

Ellis Shipley Robinson

Contact

Email: esrobinson@arizona.edu
Research website: ellissrobinson.github.io
University website: chee.engineering.arizona.edu/faculty-staff/faculty/ellis-robinson
Dept. of Chemical & Environmental Engineering
1133 E. James E. Rogers Way, Tucson, AZ 85721

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 (2025–2026)
- PI, University of Arizona Earth Dynamics Observatory: The Southern Arizona Aerosol Climatology (SoAZ-AC) project, \$10,000 (2025–2026)

Peer-reviewed Publications

2025

- 42 D. T. Ketcherside, R. J. Yokelson, V. Selimovic, **E. S. Robinson**, M. Cesler-Maloney, A. L. Holen, J. Wu, B. Temime-Roussel, A. Ijaz, J. Kuhn, A. Moon, G. Pappaccogli, K. C. d. Carvalho, S. Decesari, B. Alexander, B. J. Williams, B. D'Anna, J. Stutz, K. A. Pratt, P. F. DeCarlo, J. Mao, W. R. Simpson, P. K. Hopke, and L. Hu, "Wintertime Abundance and Sources of Key Trace Gas and Particle Species in Fairbanks, Alaska," *Journal of Geophysical Research: Atmospheres*, vol. 130, no. 15, 2025, ISSN: 2169-897X. DOI: 10.1029/2025jd043677.
- 41 **E. S. Robinson** and R. Dhammapala, "Ethylene oxide ambient concentration trends across the united states," *ACS ES&T Air*, 2025, Accepted for publication.
- 40 **E. S. Robinson**, Many others, and P. F. DeCarlo, "Total cancer risk estimates from measured concentrations of volatile organic compounds in industrialized southeastern louisiana," *Proceedings of the National Academy of Sciences*, 2025, Accepted for publication.
- 39 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, no. 10, pp. 1166–1179, 2025, ISSN: 0278-6826. DOI: 10.1080/02786826.2025.2521337.

