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Education

Ph.D. in Chemical Engineering, Carnegie Mellon University, Sep 2005.
B.S. in Civil Engineering with Honors, University of Texas at Austin, May 2000.

Professional Experience

Assistant Professor, École Polytechnique Fédérale de Lausanne, Switzerland, Mar 2012–present.
Visiting Fellow, Centre for Scientific Computing, University of Warwick, UK, Oct–Dec 2011.
Assistant Project Scientist, Scripps Inst. of Oceanography, UC San Diego, USA, Jan 2009–Jan 2012.
Postdoctoral Researcher, Scripps Inst. of Oceanography, UC San Diego, USA, Jan 2006–Dec 2008.
Researcher, Carnegie Mellon University, USA, Sep–Dec 2005.
Research Assistant, Carnegie Mellon University, USA, Jul 2000–Sep 2005.
Research Assistant, University of Texas at Austin, USA, May 1999–Jun 2000.
Intern, City of Greenville Traffic Engineering Division, USA, Jun 1998–Aug 1998.

Teaching

Co-teacher, *Physical Chemistry of the Atmosphere*, Bachelor course, Section of Environmental Sciences and Engineering, EPFL, 2014–present.
Main teacher, *Air Pollution*, Masters course, Section of Environmental Sciences and Engineering, EPFL, Spring 2014.
Main teacher, *Air Pollution and Climate Change*, Masters course, Section of Environmental Sciences and Engineering, EPFL, 2015–present.
Co-teacher *Technical Ecology of Human Communities*, Bachelor course, School of Architecture, Civil and Environmental Engineering, EPFL, 2015–2016.
Teaching Assistant, *Environmental Sustainability in Engineering*, Master course, Department of Civil and Environmental Engineering, Carnegie Mellon University, Fall 2002.
Teaching Assistant, *Introduction to Civil and Environmental Engineering*, Bachelor course, Department of Civil and Environmental Engineering, Carnegie Mellon University, Spring 2001.

Honors and Awards

U.S. National Science Foundation Graduate Fellowship, 2000–2005 (3 out of 5 years).
University of Texas Department of Civil & Architectural Engineering Endowed Presidential Scholarship, 1999–2000.
University of Texas Department of Civil & Architectural Engineering Scholarship, 1998–1999.
University of Texas Student Endowed Fund Scholarships, 1997–2000.
Greenville County School District Sirrine Scholarship, 1996–1998.

Professional Activities

External reviewer for COST (European Cooperation in Science and Technology) Action 729, “Assessing and Managing Nitrogen Fluxes in the Atmosphere-Biosphere System in Europe” (2011).
External reviewer for Canadian Light Source beamtime allocation proposals (2010–present).
Member of Editorial Board, *Dataset Papers in Geosciences* (Mar 2012–present).

Committee member (2008–2011) and editor (2011) for *Particulars*, newsletter for the American Association for Aerosol Research.

Reviewer for journal articles: *Aerosol Science & Technology*, *AIChE Journal*, *Applied Spectroscopy*, *Atmospheric Chemistry & Physics*, *Atmospheric Environment*, *Atmospheric Measurement Techniques*, *Atmospheric Research*, *Chemometrics and Intelligent Laboratory Systems*, *Chemosphere*, *Environmental Science & Technology*, *Geophysical Model Development*, *IEEE Signal Processing Letters*, *Journal of Geophysical Research-Atmospheres*, *Journal of Hazardous Materials*, *Journal of Physical Chemistry A*, *The Journal of Physical Chemistry Letters*, *Review of Scientific Instruments*, *Science of the Total Environment*, *Sensors*, *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy*.

Reviewer for grant proposals: AXA Research Fund, Swiss National Science Foundation, U.S. Department of Energy.

Reviewer for book proposals: CRC Press.

