Yufang Hao

Contact Information

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Education

Peking University, Beijing, China
Ph.D. in Environmental Engineering — 2014–2020

Dalian University of Technology, Dalian, China
B.S. in Environmental Engineering — 2010–2014

Research Experience

Laboratory of Atmospheric Chemistry, Paul Scherrer Institute (PSI)
Project Scientist — Feb 2025–Present
Postdoctoral Researcher — Feb 2021–Jan 2024

- Non-target mass spectrometric analysis of organic aerosols in diverse polluted regions.
- Development of advanced ionization techniques (e.g., EESI) and corresponding data processing tools for high-resolution mass spectrometers (HRMS).
- Design of novel statistical models linking pollution sources to health outcomes.
- Supervision of Ph.D. students in laboratory operations and instrument maintenance.

College of Environmental Science and Engineering, Peking University
Graduate Research Assistant — Sep 2014–Dec 2024

- Spatial mapping and health risk assessment of ambient trace metals across China.
- Quantification of aerosol sources by integrating observations with numerical models.
- Design of urban environmental monitoring networks with heuristic algorithm.
- Development of air pollutant emission inventories through multiple approaches.

School of Environment, Dalian University of Technology
Undergraduate Research Assistant for thesis (Rank 1/90) — Sep 2013–June 2014

- Designed and optimized reactor via computational fluid dynamics simulations (CFD).
- Built prototype reactors and evaluated performance for water disinfection.

Technical Skills

Laboratory and Analytical Skills

- Proficient in high-resolution MS (HRMS) including **AMS**, **TOF**, **Orbitrap**.
- Experienced in a variety of analytical instruments such as **ion chromatography**, **GC/MS**, and **ICP-MS**.
- Skilled in field sampling techniques for **atmospheric aerosols** and **volatile organic compounds (VOCs)**.

Professional Softwares/Models

- Proficient in multi-scale atmospheric modeling with hands-on experience in **FLEXPART**, **GEOS-Chem**, and **WRF-Chem**.

- Skilled in diverse MS-based data processing and interpretation with expertise in:
  - Instrument-specific software (e.g., **Xcalibur**, **Tofware**) and source apportionment using tools as **SOFI** or custom statistical methods.
  - Structural annotation based on MS^2 data using **SIRIUS** and **CSI:FingerID**.
  - Development of custom tools/workflows, including **OrbiTrack**, designed to streamline analysis for untargeted Orbitrap measurements (Project Page).
- Experienced in computational simulation using **COMSOL Multiphysics**.

Programming

- Advanced proficiency in **Python** for statistics, visualization, geospatial analysis.
- Familiar with **R** for statistics and visualization.
- Experienced in work with **Linux-based HPC environments**.

👉 For more details of technical insights, welcome to visit my blog: `link`

Honors and Awards

Peking University's Merit Student

Peking University's Doctorate Academic Excellence Scholarship

Peking University's Wusi Fellowship Award

Dalian University of Technology's Outstanding Undergraduate Thesis Award

Dalian University of Technology's Merit Student

Publications

Authored **32** peer-reviewed publications, **8** as first author with h-index of **16**.
Currently preparing 3 first-authored manuscripts.
Google Scholar ORCID ResearchGate

Selected Journal Articles

Hao, Y., Jan Strahl, Peeyush Khare, ... S. N., Prevot, A. S. H., Kaspar Rudolf Daellenbach. (2025). Transported smoke from crop residue burning as the major source of organic aerosol and health risks in northern Indian cities during post-monsoon. *Environmental International*. *909*, 171234.

👉 Media coverage: Guardian, Indian Express

Paglione, M., **Hao, Y.**, (co-first author), Decesari, S., Russo, M., Mansour, ... Rinaldi, M. (2025). Unraveling Arctic submicron organic aerosol sources: a year-long study by H-NMR and AMS in Ny-Ålesund, Svalbard. *EGUsphere preprint*, 760.

Ren, J., **Hao, Y.**, Zheng, X., Li, X., & Xie, S. (2024). Ozone response to precursors changes in the Chengdu-Chongqing economic circle, China, from satellite and ground-based observations. *Science of The Total Environment*, *953*, 176037.

Daellenbach, K. R., Cai, J., Hakala, S., Dada, L., Yan, C., Du, W., ... **Hao, Y.**, ..., & Kulmala, M. (2024). Substantial contribution of transported emissions to organic aerosol in Beijing. *Nature Geoscience*, *17*(8), 747–754.

Cui, T., Manousakas, M. I., Wang, Q., Uzu, G., **Hao, Y.**, Khare, P., ... & Daellenbach, K. R. (2024). Composition and Sources of Organic Aerosol in Two Megacities in

Western China Using Complementary Mass Spectrometric and Statistical Techniques. *ACS EST Air*, 1(9), 1053–1065.

Bhattu, D., Tripathi, S. N., Bhowmik, H. S., Moschos, V., Lee, C. P., Rauber, M., ..., **Hao, Y.**, Qi, L., Khare, P., Manousakas, M. I., Wang, Q., Han, Y., ... Prevot, A. S. H. (2024). Local incomplete combustion emissions define the $PM_{2.5}$ oxidative potential in Northern India, *Nature Communications*, 15(1), 3517.

In't Veld, M., Khare, P., **Hao, Y.,** Reche, C., Perez, N., Alastuey, A., ... Daellenbach, K. R. (2023). Characterizing the sources of ambient PM_{10} organic aerosol in urban and rural Catalonia, Spain, *Science of the Total Environment*, 902, 166440.

