Dept. of Public Health & Environment Air Toxics & Ozone Precursors Section, Mar. 2025.
- 6 Platform (conference), *Total cancer risk estimates from measured concentrations of volatile organic compounds in industrialized southeastern Louisiana*, Environmental Health Justice Conference Industrial Pollution and Health: The Evidence, Dillard University, Jan. 2025.

### 2024

- 5 Platform (conference), *Wintertime spatial patterns of particulate matter in Fairbanks, Alaska during ALPACA 2022*, Session: Urban Air Quality in Winter and Other Cold/Dark Conditions: Challenges and Opportunities, American Geophysical Union Annual Conference, Dec. 2024.
- 4 Department seminar, *Mapping air pollutants at high spatial resolution: community exposure assessment using mobile monitoring and fast, in situ instrumentation*, Dept. of Hydrology & Atmospheric Sciences, University of Arizona, Oct. 2024.

### 2023

- 3 Research center seminar, *Ethylene oxide in southeastern Louisiana during HAP-MAP*, Center for Atmospheric Particle Studies, Carnegie Mellon University, Nov. 2023.
- 2 Department seminar, *From laboratory to neighborhood to living room: tracking atmospheric particles to understand where they come from, where they go, and how they evolve*, Dept. of Civil & Environmental Engineering, Northeastern University, Mar. 2023.
- 1 Department seminar, *From laboratory to neighborhood to living room: tracking atmospheric particles to understand where they come from, where they go, and how they evolve*, Dept. of Chemical & Environmental Engineering, University of Arizona, Feb. 2023.