

Yaowei Li

Dept of Earth, Atmospheric, & Planetary Sciences, Massachusetts Institute of Technology
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EDUCATION

Harvard University	09/2018-05/2024
Ph.D. in Environmental Science & Engineering, Secondary Field in Computational Science & Engineering	
• Thesis: <i>New Insights into Aerosol Properties, Perturbations, and Radiative Effects in the Stratosphere and Upper Troposphere</i> (Advisor: Frank Keutsch)	
M.S. in Environmental Science & Engineering	05/2022
Peking University	
B.S. in Environmental Science (with honor, class rank: 1/28), and B.A. in Economics	
• Thesis: <i>Development and Application of Drone-based VOC Monitoring Platform</i> (Advisor: Qi Chen)	

PROFESSIONAL EXPERIENCE

NOAA Climate & Global Change Postdoctoral Fellow, MIT & Caltech	08/2024-present
Hosts: Susan Solomon (MIT) & Paul Wennberg (Caltech)	
Foster and Coco Stanback Postdoctoral Scholar, Caltech	10/2025-present
Hosts: Paul Wennberg & Yuk Yung	
Postdoctoral Fellow, Harvard University	05/2024-08/2024
Advisor: Frank Keutsch	
Graduate Research Assistant, Harvard University	09/2018-05/2024
Advisor: Frank Keutsch	
Summer Undergraduate Research Assistant, Harvard University	06/2017-09/2017
Advisor: Scot Martin	
Undergraduate Research Assistant, Peking University	01/2016-06/2018
Advisor: Qi Chen	

GRANTS & FUNDS

• NOAA Climate & Global Change Postdoctoral Fellowship, NOAA Climate Program Office	2024-2026
• Foster and Coco Stanback Postdoctoral Fellowship, Division of GPS at Caltech	Extended to 2026
• FY 2024 EMSL Large-Scale Research Funding (as an Investigator), US Department of Energy	2023-2025
• AAAR 41 st Annual Conference Student Travel Grant, American Association for Aerosol Association	2023
• GSAS Professional Development Fund, Harvard University	2022
• Clare Marie Doris Innovation Fund in Engineering and Applied Sciences, Harvard University	2018-2019
• Chen Shouren Overseas Research Summer Fund, Peking University	2017

AWARDS & HONORS

- Houghton Postdoctoral Fellowship, Department of EAPS at MIT (declined) 2024
- NASA Group Achievement Award for the DCOTSS Airborne Mission 2024
- AMS 2024 Best Student Presentation Award, American Meteorological Society 2024
- AGU 2022 Outstanding Student Presentation Award (OSPA), American Geophysical Union 2023
- Certificate of Distinction in Teaching, Harvard University 2020
- Beijing Outstanding Graduate Award (Highest honor for graduate set by the government of Beijing) 2018
- Tang Xiaoyan Environmental Science and Innovation Scholarship 2018
- Best Poster Award, 5th International Conference on Environment Simulation and Pollution Control 2017
- National Scholarship, Chinese Ministry of Education 2016 & 2017
- Chongto Environmental Science Scholarship, Peking University 2016
- Robin Li Scholarship, Peking University 2015
- First Prize Spark Scholarship, Peking University 2015, 2016, 2017

PUBLICATIONS (*Google Scholar*)