Zheng, X., Ren, J., **Hao, Y.,** Xie, S. (2023). Weekend-weekday variations, sources, and secondary transformation potential of volatile organic compounds in urban Zhengzhou, China, *Atmospheric Environment*, 300, 119679.

Ren, J., **Hao, Y.,** Simayi, M., Shi, Y., Xie, S. (2021). Spatiotemporal variation of surface ozone and its causes in Beijing, China since 2014, *Atmospheric Environment*, 260, 118556.

Simayi, M., **Hao, Y.,** Li, J., Shi, Y., Ren, J., Xi, Z., Xie, S. (2021). Historical volatile organic compounds emission performance and reduction potentials in China's petroleum refining industry, *Journal of Cleaner Production*, 292, 125810.

Hao, Y., Luo, B., Simayi, M., Zhang, W., Jiang, Y., He, J., Xie, S. (2020). Spatiotemporal patterns of $PM_{2.5}$ elemental composition over China and associated health risks, *Environmental Pollution*, 265, 114910.

Chen, X., Yang, T., Wang, Z., **Hao, Y.,** He, L., Sun, H. (2020). Investigating the impacts of coal-fired power plants on ambient $PM_{2.5}$ by a combination of a chemical transport model and receptor model, *Science of the Total Environment*, 727, 138407.

Hao, Y., Meng, X., Yu, X., Lei, M., Li, W., Yang, W., ... Xie, S. (2020). Chemical characteristics and health risks of trace metals in $PM_{2.5}$ from firework/firecracker burning during the Spring Festival in North China, *IOP Conference Series: Earth and Environmental Science*, 489(1), 012002.

Hao, Y., Meng, X., Yu, X., Lei, M., ... Xie, S. (2020). Quantification of primary and secondary sources to $PM_{2.5}$ using an improved source regional apportionment method in an industrial city, China, *Science of the Total Environment*, 706, 135715.

Simayi, M., **Hao, Y.,** Li, J., Wu, R., Shi, Y., Xi, Z., ... Xie, S. (2019). Establishment of county-level emission inventory for industrial NMVOCs in China and spatial-temporal characteristics for 2010–2016, *Atmospheric Environment*, 211, 194-203.

Hao, Y., Meng, X., Yu, X., Lei, M., Li, W., Yang, W., ... Xie, S. (2019). Exploring the characteristics and sources of carbonaceous aerosols in the agro-pastoral transitional zone of Northern China, *Environmental Pollution*, 249, 589-597.

Li, J., **Hao, Y.,** Simayi, M., Shi, Y., Xi, Z., Xie, S. (2019). Verification of anthropogenic VOC emission inventory through ambient measurements and satellite retrievals, *Atmospheric Chemistry and Physics*, 19(9), 5905-5921.

Hao, Y., Meng, X., Yu, X., Lei, M., Li, W., Shi, F., ... Xie, S. (2018). Character-

istics of trace elements in $PM_{2.5}$ and PM_{10} of Chifeng, northeast China: Insights into spatiotemporal variations and sources, *Atmospheric Research*, 213, 550-561.

Hao, Y., Xie, S. (2018). Optimal redistribution of an urban air quality monitoring network using atmospheric dispersion model and genetic algorithm, *Atmospheric Environment*, 177, 222-233.

Wu, R., Li, J., **Hao, Y.,** Li, Y., Zeng, L., Xie, S. (2016). Evolution process and sources of ambient volatile organic compounds during a severe haze event in Beijing, China, *Science of the Total Environment*, 560, 62-72.

Li, J., Wu, R., Li, Y., **Hao, Y.,** Xie, S., Zeng, L. (2016). Effects of rigorous emission controls on reducing ambient volatile organic compounds in Beijing, China, *Science of the Total Environment*, 557, 531-541.

Yu, H., Song, L., **Hao, Y.,** Lu, N., Quan, X., Chen, S., ... Feng, Y. (2016). Fabrication of pilot-scale photocatalytic disinfection device by installing TiO_2 coated helical support into UV annular reactor for strengthening sterilization, *Chemical Engineering Journal*, 283, 1506-1513.

Presentations

Oral Presentations

2024 "From Flames to Haze: A Molecular Perspective on Tracing Organic Aerosols from Punjab's Fields to New Delhi's Air", Europe Aerosol Conference, Tampere, Finland.

2023 "A Year-Long Quantitative Molecular Analysis of Crop Residue's Influence on Organic Aerosols in the IGP", Indian Aerosol Science and Technology Association Conference, Mumbai, India.

2019 "Chemical characteristics and health risks of trace metals in $PM_{2.5}$ during the Spring Festival in China", 15th International Conference on Atmospheric Sciences and Applications to Air Quality, Kuala Lumpur, Malaysia.

Conference Posters

2023 European Aerosol Conference, Malaga, Spain.

2023 Wilhelm und Else Heraeus-Foundation Seminar on Aerosols, Health, and Climate: Gigacity and Future, Bad Honnef, Germany.

2022 International Aerosol Conference, Athens, Greece.

References

Prof. Dr. Andre Prevot, Group Head Atmospheric Pollution Sources, Laboratory of Atmospheric Chemistry, Paul Scherrer Institute, Switzerland
`andre.prevot@psi.ch`

Dr. Kaspar Dallenbach, Group Head Aerosol and Health, Laboratory of Atmospheric Chemistry, Paul Scherrer Institute, Switzerland
`kaspar.daellenbach@psi.ch`

Prof. Dr. Shaodong Xie, College of Environmental Science and Engineering, Peking University, China
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