2024

- 38 J. R. Campbell, M. B. Jr., K. K. Dingilian, M. Cesler-Maloney, W. R. Simpson, **E. S. Robinson**, P. F. DeCarlo, B. Temime-Roussel, B. D'Anna, A. L. Holen, J. Wu, K. A. Pratt, J. E. Dibb, A. Nenes, R. J. Weber, and J. Mao, "Enhanced aqueous formation and neutralization of fine atmospheric particles driven by extreme cold," *Science Advances*, vol. 10, no. 36, eado4373, 2024. DOI: 10.1126/sciadv.ado4373.
- 37 S. Kapur, K. C. Edwards, T. Fang, M. Schervish, P. S. J. Lakey, Y. Yang, **E. S. Robinson**, P. F. DeCarlo, W. R. Simpson, R. J. Weber, and M. Shiraiwa, "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, no. ahead-of-print, pp. 1–18, 2024, ISSN: 0278-6826. DOI: 10.1080/02786826.2024.2433656.
- 36 W. R. Simpson, J. Mao, G. J. Fochesatto, K. S. Law, P. F. DeCarlo, J. Schmale, K. A. Pratt, S. R. Arnold, J. Stutz, J. E. Dibb, J. M. Creamean, R. J. Weber, B. J. Williams, B. Alexander, L. Hu, R. J. Yokelson, M. Shiraiwa, S. Decesari, C. Anastasio, B. D'Anna, R. C. Gilliam, A. Nenes, J. M. S. Clair, B. Trost, J. H. Flynn, J. Savarino, L. D. Conner, N. Kettle, K. M. Heeringa, S. Albertin, A. Baccarini, B. Barret, M. A. Battaglia, S. Bekki, T. Brado, N. Brett, D. Brus, J. R. Campbell, M. Cesler-Maloney, S. Cooperdock, K. C. d. Carvalho, H. Delbarre, P. J. DeMott, C. J. Dennehy, E. Dieudonne, K. K. Dingilian, A. Donato, K. M. Doulgieris, K. C. Edwards, K. Fahey, T. Fang, F. Guo, L. M. D. Heinlein, A. L. Holen, D. Huff, A. Ijaz, S. Johnson, S. Kapur, D. T. Ketcherside, E. Levin, E. Lill, A. R. Moon, T. Onishi, G. Pappaccogli, R. Perkins, R. Pohorsky, J.-C. Raut, F. Ravetta, T. Roberts, **E. S. Robinson**, F. Scoto, V. Selimovic, M. O. Sunday, B. Temime-Roussel, X. Tian, J. Wu, and Y. Yang, "Overview of the Alaskan Layered Pollution and Chemical Analysis (ALPACA) Field Experiment," *ACS ES&T Air*, vol. 1, no. 3, pp. 200–222, 2024, ISSN: 2837-1402. 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, ISSN: 2837-1402. 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, no. 6, pp. 685–698, 2024. DOI: 10.1039/d4ea00008k.
- 33 **E. S. Robinson**, M. W. Tehrani, A. Yassine, S. Agarwal, B. A. Nault, C. Gigot, A. A. Chiger, S. N. Lupolt, C. Daube, A. M. Avery, M. S. Claflin, H. Stark, E. M. Lunny, J. R. Roscioli, S. C. Herndon, K. Skog, J. Bent, K. Koehler, A. M. Rule, T. Burke, T. I. Yacovitch, K. Nachman, and P. F. DeCarlo, "Ethylene Oxide in Southeastern Louisiana's Petrochemical Corridor: High Spatial Resolution Mobile Monitoring during HAP-MAP," *Environmental Science & Technology*, 2024, ISSN: 0013-936X. DOI: 10.1021/acs.est.3c10579.
- 32 Y. Yang, M. A. Battaglia, M. K. Mohan, **E. S. Robinson**, P. F. DeCarlo, K. C. Edwards, T. Fang, S. Kapur, M. Shiraiwa, M. Cesler-Maloney, W. R. Simpson, J. R. Campbell, A. Nenes, J. Mao, and R. J. Weber, "Assessing the Oxidative Potential of Outdoor PM_{2.5} in Wintertime Fairbanks, Alaska," *ACS ES&T Air*, vol. 1, no. 3, pp. 175–187, 2024, ISSN: 2837-1402. DOI: 10.1021/acsestair.3c00066.
- 31 Y. Yang, M. A. Battaglia, **E. S. Robinson**, P. F. DeCarlo, K. C. Edwards, T. Fang, S. Kapur, M. Shiraiwa, M. Cesler-Maloney, W. R. Simpson, J. R. Campbell, A. Nenes, J. Mao, and R. J. Weber, "Indoor–Outdoor Oxidative Potential of PM_{2.5} in Wintertime Fairbanks, Alaska: Impact of Air Infiltration and Indoor Activities," *ACS ES&T Air*, vol. 1, no. 3, pp. 188–199, 2024, ISSN: 2837-1402. DOI: 10.1021/acsestair.3c00067.

2023

- 30 M. W. Tehrani, E. C. Fortner, **E. S. Robinson**, A. A. Chiger, R. Sheu, B. S. Werden, C. Gigot, T. Yacovitch, S. V. Bramer, T. Burke, K. Koehler, K. E. Nachman, A. M. Rule, and P. F. DeCarlo, "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, no. 9, pp. 1491–1504, 2023, ISSN: 2050-7887. DOI: 10.1039/d3em00142c.
- 29 **E. S. Robinson**, M. Cesler-Maloney, X. Tan, J. Mao, W. Simpson, and P. F. DeCarlo, "Wintertime spatial patterns of particulate matter in Fairbanks, AK during ALPACA 2022," *Environmental Science: Atmospheres*, vol. 3, no. 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, **E. Robinson**, P. DeCarlo, W. Simpson, A. Nenes, R. J. Weber, and J. Mao, "Source and Chemistry of Hydroxymethanesulfonate (HMS) in Fairbanks, Alaska," *Environmental Science & Technology*, vol. 56, no. 12, pp. 7657–7667, 2022, ISSN: 0013-936X. 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, no. 6, 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, no. 11, 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, A. L. Robinson, N. M. Donahue, and A. A. Presto, "Moving beyond Fine Particle Mass: High-Spatial Resolution Exposure to Source-Resolved Atmospheric Particle Number and Chemical Mixing State," *Environmental Health Perspectives*, vol. 128, no. 1, p. 017009, 2020, ISSN: 0091-6765. DOI: 10.1289/ehp5311.

