

# Prof. Alexander Laskin

## *Curriculum Vitae*

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### PROFESSIONAL POSITIONS

- 2017- Professor, *Department of Chemistry, Purdue University, West Lafayette, IN*
- 2001-2017 Staff Scientist - Scientist V (2013-2017), Scientist IV (2006-2013), Scientist III (2001-2006) at *William R. Wiley Environmental Molecular Sciences Laboratory, Pacific Northwest National Laboratory, Richland, WA*
- 1999-2001 Postdoc, *William R. Wiley Environmental Molecular Sciences Laboratory Pacific Northwest National Laboratory, Richland, WA*
- 1998-1999 Postdoc, *University of Delaware Newark, DE and Princeton University, Princeton, NJ* (joint position).

### EDUCATION

- 1992-1998 *The Hebrew University of Jerusalem, Israel.* Department of Physical Chemistry. Faculty of Natural Sciences. Ph.D. in Physical Chemistry 1998.
- 1984-1990 *St. Petersburg State Technical University, (Former Polytechnical Institute), Russia.* Department of Thermal Physics. Faculty of Physical and Mechanical Sciences. M.Sc. in Physics 1991

### PROFESSIONAL SERVICES AND HONORS

- 2018-2022 member of Editorial Board for *Aerosol Science and Technology* journal
- 2015-2018 member of the *AAAR* Board of Directors
- 2014- member of Editorial Board for *Scientific Reports* journal
- 2013- Co-editor of *Atmospheric Chemistry and Physics* journal
- Conference organizer – symposia and sessions at *ACS* (fall 2017, fall 2014), *AGU* (2014, 2013, 2012), *Pacificchem* (2010, 2015), *Goldschmidt* (2015), *LAC* (2014); organizer (with K. Wilson) of the “Towards a Molecular Level Understanding of Atmospheric Aerosols” conference, Santa Cruz, CA, 2016; organizer (with J. Surratt) of the “Organic Particles in the Atmosphere: Formation, Properties, Processing, and Impact” conference, Telluride, CO, 2018.
- Review panels - *Environmental Protection Agency* (2010), *National Aeronautics and Space Administration* (2014, 2016), *DOE Basic Energy Science* (2018)
- Journal Reviewer - *Aerosol Science and Technology, Analytical Chemistry, Angewandte Chemie, Atmospheric Chemistry and Physics, Atmospheric Environment, Applied Spectroscopy, Chemical Reviews, Chemical Science, Combustion and Flame, Environmental Chemistry, Environmental Science and Technology, International Journal of Chemical Kinetics, International Journal of Mass Spectrometry, International Reviews in Physical Chemistry, Journal of Aerosol Science, Journal of Atmospheric Chemistry, Journal of Environmental Management, Journal of Geophysical Research – Atmospheres, Journal of Hazardous Materials, Journal of Physical Chemistry, Journal of Propulsion and Power, Langmuir, Nature, Proceedings of National Academy of Sciences, Review of Scientific Instruments, Science Reports, Water Air and Soil Pollution.*
- Proposal Reviewer - *Office of Biological and Environmental Research of DOE, Small Business Innovation Research (SBIR) Program of DOE, National Aeronautics and Space Administration, Environmental Protection Agency, U.S. National Science Foundation, National Research Council of Canada, National Research Foundation of Korea, Swiss National Science Foundation, Advanced Light Source (LBNL), The Danish Council for Independent Research, German Research Foundation.*

### **Postdoctoral associates and grad students of Dr. A. Laskin:**

- Ms. Ana Morales(Ph.D. student 2017- )
- Mr. Jay Tomlin (Ph.D. student 2017- )
- Ms. Maria Misovich (Ph.D. student 2017- )
- Mr. Christopher West (Ph.D. student 2017- )
- Dr. Daniel Veghte (postdoc 2016 -)
- Dr. Swarup China (postdoc 2015 - )
- Dr. Peng Lin (postdoc 2014 - 2018), presently Senior Scientist at the *California Air Resources Board*, CA
- Dr. Bingbing Wang, (postdoc 2012-2014), presently Professor at *Xiamen University*, China
- Dr. Tran Nguyen (grad student 2008-2012 from UCI, co-advised with Prof. S. Nizkorodov), presently Assistant Professor at *University of California, Davis*
- Dr. Adam Bateman (grad student 2007-2011 from UCI, co-advised with Prof. S. Nizkorodov), presently R&D scientist at *Lam Research Corporation*, Fremont, CA.
- Dr. Jeremy Cain (grad student 2007-2011 from USC, co-advised with Prof. Hai Wang), presently Research Scientist at *the University of Dayton Research Institute*, Ohio
- Dr. Patrick J. Roach (postdoc 2009-2010, co-advised with Dr. J. Laskin), presently Research Scientist at *Agilent Inc.*, California
- Dr. Xin Yang (postdoc 2007), presently Professor at *Fudan University*, Shanghai, China.
- Dr. Yong Liu (postdoc 2005-2008), presently Associate Professor at *University of Colorado, Denver*.
- Dr. Yury Desyaterik (postdoc 2005-2008), presently Research Staff at *University of North Carolina*, Chapel Hill.