Under review & submitted

1. Li, Y., Santer, B. D., Solomon, S., Thompson, D. W. J., Fu, Q., “Detectable Global Temperature Responses to Wildfires and Volcanic Eruptions” (*under review*)
2. Zhang, J., Li, Y., Sullivan, J., Zhu, T., Catena, A., Schwab, M., Guo, Y., Mao, J., Teora, A., Schwab, J., “Revealing the formation and control of NYC downwind coastal high ozone via TEMPO observations.” (*under review*)
3. Bai, B., Vandergrift, G. W., Liang, Y., Li, Y., Cheng, Z., Wang, Y., Shin, N., Keutsch, F. N., Lambe, A. T., China, S., Ng, N. L., Liu, P., “Dynamic evolution of mass and physical properties of atmospheric organic aerosol under solar irradiance.” (*under review*)
4. Atlas, R., Ueyama, R., Kim, S., Bui, P., Dean-Day, J., Li, Y., Dykema, J., Keutsch, F., Podglajen, A., “Upper-level turbulence in the North American and Asian summer monsoon regions sampled in recent aircraft campaigns.” (*under review*)
5. Chen, X., Wang, J., Peterson, D. A., Li, Y., Julstrom, W., Keutsch, F., Dykema, J., “Particle coating influences pyrocumulonimbus smoke radiative forcing and stratospheric warming: Insights from 2019-2020 Australian megafires.” (*under review*)
6. Guan, J., Santer, B., Wang, P., Fu, Q., Garcia, R., Li, Y., Stone, K., Kinnison, D., Zhang, J., Chiodo, G., Lamarque J.F., Solomon, S., “Human Influence on the Ozone Layer Detectable by the 1960s” (*under review*)
7. Li, Y., Zhang, H., Shi, X., Li, Y., Abou-Rizk, S., Smith, J., An, Z., Wenzel, A., Song, J., Leisner, T., Keutsch, F., Chen, J., Saathoff, H., “Seasonal sources, concentrations, and variations of aerosols and VOC in downtown Munich in 2023/24.” (*submitted*)

Peer reviewed

23. Li, Y., Dykema, J., Peterson, D., Feng, X., Shen, X., June, N., Fromm, M., McHardy, T., Jacquot, J., Pittman, J., Daube, B., Wofsy, S., Dean-Day, J., Rapp, A., Bowman, K., Cziczo, D., Mickley, L., Pierce, J., Keutsch, F. (2025c) “Enhanced radiative cooling by large aerosol particles from wildfire-driven thunderstorms.” *Science Advances* (accepted)
22. Sharpe, S., Li, Y., Benjemia, S., Rivera-Adorno, F., Olayemi, T., Ese, J., Shen, X., Fraund, M., Moffet, R., Lata,

