

Gabriel Isaacman-VanWertz

Assistant Professor, Charles E. Via Department of Civil and Environmental Engineering
Virginia Polytechnic Institute and State University
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EDUCATION AND TRAINING

Massachusetts Institute of Technology University of California, Berkeley Wesleyan University	<u>Civil and Environ. Eng.</u> <u>Envi. Sci., Policy, and Manag.</u> <u>Chemistry; Earth & Envi. Sci.(High Honors)</u>	Postdoctoral Fellow 2015-2016 Ph.D. 2014 B.A. 2007
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APPOINTMENTS

Assistant professor, Department of Civil and Environmental Engineering, Virginia Tech, 2017-present.

RESEARCH AWARDS

Funded projects

- NOAA, SBIR/STTR Phase 1: “Automated Monitoring of VOCs with a Compact Gas Chromatography-Proton Transfer Reaction Mass Spectrometer (GC-mVocus).” Co-PI, \$150,000. 2020-2020.
- NSF, AGS: “Collaborative Research: Understanding ozone-ecosystem controls and feedbacks across landscapes through leaf- and canopy-scale measurements.” PI, \$295,577 (additional \$366,620 to UVA). 2018-2021
- Alfred P. Sloan Foundation: “Improved chemical characterization of indoor organics by isomer-resolved spectrometry”. PI, \$312,170. 2018-2021.
- NOAA, SBIR/STTR Phase 1 & 2: “Automated peak fitting and analysis software for advanced gas chromatography and mass spectrometer systems.” Co-PI, \$519,977. 2017-2020.
- DOE, SBIR/STTR Phase 1 & 2: “Low-cost, time-resolved chemical characterization of atmospheric aerosols. US Department of Energy.” Co-PI, \$1,322,575. 2018-2021.
- 4-VA: “Atmosphere-Forest Ozone Exchange at the Virginia Forest Lab: A University of Virginia-Virginia Tech Interdisciplinary Research Partnership.” Co-PI, \$30,000. 2017-2018.
- 4-VA: “Forest resilience in a warmer world: using novel technologies to advance interdisciplinary understanding of thermal controls over ecosystem functions at the Virginia Forest Laboratory.” Co-PI, \$35,000. 2019-2020
- VA Dept. of Environ. Quality: “Evaluation of Impacts Resulting from Home Heating Oil Tank Discharges. VA Department of Environmental Quality.” Co-PI, \$173,201, 2017-2018.

Prior to Virginia Tech

- NSF, AGS Postdoctoral Research Fellowship: “Atmospheric lifecycle of organic carbon through multiple generations of aging.” 2014.
- DOE, LNBL: Advanced Light Source User: “Exploring Ambient Organic Aerosol Composition through Gas Chromatography with High-Resolution, Soft-Ionization Mass Spectrometry.” 2011.
- EPA, STAR Graduate Research Fellowship: “Characterization of Highly Oxygenated Organic Compounds and Organosulfates in Atmospheric Particulate Matter.” 2009.
- NSF, Graduate Research Fellowship: “Chemical Speciation of Highly Oxygenated Organic Compounds (HOOCs) in Atmospheric Aerosols.” 2009.

AWARDS AND FELLOWSHIPS

2020 VT Engineering Dean’s Award of Excellence: Outstanding New Assistant Professor
 2016 American Association of Aerosol Research Friedlander Award for outstanding dissertation
 2014 NSF Atmospheric and Geospace Sciences Postdoctoral Research Fellowship
 2013 Acceptance to Atmospheric Chemistry Colloquium for Emerging Senior Scientists (ACCESS)
 2012 Atmospheric Geophysical Union Outstanding Student Paper Award

2010 NSF Graduate Student Research Fellowship
2010 EPA STAR Fellowship
Undergraduate chemistry awards: Bradley Prize, Martius Yellow Award, Hughes Summer Fellowship

SERVICE

- Chair of the Aerosol Chemistry Working Group of the American Association of Aerosol Research
- Editor of the Newsletter Committee of the American Association of Aerosol Research
- Regular journal reviewer for: Atmospheric Chemistry and Physics, Environmental Science and Technology, Journal of Geophysical Research
- Proposal reviewer for: National Oceanic and Atmospheric Administration, Alfred P. Sloan Foundation, National Science Foundation
- Regular session chair for: American Association of Aerosol Research Fall Meeting, American Geophysical Union Fall Meeting
- Member of 1 faculty search committee
- Member of approximately 20 graduate student committees

TEACHING

Annual courses:

CEE 3104 – Introduction to Environmental Engineering (2018, 2019)
CEE 5984 – Emerging Tools for Environmental Field Research (2019, 2020)

Biennial courses:

CEE 5984 – Atmospheric Chemistry (2017, 2020)
CEE 5984 – Atmospheric Measurement Techniques (2018)

Average teaching evaluations: 5.33/6

ADVISING

Current

Chenyang Bi, Postdoctoral Researcher

James Hurley, Ph.D. student
Deborah McGlynn, Ph.D. student
Sungwoo Kim, Ph.D. student
Graham Frazier, Ph.D. student
Purushottam Kumar, Ph.D. student
Namrata Panji, Ph.D. student

Graduated

Xin Lu, M.S. 2018
Asmita Deshmukh, M.S. 2019

Mary Tovillo, B.S. 2019. Previous summer intern from Multicultural Academic Opportunities Program