### **Collaborators in the Last 5 years**

Drs. Liz Alexander, Amity Andersen, Susannah Burrows, Jerome Fast, Daniel J. Gaspar, Tim Johnson, Libor Kovarik, Julia Laskin, Galya Orr, John Shilling, Manish Shrivastava, Vaithiyalingam Shutthanandan, Alla Zelenyuk, Rahul Zaveri (*PNNL*); Drs. Kenneth Cowen, Michael Holdren, Chester Spicer, (*Battelle Memorial Institute*); Prof. Paulo Artaxo (*U. Sao Paulo, Brazil*); Prof. Andy Ault (*U Michigan*); Prof. Allan Bertram (*UBC, Canada*); Prof. Sarah Brooks (*Texas A&M U*); Prof. Jeffrey Collett (*Colorado State University*); Dr. Steve Brown (*NOAA*); Dr. Jeremy Cain (*UDRI*); Prof. Donald Dabdub (*UC Irvine*), Prof. Barbara Finlayson-Pitts (*UC, Irvine*); Prof. Julie Fry (*Reed College*); Prof. Allen Goldstein (*UC, Berkeley*); Prof. Alex Guenther (*UC Irvine*), Dr. Naruki Hiranuma (*KIT, Germany*); Dr. Sherri Hunt (*EPA*), Prof. Jose Jimenez (*University of Colorado*); Prof. Tom Jobson (*Washington State University*); Prof. Anne Johansen (*Central Washington University*); Prof. Pavel Jungwirth (*Czech Academy of Science, Czech Republic*); Dr. Jenny Hand (*Colorado State University and National Park Services*); Dr. Mary K. Gilles (*LBNL*); Prof. Vicki Grassian (*UCSD*); Prof. Daniel A. Knopf (*SUNY, Stony Brook*); Prof. Assa Lifshitz (*Hebrew University, Israel*); Prof. Yong Liu (*University of Colorado, Denver*); Dr. William Malm (*National Park Services*); Prof. Scot Martin (*Harvard University*); Prof. Claudio Mazzoleni (*Michigan Tech*); Prof. Gregory McFarquhar (*UI, Urbana-Champaign*); Prof. Ryan C. Moffet (*U Pacific*); Prof. Mario Molina and Dr. Luisa Molina (*UCSD and Molina Environmental Center*); Prof. Sergey Nizkorodov (*UC, Irvine*); Prof. Marcus Petters (*NCSU*), Prof. Kim Prather (*UC, San Diego*); Prof. Kerri Pratt (*U. Michigan*); Prof Jonathan Reid (*U. Bristol*), Prof. Nicole Riemer (*UI, Urbana-Champaign*); Prof. Yinon Rudich (*Weizmann Institute of Science, Israel*); Prof. Paul Shepson (*Purdue U*), Prof. Manabu Shiraiwa (*UC, Irvine*), Prof. William Simpson (*University of Alaska, Fairbanks*); Prof. Elizabeth Stone (*University of Iowa*); Prof. Jason Surratt (*UNC*); Prof. Murray Thompson (*U. Toronto*); Prof. Alexei Tivanski (*University of Iowa*); Prof. Hai Wang (*Stanford University*); Prof. Jian Wang (*Wash. U.*); Dr. Rebecca Washenfelder (*NOAA*); Dr. Peter Weber (*LLNL*); Prof. Xin Yang (*Fudan University, China*), Dr. Robert Yokelson (*University of Montana*); Prof. Q. Zhang (*UC, Davis*)

## PATENT

Patrick J. Roach, Julia Laskin, Alexander Laskin. Focused Analyte Spray Emission Apparatus and Process For Mass Spectrometric Analysis. Patent No.: US 8,097,845 B2, Jan. 17, 2012

## PUBLICATIONS (>180 total)

ResearcherID: <http://www.researcherid.com/rid/I-2574-2012>

(*ISI statistics*: total citations – over 6,500; h-index -49).

