Mingyi Wang, Ph.D.

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PROFESSIONAL POSITIONS

- **Assistant Professor of Geophysical Sciences, University of Chicago** — Chicago, IL, USA
  Research Focus: Atmospheric Chemistry, Aerosol Microphysics, and Climate Change — Starting 01/2024
- **Postdoctoral Fellow in Chemical Engineering, Caltech** — Pasadena, CA, USA
  Adviser: Richard C. Flagan — 08/2021 – Present
  Research: Characterization of New Particles in the Upper Atmosphere During the Technological Innovation Into Iodine and Gv-aircraft Environmental Research (TI3GER) project.

EDUCATION

- **Ph.D. in Atmospheric Chemistry, Carnegie Mellon University** — Pittsburgh, PA, USA
  Adviser: Neil M. Donahue; Outstanding Dissertation Award — 08/2016 – 07/2021
  Thesis: Mechanisms Driving New Particle Formation Throughout the Troposphere.
- **M.S. in Atmospheric Science, Fudan University** — Shanghai, China
  Adviser: Lin Wang — 08/2013 – 07/2016
  Thesis: Heterogeneous Ozonolysis of Atmospheric Unsaturated Fatty Acids: Reactions of Particulate Stabilized Criegee Intermediates.
- **B.E. in Environmental Engineering, Zhongnan Univ. of Economics & Law** — Wuhan, China
  Adviser: Hongbo Wu; Graduated with Honor — 09/2009 – 07/2013
  Thesis: Characterization and Source Analysis of $PM_{2.5}$ and Related Gaseous Pollutants During the 2012 Spring Festival in Wuhan, China.

SELECTED HONORS & AWARDS

- **ACCESS XVII** (Atmospheric Chemistry Colloquium for Emerging Senior Scientists; 25 biennially worldwide) 2023
- **Sheldon K. Friedlander Award** (one recipient annually), The American Association for Aerosol Research 2022
- **Resnick Postdoctoral Scholarship**, Resnick Sustainability Institute 2022
- **Schmidt Science Fellowship** ($100,000; 29 out of 350 nominees from 83 global Universities), Rhodes Trust 2022
- **Siebel Scholars Award** ($35,000), Siebel Scholars Foundation 2021
- **Steinbrenner Doctoral Fellowship** ($40,000), Steinbrenner Institute for Environ. Education and Research 2017
- **The First Prize Scholarship**, Fudan University 2015
- **The First Prize Scholarship**, Fudan University 2013
- **Outstanding Undergraduate Student Award**, Zhongnan University of Economics & Law 2013

PROFESSIONAL SERVICE

- **Session Chair.** The American Meteorological Society's 103rd Annual Meeting.
  62144: Measurement and modeling of atmospheric cloud condensation nuclei and related chemistry. 2023
- **Guest Editor.** Peer-Reviewed Journal: Frontiers in Environmental Science (Impact Factor: 5.411).
  Special Issue: Atmospheric Chemistry in the Urban Air. Ongoing
- **Peer Reviewer.** Atmospheric Chemistry and Physics, Environmental Science & Technology, Environmental Pollution, Geophysical Research Letters, Science Advances. Ongoing
- **Presentation Judge.** The American Association for Aerosol Research's 40th Annual Conference.
  Sessions: Aerosol Chemistry, Remote and Regional Atmospheric Aerosols 2022
- **Lab Manager.** Center for Atmospheric Particle Studies (CAPS), Carnegie Mellon University.
  Co-managed general lab activities including instrument maintenance, experiment scheduling, lab safety, etc. 2020-2021
- **Mentor.** Center for Atmospheric Particle Studies (CAPS), Carnegie Mellon University.
  Trained 8 graduate students in mass spectrometer operation and data analysis. 2016-2021

PEER-REVIEWED PUBLICATIONS

(Citation Index h = 17; Citations = 1,839; Google Scholar & ORCID: 0000-0001-5782-2513)

First-author papers:

[5] **Wang, M.**; Xiao, M.; Bertozzi, B; Marie, G; Rörup, B; Schulze, B; ... Donahue, N. M. (2022). Synergistic HNO_3–H_2SO_4–NH_3 upper tropospheric particle formation. *Nature*, *605*, 483–489.

[4] **Wang, M.**; He, X.-C.; Finkenzeller, H.; Iyer, S.; Chen, D.; Shen, J.; ... Sipilä, M. (2021). Measurement of iodine species and sulfuric acid using bromide chemical ionization mass spectrometers. *Atmos. Meas. Tech.*, *14*, 4187–4202.