Summer Interns

Allahna Grant, summer intern from Multicultural Academic Opportunities Program

PUBLICATIONS

Member of the Isaacman-VanWertz group in bold*

4 publications currently in review or revision

2020

47. Heald, C. J., J. de Gouw, **G. Isaacman-VanWertz**, A. H. Goldstein, A. B. Guenther, P. L. Hayes, W. W. Hu, J. L. Jimenez, F. N. Keutsch, A. R. Koss, P. K. Misztal, B. Rappenglück, J. M. Roberts, P. S. Stevens, R. A. Washenfelder, C. Warneke, C. J. Young: Contrasting Reactive Carbon Observations in the Southeast United States (SOAS) and Southern California (CalNex). In review at *Environmental Science & Technology*.
46. **Isaacman-VanWertz, G., X. Lu***, E. Weiner, E. Smiley, and M. Widdowson: Characterization of hydrocarbon groups in complex mixtures using gas chromatography with unit-mass resolution electron ionization mass spectrometry. *Analytical Chemistry*, 92(18), 12481-12488, 2020.
45. **J. F. Hurley***, N. M. Kreisberg, B. Stump, **C. Bi***, **P. Kumar***, S. V. Hering, P. Keady, and **G. Isaacman-VanWertz**: A new approach for measuring the carbon and oxygen content of atmospherically-relevant compounds and mixtures. *Atmospheric Measurement Techniques*, 13, 4911-4925, 2020.
44. Yee, L., **G. Isaacman-VanWertz**, R.A. Wernis, N.M. Kreisberg, M. Glasius, M. Riva, J.D. Surratt, S.S. de Sá, S.T. Martin, M.L. Alexander, B.B. Palm, W.W. Hu, P. Campuzano-Jost, D.A. Day, J.L. Jimenez, Y. Liu, P.K. Misztal, P. Artaxo, J. Viegas, A. Manzi, R.A. F. de Souza, E.S. Edgerton, K. Baumann, and A.H. Goldstein: Natural and anthropogenically-influenced isoprene oxidation in the Southeastern U.S.A. and central Amazon. *Environmental Science & Technology*, 54, 5980-5991, doi: 10.1021/acs.est.0c00805, 2020.

2019

43. de Sá, S. S., L.V. Rizzo, B.B. Palm, P. Campuzano-Jost, D.A. Day, L.D. Yee, R. Wernis, **G. Isaacman-VanWertz**, J. Brito, S. Carbone, Y.J. Liu, A. Sedlacek, S. Springston, A.H. Goldstein, H.M.J. Barbosa, M.L. Alexander, P. Artaxo, J.L. Jimenez, and S.T. Martin, Contributions of biomass-burning, urban, and biogenic emissions to the concentrations and light-absorbing properties of particulate matter in central Amazonia during the dry season, *Atmospheric Chemistry and Physics*, 19, 7973-8001, doi:10.5194/acp-19-7973-2019, 2019.
42. Shrivastava, M., M.O. Andreae, P. Artaxo, H.M.J. Barbosa, L.K. Berg, J. Brito, J. Ching, R.C. Easter, J. Fan, J.D. Fast, Z. Feng, J.D. Fuentes, M. Glasius, A.H. Goldstein, E.G. Alves, H. Gomes, D. Gu, A. Guenther, S.H. Jathar, S. Kim, Y. Liu, S. Lou, S.T. Martin, V.F. McNeill, A. Medeiros, S.S. de Sá, J.E. Shilling, S.R. Springston, R.A.F. Souza, J.A. Thornton, **G. Isaacman-VanWertz**, L.D. Yee, R. Ynoue, R.A. Zaveri, A. Zelenyuk, and C. Zhao, Urban pollution greatly enhances formation of natural aerosols over the Amazon rainforest, *Nature Communications*, 10, 1046, doi:10.1038/s41467-019-08909-4, 2019.
41. Eichler, C. M. A., J. Cao, **G. Isaacman-VanWertz**, and J. Little, Modeling the formation and growth of organic films on indoor surfaces, *Indoor Air*, <https://doi.org/10.1111/ina.12518>, 29,17-29, 2019.

2018

40. Glasius, M., M. S. Bering, L. Yee, S. S. de Sá, **G. Isaacman-VanWertz**, R. Wernis, H. M.J. Barbosa, L. Alexander, B. B. Palm, W. Hu, P. Campuzano-Jost, D. Day, J. Jimenez, M. Shrivastava, S. T. Martin and A. H. Goldstein, Organosulfates in aerosols downwind of an urban region in central Amazon, *Environmental Science: Processes & Impacts*, <https://doi.org/10.1039/C8EM00413G>, in press, 2018.