Peer-reviewed Publications

1. **Takahama, S.** and Ruggeri, G.: Technical Note: Relating functional group measurements to carbon types for improved model-measurement comparisons of organic aerosol composition, *Atmos. Chem. Phys. Discuss.*, doi:10.5194/acp-2016-926, in review, 2016.
2. Ergin, G. and **Takahama, S.**: Carbon Density Is an Indicator of Mass Accommodation Coefficient of Water on Organic-Coated Water Surface, *The Journal of Physical Chemistry A*, 120, 2885–2893, doi:10.1021/acs.jpca.6b01748, 2016.
3. Kuzmiakova, A., Dillner, A. M., and **Takahama, S.**: An Automated Baseline Correction Protocol for Infrared Spectra of Atmospheric Aerosols Collected on Polytetrafluoroethylene (Teflon) Filters, *Atmospheric Measurement Techniques*, 9, 2615–2631, doi:10.5194/amt-9-2615-2016, 2016.
4. Modini, R. L. and **Takahama, S.**: Sampling strategies and post-processing methods for increasing the time resolution of organic aerosol measurements requiring long sample collection times, *Atmospheric Measurement Techniques*, 9, 3337–3354, doi:10.5194/amt-9-3337-2016, 2016.
5. Reggente, M., Dillner, A. M., and **Takahama, S.**: Predicting ambient aerosol thermal-optical reflectance (TOR) measurements from infrared spectra: extending the predictions to different years and different sites, *Atmospheric Measurement Techniques*, 9, 441–454, doi:10.5194/amt-9-441-2016, 2016.
6. Ruggeri, G. and **Takahama, S.**: Technical Note: Development of chemoinformatic tools to enumerate functional groups in molecules for organic aerosol characterization, *Atmospheric Chemistry and Physics*, 16, 4401–4422, doi:10.5194/acp-16-4401-2016, 2016.
7. Ruggeri, G., Bernhard, F. A., Henderson, B. H., and **Takahama, S.**: Model-measurement comparison of functional group abundance in α -pinene and 1,3,5-trimethylbenzene secondary organic aerosol formation, *Atmospheric Chemistry and Physics*, 8729–8747, doi:10.5194/acp-16-8729-2016, 2016.
8. **Takahama, S.**, Ruggeri, G., and Dillner, A. M.: Analysis of functional groups in atmospheric aerosols by infrared spectroscopy: sparse methods for statistical selection of relevant absorption bands, *Atmospheric Measurement Techniques*, 9, 3429–3454, doi:10.5194/amt-9-3429-2016, 2016.
9. Weakley, A. T., **Takahama, S.**, and Dillner, A. M.: Ambient aerosol composition by infrared spectroscopy and partial least-squares in the chemical speciation network: Organic carbon with functional group identification, *Aerosol Science and Technology*, doi:10.1080/02786826.2016.1217389, 2016.
10. Dillner, A. M., and **Takahama, S.**: Predicting Ambient Aerosol Thermal-Optical Reflectance (TOR) Measurements from Infrared Spectra: Organic Carbon, *Atmospheric Measurement Techniques*, 8, 1097–1109, doi:10.5194/amt-8-1097-2015, 2015.
11. Dillner, A. M., and **Takahama, S.**: Predicting Ambient Aerosol Thermal-Optical Reflectance (TOR) Measurements from Infrared Spectra: Elemental Carbon, 8, 4013–4023, doi:10.5194/amt-8-4013-2015, 2015.
12. **Takahama, S.** and Dillner, A. M.: Model selection for partial least squares calibration and implications for analysis of atmospheric organic aerosol samples with mid-infrared spectroscopy, *Journal*