- N.N., Cheng, Z., China, S., Homeyer, C., Dykema, J., Marcus, M., Wang, J., Cziczo, D., Keutsch, F., Laskin, A. (2025b). “Chemical imaging of individual stratospheric particles sampled over North America.” *Environmental Science: Atmospheres*, DOI: 10.1039/D5EA00127G. (I am a co-first author)
21. Ye, Q., Albores, I., Frey, S., Helstrom, E., Krechmer, J., **Li, Y.**, Shutter, J., Cox, J., Canagaratna, M., Keutsch, F., Kroll, J., (2025). “Changes in volatile organic compound composition from an oxidation-based air cleaner.” *ACS ES&T Air*, DOI: 10.1021/acsestair.5c00294
 20. Shen, X., Jacquot, J., **Li, Y.**, Sharpe, S., Dykema, J., Schill, G., Bowman, K., Homeyer, C., Fraund, M., Moffet, R., Olayemi, T., Pittman, J., Rivera-Adorno, F., Murphy, D., Smith, J., Laskin, A., Keutsch, F., Cziczo, D. (2025). “Stratospheric aerosol perturbation by tropospheric biomass burning and deep convection.” *Nature Geoscience*, DOI: 10.1038/s41561-025-01821-1
 19. Howar, L. and 26 others, including **Li, Y.** (2025). “Conditions necessary for chlorine activation in the midlatitude summer lower stratosphere.” *Journal of Geophysical Research: Atmospheres*, DOI: 10.1029/2025JD043786
 18. Tahsini, N., Zhang, S., Goss, M., Frey, S., **Li, Y.**, Smith, J., Allen, N., Pang, M., Williamson, R., Keutsch, F., Kroll, J. (2025). “Mitigation of indoor ozone and secondary products from 222 nm germicidal UV using commercial air cleaners.” *ACS ES&T Air*, DOI: 10.1021/acsestair.5c00138
 17. Bowman, K. and 35 others, including **Li, Y.** (2025). “The Dynamics and Chemistry of the Summer Stratosphere (DCOTSS) Project.” *Bulletin of the American Meteorological Society*, DOI: 10.1175/BAMS-D-24-0177.1
 16. **Li, Y.**, Zhang, C., Su, W., Jiang, S., Nie, D., Wang, Y., Wang, Y., He, H., Chen, Q., Martin, S. T., Ye, J. (2025a). “Copter-type UAV-based sensing in atmospheric chemistry: recent advances, applications, and future perspectives.” *Environmental Science & Technology*, DOI: 10.1021/acs.est.5c00074
 15. Santer, B. D., Solomon, S., Thompson, D. W. J., Fu, Q., **Li, Y.** (2025). “Human influence on climate detectable in the late 19th century.” *Proceedings of the National Academy of Sciences*, DOI: 10.1073/pnas.2500829122
 14. An, Z., Wang, D., Yang, S., Deng, J., Li, X., **Li, Y.**, Jiang, J. (2025). “Organic fingerprints of condensable particulate matter from ultralow-emission stationary sources in China.” *ACS ES&T Air*, DOI: 10.1021/acsestair.5c00006
 13. An, Z., Yin, R., Zhao, X., Li, X., Yuan, Y., Guo, J., Li, Y., Li, X., Li, D., **Li, Y.**, Wang, D., Yan, C., He, K., Worsnop, D. R., Keutsch, F. N., Jiang, J. (2024). “Molecular and seasonal characteristics of organic vapors in urban Beijing: insights from Vocus-PTR measurements.” *Atmospheric Chemistry and Physics*, DOI: 10.5194/acp-24-13793-2024.
 12. Zhang, J., Zhu, T., Catena, A., **Li, Y.**, Schwab, M., Liu, P., Asa-Awuku, A., Schwab, J. (2024). “Technical note: Quantified organic aerosol subsaturated hygroscopicity by a simple optical scatter monitor system through field measurements.” *Atmospheric Chemistry and Physics*, DOI: 10.5194/acp-24-13445-2024.
 11. Barber, V., LeMar, L., **Li, Y.**, Zhang, J., Keutsch, F. N., Kroll, J. H. (2024). “Enhanced organic nitrate formation from peroxy radicals in the condensed phase.” *Environmental Science & Technology Letters*, DOI: 10.1021/acs.estlett.4c00473.
 10. **Li, Y.**, Pedersen, C., Dykema, J., Vernier, J. P., Vattioni, S., Pandit, A. K., Stenke, A., Asher, E., Thornberry, T., Todt, M. A., Bui, T. P., Dean-Day, J., Keutsch, F. N. (2023b). “In situ measurements of perturbations to stratospheric aerosol and modeled ozone and radiative impacts following the 2021 La Soufrière eruption.” *Atmospheric Chemistry and Physics*, DOI: 10.5194/acp-23-15351-2023.
 9. Barber, V. P., Goss, M. B., Franco Deloya, L. J., LeMar, L. N., **Li, Y.**, Helstrom, E., Canagaratna, M., Keutsch, N. F., Kroll, J. H. (2023). “Indoor air quality implications of germicidal 222 nm light.” *Environmental Science & Technology*, DOI: 10.1021/acs.est.3c05680
 8. **Li, Y.**, Bai, B., Dykema, J., Shin, N., Lambe, A. T., Chen, Q., Kuwata, M., Ng, N. L., Keutsch, F. N., Liu, P. (2023a). “Predicting real refractive index of organic aerosols from elemental composition.” *Geophysical Research Letters*, DOI: 10.1029/2023GL103446
 7. Zheng, Y., Miao, R., Zhang, Q., **Li, Y.**, Cheng, X., Liao, K., Koenig, T. K., Ge, Y., Tang, L., Shang, D., Hu, M., Chen, S., Chen, Q. (2023). “Secondary formation of submicron and supermicron organic and inorganic aerosols in a highly polluted urban area.” *Journal of Geophysical Research: Atmospheres*, DOI: 10.1029/2022JD037865