39. de Sá, S. S., B. B. Palm, P. Campuzano-Jost, D.A. Day, W. Hu, **G. Isaacman-VanWertz**, L.D. Yee, J. Brito, S. Carbone, I.O. Ribeiro, G.G. Cirino, Y.J. Liu, R. Thalman, A. Sedlacek, A. Funk, C. Schumacher, J.E. Shilling, J. Schneider, P. Artaxo, A.H. Goldstein, R.A.F. Souza, J. Wang, K.A. McKinney, H. Barbosa, M.L. Alexander, J.L. Jimenez, and S.T. Martin, Urban influence on the concentration and composition of submicron particulate matter in central Amazonia, *Atmospheric Chemistry and Physics*, 18, 12185–12206, <https://doi.org/10.5194/acp-2018-172>, 2018.
38. Yee, L.D., **G. Isaacman-VanWertz**, R.A. Wernis, M. Meng, V. Rivera, N.M. Kreisberg, S.V. Hering, M.S. Bering, M. Glasius, M.A. Upshur, A.G. Bé, R.J. Thomson, F.M. Geiger, J.H. Offenberg, M. Lewandowski, I. Kourtchev, M. Kalberer, S. de Sá, S.T. Martin, M.L. Alexander, B.B. Palm, W.W. Hu, P. Campuzano-Jost, D.A. Day, J.-L. Jimenez, Y. Liu, K.A. McKinney, P. Artaxo, J. Viegas, A. Manzi, M.B. Oliveira, R. de Souza, L.A.T. Machado, K. Longo, and A.H. Goldstein: Observations of sesquiterpenes and their oxidation products in central Amazonia during the wet and dry seasons, *Atmospheric Chemistry and Physics*, 18, 10433-10457, doi:10.5194/acp-2018-191, 2018.
37. **Isaacman-VanWertz, G.**, P. Massoli, R. O'Brien, C.Y. Lim, J. P. Franklin, J.A. Moss, J.F. Hunter, J.B. Nowak, M.R. Canagaratna, P.K. Misztal, C. Arata, J.R. Roscioli, S.T. Herndon, T.B. Onasch, A.T. Lambe, J.T. Jayne, L. Su, D.A. Knopf, A.H. Goldstein, D.R. Worsnop, and J.H. Kroll: Chemical evolution of atmospheric organic carbon over multiple generations of oxidation, *Nature Chemistry*, 10, 462-468, doi:10.1038/s41557-018-0002-2, 2018.
36. de Gouw, J.A., J.B. Gilman, S.-W. Kim, S. Alvarez, S. Dusanter, M. Graus, S.M. Griffith, **G. Isaacman-VanWertz**, W.C. Kuster, B.L. Lefer, B.M. Lerner, B.C. McDonald, B. Rappenglück, J.M. Roberts, P.S. Stevens, J. Stutz, R. Thalman, P.R. Veres, R. Volkamer, C. Warneke, R.A. Washenfelder and C.J. Young: Chemistry of volatile organic compounds in the Los Angeles basin: formation of oxygenated compounds and determination of emission ratios, *Journal of Geophysical Research Atmospheres*, 123, 1–22, doi:10.1002/2017JD027976, 2018.
35. McDonald, B.C., J.A. de Gouw, J.B. Gilman, S.H. Jathar, A. Akherati, C.D. Cappa, J.-L. Jimenez, J. Lee-Taylor, P.L. Hayes, S.A. McKeen, Y.Y. Cui, S.-W. Kim, D.R. Gentner, **G. Isaacman-VanWertz**, A.H. Goldstein, R.A. Harley, G.J. Frost, J.M. Roberts, T.B. Ryerson, and M. Trainer: Volatile chemical products emerging as largest petrochemical source of urban organic emissions, *Science*, 359, 760–764, 2018.
34. Zhang, H., L.D. Yee, B.H. Lee, M.P. Curtis, D.R. Worton, **G. Isaacman-VanWertz**, J.H. Offenberg, M. Lewandowski, T.E. Kleindienst, M.R. Beaver, A.L. Holder, W.A. Lonneman, K.S. Docherty, M. Jaoui, H.O.T. Pye, W.W. Hu, D.A. Day, P. Campuzano-Jost, J.-L. Jimenez, H. Guo, R.J. Weber, J.A. de Gouw, A.R. Koss, E.S. Edgerton, W.H. Brune, C. Mohr, F.D. Lopez-Hilfiker, A. Lutz, N.M. Kreisberg, S.R. Spielman, S.V. Hering, K.R. Wilson, J.A. Thornton, and A.H. Goldstein: Monoterpenes are the largest source of summertime organic aerosol in the southeastern United States, *Proceedings of the National Academy of Sciences*, 115 (9), 2038-2043, doi:10.1073/pnas.1717513115, 2018.
33. Palm, B.B., S.S. de Sá, D.A. Day, P. Campuzano-Jost, W.W. Hu, R. Seco, S.J. Sjostedt, J.-H. Park, A.B. Guenther, S. Kim, J. Brito, F. Wurm, P. Artaxo, R. Thalman, J. Wang, L.D. Yee, R. Wernis, **G. Isaacman-VanWertz**, A.H. Goldstein, Y. Liu, S.R. Springston, R. Souza, M.K. Newburn, M.L. Alexander, S.T. Martin, and J.L. Jimenez: Secondary organic aerosol formation from ambient air in an oxidation flow reactor in central Amazonia, *Atmospheric Chemistry and Physics*, 18, 467-493, doi:10.5194/acp-18-467-2018, 2018.
32. Hagan, D.H., **G. Isaacman-VanWertz**, J.P. Franklin, L.M.M. Wallace, B.D. Kocar, C.L. Heald, and J.H. Kroll: Calibration and assessment of electrochemical air quality sensors by co-location with regulatory-grade instruments, *Atmospheric Measurement Techniques*, 11, 315-528, doi:10.5194/amt-11-315-2018, 2018.
31. Pye, H.O.T., A. Zuend, J.L. Fry, **G. Isaacman-VanWertz**, S.L. Capps, K.W. Appel, H. Foroutan, L. Xu, N.L. Ng, and A. H. Goldstein: Coupling of organic and inorganic aerosol systems and the effect on

gas–particle partitioning in the southeastern US, *Atmospheric Chemistry and Physics*, 18, 357-370, doi:10.5194/acp-18-357-2018, 2018.