Google Scholar: <https://scholar.google.com/citations?hl=en&user=b21VGrIAAAAJ>

## REVIEWS, PERSPECTIVES, BOOK CHAPTERS AND HIGH-IMPACT MANUSCRIPTS

168. J. Reid, A. Bertram, D. Topping, **A. Laskin**, S. Martin, M. Petters, F. Pope, G. Rovelli. The Viscosity of Organic Particles in the Atmosphere. *Nature Communications*, 9, art. 956, (2018). doi:10.1038/s41467-018-03027-z. (INVITED REVIEW)
163. J. Laskin, **A. Laskin**, S.A. Nizkorodov. Mass Spectrometry Analysis in Atmospheric Chemistry. *Analytical Chemistry*, 90, 166–189, (2018). doi: 10.1021/acs.analchem.7b04249 (INVITED REVIEW)
151. M. Shrivastava, J. Thornton, C. Cappa, J. Fan, A. Goldstein, A. Guenther, J. L. Jimenez, C. Kuang, **A. Laskin**, S. Martin, T. Petaja, J. Pierce, P. Rasch, P. Roldin, J. Seinfeld, J. Shilling, N. L. Ng, J. Smith, R. Volkamer, J. Wang, D. Worsnop, R. Zaveri, A. Zelenyuk, Q. Zhang. Recent advances in secondary organic aerosols: Implications for global climate forcing. *Reviews of Geophysics*, 55, 509–559. (2017). doi: 10.1002/2016RG000540 (INVITED REVIEW)
139. **A. Laskin**. Mass Spectrometry of Aerosols, in *Encyclopedia of Spectroscopy and Spectrometry, Third Edition*, vol. 2, pp. 735-741, (2017). doi:10.1016/B978-0-12-409547-2.12137-7 (INVITED ARTICLE)
137. **A. Laskin**, M.K. Gilles, D.A. Knopf, B. Wang, S. China. Progress in the Analysis of Complex Atmospheric Particles. *Annual Reviews of Analytical Chemistry*, 9, 117-146, (2016). doi: 10.1146/annurev-anchem-071015-041521 (INVITED REVIEW)
136. B. Wang, T.H. Harder, S.T. Kelly, D.S. Piens, S. China, L. Kovarik, M. Keiluweit, B.W. Arey, M.K. Gilles, **A. Laskin**. Airborne soil organic particles generated by precipitation. *Nature Geoscience*, 9, 433-437. (2016). doi: 10.1038/NGEO2705
122. **A. Laskin**, J. Laskin, S. Nizkorodov. Chemistry of Atmospheric Brown Carbon. *Chemical Reviews*, 115, 4335-4382 (2015). doi: 10.1021/cr5006167 (INVITED REVIEW)
97. J. Laskin, **A. Laskin**, and S.A. Nizkorodov. New Mass Spectrometry Techniques for Studying Physical Chemistry of Particles, Droplets, and Surfaces. *International Reviews in Physical Chemistry*, 32, 128–170. (2013). doi: 10.1080/0144235X.2012.752904 (INVITED REVIEW)
86. **A. Laskin**,\* J. Laskin, S.A. Nizkorodov. Mass Spectrometric Approaches for Chemical Characterization of Atmospheric Aerosols: Critical Review of Most Recent Advances. *Environmental Chemistry*, 2012, 9, 163-189. doi: 10.1071/EN12052. (INVITED REVIEW)
71. S. A. Nizkorodov, J. Laskin, **A. Laskin** “Molecular Chemistry of Organic Aerosols Through Applications of the High Resolution Mass Spectrometry” *Phys. Chem. Chem. Phys.*, 13, 3612–3629, (2011). doi:10.1039/C0CP02032J (INVITED PERSPECTIVE)
69. **A. Laskin** “Electron Beam Analysis and Microscopy of Individual Particles” in *Fundamentals and Applications in Aerosol Spectroscopy*, eds. R. Signorell and J. Reid, Boca Raton, FL: CRC Press Taylor and Francis Group, 2010, pp. 463-491. (INVITED BOOK CHAPTER)
33. Y. Liu, J. P. Cain, H. Wang, **A. Laskin** “Kinetic Study of Heterogeneous Reaction of Deliquesced NaCl Particles with Gaseous HNO<sub>3</sub> Using Particle-on-Substrate Stagnation Flow Reactor Approach” *J. Phys. Chem. A.*, 111, 10026-10043, (2007). doi:10.1021/jp072005p (INVITED FEATURE ARTICLE)
28. **A. Laskin**, J. P. Cowin, M. J. Iedema “Analysis of individual environmental particles using modern methods of electron microscopy and X-ray microanalysis” *Journal of Electron Spectroscopy and Related Phenomena*, 150, 260-274, (2006). doi:10.1016/j.elspec.2005.06.008 (INVITED REVIEW)

16. **A. Laskin**, D. J. Gaspar, W. Wang, S. W. Hunt, J. P. Cowin, S. D. Colson and B. J. Finlayson-Pitts “Reactions at Interfaces as a Source of Sulfate Formation in Sea Salt Particles.” *Science*, *301*, 340-344 (2003).

*OTHER MANUSCRIPTS (2016-2018)*

170. W.-S. Wong DeRieux, Y. Li, P. Lin, J. Laskin, **A. Laskin**, A.K. Bertram, S.A. Nizkorodov, M. Shiraiwa. Predicting the glass transition temperature and viscosity of secondary organic material using molecular composition. *Atmospheric Chemistry and Physics*, *18*, 6331–6351, (2018). <https://doi.org/10.5194/acp-18-6331-2018>
169. R.M. Kirpes, A.L. Bondy, D. Bonanno, R.C. Moffet, B. Wang, A. Laskin, A.P. Ault, K.A. Pratt. Secondary Sulfate is Internally Mixed with Sea Spray Aerosol and Organic Aerosol in the Winter-Spring Arctic. *Atmospheric Chemistry and Physics*, *18*, 3937–3949, (2018). <https://doi.org/10.5194/acp-18-3937-2018>
167. L.T. Fleming, P. Lin, **A. Laskin**, J. Laskin, R. Weltman, R.D. Edwards, N.K. Arora, S. Gautam, A. Yadav, D.R. Blake, K.R. Smith, and S.A. Nizkorodov. Molecular Composition of Particulate Matter Emissions from Dung and Brushwood Burning Household Cookstoves. *Atmospheric Chemistry and Physics*, *18*, 2461–2480, (2018). doi: 10.5194/acp-18-2461-2018
166. R.A. Zaveri, J.E. Shilling, A. Zelenyuk-Imre, J. Liu, D. Bell, E. D’Ambro, C. Gaston, J.A. Thornton, **A. Laskin**, P. Lin, J. Wilson, R.C. Easter, J. Wang, J.H. Seinfeld, A.K. Bertram, S.T. Martin, C. Kuang, D.J. Cziczo, A. Setyan, Q. Zhang, T.B. Onasch, D.R. Worsnop. Growth kinetics of viscous semisolid secondary organic aerosol. *Environmental Science and Technology*, *52*, 1191–1199, (2018). doi:10.1021/acs.est.7b04623
165. M.L. Hinks, J. Montoya, L. Ellison, P. Lin, **A. Laskin**, J. Laskin, M. Shiraiwa, D. Dabdub, S.A. Nizkorodov. Effect of Relative Humidity on the Composition of Secondary Organic Aerosol from Oxidation of Toluene. *Atmospheric Chemistry and Physics*, *18*, 1643–1652, (2018). doi: 10.5194/acp-18-1643-2018.
164. N.W. May, N.E. Olson, M. Panas, J.L. Axson, P.S. Tirella, R.M. Kirpes, R.M. Craig, M.J. Gunsch, S. China, **A. Laskin**, A.P. Ault, K.A. Pratt. Aerosol Emissions from Great Lakes Harmful Algal Blooms. *Environmental Science and Technology*, *52*, 397–405, (2018). doi: 10.1021/acs.est.7b03609 (COVER ARTICLE)
162. A. Lavi, P. Lin, B. Bhaduri, R. Carmieli, **A. Laskin**, Y. Rudich. Characterization of light absorbing oligomers from the reaction of lignin pyrolysis products and Fe (III). *ACS Earth and Space Chemistry*, *1*, 637–646, (2017). doi:10.1021/acsearthspacechem.7b00099
161. R. Cook, Y.-H. Lin, Z. Peng, E. Boone, R.K. Chu, J. Dukett, M. Gunsch, W.G Zhang, N. Tolic, **A. Laskin**, K.A. Pratt. Biogenic, Urban, and Wildfire Influences on the Molecular Composition of Dissolved Organic Compounds in Cloud Water. *Atmospheric Chemistry and Physics*, *17*, 15167–15180, (2017). doi: 10.5194/acp-17-15167-2017.
160. P. Aiona, H.J. Lee, R. Leslie, P. Lin, **A. Laskin**, J. Laskin, S. A. Nizkorodov. Photochemistry of Products of the Aqueous Reaction of Methylglyoxal with Ammonium Sulfate. *ACS Earth and Space Chemistry*, *1*(8), 522–532, (2017). DOI: 10.1021/acsearthspacechem.7b00075
159. D.P. Veghte, S. China, L. Kovarik, J. Weiss, M.K. Gilles, **A. Laskin**. Optical Properties of Airborne Soil Organic Particles. *ACS Earth and Space Chemistry*, *1*(8), 511–521, (2017). doi: 10.1021/acsearthspacechem.7b00071
158. P. Lin, N. Bluvshstein, Y. Rudich, J. Laskin, **A. Laskin**. Molecular Chemistry of Atmospheric Brown Carbon Inferred from a Nationwide Biomass Burning Event. *Environmental Science and Technology*, *51* (20), 11561–11570, (2017). doi: 10.1021/acs.est.7b02276. (COVER ARTICLE)
157. P.K. Aiona, H.-J. Lee, P. Lin, F. Heller, **A. Laskin**, J. Laskin, S.A. Nizkorodov. Aqueous Reaction of 4-Oxopentanal with Ammonium Sulfate Forms Brown Carbon Through a 2-Methyl Pyrrole Intermediate. *Environmental Science and Technology*, *51*, 11048–11056, (2017). doi:10.1021/acs.est.7b02293