6. Ye, Q., Goss, M. B., Krechmer, J. E., Majluf, F., Zaytsev, A., Li, Y., Roscioli, J. R., Canagaratna, M., Keutsch, F. N., Heald, C. L., Kroll, J. H. (2022). “Product distribution, kinetics, and aerosol formation from the OH oxidation of dimethyl sulfide under different RO₂ regimes.” *Atmospheric Chemistry and Physics*, DOI: 10.5194/acp-22-16003-2022
5. Li, Y., Dykema, J., Deshler, T. and Keutsch, F., (2021b). “Composition dependence of stratospheric aerosol shortwave radiative forcing in northern midlatitudes.” *Geophysical Research Letters*, DOI: 10.1029/2021GL094427
4. Li, Y., Liu, B., Ye, J., Jia, T., Khuzestani, R. B., Sun, J. Y., Cheng, X., Zheng, Y., Li, X., Wu, C., Xin, J., Wu, Z., Tomoto, M. A., McKinney, K. A., Martin, S. T., Li, Y. J., Chen, Q. (2021a). “Unmanned aerial vehicle measurements of volatile organic compounds over a subtropical forest in China and implications for emission heterogeneity.” *ACS Earth and Space Chemistry*, DOI: 10.1021/acsearthspacechem.0c002713
3. Ye, Q., Krechmer, J.E., Shutter, J.D., Barber, V.P., Li, Y., Helstrom, E., Franco, L. J., Cox, J. L., Hrdina, A. I. H., Goss, M. B., Tahsini, N., Canagaratna, M., Keutsch, F. N., Kroll, J. H. (2021). “Real-time laboratory measurements of VOC emissions, removal rates, and byproduct formation from consumer-grade oxidation-based air cleaners.” *Environmental Science & Technology Letters*, DOI: 10.1021/acs.estlett.1c0077
2. Zheng, Y., Cheng, X., Liao, K., Li, Y., Li, Y. J., Huang, R. J., Hu, W., Liu, Y., Zhu, T., Chen, S., Zeng, L., Worsnop, D. R., Chen, Q. (2020). “Characterization of anthropogenic organic aerosols by TOF-ACSM with the new capture vaporizer.” *Atmospheric Measurement Techniques*, DOI: 10.5194/amt-13-2457-2020
1. Liu, B., Wu, C., Ma, N., Chen, Q., Li, Y., Ye, J., Martin, S. T., Li, Y. J. (2020). “Vertical profiling of fine particulate matter and black carbon by using unmanned aerial vehicle in Macau, China.” *Science of the Total Environment*, DOI: 10.1016/j.scitotenv.2019.136109

FIELD EXPERIENCE

- **Science Team Member**, NASA INSPYRE aircraft mission (Earth Venture Suborbital-4) 2025-present
- **Instrument Co-PI**, NOAA SABRE WB-57 aircraft mission 2022-present
- **Instrument Co-PI**, NASA DCOTSS ER-2 aircraft mission (Earth Venture Suborbital-3) 2019-2025
- **Instrument Lead**, Munich Urban Air Quality Campaigns (ground station) 2023-2025
- **Team Member**, AIRLESS campaign in Beijing on air pollution and human health (ground station) 2017

INVITED TALKS

- 2026 American Meteorological Society (AMS) Annual Meeting, Houston, TX, January 2026 (*scheduled*)
- The Department of Environmental Science at Stockholm University, Stockholm, October 2025
- Atmospheric Chemistry Gordon Research Seminar (GRS), Newry, ME, August 2025
- Civil and Environmental Engineering (CEE) Seminar at Texas A&M University, College Station, TX, February 2025
- Atmospheric and Oceanic Sciences at McGill University, Montreal, QC, October 2024
- Atmospheric Integrated Research at the University of California, Irvine, CA, October 2024
- Seinfeld Symposium, Caltech, CA, September 2024
- Department of Earth, Environmental, and Planetary Sciences, Brown University, RI, September 2024
- Environmental Molecular Sciences Laboratory (EMSL) Seminar, PNNL, Richland, WA, July 2024
- 2024 American Meteorological Society (AMS) Annual Meeting, Baltimore, MD, January 2024
- Engineering Special Seminar, School of Engineering at Westlake University, Hangzhou, January 2024
- College of Environmental Sciences and Engineering at Peking University, Beijing, January 2024

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- The Department of Atmospheric Sciences at Zhejiang University, Virtual, December 2023
 - VollImpact Seminar, DFG (German Research Foundation) Research Unit, Virtual, November 2023
 - Earth, Atmospheric, and Planetary Sciences (EAPS) Seminar at Purdue University, West Lafayette, IN, April 2023
 - The Department of Atmospheric Sciences at Texas A&M University, College Station, TX, January 2023