2017

30. **Isaacman-VanWertz, G.**, D.T. Sueper, K.C. Aikin, B.M. Lerner, J.B. Gilman, J.A. de Gouw, D.R. Worsnop, and A.H. Goldstein: Automated single-ion peak fitting as an efficient approach for analyzing complex chromatographic data, *Journal of Chromatography A*, 1529, 81-92, doi:10.1016/j.chroma.2017.11.005, 2017.
29. de Gouw, J.A., J.B. Gilman, S.-W. Kim, B.M. Lerner, **G. Isaacman-VanWertz**, B.C. McDonald, C. Warneke, W. C. Kuster, B.L. Lefer, S.M. Griffith, S. Dusanter, P. S. Stevens, and J. Stutz: Chemistry of volatile organic compounds in the Los Angeles basin: nighttime removal of alkenes and determination of emission ratios, *Journal of Geophysical Research Atmospheres*, 122 (21), 11843-11861, doi: 10.1002/2017JD027459, 2017.
28. **Isaacman-VanWertz, G.**, P. Massoli, R.E. O'Brien, J.B. Nowak, M.R. Canagaratna, J.T. Jayne, D.R. Worsnop, L. Su, D.A. Knopf, P.K. Misztal, C. Arata, A.H. Goldstein and J.H. Kroll: Using advanced mass spectrometry techniques to fully characterize atmospheric organic carbon: current capabilities and remaining gaps, *Faraday Discussions*, 200, 579-598, doi:10.1039/C7FD00021A, 2017.
27. Worton, D.R., M. Decker, **G. Isaacman-VanWertz**, A.W.H. Chan, K.R. Wilson, and A.H. Goldstein: Improved molecular level identification of organic compounds using comprehensive two-dimensional chromatography, dual ionization energies and high resolution mass spectrometry, *Analyst*, 142, 2395-2403, doi:10.1039/C7AN00625J, 2017.
26. de Sá, S.S., B.B. Palm, P. Campuzano-Jost, D.A. Day, M.K. Newburn, W. Hu, **G. Isaacman-VanWertz**, L.D. Yee, R. Thalman, J. Brito, S. Carbone, P. Artaxo, A.H. Goldstein, A.O. Manzi, R.A.F. Souza, F. Mei, J.E. Shilling, S.R. Springston, J. Wang, J.D. Surratt, M.L. Alexander, J.L. Jimenez, and S.T. Martin: Influence of urban pollution on the production of organic particulate matter from isoprene epoxydiols in central Amazonia, *Atmospheric Chemistry and Physics*, 17, 6611-6629, doi:10.5194/acp-17-6611-2017, 2017.
25. Pye, H.O.T., B.N. Murphy, L. Xu, N.L. Ng, A.G. Carlton, H. Guo, R. Weber, P. Vasilakos, K.W. Appel, S.H. Budisulistiorini, J.D. Surratt, A. Nenes, A., W. Hu, J.L. Jimenez, **G. Isaacman-VanWertz**, P. K. Misztal, and A. H. Goldstein: On the implications of aerosol liquid water and phase separation for organic aerosol mass, *Atmospheric Chemistry and Physics*, 17, 343-369, doi:10.5194/acp-17-343-2017, 2017.
24. Lerner B.M., J.B. Gilman, K.C. Aiken, E.L. Atlas, P.D. Goldan, M. Graus, R. Hendershot, **G. Isaacman-VanWertz**, A. Koss, W.C. Kuster, R.A. Lueb, R.J. McLaughlin, J. Peischl, D. Sueper, T.B. Ryerson, T.W. Tokarek, C. Warneke, B. Yuan, and J.A. de Gouw: An improved, automated whole air sampler and gas chromatography mass spectrometry analysis system for volatile organic compounds in the atmosphere, *Atmospheric Measurement Techniques*, 10, 291-313, doi:10.5194/amt-10-291-2017, 2017.
23. Thompson, S.L., R.L.N. Yatavelli, H. Stark, J.R. Kimmel, J.E. Krechmer, D.A. Day, W. Hu, **G. Isaacman-VanWertz**, L. Yee, A.H. Goldstein, M.A.H. Khan, R. Holzinger, N. Kreisberg, F.D. Lopez-Hilfiker, C. Mohr, J.A. Thornton, J.T. Jayne, M. Canagaratna, D.R. Worsnop and J.L. Jimenez: Field intercomparison of the gas/particle partitioning of oxygenated organics during the Southern Oxidant and Aerosol Study (SOAS) in 2013, *Aerosol Science and Technology*, 51, 30-56, doi: 10.1080/02786826.2016.1254719, 2017.

2016

22. **Isaacman-VanWertz, G.**, L.D. Yee, N.M. Kreisberg, R. Wernis, J.A. Moss, S.V. Hering, S.S. de Sá, S.T. Martin, L. Alexander, B.B. Palm, W.W. Hu, P. Campuzano-Jost, D.A. Day, J.L. Jimenez, M. Riva, J.D. Surratt, J. Viegas, A. Manzi, E. Edgerton, K. Baumann, R. Souza, P. Artazo, and A.H. Goldstein: Ambient gas-particle partitioning of tracers for biogenic oxidation, *Environmental Science & Technology*, 50 (18), 9952-9962, doi: 10.1021/acs.est.6b01674, 2016.

2015

21. Worton, D.R., H. Zhang, **G. Isaacman-VanWertz**, A. Chan, K. Wilson, and A.H. Goldstein: Comprehensive chemical characterization of hydrocarbons in NIST standard reference material 2779 Gulf of Mexico crude oil, *Environmental Science & Technology*, 49 (22), 13130-13138, doi: 10.1021/acs.est.5b03472, 2015.
20. Hu, W.W., P. Campuzano-Jost, B.B. Palm, D.A. Day, A.M. Ortega, P. L. Hayes, J.E. Krechmer, Q. Chen, M. Kuwata, Y. J. Liu, S.S. de Sá, S.T. Martin, M. Hu, S.H. Budisulistiorini, M. Riva, J.D. Surratt, J.M. St. Clair, **G. Isaacman-VanWertz**, L.D. Yee, A.H. Goldstein, S. Carbone, P. Artaxo, J.A de Gouw, A. Koss, A. Wisthaler, T. Mikoviny, T. Karl, L. Kaser, W. Jud, A. Hansel, K. S. Docherty, M.R. Canagaratna, F. Paulot, and J.L. Jimenez: Characterization of a real-time tracer for isoprene epoxydiols-derived secondary organic aerosol (IEPOX-SOA) from aerosol mass spectrometer measurements, *Atmospheric Chemistry and Physics*, 15, 11807–11833, doi:10.5194/acp-15-11807-2015, 2015.
19. Zhang, H., D.R. Worton, S. Shen, T. Nah, **G. Isaacman-VanWertz**, K.R. Wilson, and A.H. Goldstein: Fundamental time scales governing organic aerosol multiphase partitioning and oxidative aging, *Environmental Science & Technology*, 49 (16), 9768-9777, doi: 10.1021/acs.est.5b02115, 2015.
18. Xu, L., H. Guo, C.M. Boyd, M. Klein, A. Bougiatioti, K.M. Cerully, J.R. Hite, **G. Isaacman-VanWertz**, N.M. Kreisberg, C. Knote, K. Olson, A.I Koss, A.H. Goldstein, S.V. Hering, J. de Gouw, K. Baumann, S-H. Lee, A. Nenes, R.J. Weber, and N.L. Ng: Effects of anthropogenic emissions on aerosol formation from isoprene and monoterpenes in the southeastern United States, *Proceedings of the National Academy of Sciences*, 112 (1), 37-42, doi: 10.1073/pnas.1417609112, 2015.