- of *Chemometrics*, 29, 659–668, doi:10.1002/cem.2761, 2015.
13. Allen, H. M., Draper, D. C., Ayres, B. R., Ault, A., Bondy, A., **Takahama, S.**, Modini, R. L., Baumann, K., Edgerton, E., Knote, C., Laskin, A., Wang, B., and Fry, J. L.: Influence of crustal dust and sea spray supermicron particle concentrations and acidity on inorganic NO_3^- aerosol during the 2013 Southern Oxidant and Aerosol Study, *Atmospheric Chemistry and Physics*, 15, 10669–10685, doi:10.5194/acp-15-10669-2015, 2015.
 14. Ayres, B. R., Allen, H. M., Draper, D. C., Brown, S. S., Wild, R. J., Jimenez, J. L., Day, D. A., Campuzano-Jost, P., Hu, W., de Gouw, J., Koss, A., Cohen, R. C., Duffey, K. C., Romer, P., Baumann, K., Edgerton, E., **Takahama, S.**, Thornton, J. A., Lee, B. H., Lopez-Hilfiker, F. D., Mohr, C., Wennberg, P. O., Nguyen, T. B., Teng, A., Goldstein, A. H., Olson, K., and Fry, J. L.: Organic nitrate aerosol formation via NO_3 + biogenic volatile organic compounds in the southeastern United States, *Atmospheric Chemistry and Physics*, 15, 13377–13392, doi:10.5194/acp-15-13377-2015, 2015.
 15. Guzman-Morales, J., Frossard, A. A., Corrigan, A. L., Russell, L. M., Liu, S., **Takahama, S.**, Taylor, J. W., Allan, J., Coe, H., Zhao, Y., and Goldstein, A. H.: Estimated Contributions of Primary and Secondary Organic Aerosol from Fossil Fuel Combustion during the CalNex and Cal-Mex Campaigns, *Atmospheric Environment*, 88, 330–340, doi:10.1016/j.atmosenv.2013.08.047, 2014.
 16. Levy, M., Zhang, R., Zheng, J., Tan, H., Molina, L. T., **Takahama, S.**, and Russell, L.: Measurements of Submicron Aerosols at the California-Mexico Border during the Cal-Mex 2010 Field Campaign, *Atmospheric Environment*, 88, 308–319, doi:10.1016/j.atmosenv.2013.08.062, 2014.
 17. **Takahama, S.**, Russell, L. M., Shores, C. A., Marr, L. C., Zheng, J., Levy, M., Zhang, R., Castillo, E., Rodriguez-Ventura, J. G., Quintana, P., Subramanian, R., Zavala, M., and Molina, L. T.: Diesel vehicle and urban burning contributions to black carbon concentrations and size distributions in Tijuana, Mexico, during the Cal-Mex 2010 campaign, *Atmospheric Environment*, 88, 341–352, doi:10.1016/j.atmosenv.2013.09.057, 2014.
 18. You, Y., Kanawade, V. P., de Gouw, J. A., Guenther, A. B., Madronich, S., Sierra-Hernandez, M. R., Lawler, M., Smith, J. N., **Takahama, S.**, Ruggeri, G., Koss, A., Olson, K., Baumann, K., Weber, R. J., Nenes, A., Guo, H., Edgerton, E. S., Porcelli, L., Brune, W. H., Goldstein, A. H., and Lee, S.-H.: Atmospheric amines and ammonia measured with a chemical ionization mass spectrometer (CIMS), *Atmospheric Chemistry and Physics*, 14, 12181–12194, doi:10.5194/acp-14-12181-2014, 2014.
 19. Corrigan, A. L., Russell, L. M., **Takahama, S.**, Äijälä, M., Ehn, M., Junninen, H., Rinne, J., Petäjä, T., Kulmala, M., Vogel, A. L., Hoffmann, T., Ebben, C. J., Geiger, F. M., Chhabra, P., Seinfeld, J. H., Worsnop, D. R., Song, W., Auld, J., and Williams, J.: Biogenic and biomass burning organic aerosol in a boreal forest at Hyytiälä, Finland, during HUMPPA-COPEC 2010, *Atmospheric Chemistry and Physics*, 13, 12233–12256, doi:10.5194/acp-13-12233-2013, 2013.
 20. Shakya, K. M., Liu, S., **Takahama, S.**, Russell, L. M., Keutsch, F. N., Galloway, M. M., Shilling, J. E., Hiranuma, N., Song, C., Kim, H., Paulson, S. E., Pfaffenberger, L., Barmet, P., Slowik, J., Prevot, A. S. H., Dommen, J., and Baltensperger, U.: Similarities in STXM-NEXAFS Spectra of Atmospheric Particles and Secondary Organic Aerosol Generated from Glyoxal, alpha-Pinene, Isoprene, 1,2,4-Trimethylbenzene, and d-Limonene, *Aerosol Science and Technology*, 47, 543–555, doi:10.1080/02786826.2013.772950, 2013.
 21. **Takahama, S.**, Johnson, A., Morales, J. G., Russell, L. M., Duran, R., Rodriguez, G., Zheng, J., Zhang, R., Toom-Sauntry, D., and Leaitch, W. R.: Submicron organic aerosol in Tijuana, Mexico, from local and Southern California sources during the CalMex campaign, *Atmospheric Environment*, 70, 500–512, doi:10.1016/j.atmosenv.2012.07.057, 2013.
 22. **Takahama, S.**, Johnson, A., and Russell, L. M.: Quantification of carboxylic and carbonyl functional groups in organic aerosol infrared absorbance spectra, *Aerosol Science and Technology*, 47, 3, doi:10.1080/02786826.2012.752065, 2013.
 23. Zheng, J., Zhang, R., Garzn, J. P., Huertas, M. E., Levy, M., Ma, Y., Torres-Jardn, R., Ruiz-Surez, L. G., Russell, L., **Takahama, S.**, Tan, H., Li, G., and Molina, L.: Measurements of formaldehyde at the U.S.Mexico border during the Cal-Mex 2010 air quality study, *Atmospheric Environment*, 70, 513 – 520, doi:http://dx.doi.org/10.1016/j.atmosenv.2012.09.041, 2013.