[3] **Wang, M.**; Chen, D.; Xiao, M.; Ye, Q.; Stolzenburg, D.; Hofbauer, V.; ... Donahue, N. M. (2020). Photo-oxidation of aromatic hydrocarbons produces low-volatility organic compounds. *Environ. Sci. Technol.*, *54*, 7911–7921.

[2] **Wang, M.**; Kong, W.; Marten, R.; He, X.-C.; Chen, D.; Pfeifer, J.; ... Donahue, N. M. (2020). Rapid growth of new atmospheric particles by nitric acid and ammonia condensation. *Nature*, *581*, 184–189.

[1] **Wang, M.**; Yao, L.; Zheng, J.; Wang, X.; Chen, J.; Yang, X.; Worsnop, D. R.; Donahue, N. M.; Wang, L. (2016). Reactions of atmospheric particulate stabilized Criegee intermediates lead to high-molecular-weight aerosol components. *Environ. Sci. Technol.*, *50*, 5702–5710.

Co-author papers:

[30] Nie, W.; Yan, C.; Yang, L.; Roldin, P.; Liu, Y.; Vogel, A. L.; ... **Wang, M.**; ... Ding, A. (2023). NO at low concentration can enhance the formation of highly oxygenated biogenic molecules in the atmosphere. *Nature Communications*, *14*, 3347.

[29] Surdu, M.; Lamkaddam, H.; Wang, D. S.; Bell, D. M.; Xiao, M.; ... **Wang, M.**; ... El Haddad, I. (2023). Molecular understanding of the enhancement in organic aerosol mass at high relative humidity. *Environ. Sci. Technol.*, *57*, 2297–2309.

[28] Finkenzeller, H.; Iyer, S.; He, X.-C.; Simon, M.; Koenig, T. K.; ... **Wang, M.**; ... Volkamer, R. (2022). The gas-phase formation mechanism of iodic acid as an atmospheric aerosol source. *Nature Chemistry*, *15*, 129–135.

[27] Shen, J.; Scholz, W.; He, X.-C.; Zhou, P.; Marie, G.; **Wang, M.**; ... Worsnop, D. R. (2022). High gas-phase methanesulfonic acid production in the OH-Initiated oxidation of dimethyl sulfide at low temperatures. *Environ. Sci. Technol.*, *56*, 13931–13944.

[26] Stolzenburg, D.; **Wang, M.**; Schervish, M.; Donahue, N. M. (2022). Tutorial: Dynamic organic growth modeling with a volatility basis set. *J. Aero. Sci.*, 106063.

[25] Caudillo, L.; Surdu, M.; Lopez, B.; **Wang, M.**; Thoma, M.; Bräkling, S.; ... Curtius, J. (2022). An intercomparison study of four different techniques for measuring the chemical composition of nanoparticles. *Atmos. Chem. Phys.*, *23*, 6613–6631.

[24] Humes, M. B.; **Wang, M.**; Kim, S.; Machesky, J. E.; Gentner, D. R.; Robinson, A. L.; ... Presto, A. A. (2022). Limited secondary organic aerosol production from acyclic oxygenated volatile chemical products. *Environ. Sci. Technol.*, *56*, 4806–4815.

[23] Nie, W.; Yan, C.; Huang, D.; Wang, Z.; Liu, Y.; ... **Wang, M.**; ... Ding, A. (2022). Secondary organic aerosol formed by condensing anthropogenic vapours over China's megacities. *Nature Geoscience*, *15*, 255–261.

[22] Marten, R.; Xiao, M.; Rörup, B; **Wang, M.**; Kong, W.; He, X.-C.; ... El Haddad, I. (2022). Survival of newly formed particles in haze conditions. *Environ. Sci.: Atmos.*, *2*, 491–499.

[21] Caudillo, L.; Rörup, B.; Heinritzi, M.; Marie, G.; Simon, M.; ... **Wang, M.**; ... Curtius, J. (2021). Chemical composition of nanoparticles from α-pinene nucleation and the influence of isoprene and relative humidity at low temperature. *Atmos. Chem. Phys.*, *21*, 17099–17114.

[20] Wang, Y.; Clusius, P.; Yan, C.; Dällenbach, K.; Yin, R.; **Wang, M.**; ... Kulmala, M. (2021). Molecular composition of oxygenated organic molecules and their contributions to organic aerosol in Beijing. *Environ. Sci. Technol.*, *56*, 770–778.

[19] Qiao, X.; Yan, C.; Li, X.; Guo, Y.; Deng, C.; ... **Wang, M.**; ... Jiang, J. (2021). Contribution of atmospheric oxygenated organic compounds to particle growth in an urban environment. *Environ. Sci. Technol.*, *55*, 13646–13656.