CONFERENCE PRESENTATIONS

- Li, Y., et al., Jan. 2025, Oxygenated organic aerosols in Munich: Molecular characterization, seasonal variability, and influence of biomass burning. **AMS Annual Meeting 2025**, New Orleans, LA (Talk)
- Li, Y., et al., Jun. 2024, Radiative effects of organic aerosols in the stratosphere and upper troposphere. **AMS 22nd Middle Atmosphere Conference**, Burlington, VT (Poster)
- Li, Y., et al., Apr. 2024, Variations in stratospheric aerosol layer and aerosol microphysical processes following the 2021 La Soufrière eruption: insights from in situ and satellite observations. **EGU General Assembly 2024**, Vienna, Austria (Poster)
- Li, Y., et al., Jan. 2024, *In situ* measurements of perturbations to stratospheric aerosol and modeled ozone and radiative impacts following the 2021 La Soufrière eruption. **AMS Annual Meeting 2024**, Baltimore, MD (Talk)
- Li, Y., et al., Dec. 2023, Radiative impacts of pyrocumulonimbus smoke in the upper troposphere: insights from *in-situ* aircraft observations and microphysical modelling. **AGU Fall Meeting 2023**, San Francisco, CA (eLightning talk)
- Li, Y., et al., Nov. 2023, Morphological and chemical properties of stratospheric aerosols from *in situ* and offline measurements. **NASA DCOTSS 2023 Science Team Meeting**, Norman, OK (Talk)
- Li, Y., et al., Oct. 2023, Predicting Real Refractive Index of Organic Aerosols from Elemental Composition. **AAAR 41st Annual Conference**, Portland, OR (Talk)
- Li, Y., et al., Oct. 2023, Aerosol Perturbations in the Upper Troposphere and Lower Stratosphere due to Volcanic and Wildfire Injections: Insights from the DCOTSS Airborne Mission. **AAAR 41st Annual Conference**, Portland, OR (Talk)
- Li, Y., et al., Aug. 2023, Organic-containing Aerosols in the Upper Troposphere and Lower Stratosphere (UT/LS): Climate and Chemical Impacts. **Atmospheric Chemistry Gordon Research Conference 2023**, Newry, ME (Poster)
- Li, Y., et al., Jan. 2023, Aircraft measurements of aerosol microphysics in 2021 La Soufrière volcanic plumes and their stratospheric impacts. **NASA DCOTSS 2022 Science Team Meeting**, College Station, TX (Talk)
- Li, Y., et al., Dec. 2022, Microphysical and Chemical Characterization of Aerosols in the Stratosphere and Upper Troposphere: Influence of Biomass Burning. **AGU Fall Meeting 2022**, Chicago, IL (Poster)
- Li, Y., et al., Oct. 2022, Volcanic and Wildfire Perturbations of Aerosols in the Stratosphere and Upper Troposphere during the NASA DCOTSS Airborne Mission. **the 7th SPARC General Assembly**, Boulder, CO (Poster)
- Li, Y., et al., Dec. 2021, Estimation of the Elemental Composition of Organic Aerosols in the Mid-latitude Lower Stratosphere over the Continental US. **AGU Fall Meeting 2021**, Virtual (Poster)
- Li, Y., et al., Apr. 2021, Composition Dependence of Stratospheric Aerosol Radiative Forcing. **EGU General Assembly 2021**, Virtual (Talk)
- Li, Y., et al., Dec. 2020, Unmanned Aerial Vehicle Measurements of Volatile Organic Compounds over a Subtropical Forest in China and Implications for Emission Heterogeneity. **AGU Fall Meeting 2020**, Virtual (Talk)
- Li, Y., et al., Dec. 2019, Measurements of α -Pinene Ozonolysis Products Uptake to Submicron Aerosols at A Broad Range of Tropospheric Temperatures. **AGU Fall Meeting 2019**, San Francisco, CA (Talk)
- Li, Y., et al., Nov. 2017, Detection of Non-refractory PM_{2.5} chemical composition by Time-of-Flight Aerosol Chemical Speciation Monitor equipped with a Capture Vaporizer. **the 5th International Conference on Environmental**

Simulation and Pollution Control, Beijing, China (Poster)

TEACHING & MENTORING EXPERIENCE

Teaching Fellow / Teaching Assistant:

- GENED 1137 - The Challenge of Human Induced Climate Change: Transitioning to a Post Fossil Fuel Future (Spring 2023, Harvard University)
- EPS/ESE 162 - Hydrology (Fall 2020, Harvard University)
- 12730070 - China's Energy and Environmental Challenges (Spring 2016, Peking University)

Guest Lecturer:

- CHEM 610 - Environmental Chemistry (Spring 2025, University of Tennessee, Knoxville)
- ESE/EPS 166 - State-of-the-Art Harvard Climate Observatory and Associated Instrumentation (Spring 2024 and 2025, Harvard University)
- SEE 3201 - Atmospheric Science – An Introductory Survey (Spring 2024, City University of Hong Kong)
- PUM 6306 - Energy, Climate Change and Sustainable Development in China (Spring 2023, Shanghai Jiao Tong University)

Teaching Certificate from Harvard Derek Bok Center for Teaching & Learning (2024)

Student Mentor:

- Research mentor for 4 undergraduate students: Brahm Erdmann, Emmanuel Rassou, Bella Nesti, Ploy Assawaphadungsit
- Research mentor for 2 graduate students: Sophie Abou-Rizk, Michael Gee
- Graduate Qualifying Exam mentor for 2 graduate students: Mona Dai, Lucas Estrada
- Graduate School Application mentor for 2 students: Yi Xia, Daniel Adjei

PROFESSIONAL ACTIVITIES & SERVICE

- **Co-Chair** for the 2027 Atmospheric Chemistry Gordon Research Seminar (GRS) 2025-present
- **Committee member:** AGU Atmospheric Science Section Early Career Committee 2024-present
- **Program Chair** of the AMS 22nd Conference on Middle Atmosphere 2023-2024
- **Committee member:** AMS Middle Atmosphere committee 2023-present
- **Instrument Co-PI** (mini-MOUDI instrument) for NOAA SABRE airborne mission 2022-present
- **Instrument Co-PI** (DPOPS & mini-MOUDI instruments) for NASA DCOTSS airborne mission 2019-present
- **Session chair** for AAAR 2023 Annual Conference 2023
- **Session chair** for NASA DCOTSS Science Team Meetings 2021, 2023
- **Organizer** of the Harvard Stratospheric Supergroup Meeting series 2021-2022
- **Host** for the Harvard Atmospheric & Environmental Chemistry (AEC) Seminar series 2019-present
- **Conference student presentation judge/reviewer:** AGU (2023, 2024), AAAR (2023)
- **Proposal reviewer** for *NASA Earth Science ROSES Program* (2024), *NOAA Climate Program* (2025)
- **Journal reviewer** for *JGR-Atmosphere* | *Atmospheric Chemistry and Physics* | *Environmental Health Perspectives* | *Atmospheric Environment* | *Urban Climate* | *Meteorological Applications* | *Environmental Science: Atmospheres* |

Communications Earth & Environment

- **Professional Memberships:** AGU, AMS, AAAR, EGU

OUTREACH

- **Speaker** at Climate Change Seminar for K-12 students, Cambridge, MA 2024
- **Speaker** at Harvard SEAS Lightening Talks on Sustainability and Climate 2024
- **Mentor** in Harvard SEAS Research Mentorship Program (RMP) for undergraduate students 2024
- **Mentor** in Harvard Graduate Admissions Assistance Program (GAAP) 2023
- **Presenter** at Harvard Undergraduate Research Opportunities (HUROS) Fair 2023
- **Scientific instrument showcase** at the 4th Annual Harvard Nexus Event 2023
- **Science outreach interview participant** at Superheroes of Science 2022
- **Vice President** of the Harvard Chinese Students and Scholars Association (HCSSA) 2021-2022
- **Student Group Leader** at Harvard Graduate School of Arts and Sciences (GSAS) 2021-2022
- **Judge** of the National Collegiate Research Conference 2021
- **Member of the Standing Committee**, 35th Student Union, Peking University 2017-2018
- **President** of the Youth Volunteer Association in College of Environmental Sciences and Engineering (CESE), Peking University 2015-2016
- **STEM Class Tutor** in a K-12 school, Hebei, China 2014-2017