156. J. Montoya-Aguilera, J.R. Horne, M.L. Hinks, L.T. Fleming, V. Perraud, P. Lin, **A. Laskin**, J. Laskin, D. Dabdub, S.A. Nizkorodov. Secondary Organic Aerosol from Atmospheric Photooxidation of Indole. *Atmospheric Chemistry and Physics*, 17, 11605–11621, (2017). doi: 10.5194/acp-17-11605-2017
155. Y. Derimian, M. Choël, Y. Rudich, K. Deboudt, O. Dubovik, **A. Laskin**, M. Legrand, B. Damiri, I. Koren, F. Unga, M. Moreau, M.O. Andreae, A. Karnieli. Effect of sea breeze on aerosol mixing state and radiative properties in a desert setting. *Atmospheric Chemistry and Physics*, 17, 11331–11353, (2017). doi:10.5194/acp-17-11331-2017.
154. M. Fraund, D. Q. Pham, D. Bonanno, T. Harder, B. Wang, J. Brito, S. S. de Sá, S. Carbone S. China, P. Artaxo, S.T. Martin, C. Pöhlker, M.O. Andreae, **A. Laskin**, M.K. Gilles, R. C. Moffet. Elemental Mixing State of Aerosol Particles Collected in Central Amazonia during GoAmazon2014/15. *Atmosphere*, 8, 173, (2017). doi:10.3390/atmos8090173
153. M.J. Gunsch, R.M. Kirpes, K.R. Kolesar, T.E. Barrett, S. China, **A. Laskin**, R.J. Sheesley, A. Jefferson, T. Tuch, W. Birmili, A. Wiedensohler, K.A. Pratt. Contributions of Transported Prudhoe Bay Oilfield Emissions to the Aerosol Population in Utqiagvik, Alaska. *Atmospheric Chemistry and Physics*, 17, 10879–10892, (2017). doi: 10.5194/acp-17-10879-2017.
152. A.L. Bondy, B. Wang, **A. Laskin**, R.L. Craig, V.M. Nhliziyo, S.B. Bertman, K.A. Pratt, P.B. Shepson, A.P. Ault. Inland Sea Spray Aerosol Transport and Incomplete Chloride Displacement: Varying Heterogeneous Reactivity Observed during SOAS. *Environmental Science and Technology*, 51, 9533–9542. (2017). doi: 10.1021/acs.est.7b02085
150. N. Bluvshstein, P. Lin, J. M. Flores, L. Segev, Y. Mazar, E. Tas, G. Snider, C. Weagle, S. S. Brown, **A. Laskin**, Y. Rudich. Broadband optical properties of biomass burning aerosol and identification of brown carbon chromophores. *Journal of Geophysical Research-Atmospheres*, 122, 5441–5456, (2017). doi: 10.1002/2016JD026230
149. S.T. Martin, P. Artaxo, L. Machado, A.O. Manzi, R.A.F. Souza, C. Schumacher, J. Wang, T. Biscaro, J. Brito, A. Calheiros, K. Jardine, A. Medeiros, B. Portela, S. de Sá, K. Adachi, A.C. Aiken, R. Albrecht, L. Alexander, M.O. Andreae, H.M.J. Barbosa, P. Buseck, D. Chand, J.M. Comstock, D.A. Day, M. Dubey, J. Fan, J. Fast, G. Fisch, E. Fortner, S. Giangrande, M. Gilles, A.H. Goldstein, A. Guenther, J. Hubbe, M. Jensen, J.L. Jimenez, F.N. Keutsch, S. Kim, C. Kuang, **A. Laskin**, K. McKinney, F. Mei, M. Miller, R. Nascimento, T. Pauliquevis, M. Pekour, J. Peres, T. Petäjä, C. Pöhlker, U. Pöschl, L. Rizzo, B. Schmid, J.E. Shilling, M.A. Silva Dias, J.N. Smith, J.M. Tomlinson, J. Tóta, M. Wendisch. The Green Ocean Amazon Experiment (GoAmazon2014/5) Observes Pollution Affecting Gases, Aerosols, Clouds, and Rainfall over the Rain Forest. *Bulletin of the American Meteorological Society*, 981–997, (2017). <http://dx.doi.org/10.1175/BAMS-D-15-00221.1>
148. R.E. Cochran, O. Laskina, J. Trueblood, A.D. Estillore, H.S. Morris, T. Jayarathne, C.M. Sultana, C. Lee, P. Lin, J. Laskin, **A. Laskin**, J. Dowling, Z. Qin, C. D. Cappa, T.H. Bertram, A. Tivanski, E.A. Stone, K.A. Prather, V.H. Grassian. Molecular Characterization of Individual Nascent Sea Spray Particles: Influence of Ocean Biology on Particle Composition and Interaction with Water. *Chem*, 2, 655–667, (2017). <http://dx.doi.org/10.1016/j.chempr.2017.03.007>
147. J. Moran, M.L. Alexander, **A. Laskin**. Soil Carbon: Compositional and Isotopic Analysis. In *Encyclopedia of Soil Science, 3<sup>rd</sup> Edition*, ed. R. Lal. CRC Press, Boca Raton, FL. pp. 2073-2077, (2017). doi: 10.1081/E-ESS3-120053885 (INVITED ARTICLE)
146. D.E. Romonosky, Y. Li, M. Shiraiwa, **A. Laskin**, J. Laskin, S.A. Nizkorodov. Aqueous Photochemistry of Secondary Organic Aerosol of  $\alpha$ -Pinene and  $\alpha$ -Humulene Oxidized with Ozone, Hydroxyl Radical, and Nitrate Radical. *Journal of Physical Chemistry A*, 121, 1298–1309 (2017). doi: 10.1021/acs.jpca.6b10900
145. A. Bateman, Z. Gong, T. Harder, S. de Sá, B. Wang, P. Castillo, S. China, Y. Liu, R. O'Brien, B. Palm, H.-W. Shiu, G. da Silva, R. Thalman, K. Adachi, M. L. Alexander, P. Artaxo, A. Bertram, P. Buseck, M. Gilles, J. Jimenez, **A. Laskin**, A. Manzi, A. Sedlacek, R. Souza, J. Wang, R. Zaveri, and S. Martin. Anthropogenic influences on the physical state of submicron particulate matter over a tropical forest. *Atmospheric Chemistry and Physics*, 17, 1759–1773, (2017). doi:10.5194/acp-17-1759-2017.
144. S.L. Blair, A.C. MacMillan, G.T. Drozd, A.H. Goldstein, R.K. Chu, L. Pasa-Tolic, J. Shaw, N. Tolic, P. Lin, J. Laskin, **A. Laskin**, S.A. Nizkorodov. Molecular Characterization and the Effects of SO<sub>2</sub> on