2014

17. **Isaacman, G.**, N.M. Kreisberg, L.D. Yee, D.R. Worton, A.W.H. Chan, J.A. Moss, S.V. Hering, and A.H. Goldstein: Online derivatization for hourly measurements of gas- and particle-phase semi-volatile oxygenated organic compounds by thermal desorption aerosol gas chromatography (SV-TAG), *Atmospheric Measurement Techniques*, 7, 4417-4429, doi:10.5194/amt-7-4417-2014, 2014.
16. Kreisberg, N.M., D.R. Worton, Y. Zhao, **G. Isaacman**, A.H. Goldstein, and S.V. Hering: Development of an automated high-temperature valveless injection system for online gas chromatography, *Atmospheric Measurement Techniques*, 7, 4431-4444, doi:10.5194/amt-7-4431-2014, 2014.
15. Worton, D.R., **G. Isaacman**, D.R. Gentner, T.R. Dallmann, A.W.H. Chan, C. Ruehl, T.W. Kirchstetter, K.R. Wilson, R.A. Harley, and A.H. Goldstein: Lubricating oil dominates primary organic aerosol emissions from motor vehicles, *Environmental Science & Technology*, 48 (7), pp 3698–3706, doi: 10.1021/es405375j, 2014.

2013

14. Zhang, H., C.R. Ruehl, A. Chan, T. Nah, D. Worton, **G. Isaacman**, A.H. Goldstein, and K.R. Wilson: OH-initiated heterogeneous oxidation of cholestane: a model system for understanding the

photochemical aging of cyclic alkane aerosols, *Journal of Physical Chemistry A*, 117, 12449, doi: 10.1021/jp407994m, 2013.

13. Zhao, Y., N.M. Kreisberg, D.R. Worton, **G. Isaacman**, D.R. Gentner, A.W.H. Chan, R.J. Weber, S. Liu, D.A. Day, L.M. Russell, S.V. Hering, and A.H. Goldstein: Sources of organic aerosol investigated using organic compounds as tracers measured during CalNex in Bakersfield, *Journal of Geophysical Research Atmospheres*, 118 (19), 11388–11398, 2013.
12. Gentner, D.R., D.R. Worton, **G. Isaacman**, L. Davis, T. Dallmann, E. Wood, S. Herndon, A.H. Goldstein, and R. Harley: Chemical composition of gas-phase organic carbon emissions from motor vehicles and implications for ozone production, *Environmental Science & Technology*, 47, 11837–11848, doi: dx.doi.org/10.1021/es401470e, 2013.
11. Zhao, Y., N.M. Kreisberg, D.R. Worton, **G. Isaacman**, R.J. Weber, S. Liu, D.A. Day, L.M. Russell, M.Z. Markovic, T.C. VandenBoer, J.G. Murphy, S.V. Hering, and A.H. Goldstein: Insights into secondary organic aerosol formation mechanisms from measured gas/particle partitioning of specific organic tracer compounds, *Environmental Science & Technology*, 47 (8), 3781–3787, doi: 10.1021/es304587x, 2013.
10. Hayes, P.L., A.M. Ortega, M.J. Cubison, K.D. Froyed, Y. Zhao., S.S. Cliff, W.W. Hu, D.W. Toohey, J.H. Flynn, B.L. Lefer, N. Grossberg, S. Alvarez, B. Rappenglück, J.W. Taylor, J.D. Allan, J.S. Holloway, J.B. Gilman, W.C. Kuster, J.A. de Gouw, P. Massoli, X. Zhang, J. Liu, R.J. Weber, A.L. Corrigan, L.M. Russell, **G. Isaacman**, D.R. Worton, N.M. Kreisberg, A.H. Goldstein, R. Thalman, E.M. Waxman, R. Volkamer, Y.H. Lin, J.D. Surratt, T.E. Kleindienst, J.H. Offenberg, S. Dusanter, S. Griffith, P.S. Stevens, J. Brioude, W.M. Angevine, and J.L. Jimenez: Organic aerosol composition and sources in Pasadena, California during the 2010 CalNex campaign, *Journal of Geophysical Research Atmospheres*, 118 (16), 9233–9257, doi: 10.1002/jgrd.50530, 2013.
9. Chan, A.W.H., **G. Isaacman**, K.R. Wilson, D.R. Worton, C.R. Ruehl, T. Nah, D.R. Gentner, T.R. Dallmann, T.W. Kirchstetter, R.A. Harley, J.B. Gilman, W.C. Kuster, J.A. de Gouw, J.H. Offenberg, T.E. Kleindienst, Y.H. Lin, C.L. Rubitschun, J.D. Surratt, P.L. Hayes, J.L. Jimenez, and A.H. Goldstein: Detailed chemical characterization of unresolved complex mixtures in atmospheric organics: insights into emission sources, atmospheric processing and secondary organic aerosol formation, *Journal of Geophysical Research Atmospheres*, 118, 1–14, doi:10.1002/jgrd.50533, 2013.
8. Ruehl, C.R., T. Nah, **G. Isaacman**, D.R. Worton, A.W.H. Chan, K.R. Kolesar, C.D. Cappa, A.H. Goldstein, and K.R. Wilson: The influence of molecular structure and aerosol phase on the heterogeneous oxidation of normal and branched alkanes by OH, *Journal of Physical Chemistry A*, doi: 10.1021/jp401888q, 117 (19), 3990–4000, 2013.