2019

- 24 A. T. Ahern, **E. S. Robinson**, D. S. Tkacik, R. Saleh, L. E. Hatch, K. C. Barsanti, C. E. Stockwell, R. J. Yokelson, A. A. Presto, A. L. Robinson, R. C. Sullivan, and N. M. Donahue, "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, no. 6, pp. 3583–3606, 2019, ISSN: 2169-897X. DOI: 10.1029/2018jd029068.
- 23 V. Dufлот, P. Tulet, O. Flores, C. Barthe, A. Colomb, L. Deguillaume, M. Vařtilingom, A. Perring, A. Huffman, M. T. Hernandez, K. Sellegri, **E. Robinson**, D. J. O'Connor, O. M. Gomez, F. Burnet, T. Bourriane, D. Strasberg, M. Rocco, A. K. Bertram, P. Chazette, J. Totems, J. Fournel, P. Stamenoff, J.-M. Metzger, M. Chabasset, C. Rousseau, E. Bourriane, M. Sancelme, A.-M. Delort, R. E. Wegener, C. Chou, and P. Elizondo, "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, no. 16, 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, J. S. Apte, A. L. Robinson, and A. A. Presto, "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, ISSN: 2590-1621. 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, no. 15, pp. 8925–8937, 2019, ISSN: 0013-936X. 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, no. 20, pp. 11545–11554, 2018, ISSN: 0013-936X. 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, no. 12, pp. 6798–6806, 2018, ISSN: 0013-936X. 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, no. 22, 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, R. C. Sullivan, A. L. Robinson, and N. M. Donahue, "Mass accommodation coefficients of fresh and aged biomass-burning emissions," *Aerosol Science and Technology*, vol. 52, no. 3, pp. 300–309, 2018, ISSN: 0278-6826. 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, no. 16, pp. 9285–9294, 2018, ISSN: 0013-936X. DOI: 10.1021/acs.est.8b02654.
- 15 Q. Ye, P. Gu, H. Z. Li, E. S. Robinson, E. Lipsky, C. Kaltsonoudis, A. K. Y. Lee, J. S. Apte, A. L. Robinson, R. C. Sullivan, A. A. Presto, and N. M. Donahue, "Spatial Variability of Sources and Mixing State of Atmospheric Particles in a Metropolitan Area," *Environmental Science & Technology*, vol. 52, no. 12, pp. 6807–6815, 2018, ISSN: 0013-936X. 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, no. 2, pp. 318–333, 2018, ISSN: 2451-9294. 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, no. 4, pp. 501–508, 2017, ISSN: 0278-6826. 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, no. 5, 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 α -pinene secondary organic aerosol particles explored via light-scattering single-particle aerosol mass spectrometry," *Atmospheric Measurement Techniques*, vol. 10, no. 3, 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, I. J. Simpson, S. Meinardi, D. R. Blake, R. J. Yokelson, A. A. Presto, R. C. Sullivan, N. M. Donahue, and A. L. Robinson, "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, no. 11, pp. 6043–6058, 2017, ISSN: 2169-897X. DOI: 10.1002/2016jd025784.
- 9 N. Zimmerman, A. A. Presto, S. P. N. Kumar, J. Gu, A. Hauryliuk, **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, no. 1, 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, ISSN: 1359-6640. 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, no. 8, pp. 822–834, 2016, ISSN: 0278-6826. 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 α -Pinene into Nonvolatile Polyethylene Glycol Probe Particles," *The Journal of Physical Chemistry A*, vol. 120, no. 9, pp. 1459–1467, 2016, ISSN: 1089-5639. 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, no. 45, pp. 12 649–12 654, 2016, ISSN: 0027-8424. 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, no. 16, pp. 9724–9732, 2015, ISSN: 0013-936X. DOI: 10.1021/acs.est.5b01692.

2014

- 3 R. Saleh, **E. S. Robinson**, D. S. Tkacik, A. T. Ahern, S. Liu, A. C. Aiken, R. C. Sullivan, A. A. Presto, M. K. Dubey, R. J. Yokelson, N. M. Donahue, and A. L. Robinson, "Brownness of organics in aerosols from biomass burning linked to their black carbon content," *Nature Geoscience*, vol. 7, no. 9, pp. 647–650, 2014, ISSN: 1752-0894. 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 photochemically aged biomass-burning emissions," *Atmospheric Chemistry and Physics*, vol. 13, no. 15, 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, no. 51, pp. 13 935–13 945, 2013, ISSN: 1089-5639. 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.