- Biodiesel and Diesel Fuel Secondary Organic Aerosol. *Environmental Science and Technology*, 51, 119–127, (2017). doi: 10.1021/acs.est.6b03304
143. R.C. Moffet, R.E. O'Brien, P. Alpert, S.T. Kelly, D.Q. Pham, M.K. Gilles, D. Knopf, **A. Laskin**. Morphology and Mixing of Soot Particles Collected in Central California During the CARES Field Study. *Atmospheric Chemistry and Physics*, 16, 1–11, (2016). doi: 10.5194/acp-16-14515-2016
142. S. China, B. Wang, J. Weis, L. Rizzo, J. Brito, G. Cirino, L. Kovarik, P. Artaxo, M.K. Gilles, **A. Laskin**. Rupturing Of Biological Spores As A Source Of Secondary Particles In Amazonia. *Environmental Science and Technology*, 50, 12179–12186, (2016). doi: 10.1021/acs.est.6b02896
141. B. Wang, D. A. Knopf, S. China, B. W. Arey, T. H. Harder, M. K. Gilles, **A. Laskin**. Probing Individual Ice Nucleation Events with Environmental Scanning Electron Microscopy. *Physical Chemistry Chemical Physics*, 18, 29721–29731, (2016). doi: 10.1039/C6CP05253. (COVER ARTICLE)
140. P. Lin, P. Aiona, Y. Li, M. Shiraiwa, J. Laskin, S.A. Nizkorodov, **A. Laskin**. Molecular Characterization of Brown Carbon in Biomass Burning Aerosol. *Environmental Science and Technology*, 50, 11815–11824, (2016). doi: 10.1021/acs.est.6b03024
138. J. Liu, P. Lin, **A. Laskin**, J. Laskin, S. Kathmann, M. Wise, R. Caylor, F. Imholt, V. Selimovic, J. Shilling. Optical Properties and Aging of Light Absorbing Secondary Organic Aerosol. *Atmospheric Chemistry and Physics*, 16, 12815–12827, (2016). doi:10.5194/acp-2016-482.
135. D. S. Piens, S. T. Kelly, R. E. O'Brien, B. Wang, M. D. Petters, **A. Laskin**, M. K. Gilles. Quantifying the mass based hygroscopicity of individual submicron atmospheric aerosol particles with x-ray and electron spectro-microscopy. *Environmental Science and Technology*, 50, 5172–5180. (2016). doi: 10.1021/acs.est.6b00793
134. G. Kulkarni, S. China, S. Liu, M. Nandasiri, N. Sharma, J. Wilson, A. C. Aiken, D. Chand, **A. Laskin**, C. Mazzoleni, M. Pekour, J. Shilling, V. Shutthanandan, A. Zelenyuk, R. A. Zaveri. Ice nucleation activity of diesel soot particles: Effects of hydration, secondary organics coating, soot morphology, and coagulation. *Geophysical Research Letters*, 43, 3580–3588, (2016). doi: 10.1002/2016GL068707
133. L. Yu, J. Smith, **A. Laskin**, K.M. George, C. Anastasio, J. Laskin, A.M. Dillner, Q. Zhang. Molecular transformation of phenolic SOA during photochemical aging in aqueous phase. *Atmospheric Chemistry and Physics*, 16, 4511–4527, (2016). doi:10.5194/acp-16-1-2016
132. R.E. Cochran, O. Laskina, T. Jayarathne, **A. Laskin**, J. Laskin, P. Lin, C. Sultana, C. Lee, K.A. Moore, C.D. Cappa, T.H. Bertram, K. Prather, V.H. Grassian, E. A. Stone. Analysis of Organic Anionic Surfactants in Fine (PM<sub>2.5</sub>) and Coarse (PM<sub>10</sub>) Fractions of Freshly Emitted Sea Spray Aerosol. *Environmental Science and Technology*, 50, 2477–2486, (2016). doi:10.1021/acs.est.5b04053
131. M.L. Hinks, M.V. Brady, H. Lignell, M. Song, J. Grayson, A.K. Bertram, P. Lin, **A. Laskin**, J. Laskin, S.A. Nizkorodov. Effects of temperature and relative humidity on photochemistry inside secondary organic aerosol materials. *Physical Chemistry Chemical Physics*, 18, 8785–8793, (2016). doi:10.1039/C5CP05226B (COVER ARTICLE)