24. Leaitch, W. R., Macdonald, A. M., Brickell, P. C., Liggio, J., Sjostedt, S. J., Vlasenko, A., Bottenheim, J. W., Huang, L., Li, S.-M., Liu, P. S., Toom-Sauntry, D., Hayden, K. A., Sharma, S., Shantz, N. C., Wiebe, H. A., Zhang, W., Abbatt, J. P., Slowik, J. G., Chang, R. Y.-W., Russell, L. M., Schwartz, R. E., **Takahama, S.**, Jayne, J. T., and Ng, N. L.: Temperature response of the submicron organic aerosol from temperate forests, *Atmospheric Environment*, 45, 6696 – 6704, doi:10.1016/j.atmosenv.2011.08.047, 2011.
25. **Takahama, S.** and Russell, L. M.: A molecular dynamics study of water mass accommodation on condensed phase water coated by fatty acid monolayers, *Journal of Geophysical Research-Atmospheres*, 116, D02 203, doi:10.1029/2010JD014842, 2011.
26. **Takahama, S.**, Schwartz, R. E., Russell, L. M., Macdonald, A. M., Sharma, S., and Leaitch, W. R.: Organic functional groups in aerosol particles from burning and non-burning forest emissions at a high-elevation mountain site, *Atmospheric Chemistry and Physics*, 11, 6367–6386, doi:10.5194/acp-11-6367-2011, 2011.
27. **Takahama, S.**, Liu, S., and Russell, L. M.: Coatings and clusters of carboxylic acids in carbon-containing atmospheric particles from spectromicroscopy and their implications for cloud-nucleating and optical properties, *Journal of Geophysical Research-Atmospheres*, 115, D01 202, doi:10.1029/2009JD012622, 2010.
28. Day, D. A., **Takahama, S.**, Gilardoni, S., and Russell, L. M.: Organic composition of single and submicron particles in different regions of western North America and the eastern Pacific during INTEX-B 2006, *Atmospheric Chemistry and Physics*, 9, 5433–5446, doi:10.5194/acp-9-5433-2009, 2009.
29. Gilardoni, S., Liu, S., **Takahama, S.**, Russell, L. M., Allan, J. D., Steinbrecher, R., Jimenez, J. L., De Carlo, P. F., Dunlea, E. J., and Baumgardner, D.: Characterization of organic ambient aerosol during MIRAGE 2006 on three platforms, *Atmospheric Chemistry and Physics*, 9, 5417–5432, doi:10.5194/acp-9-5417-2009, 2009.
30. Leaitch, W. R., Macdonald, A. M., Anlauf, K. G., Liu, P. S. K., Toom-Sauntry, D., Li, S.-M., Liggio, J., Hayden, K., Wasey, M. A., Russell, L. M., **Takahama, S.**, Liu, S., van Donkelaar, A., Duck, T., Martin, R. V., Zhang, Q., Sun, Y., McKendry, I., Shantz, N. C., and Cubison, M.: Evidence for Asian dust effects from aerosol plume measurements during INTEX-B 2006 near Whistler, BC, *Atmospheric Chemistry and Physics*, 9, 3523–3546, doi:10.5194/acp-9-3523-2009, 2009.
31. Liu, S., **Takahama, S.**, Russell, L. M., Gilardoni, S., and Baumgardner, D.: Oxygenated organic functional groups and their sources in single and submicron organic particles in MILAGRO 2006 campaign, *Atmospheric Chemistry and Physics*, 9, 6849–6863, doi:10.5194/acp-9-6849-2009, 2009.
32. Russell, L. M., **Takahama, S.**, Liu, S., Hawkins, L. N., Covert, D. S., Quinn, P. K., and Bates, T. S.: Oxygenated fraction and mass of organic aerosol from direct emission and atmospheric processing measured on the R/V Ronald Brown during TEXAQS/GoMACCS 2006, *Journal of Geophysical Research-Atmospheres*, 114, D00F05, doi:10.1029/2008JD011275, 2009.
33. **Takahama, S.**, Gilardoni, S., and Russell, L. M.: Single-particle oxidation state and morphology of atmospheric iron aerosols, *Journal of Geophysical Research-Atmospheres*, 113, D22 202, doi:10.1029/2008JD009810, 2008.
34. **Takahama, S.**, Gilardoni, S., Russell, L. M., and Kilcoyne, A. L. D.: Classification of multiple types of organic carbon composition in atmospheric particles by scanning transmission X-ray microscopy analysis, *Atmospheric Environment*, 41, 9435–9451, doi:10.1016/j.atmosenv.2007.08.051, 2007a.
35. **Takahama, S.**, Pathak, R. K., and Pandis, S. N.: Efflorescence transitions of ammonium sulfate particles coated with secondary organic aerosol, *Environmental Science & Technology*, 41, 2289–2295, doi:10.1021/es0619915, 2007b.
36. Grieshop, A. P., Lipsky, E. M., Pekney, N. J., **Takahama, S.**, and Robinson, A. L.: Fine particle emission factors from vehicles in a highway tunnel: Effects of fleet composition and season, *Atmospheric Environment*, 40, Amer Assoc Aerosol Res; US EPA, doi:10.1016/j.atmosenv.2006.03.064, 2006.
37. **Takahama, S.**, Davidson, C. I., and Pandis, S. N.: Semicontinuous measurements of organic carbon and acidity during the Pittsburgh air quality study: Implications for acid-catalyzed organic