2012

7. Gentner, D.R., **G. Isaacman**, D.R. Worton, A.W.H. Chan, T.R. Dallmann, L. Davis, S. Liu, D.A. Day, L.M. Russell, K.R. Wilson, R. Weber, A. Guha, R.A. Harley, and A.H. Goldstein: Elucidating secondary organic aerosol from diesel and gasoline vehicles through detailed characterization of organic carbon emissions, *Proceedings of the National Academy of Sciences*, 109 (45), 18318–18323, doi: 10.1073/pnas.1212272109, 2012.
6. **Isaacman, G.**, A.W.H. Chan, T. Nah, D.R. Worton, C.R. Ruehl, K.R. Wilson and A.H. Goldstein: Heterogeneous OH oxidation of motor oil particles causes selective depletion of branched and less cyclic hydrocarbons, *Environmental Science & Technology*, 46 (19), 10632–10640, doi: 10.1021/es302768a, 2012.
5. Worton, D.R., D.R. Gentner, **G. Isaacman**, and A.H. Goldstein: Embracing complexity: Deciphering origins and transformations of atmospheric organics through speciated measurements, *Environmental Science & Technology*, 46 (10), 5265–5266, doi: 10.1021/es301199y, 2012.

4. **Isaacman, G.**, K.R. Wilson, A.W.H. Chan, D.R. Worton, J.R. Kimmel, T. Nah, T. Hohaus, M. Gonin, J.H. Kroll, D.R. Worsnop, and A.H. Goldstein: Improved resolution of hydrocarbon structures and constitutional isomers in complex mixtures using gas chromatography-vacuum ultraviolet-mass spectrometry, *Analytical Chemistry*, 84 (5), 2335-2342, 2012.
3. Worton, D.R., N.M. Kreisberg, **G. Isaacman**, A.P. Teng, C. McNeish, T. Gorecki, S.V. Hering, and A.H. Goldstein: Thermal desorption comprehensive two-dimensional gas chromatography: An improved instrument for in-situ speciated measurements of organic aerosols, *Aerosol Science and Technology*, 46 (4), 380-393, 2012.

2011

2. **Isaacman, G.**, N.M. Kreisberg, D.R. Worton, S.V. Hering, and A.H. Goldstein: A versatile and reproducible automatic injection system for liquid standard introduction: application to in-situ calibration, *Atmospheric Measurement Techniques*, 4, 1937-1942, doi:10.5194/amt-4-1937-2011, 2011.
1. **Isaacman, G.**, D.R. Worton, N.M. Kreisberg, C.J. Hennigan, A.P. Teng, S.V. Hering, A.L. Robinson, N.M. Donahue, and A.H. Goldstein: Understanding evolution of product composition and volatility distribution through in-situ GC × GC analysis: a case study of longifolene ozonolysis, *Atmospheric Chemistry and Physics*, 11, 5335-5346, doi:10.5194/acp-11-5335-2011, 2011.

Academic work:

Ph.D. Dissertation: Isaacman, G. Enabling the identification, quantification, and characterization of organics in complex mixtures to understand atmospheric aerosols. University of California, Berkeley. 2014.

B.A. Thesis: Isaacman, G. Synthesis of Triarylamine Catalysts for Electrochemical Oxidation. Wesleyan University. 2009.

PATENTS AND DISCLOSURES

1. "Volatility-Resolved Chemical Characterization of Airborne Particles"
Inventors: Gabriel Isaacman-VanWertz, Nathan M. Kreisberg, Susanne V. Hering.
Assignees: Aerosol Dynamics Inc., Virginia Polytechnic Institute and State University
Patent pending, disclosure filed January 2019, patent application filed January 2020 (US 16/775,033 ; PCT/US2020/015695)
2. "Apparatus for Enriching the Concentration of Trace Components in an Air Flow"
Inventor: Gabriel Isaacman-VanWertz
Disclosure filed December 2020

IN THE PUBLIC PRESS

Reuben, A. and Isaacman, G. Soundscapes of Smog: Researchers Let You Hear the Pollution of Cities (Literally). *The Atlantic*, 2012. Available online at:
<http://www.theatlantic.com/technology/archive/2012/09/soundscapes-of-smog-researchers-let-you-hear-the-pollution-of-cities-literally/262152>.

Isaacman, G. Lessons from Air Pollution Past. *Sage Magazine*, 2012. Available online at:
<http://www.sagemagazine.org/lessons-from-air-pollution-past/>

PRESENTATIONS

Member of the Isaacman-VanWertz group in **bold***

Invited Platform

7. Frontiers of Atmospheric Chemistry Sciences Seminar, 2020. "Understanding the impacts of molecular structure on the fate of atmospheric organics." (*multi-institution, 300 attendees*)
6. Georgia Tech, Chemical & Biomolecular Engineering Seminar, 2020. "How important is molecular structure in the atmospheric chemistry and impacts of organic compounds?"
5. University of Virginia, Atmospheric Sciences Seminar, 2018. "Measuring the complex mixture of organic compounds in the atmosphere to understand the lifecycle and fate of emissions."
4. U.S. Environmental Protection Agency, 2016. "Of molecules and men: Particle- and gas-phase atmospheric composition at anthropogenically-influenced forested sites."
3. NOAA, Chemical Sciences Division Seminar 2015. "Characterizing the composition and oxidation of particles and atmospheric mixtures using GC/MS."
2. Aerodyne Research, Inc., 2013. "Constraining chemistry in biogenic environments through GC/MS: TAG, Tracers, and Total Taxonomy."
1. Drexel University, Chemistry Seminar, 2013. "Oxygenated biogenic organics in ambient aerosol: Toward a complete picture of formation and oxidation."