#### INVITED TALKS AND SEMINARS

64. **A. Laskin**. Molecular Characterization of Atmospheric Brown Carbon. *Invited seminar at Technion – Israeli Institute of Technology*, Haifa, Israel. May 2, 2018.
63. **A. Laskin**. Atmospheric Particles from Unacknowledged Natural Processes. *Invited seminar at Hebrew University of Jerusalem*, Jerusalem, Israel. May 1, 2018.
62. **A. Laskin**. Molecular Characterization of Atmospheric Brown Carbon. *Invited seminar at Weizmann Institute of Science*, Rehovot, Israel. April 29, 2018.
61. **A. Laskin**. Atmospheric Particles from Unacknowledged Natural Processes. *Invited seminar at Stony Brook University*, Stony Brook, NY. April 6, 2018.
60. **A. Laskin**. Chemistry of Atmospheric Brown Carbon. *Spring 2018 254<sup>th</sup> National Meeting of the American Chemical Society*, New Orleans, Louisiana, March 18–22, 2018 (paper ENVR 368)
59. **A. Laskin**. Atmospheric Particles from Unacknowledged Natural Processes. *Invited seminar at University of Illinois*, Urbana-Champaign, IL. February 8, 2018.

58. **A. Laskin.** Multi-phase Chemistry of Atmospheric Particles. *Invited seminar at University California, San Diego, San Diego, CA. March 14, 2017.*
57. **A. Laskin.** Multi-phase Chemistry of Atmospheric Particles. *Invited seminar at University California, Irvine, Irvine, CA. March 13, 2017.*
56. **A. Laskin.** Atmospheric Chemistry of Marine Aerosols. *3<sup>rd</sup> International Xiamen Symposium on Marine Environmental Sciences (XMAS-III), Xiamen University, China January 9, 2017.*
55. **A. Laskin.** Multi-phase Chemistry of Atmospheric Particles. *Invited seminar at Purdue University, West Lafayette, IN. January 4, 2017*
54. **A. Laskin.** Multi-phase Chemistry of Atmospheric Particles. *Invited seminar at the Hong Kong University of Science and Technology, Hong Kong, December 8, 2016*
53. **A. Laskin.** Atmospheric Soil Organic Particles. *3<sup>rd</sup> international workshop "Towards a molecular-level understanding of atmospheric aerosols", Chaminade, CA August 28 – September 2, 2016*
52. **A. Laskin.** Atmospheric Soil Organic Particles. *International workshop "Organic Particles in the Atmosphere: Formation, Properties, Processing, and Impact" Telluride Science Research Center, CO, July 18-22, 2016.*
51. **A. Laskin.** Atmospheric Soil Organic Particles. *Goldschmidt International Conference on Geosciences, Yokohama, Japan, June 26 - July 1, 2016. (keynote presentation)*
50. **A. Laskin.** Discovery of Unique Atmospheric Solid Particles through Chemical Imaging. *Invited science highlight presentation at ALS User Meeting, Berkeley, October 6, 2015.*
49. **A. Laskin.** Chemical Imaging and Molecular Characterization of Atmospheric Particles. *Invited seminar at Max Plank Institute for Chemistry, Mainz, Germany, August 24<sup>th</sup>, 2015.*
48. **A. Laskin.** Chemical Imaging of Atmospheric Particles *Fall 2015 250<sup>th</sup> National Meeting of the American Chemical Society, Boston, Massachusetts, March 22-26, 2015 (paper PHYS 14)*
47. **A. Laskin.** Chemical Imaging and Molecular Characterization of Atmospheric Aerosols. *Workshop on Innovations In Aerosol Physics And Chemistry (CASE), Washington University, St. Louis, MO. July 13-15, 2015.*
46. **A. Laskin.** Chemical Imaging and Molecular Analysis of Atmospheric Particles *Spring 2015 249<sup>th</sup> National Meeting of the American Chemical Society, Denver, Colorado, March 22-26, 2015 (paper ENVR 22)*
45. **A. Laskin, J. Laskin, S.A. Nizkorodov,** Probing Molecular Composition of Soil Organic Matter with Nanospray Desorption Electrospray Ionization High-Resolution Mass Spectrometry. *American Geophysical Union, 2014 Fall Meeting, December 15-19, 2014, presentation B31L-06.*
44. **A. Laskin.** Chemical Characterization of Atmospheric Particles by Off-line Methods of Analysis. *AAAR 2014 Annual Meeting, October 20-24, Orlando, FL.*
43. **A. Laskin.** Effects of Chemical Transformations of Aerosols on Their Physical Properties. *2<sup>nd</sup> international workshop "Towards a molecular-level understanding of atmospheric aerosols", Stefano Franscini Congress Center of Swiss Federal Institute of Technology, Ascona, Switzerland, August 31 – September 5, 2014*
42. **A. Laskin.** Environmental Molecular Chemistry of Atmospheric Particles. *The 9<sup>th</sup> International Aerosol Conference (IAC2014), Busan, Korea. August 28 – Sept 2, 2014*
41. **A. Laskin.** Molecular Analysis of Atmospheric Aerosols by High-Resolution Mass Spectrometry. *International Mass Spectrometry Conference 2014, Geneva, Switzerland. August 24-29, 2014*
40. **A. Laskin.** Environmental molecular chemistry of atmospheric particles. *Fall 2014 248<sup>th</sup> National Meeting of the American Chemical Society, San Francisco, California, August 10-14, 2014 (paper 347)*