- aerosol formation, *Environmental Science & Technology*, 40, 2191–2199, doi:10.1021/es050856+, 2006.
38. Khlystov, A., Stanier, C. O., **Takahama, S.**, and Pandis, S. N.: Water content of ambient aerosol during the Pittsburgh air quality study, *Journal of Geophysical Research-Atmospheres*, 110, D07S10, doi:10.1029/2004JD004651, 2005.
 39. Vayenas, D. V., **Takahama, S.**, Davidson, C. I., and Pandis, S. N.: Simulation of the thermodynamics and removal processes in the sulfate-ammonia-nitric acid system during winter: Implications for PM_{2.5} control strategies, *Journal of Geophysical Research-Atmospheres*, 110, D07S14, doi:10.1029/2004JD005038, 2005.
 40. Cabada, J. C., Rees, S., **Takahama, S.**, Khlystov, A., Pandis, S. N., Davidson, C. I., and Robinson, A. L.: Mass size distributions and size resolved chemical composition of fine particulate matter at the Pittsburgh supersite, *Atmospheric Environment*, 38, 3127–3141, doi:10.1016/j.atmosenv.2004.03.004, 2004.
 41. Modey, W. K., Eatough, D. J., Anderson, R. R., Martello, D. V., **Takahama, S.**, Lucas, L. J., and Davidson, C. I.: Ambient fine particulate concentrations and chemical composition at two sampling sites in metropolitan Pittsburgh: a 2001 intensive summer study, *Atmospheric Environment*, 38, 3165–3178, doi:10.1016/S1352-2310(04)00193-1, 2004.
 42. **Takahama, S.**, Wittig, A. E., Vayenas, D. V., Davidson, C. I., and Pandis, S. N.: Modeling the diurnal variation of nitrate during the Pittsburgh Air Quality Study, *Journal of Geophysical Research-Atmospheres*, 109, D16S06, doi:10.1029/2003JD004149, 2004.
 43. Wittig, A. E., **Takahama, S.**, Khlystov, A. Y., Pandis, S. N., Hering, S., Kirby, B., and Davidson, C.: Semi-continuous PM_{2.5} inorganic composition measurements during the Pittsburgh air quality study, *Atmospheric Environment*, 38, 3201–3213, doi:10.1016/S1352-2310(04)00190-6, 2004.

Other Publications

1. Corsi, R. L., Torres, V. M., Carter, G., Dombrowski, K., Dondelle, M., Fredenberg, S., Takahama, S., and Taylor, T.: Non-Point Source Ammonia Emissions In Texas: A First Estimate, Tech. rep., Prepared for Texas Natural Resource Conservation Commission, Austin, TX, Work Order No. 9880077600-04, August, 2000.