

Simeon K. Schum

Michigan Technological University
Department of Chemistry
1400 Townsend Drive, Houghton, MI 49931

Professional Positions:

Research Specialist in Mass Spectrometry, Chemical Advanced Resolution Methods (ChARM) Shared Facility, Michigan Technological University June 2019-Present

Education:

PhD in Chemistry, Michigan Technological University May 2019

BS in Chemistry, University of Alaska, Fairbanks May 2013

Honors and Awards:

Michigan Technological University Graduate Finishing Fellowship, Spring 2019

Outstanding Graduate Student Leadership Award, Michigan Technological University, Department of Chemistry, 2016-2017

Outstanding Upper-Division Chemistry Teaching Assistant Award, Michigan Technological University, Department of Chemistry, 2016-2017

Outstanding Graduate Student Teaching Award, Michigan Technological University, Graduate School, Spring 2017

Outstanding Chemistry Undergraduate Student Award, University of Alaska, Fairbanks, Department of Chemistry, 2013

Publications:

Schum S.K., L. R. Mazzoleni, L. R. Brown, **MFAssignR: Software Tools for Data Preparation and Molecular Formula Assignment**, *in preparation*, 2019.

Schum S.K., L. R. Mazzoleni, **Observations of Unprecedented Isobaric Complexity and FT-ICR MS/MS Fragmentation Analysis of Long-range Transported Free Tropospheric Wildfire Aerosol**, *in preparation*, 2019

Hawkes J. A., J. D'Andrilli^{2*+}, R. Sleighter, H. Chen, P. Hatcher, A. Ijaz, M. Khaksari, S. Schum, L. Mazzoleni, S. Berg, C. Remucal, R. Chu, N. Tolic, N. Hess, J. Lv, S. Zhang, H. Chen, Q. Shi, R. Hutchins, S. Tank, D. Catalina P. Lozano, R. Gavard, H. Jones, M. Barrow, H. Osterholz, T. Dittmar, N. Schmitt, A. Stubbins, J. Agar, C. Simon, G. Gleixner, N. Radoman, B. Noreiga-Ortega, G. Singer, N. Catalan, D. Podgorski, **Quality Control in Dissolved Organic Matter Composition Analysis by High Resolution Mass Spectrometry, An International Laboratory Comparison**, *in preparation*, 2019.

Schum S.K., B. Zhang, K. Dzepina, D. Helmig, P. Fialho, C. Mazzoleni, and L.R. Mazzoleni, **Molecular and Physical Characteristics of Aerosol at a Remote Free Troposphere Site: Implications**

for Atmospheric Aging, *Atmospheric Chemistry and Physics*, <https://doi.org/10.5194/acp-18-14017-2018>, 2018.

Clegg, S., L. R. Mazzoleni, V. Samburova, N. F. Taylor, D. R. Collins, S. K. Schum, and Hallar, A. G.; **Modeling the Hygroscopic Growth Factors of Aerosol Material Containing Large Fractions of Water-Soluble Organic Material, Collected at the Storm Peak Laboratory**. *Atmospheric Environment*, <https://www.sciencedirect.com/science/article/pii/S1352231019303735>. 2019, In Press.

Chapp, A., S. Schum, J. Behnke, T. Hahka, M. Huber, E. Jiang, R. Larson, Z. Shan, and Q. Chen, **Measurements of Cations, Anions and Acetate in Serum, Urine, Cerebrospinal Fluid and Tissue by Ion Chromatography**. *Physiological Reports*, <https://doi.org/10.14814/phy2.13666> 2018.

China, S., P.A. Alpert, B. Zhang, S. Schum, K. Dzepina, K. Wright, R.C. Owen, L.R., Mazzoleni, C. Mazzoleni, and D.A. Knopf, **Ice Cloud Formation Potential by Free Tropospheric Particles from Long-Range Transport over the Northern Atlantic Ocean**, *J. Geophysical Research*, <http://onlinelibrary.wiley.com/doi/10.1002/2016JD025817/full.2017>, 2017

Conference Presentations:

Schum, S. K., C. Mazzoleni, P. Fialho, B. Zhang, L. R. Mazzoleni. **Functional Group Analysis of Wildfire-Influenced Free Tropospheric Organic Aerosol using Ultrahigh Resolution Tandem Mass Spectrometry**. *American Association of Aerosol Research Annual Conference*, Portland Oregon, October 2019. (Poster)

Schum, S. K., L. Brown, L. R. Mazzoleni. **MFAssignR: Software Tools for Molecular Formula Assignment of Organic Aerosol**. *American Association of Aerosol Research Annual Conference*, Portland Oregon, October 2019. (Poster)

Brege, M., S. China, A. Zelenyuk, S. Schum, L. Mazzoleni. **Extreme Molecular Complexity Resulting in a Continuum of Carbonaceous Species in Biomass Burning Tar Balls**. *American Association of Aerosol Research Annual Conference*, Portland Oregon, October 2019. (Poster)

Zelenyuk, A., K. J. Suski, D. Bell, D. Imre, S. Schum, L. Mazzoleni, M. Shrivastava, A. Kramer, S. L. Simonich. **Ozonolysis of Polycyclic Aromatic Hydrocarbons on the Surfaces of Secondary Organic Aerosol Particles**. *American Association of Aerosol Research Annual Conference*, Portland Oregon, October 2019.