39. **A. Laskin.** Atmospheric Reaction Chemistry of Water Soluble Organic Acids with Inorganic Particles. *Invited seminar at University of Delaware, Newark, DE, April 25<sup>th</sup>, 2014.*
38. **A. Laskin.** Probing Environmental Chemistry of Aerosols with Complementary Methods of Chemical Imaging and Molecular Analysis *Invited seminar at Michigan Technological University, Houghton, MI, October 21<sup>st</sup>, 2013.*
37. **A. Laskin.** Effects of Chemical Transformations of Aerosols on Their Physical Properties.

*Gordon Research Conference on Atmospheric Chemistry*, Mt. Snow, VT. July 27<sup>th</sup>-August 2<sup>nd</sup>, 2013.

36. **A. Laskin.** "Advancing Discoveries in Energy and Environmental Science Using Chemical Imaging Analysis." Invited seminar at *University of California, Irvine*, Irvine, CA. May 15<sup>th</sup>, 2013.
35. **A. Laskin.** Molecular Chemistry of Atmospheric Aerosols and Their Environmental Impacts. Invited seminar at *the Earth System Research Laboratory, NOAA*, Boulder, CO. March 27<sup>th</sup>, 2013.
34. **A. Laskin.** Chemical Imaging Analysis of Flame Synthesized Nanomaterials. *3rd International Workshop on Photon Tools for Combustion and Energy Conversion Program*. Argonne National Laboratory, Argonne, IL. March 3-6, 2013.
33. **A. Laskin,** J. Laskin, S.A. Nizkorodov, P.A. Eckert, P.J. Roach, B.S. Heath. Chemical Analysis of Complex Organic Mixtures Using Reactive Nano-DESI High-Resolution Mass Spectrometry. *The 4th Conference on Atmospheric Chemical Mechanisms, University of California, Davis*. December 10-13, 2012.
32. **A. Laskin.** Chemical imaging and molecular analysis of atmospheric aerosols. *13<sup>th</sup> European Meeting on Environmental Chemistry*, Moscow, Russia. December 5-8, 2012.
31. **A. Laskin** and M.K. Gilles. Chemical Imaging of Combustion Synthesized Nanomaterials. *Materials Research Society Fall Meeting & Exhibit*, Boston, MA. November 25 - 30, 2012. (paper Y2.01)
30. **A. Laskin.** Chemical imaging and molecular analysis of atmospheric aerosols. *1<sup>st</sup> International Workshop on Physical chemistry of Aerosols. University of British Columbia*, Vancouver, Canada. August 27-29, 2012.
29. **A. Laskin.** Methods of Chemical Imaging and Molecular Analysis for Understanding Environmental Chemistry of Aerosols. Invited seminar at "*Panorama Actual de las Ciencias Atmosféricas*" - international forum organized by Universidad Nacional Autonoma de Mexico (UNAM), Mexico city, Mexico, June 11-22, 2012.
28. **A. Laskin.** Probing Environmental Chemistry of Aerosols with Complementary Methods of Chemical Imaging and Molecular Analysis. *The 95th Canadian Chemistry Conference and Exhibition (CSC2012)*, Calgary, Alberta, May 26-30, 2012.
27. **A. Laskin.** Environmental Molecular Chemistry of Atmospheric Aerosols. *Spring 2012 National Meeting of the American Chemical Society*, San Diego, California, March 25-29, 2012
26. **A. Laskin.** Probing Environmental Chemistry of Aerosols with Complementary Methods of Chemical Imaging and Molecular Analysis. *Spring 2012 National Meeting of the American Chemical Society*, San Diego, California, March 25-29, 2012
25. **A. Laskin,** Environmental Molecular Chemistry of Atmospheric aerosols. Invited seminar at *University of British Columbia*, Vancouver, Canada, November 17<sup>th</sup>, 2011.
24. **A. Laskin,** A. Zelenyuk, M. Gilles, H. Wang. Comprehensive Characterization of Soot Using Complementary Methods of Chemical Imaging and Molecular Analysis. *The second International Workshop on Frontiers in Synchrotron Tools for Studies of Combustion and Energy Conversion*, Shanghai, October 15 - 18, 2011.
23. **A. Laskin,** Comprehensive analysis of atmospheric particles using complementary methods of chemical analysis. *The 242<sup>nd</sup> ACS National Meeting*, August 28- September 1, 2011, Denver, CO, paper ENVR 136.
22. **A. Laskin,** Environmental Molecular Chemistry of Atmospheric aerosols. Invited seminar at *University of Iowa, Iowa City, IA*, April 2011.
21. **A. Laskin,** Analytical and Physical Chemistry of Environmental Particles. Invited seminar at *Fudan University, Shanghai, China*, March 20, 2010.
20. **A. Laskin,** M.K. Gilles, R.C. Moffet. Applications of Complementary Analytical Techniques to Study Chemical Composition and Properties of Atmospheric Particles. *American Geophysical Union, 2009 Joint Assembly*, May 24-27, 2009, Toronto, Canada, paper MA21B-01
19. **A. Laskin,** "Applications of Complementary Analytical Techniques to Study Chemical Composition and Properties of Atmospheric Particles" *the American Geophysical Union Fall meeting, San Francisco, CA*, December 15-19, 2008