Conference Platform

25. American Geophysical Union Annual Fall Meeting 2020. "Coupling a gas chromatograph simultaneously to a flame ionization detector and chemical ionization mass spectrometer for isomer-resolved quantification of particle-phase organic compounds." Presented by **C. Bi***
24. American Geophysical Union Annual Fall Meeting 2020. "Coupling a Gas Chromatograph Simultaneously to a Flame Ionization Detector and Chemical Ionization Mass Spectrometer for Isomer-Resolved Quantification of Particle-Phase Organic Compounds." Presented by **D. McGlynn***
23. American Geophysical Union Annual Fall Meeting 2020. "Laboratory investigation of dimethyl sulfide oxidation: Comprehensive product characterization, peroxy radical isomerization, and implications for sulfur distribution." Presented by Q. Ye
22. American Association of Aerosol Research Annual Meeting 2020. "Isomer-resolved Quantification of Particle-phase Organic Compounds Using a Coupled GC-CIMS/FID" Presented by **C. Bi***
21. American Association of Aerosol Research Annual Meeting 2020. "Variability in the Composition and Chemical Impacts of Biogenic Volatile Organic Compounds in the Southeastern U.S." Presented by **D. McGlynn***
20. American Association of Aerosol Research Annual Meeting 2019. "Laboratory Evaluation of Organic Aerosol Chemical Composition and Partitioning Measurements Obtained from High-Resolution Mass Spectrometers with Different Soft Ionization Schemes." Presented by M. Canagaratna
19. American Association of Aerosol Research Annual Meeting 2019. "Isomer-resolved Chemical Characterization of the Particle-phase Oxidation Products of Indoor Emissions Using Gas Chromatography-Chemical Ionization Mass Spectrometry." Presented by **C. Bi***
18. American Association of Aerosol Research Annual Meeting 2019. "A New Method for Robust, Moderate-Cost Measurement of Oxygen, Carbon, and Sulfur Content of Organic Compounds and Mixtures." Presented by **G. Isaacman-VanWertz**

17. Gordon Research Conference – Atmospheric Chemistry 2019. “A Human Forest in New York City and Implications on Urban Air Quality.” Presented by B. McDonald
16. American Association of Aerosol Research Annual Meeting 2018. “Formula vs. Structure: Impacts of Isomers on Interpretation, Calibration, and Parameterization of Atmospheric Mass Spectrometric Data.” Presented by **G. Isaacman-VanWertz**
15. American Association of Aerosol Research Annual Meeting 2017. “Efficient and Improved Processing of Chromatographic Data Using Peak Fitting and Deconvolution.” Presented by **G. Isaacman-VanWertz**
14. American Association of Aerosol Research Annual Meeting 2017. “Secondary Organic Aerosol Formation from Ambient Air in an Oxidation Flow Reactor at GoAmazon2014/5.” Presented by B.B. Palm
13. American Association of Aerosol Research Annual Meeting 2017. “What Aerosol Water do Organic Compounds See?” Presented by H.O.T. Pye
12. American Association of Aerosol Research Annual Meeting 2017. “Monoterpene Oxidation Products Dominate Organic Aerosol Mass in Centreville, Alabama during the SOAS Field Campaign.” Presented by H. Zhang
11. American Geophysical Union Fall Meeting 2017. “A field-deployable GC-EI-HRTOF-MS for in situ characterization of volatile organic compounds.” Presented by B. Lerner
10. American Geophysical Union Fall Meeting 2017. “Anthropogenic Emissions Change the Amount and Composition of Organic PM1 in Amazonia.” Presented by S.S. de Sá
9. American Association of Aerosol Research Annual Meeting 2016. “Comprehensive Measurements of Gas- and Particle-phase Organic Carbon Formed in the Multigenerational Oxidation of Biogenic Hydrocarbons.” Presented by **G. Isaacman-VanWertz**
8. International Global Atmospheric Chemistry Science Conference 2016. “Tracking the evolution of all carbon in the multigenerational oxidation of biogenic organic compounds” at Presented by **G. Isaacman-VanWertz**
7. American Geophysical Union Fall Meeting 2015. “Understanding the lifecycle of organic carbon through multiple generations of aging.” Presented by **G. Isaacman-VanWertz**
6. American Association of Aerosol Research Annual Meeting 2015. “Understanding the role of aerosols in the lifecycle of organic carbon through multiple generations of aging.” Presented by **G. Isaacman-VanWertz**
5. American Chemical Society Fall Meeting 2015. “Comprehensive characterization of organic carbon through multiple generations of aging.” Presented by **G. Isaacman-VanWertz**
4. American Association of Aerosol Research Annual Meeting 2013. “Hourly measurements of highly oxygenated organic compounds in ambient aerosols.” Presented by **G. Isaacman-VanWertz**
3. American Geophysical Union Fall Meeting 2013. “Constraints on atmospheric oxidation pathways through biogenic oxygenated tracers.” Presented by **G. Isaacman-VanWertz**
2. Atmospheric Chemistry Colloquium for Emerging Senior Scientists XII 2013. “Hourly measurements of highly oxygenated organic compounds in ambient aerosols: Isoprene oxidation pathways.” Presented by **G. Isaacman-VanWertz**
1. American Geophysical Union Fall Meeting 2012. “Effects of molecular structure on the heterogeneous OH oxidation of motor oil particles.” Presented by **G. Isaacman-VanWertz**

Conference Poster

34. American Geophysical Union Annual Fall Meeting 2020. “Impacts of molecular structure on atmospherically-important physicochemical parameters.” Presented by **G. Isaacman-VanWertz***