China, S., M. Brege, S. Schum, D. Veghte, K. J. Suski, G. Kulkarni, M. Shrivastava, L. Mazzoleni, A. Zelenyuk. **Physical, Chemical and Optical Properties of Wildfire Aerosols**. *American Association of Aerosol Research Annual Conference*, Portland Oregon, October 2019.

Shetty, N., A. Pandey, S. Schum, M. Khaksari, L. Mazzoleni, R. K. Chakrabarty. **Toward Development of a Metric to Relate Molecular Characteristics with Optical Properties for Biomass Burning Aerosol**. *American Association of Aerosol Research Annual Conference*, Portland Oregon, October 2019.

Mazzoleni L., M. Brege, S. Schum, S. Gilardoni, S. Decessari, M. Paglione, M.C. Facchini. **Molecular Insights on the Aqueous Phase Processing of Ambient Biomass Burning Emissions Influenced Fog and Aerosol using Ultrahigh Resolution Orbitrap Elite Mass Spectrometry**. *8th International Conference on Fog, Fog Collection and Dew*, Taipei Taiwan, July 2019.

Schum, S. K., B. Zhang, K. Dzepina, P. Fialho, C. Mazzoleni, L. R. Mazzoleni. **Molecular and Physical Characteristics of Aerosol at a Remote Marine Free Troposphere Site: Implications for Atmospheric Aging.** *International Aerosol Conference*, St. Louis, MO, Fall 2018. (Platform Talk)

Mazzoleni, L. R., S. K. Schum, M. Brege, T. Levertson, E. Rose, M. Khaksari. **Ultrahigh Resolution Orbitrap Elite Mass Spectrometry Reveals Unprecedented Molecular Detail in Atmospheric Aerosol.** *International Aerosol Conference*, St. Louis, MO, Fall 2018. (Poster)

Mazzoleni, C., L. Mazzoleni, P. Fialho, S. China, B. Zhang, A. Baccarini, K. Anderson, S. Schum. **Physico-Chemical Properties of Free Tropospheric Particles at the Remote Pico Mountain Observatory, in the Azores.** *International Aerosol Conference*, St. Louis, MO, Fall 2018. (Platform Talk)

Wehner, B., K. Chevalier, S. Henning, K. Weinhold, O. Welz, C. Mazzoleni, P. Fialho, S. Schum, S. Viviani, G. Robert. **Aerosol Measurements in the Free Troposphere over the North Eastern Atlantic Ocean and its Relationship to the Marine Boundary Layer.** *International Aerosol Conference*, St. Louis, MO, Fall 2018. (Platform Talk)

Mazzoleni, L., E. Kirillova, S. Schum, M. Khaksari, D. Sengupta, C. Bhattarai, V. Samburova, A. C. Watts, H. Moosmüller, A. Khlystov. **Water-Soluble Aerosol Organic Matter from Wildland Fire Emissions as Observed using Ultrahigh Resolution Orbitrap Elite Mass Spectrometry.** *Goldschmidt Conference 2018*. Boston, MA, Summer 2018. (Invited Talk)

Schum, S. K., B. Zhang, K. Dzepina, P. Fialho, C. Mazzoleni, L. R. Mazzoleni. **Molecular Characteristics of Long-range Transported Organic Aerosol at the Pico Mountain Observatory (PMO).** *AAAR Fall 2017 Meeting*, Raleigh, NC, October 2017. (Platform Talk)

Kirillova, E.N., S. Schum, V. Samburova, C. Bhattarai, D. Sengupta, H. Moosmüller, A. Khlystov, and L.R. Mazzoleni, **Molecular Characterization of Water-Soluble Organic Carbon (WSOC) from Biomass Burning of Wildland Fuels Using Ultrahigh Resolution Orbitrap Elite Mass Spectrometry,** *American Association of Aerosol Research Annual Conference*, Raleigh NC, October 2017 (Platform Talk)

Mazzoleni, L.R., S. Schum, B. Zhang, K. Dzepina, P. Fialho, and C. Mazzoleni, **Molecular Characteristics of Long-Range Transported Organic Aerosol in the North Atlantic: The Resilient Aerosol,** *Gordon Research Conference: Atmospheric Chemistry*, Newry, ME, August 2017. (Poster)

Schum, S. K., L. R. Mazzoleni. **Unprecedented Isobaric Complexity in Long Range Transported Atmospheric Aerosol Observed using Fourier Transform Ion Cyclotron Resonance Mass Spectrometry.** *American Society of Mass Spectrometry Conference*, Indianapolis, IN, June 2017. (Poster)

Other Research Products:

Schum, S., L. Mazzoleni, and L. Brown, **MFAssignR: Molecular Formula Assignment using CHOFIT Algorithm.** R package version 0.0.4., <https://github.com/skschum/MFAssignR>, 8dc7202, 2019.

Teaching:

Lead TA for Instrumental Analysis (CH4212): Fall 2013, 2014, 2016, 2017, and 2018

Chemistry I and II Recitation Instructor (CH1153&1163): Spring 2016, 2017, and 2018

Lead TA for Quantitative Analytical Chemistry (CH2212): Spring 2015

Lead TA for Bioanalytical Chemistry (CH4222): Fall 2015

TA for Physical Chemistry I (CH3511): Spring 2014

Other Research Experience:

Development and release on GitHub of an R package for data preparation and molecular formula assignment for ultrahigh resolution mass spectrometry data: Ongoing.

Operation/Maintenance of ion chromatography instruments as part of a core facility: 2016-Present.

Field support for TROPOS collaborators at the Pico Mountain Observatory, Azores: June- July 2017.