18. **A. Laskin**, "Atmospheric Chemistry of Environmental Particles" *June 2008, BioPIXE6 - Sixth International Symposium dedicated to advances in biological, medical, and environmental applications of Proton-Induced X-Ray Emission. PNNL, Richland, WA*
17. **A. Laskin**, "Chemistry of Atmospheric Particles: Field and Laboratory Studies" *April 2008, Environmental Chemistry Series Seminar University of Alaska, Fairbanks, AK*
16. **A. Laskin**, "Chemistry of Individual Atmospheric Particles" *April 2008, The 235th ACS National Meeting, April 6-10, 2008, New Orleans, LA, paper COLL 318.*
15. **A. Laskin**, "Chemistry of Individual Atmospheric Particles" *March 2008, Annual American Physical Society March Meeting 2008, March 10-14, 2008, New Orleans, LA*
14. **A. Laskin**, "Chemical Speciation of Sulfur in Marine Cloud Droplets" *October 2007, The Advanced Light Source Users' Meeting, Lawrence Berkeley National Laboratory, Berkeley, CA*
13. **A. Laskin**, "Chemistry of Atmospheric Aerosols: Field and Laboratory Studies" *April 2007, Institute of Organic Chemistry and Biochemistry, Czech Academy of Science, Prague, Czech Republic.*
12. **A. Laskin**, "Analysis of individual environmental particles using modern microprobe methods" *February 2007, Central Washington University, Ellensburg, WA.*
11. **A. Laskin**, "Analysis of individual environmental particles using modern microprobe methods" *232nd American Chemical Society Meeting, Sept 10-14, 2006, San Francisco, CA, paper COLL 17.*
10. **A. Laskin**, "Single Particle Analysis of Laboratory and Field Collected Aerosols." *October 2005, Annual Meeting of US EPA Region 6, Dallas, TX.*
9. **A. Laskin**, "Application of Novel Analytical Techniques for Analysis of Laboratory and Field Collected Aerosols." *September 2005, Colloquium Spectroscopicum Internationale 2005 (CSI-XXXIV), Antwerp, Belgium.*
8. **A. Laskin**, "Application of Novel Analytical Techniques for Analysis of Laboratory and Field Collected Aerosols." *December 2004, University of Southern California, Los Angeles, CA.*
7. **A. Laskin**, "Probing Heterogeneous Chemistry of Individual Atmospheric Particles Using Electron Microscopy Techniques." *December 2003, Weizmann Institute of Science, Rehovot, Israel*
6. **A. Laskin**, "Probing Heterogeneous Chemistry of Individual Atmospheric Particles Using Electron Microscopy Techniques." *November 2003, Harvard University, Cambridge, MA*
5. **A. Laskin**, "Probing Heterogeneous Chemistry of Individual Atmospheric Particles Using Electron Microscopy Techniques." *October 2003, University of British Columbia, Vancouver, BC*
4. **A. Laskin**, "Probing Heterogeneous Chemistry of Individual Atmospheric Particles Using Scanning Electron Microscopy." *May 2003, University of California, Irvine, CA*
3. **A. Laskin**, "Applications of SEM, CCSEM/EDX, ESEM and TOF-SIMS Techniques for Single Particle Characterization of Aerosols." *March 2003, University of Delaware, Newark, DE*
2. **A. Laskin**, "Applications of SEM, CCSEM/EDX, ESEM and TOF-SIMS Techniques for Single Particle Characterization of Aerosols." *March 2003, University of Iowa, Iowa City, IA*
1. **A. Laskin**, "Time-resolved field study of chloride depletion and nitrate enrichment in sea salt aerosol using single particle analysis" *July 2001, University of Delaware, Newark, DE*