33. American Geophysical Union Annual Fall Meeting 2020. "Observing ozone effects on transpiration, carbon assimilation, and photosynthesis by perturbing stomatal diffusive resistance." Presented by J. Bushey
32. American Geophysical Union Annual Fall Meeting 2020. "Chemical evolution of particle-phase dimethyl sulfide oxidation products." Presented by M. Goss
31. American Geophysical Union Annual Fall Meeting 2020. "Characterization of organic aerosol by volatility and elemental ratios using a new moderate-cost detection method, and implications for sulfur distribution." Presented by **P. Kumar***
30. American Geophysical Union Annual Fall Meeting 2020. "Novel Low-Cost Concentrating Inlet for Enhancing Instrument Sensitivity and Level of Detection for Reactive Organic Gases in Small Sample Flows." Presented by **N. Panji***
29. American Geophysical Union Annual Fall Meeting 2020. "Observing canopy-scale relationships between ozone flux, conductance, photosynthesis (SIF), and leaf skin temperature." Presented by L.E.R. Barry
28. American Geophysical Union Annual Fall Meeting 2020. "Composition, concentrations, and reactivity of sesquiterpenes in the southeastern US." Presented by **G. Frazier***
27. American Geophysical Union Annual Fall Meeting 2020. "Comprehensive Detection of All Analytes in Large Chromatographic Atmospheric Dataset." Presented by **S. Kim***
26. American Association of Aerosol Research Annual Meeting 2020. "Influence of Small-scale Agricultural Activity on Local Particle- and Gas-phase Organic Composition." Presented by **G. Frazier***
25. American Association of Aerosol Research Annual Meeting 2020. "New Inlet for Increasing Concentrations of Reactive Organic Gases in SCCM-Level Sample Flows." Presented by **N. Panji***
24. American Association of Aerosol Research Annual Meeting 2020. "Comprehensive Detection of All Analytes in Large Chromatographic Atmospheric Dataset." Presented by **S. Kim***
23. American Association of Aerosol Research Annual Meeting 2020. "The Impact of Structure on the Estimation of Atmospherically Relevant Physicochemical Parameters." Presented by **G. Isaacman-VanWertz**
22. American Association of Aerosol Research Annual Meeting 2020. "A New Moderate-cost Method for the Characterization of Organic Aerosol by Volatility and Elemental Ratios." Presented by **P. Kumar***
21. American Association of Aerosol Research Annual Meeting 2020. "Particle- and Gas-phase Chamber Measurements of Dimethyl Sulfide Oxidation.." Presented by M. Goss
20. American Association of Aerosol Research Annual Meeting 2020. "Anthropogenic Influences on Amazonian Organic Aerosol: A Molecular-Level Analysis." Presented by E. Barnes
19. American Association of Aerosol Research Annual Meeting 2019. "Comprehensive Detection of All Analytes in a Large Chromatographic Dataset of Complex Environmental Samples." Presented by **S. Kim***
18. American Association of Aerosol Research Annual Meeting 2019. "Concentrations of Biogenic Volatile Organic Compound in an East Coast Forest, and Their Relative Importance for Ozone Chemical Loss." Presented by **D. McGlynn***
17. American Association of Aerosol Research Annual Meeting 2019. "Biogenic Oxidation Products in a Mixed Forest: Their Concentrations, Reactivity, and Fates." Presented by **G. Frazier***
16. Gordon Research Conference – Atmospheric Chemistry, 2019. "Laboratory Evaluation of Organic Aerosol Chemical Composition Measurements Obtained from Different Soft Chemical Ionization High-Resolution Mass Spectrometers." Presented by J. Krechmer

15. American Geophysical Union Fall Meeting 2018. "Measuring the oxygen content of atmospherically relevant compounds using a novel, robust detection approach." Presented by **G. Isaacman-VanWertz**
14. American Geophysical Union Fall Meeting 2018. "A new low-weight, portable device for distributed sampling of gas-phase organic compounds." Presented by **D. McGlynn***
13. American Geophysical Union Fall Meeting 2018. "Isomers and their impacts on interpreting chemical ionization mass spectrometry data." Presented by **G. Isaacman-VanWertz**
12. Alfred P Sloan Foundation Chemistry of the Indoor Environment Meeting 2018. "Isomers and their impacts on interpreting chemical ionization mass spectrometry data." Presented by **G. Isaacman-VanWertz**
11. National Science Foundation/National Center for Atmospheric Research - Atmospheric Chemistry Workshop, 2018. "Carbon closure and chemical evolution of multi-generational atmospheric oxidation." Presented by **G. Isaacman-VanWertz**
10. Gordon Research Conference – Atmospheric Chemistry 2017. "Carbon closure and chemical evolution of multi-generational atmospheric oxidation." Presented by **G. Isaacman-VanWertz**
9. American Association of Aerosol Research Annual Meeting 2017. "In-Particle Chemistry and Gas-Particle Partitioning of Isoprene SOA Tracers." Presented by A. Fankhauser
8. International Global Atmospheric Chemistry Science Conference 2014. "Partitioning and variability of biogenic oxidation products measured by SV-TAG in anthropogenically influenced forested regions." Presented by **G. Isaacman-VanWertz**
7. American Geophysical Union Fall Meeting 2014. "Understanding factors affecting partitioning of oxygenated organics in natural and polluted environments using SV-TAG." Presented by **G. Isaacman-VanWertz**
6. Gordon Research Conference – Atmospheric Chemistry 2013. "Hourly measurements of highly oxygenated organic compounds in ambient aerosols: Exploring isoprene oxidation pathways." Presented by **G. Isaacman-VanWertz**
5. International Global Atmospheric Chemistry Science Conference 2012. "Effects of branching on the heterogeneous OH oxidation of motor oil particles: Impacts on ambient aerosol and reaction pathways." Presented by **G. Isaacman-VanWertz**
4. American Geophysical Union Fall Meeting 2011. "Aerosol sources using in-situ GC×GC in Pasadena, CA during CalNex 2010." Presented by **G. Isaacman-VanWertz**
3. US Environmental Protection Agency – Science To Achieve Results Fellows Conference 2011. "Quantitative speciation of aerosols through in-situ GC×GC sampling in urban California." Presented by **G. Isaacman-VanWertz**
2. American Geophysical Union Fall Meeting 2010. "Quantitative speciation of aerosols through in-situ GC×GC over Pasadena, CA during the CalNex 2010 experiment." Presented by **G. Isaacman-VanWertz**
1. American Association of Aerosol Research Annual Meeting 2010. "Understanding evolution of product composition and volatility distribution in longifolene ozonolysis through in-situ GC×GC analysis." Presented by **G. Isaacman-VanWertz**

PROFESSIONAL MEMBERSHIPS

- 2010 - present American Geophysical Union (AGU)
2010 - present American Association for Aerosol Research (AAAR)