[18] Xiao, M.; Hoyle, C. R.; Dada, L.; Stolzenburg, D.; Kürten, A.; **Wang, M.**; ... Baltensperger, U. (2021). The driving factors of new particle formation and growth in the polluted boundary layer. *Atmos. Chem. Phys.*, *21*, 14275–14291.

[17] Lee, C. P.; Surdu, M.; Bell, D. M.; Lamkaddam, H.; **Wang, M.**; Ataei, F.; ... El Haddad, I. (2021). Effects of aerosol size and coating thickness on the molecular detection using extractive electrospray ionization. *Atmos. Meas. Tech.*, *14*, 5913–5923.

[16] He, X.-C.; Tham, Y. J.; Dada, L.; **Wang, M.**; Finkenzeller, H.; Stolzenburg, D.; ... Sipilä, M. (2021). Role of iodine oxoacids in atmospheric aerosol nucleation. *Science*, *371*, 589–595.

[15] He, X.-C.; Iyer, S.; Sipilä, M.; Ylisirniö, A.; Peltola, M.; ... **Wang, M.**; ... Kulmala, M. (2020). Determination of the collision rate coefficient between charged iodic acid clusters and iodic acid using the appearance time method. *Aerosol Sci. Tech.*, *55*, 231–242.

[14] Surdu, M.; Pospisilova, V.; Xiao, M.; **Wang, M.**; Mentler, B.; Simon, M.; ... Lamkaddam, H. (2021). Molecular characterization of ultrafine particles using extractive electrospray time-of-flight mass spectrometry. *Environ. Sci.: Atmos.*, *1*, 434–448.

[13] Heinritzi, M.; Dada, L.; Simon, M.; Stolzenburg, D.; Wagner, A. C.; ... **Wang, M.**; ... Curtius, J. (2020). Molecular understanding of the suppression of new-particle formation by isoprene. *Atmos. Chem. Phys.*, *20*, 11809–11821.

[12] Zhang, B.; Hu, X.; Yao, L.; **Wang, M.**; Yang, G.; Lu, Y.; Liu, Y.; Wang, L. (2020). Hydroxyl radical-initiated aging of particulate squalane. *Atmos. Environ.*, *237*, 117663.

[11] Simon, M.; Dada, L.; Heinritzi, M.; Scholz, W.; Stolzenburg, D.; ... **Wang, M.**; ... Curtius, J. (2020). Molecular understanding of new-particle formation from α-pinene between -50 and +25 °C. *Atmos. Chem. Phys.*, *20*, 9183–9207.

[10] Stolzenburg, D.; Simon, M.; Ranjithkumar, A.; Kürten, A.; Lehtipalo, K.; ... **Wang, M.**; ... Winkler, P. M. (2020). Enhanced growth rate of atmospheric particles from sulfuric acid. *Atmos. Chem. Phys.*, *20*, 7359–7372.

[9] Ye, Q.; **Wang, M.**; Hofbauer, V.; Stolzenburg, D.; Chen, D.; Schervish, M.; ... Donahue, N. M. (2019). Molecular composition and volatility of nucleated particles from α-pinene oxidation between -50 °C and +25 °C. *Environ. Sci. Technol.*, *53*, 12357–12365.

[8] Jing, W.; Liu, Q.; **Wang, M.**; Zhang, X.; Chen, J.; Sui, G.; Wang, L. (2019). A method for particulate matter 2.5 ($PM_{2.5}$) biotoxicity assay using luminescent bacterium. *Ecotox. Environ. Safe.*, *170*, 796–803.

[7] Lehtipalo, K.; Yan, C.; Dada, L.; Bianchi, F.; Xiao, M.; ... **Wang, M.**; ... Worsnop, D. R. (2018). Multicomponent new particle formation from sulfuric acid, ammonia, and biogenic vapors. *Science Advances*, *4*, eaau5363.

[6] Stolzenburg, D.; Fischer, L.; Vogel, A. L.; Heinritzi, M.; Schervish, M.; ... **Wang, M.**; ... Winkler, P. M. (2018). Rapid growth of organic aerosol nanoparticles over a wide tropospheric temperature range. *P. Natl. Acad. Sci.*, *115*, 9122–9127.

[5] Yao, L.; Garmash, O.; Bianchi, F.; Zheng, J.; Yan, C.; ... **Wang, M.**; ... Wang, L. (2018). Atmospheric new particle formation from sulfuric acid and amines in a Chinese megacity. *Science*, *361*, 278–281.

