Qindan Zhu

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Education

University of California, Berkeley	Berkeley, CA
Ph.D., Earth and Planetary Science	May 2022
Peking University	Beijing, China
B.S., Environmental Science & B.S., Mathematics and Applied Mathematics	Jul 2017

Research Interests

I am an atmospheric scientist who studies the interaction between air pollution and climate, utilizing a combination of chemical transport models, chemistry-climate models, remote sensing, field observations, and machine learning techniques. My research places a special emphasis on policies that promote the co-benefits of air pollution control and climate mitigation.

PROFESSIONAL EXPERIENCE

MIT Houghton Postdoctoral Fellow (Host: Arlene Fiore) Massachusetts Institute of Technology	Aug 2024 – Now
NOAA Climate & Global Change Postdoctoral Fellow (Host: Arlene Fiore) Massachusetts Institute of Technology	Aug 2022 – Aug 2024
Temporary Researcher on Model Development (Host: Rebecca Schwantes) Cooperative Institute for Research in Environmental Sciences at the University of Colorado Box	Jan – Aug 2022 ulder
Graduate Student Researcher (Advisor: Ron Cohen) University of California, Berkeley	Aug 2017 – Dec 2021
Summer Research Intern (Advisor: Rod Jones) University of Cambridge	Jun – Sep 2016
Undergraduate Researcher (Advisor: Keding Lu & Qi Chen) Peking University	Sep 2014 – Jul 2017
Honors & Awards	
Houghton Postdoctoral Fellowship Massachusetts Institute of Technology	Extended to 2024
NOAA Climate & Global Change Postdoctoral Fellowship University Corporation for Atmospheric Research	2022-2024
Atmospheric Chemistry Colloquium for Emerging Senior Scientists (ACCE Brookhaven National Laboratory	SS XVII) 2023
Civil and Environmental Engineering Rising Stars Carnegie Mellon University	2022
AGU Outstanding Student Presentation Award American Geophysical Union	2021
Peking University Outstanding Student Award Peking University	2013-2017

PUBLICATIONS

H-index: 12, citations: 639 (as of September 2024, Google Scholar), *Submitted

First-authored papers (7):

*27. **Zhu, Q.**, Schwantes, R. H., Coggon, M., Harkins, C., Schnell, J., He, J., ... & McDonald, B. C. (2024). Co-benefits of Zero-Emission Vehicle Adoption on CO₂ Emissions and O₃ Pollution in Los Angeles. Submitted.

25. Zhu, Q., Fiore, A., Correa, G., Lamarque, J. F., Worden, H., (2024). The impact of internal climate variability on OH trends between 2005 and 2014. Environmental Research Letters. 19 (6), 064032

23. Zhu, Q., Schwantes, R. H., Coggon, M., Harkins, C., Schnell, J., He, J., ... & McDonald, B. C. (2024). A better representation of VOC chemistry in WRF-Chem and its impact on ozone over Los Angeles. Atmos. Chem. Phys., 24, 5265–5286.

18. Zhu, Q., Place, B., Pfannerstill, E., Goldstein, A. C., Cohen, R. C. (2023). Direct observations of NOx emissions over San Joaquin Valley using airborne flux measurements during RECAP-CA 2021 field campaign. Atmospheric Chemistry and Physics, 23, 9669–9683.

13. Zhu, Q., Laughner, J. L., & Cohen, R. C. (2022). Estimate of OH trends over one decade in North American cities. Proceedings of the National Academy of Sciences, 119(16), e2117399119.

12. Zhu, Q., Laughner, J. L., & Cohen, R. C. (2022). Combining Machine Learning and Satellite Observations to Predict Spatial and Temporal Variation of near Surface OH in North American Cities. Environmental Science & Technology, 56(11), 7362-7371.

7. **Zhu**, **Q.**, Laughner, J. L., & Cohen, R. C. (2019). Lightning NO₂ simulation over the contiguous US and its effects on satellite NO₂ retrievals. Atmospheric Chemistry and Physics. 19. 13067-13078.