[4] Chen, H.; **Wang, M.**; Yao, L.; Chen, J.; Wang, L. (2017). Uptake of gaseous alkylamides by suspended sulfuric acid particles: Formation of ammonium/aminium salts. *Environ. Sci. Technol.*, *51*, 11710–11717.

[3] Yao, L.; **Wang, M.**.; Wang, X.; Liu, Y.; Chen, H.; Zheng, J.; ... Wang, L. (2016). Detection of atmospheric gaseous amines and amides by a high-resolution time-of-flight chemical ionization mass spectrometer with protonated ethanol reagent ions. *Atmos. Chem. Phys.*, *16*, 14527–14543.

[2] Wang, X.; Rossignol, S.; Ma, Y.; Yao, L.; **Wang, M.**; Chen, J.; George, C.; Wang, L. (2016). Molecular characterization of atmospheric particulate organosulfates in three megacities at the middle and lower reaches of the Yangtze River. *Atmos. Chem. Phys.*, *16*, 2285–2298.

[1] Xiao, S.; **Wang, M.**; Yao, L.; Kulmala, M.; Zhou, B.; Yang, X.; ... Wang, L. (2015). Strong atmospheric new particle formation in winter in urban Shanghai, China. *Atmos. Chem. Phys.*, *15*, 1769–1781.

Book chapters:

[1] Cao, X.* **Wang, M.*** (2023). Chapter 6: Benchmarking, Monitoring, Reporting, and Verification of Direct Air Capture Technologies. *Springer Nature*. (Forthcoming)

CONFERENCE PRESENTATIONS

- *"Upper tropospheric particle formation from anthropogenic pollution"* (Oral, Invited).
  Resnick Sustainability Institute Seminar 05/2023
- *"Atmospheric aerosol formation from anthropogenic pollution"* (Oral, Invited).
  Caltech Environmental Science and Engineering Seminar 04/2023
- *"Synergistic HNO_3–H_2SO_4–NH_3 upper tropospheric particle formation"* (Oral, Invited).
  American Chemical Society Spring Meeting 2023 03/2023
- *"Atmospheric aerosol formation from anthropogenic pollution"* (Oral, Invited).
  University of Miami Junior Faculty Candidate Seminar 03/2023

- *"Atmospheric aerosol formation from anthropogenic pollution"* (Oral, Invited).
  Harvard University Junior Faculty Candidate Seminar 03/2023
- *"Atmospheric aerosol formation from anthropogenic pollution"* (Oral, Invited).
  University of Chicago Junior Faculty Candidate Seminar 01/2023
- *"Synergistic HNO_3–H_2SO_4–NH_3 upper tropospheric particle formation"* (Oral).
  The 11^{th} International Aerosol Conference 09/2022
- *"Role of nitric acid and ammonia in upper tropospheric particle formation"* (Oral).
  American Geophysical Union Fall Meeting 2021 12/2021
- *"Synergistic particle formation in the upper troposphere by nitric acid, sulfuric acid and ammonia"* (Oral).
  The 39^{th} Annual Conference of American Association for Aerosol Research 10/2021
- *"New-particle formation in the free upper troposphere by nitric acid and ammonia"* (Oral).
  American Geophysical Union Fall Meeting 2020 12/2020
- *"Rapid growth of new atmospheric particles by nitric acid and ammonia condensation"* (Oral).
  The 38^{th} Annual Conference of American Association for Aerosol Research 10/2020
- *"Contribution of aromatic highly oxidized multifunctional compounds (HOMs) to initial particle growth"* (Oral).
  The 10^{th} International Aerosol Conference 09/2018

TEACHING EXPERIENCE

- Introduction to Experimental Chemistry (UGRD level), Teaching Assistant, CMU Spring 2018
- Introduction to Modern Chemistry (UGRD level), Teaching Assistant, CMU Spring 2017
- Introduction to Atmospheric Chemistry (UGRD level, in English), Teaching Assistant, FDU Spring 2014

SCIENCE COMMUNICATION

Engagement with local and international media outlets on published research and issues related to air pollution and climate change. Selected coverage:

- Forbes, "The 2022 Cohort Of Schmidt Science Fellows Has Been Selected".
- EurekAlert! by AAAS, "How ice clouds develop – Asian monsoon influences large parts of the Northern Hemisphere".
- Phys.org, "Discovery uncovers need for ammonia emission regulations".
- Bloomberg, "Siebel Scholars Foundation Announces Class of 2021".
- EurekAlert! by AAAS, "New, rapid mechanism for atmospheric particle formation".
- News & Views by Nature, "Airborne particles might grow fast in cities".
- Chemical & Engineering News by ACS, "Understanding how urban smog particles grow quickly".