Co-authored papers (20):

26. Yu, X., Fiore, A. M., Santer, B. D., Correa, G. P., Lamarque, J. F., Ziemke, J. R., ... Zhu, Q. (2024). Anthropogenic Fingerprint Detectable in Upper Tropospheric Ozone Trends Retrieved from Satellite. Environmental Science & Technology.

24. Pfannerstill, E. Y., Arata, C., **Zhu, Q.**, Schnell, J., Ward. R., Woods, R., Harkins, C., Schwantes, R. H., Seinfeld, J. H., Bucholtz, A., Cohen, R. C., Goldstein, A. H.(2024), Temperature-dependent emissions dominate aerosol and ozone formation in Los Angeles, Science, 2024, 384 (6702), 1324-1329.

22. Coggon, M. M., Stockwell, C. E., Xu, L., Peischl, J., Gilman, J. B., Lamplugh, A., .. **Zhu, Q.**,.. & Warneke, C. (2024). Contribution of Cooking Emissions to the Urban Volatile Organic Compounds in Las Vegas, NV. Atmos. Chem. Phys., 24, 4289–4304.

21. Fiore, A.; Loretta, M.; Zhu, Q.; Baublitz, C. (2024); Climate and Tropospheric Oxidizing Capacity, Annual Reviews of Earth & Planetary Sciences, 52.

20. Schulze, B. C., Ward, R. X., Pfannerstill, E. Y., **Zhu**, **Q.**, Arata, C., Place, B., ... & Seinfeld, J. H. (2023). Methane emissions from dairy operations in California's San Joaquin Valley evaluated using airborne flux measurements. Environmental Science & Technology, 57(48), 19519-19531.

19. Yu, K. A., Li, M., Harkins, C., He, J., Zhu, Q., Verreyken, B., ... & Harley, R. A. (2023). Improved Spatial Resolution in Modeling of Nitrogen Oxide Concentrations in the Los Angeles Basin. Environmental Science Technology, 57(49), 20689-20698.

17. Pfannerstill, E. Y., Arata, C., **Zhu, Q.**, Schulze, B. C., Woods, R., Harkins, C., ... & Goldstein, A. H. (2023). Comparison between Spatially Resolved Airborne Flux Measurements and Emission Inventories of Volatile Organic Compounds in Los Angeles. Environmental Science & Technology, 57(41), 15533-15545.

16. Pfannerstill, E. Y., Arata, C., **Zhu, Q.**, Schulze, B. C., Woods, R., Seinfeld, J. H., ... & Goldstein, A. H. (2023). Volatile organic compound fluxes in the agricultural San Joaquin Valley–spatial distribution, source attribution, and inventory comparison. Atmospheric Chemistry and Physics, 23(19), 12753-12780.

15. Nussbaumer, C. M., Place, B. K., **Zhu**, **Q.**, Pfannerstill, E. Y., Wooldridge, P., Schulze, B. C., Arata, C., Ward, R., Bucholtz, A., Seinfeld, J. H., Goldstein, A. H., and Cohen, R. C. (2023): Measurement report: Airborne measurements of NOx fluxes over Los Angeles during the RECAP-CA 2021 campaign, Atmos. Chem. Phys., 23, 13015–13028.

 Romps, D. M., Latimer, K., Zhu, Q., Jurkat-Witschas, T., Mahnke, C., Prabhakaran, T., ... & Wendisch, M. (2023). Air pollution unable to intensify storms via warm-phase invigoration. Geophysical Research Letters, e2022GL100409.
Li, C., Zhu, Q., Jin, X., & Cohen, R. C. (2022). Elucidating Contributions of Anthropogenic Volatile Organic Compounds and Particulate Matter to Ozone Trends over China. Environmental Science and Technology, 56(18), 12906-12916.

 Li, C., Xu, X., Liu, X., Wang, J., Sun, K., van Geffen, J., Zhu, Q., Cohen, R. C. (2022). Direct Retrieval of NO2 Vertical Columns from UV-Vis (390-495 nm) Spectral Radiances Using a Neural Network. Journal of Remote Sensing.
Jin, X., Zhu, Q., & Cohen, R. C. (2021). Direct estimates of biomass burning NOx emissions and lifetimes using daily observations from TROPOMI. Atmospheric Chemistry and Physics, 21(20), 15569-15587.

8. Delaria, E. R., Place, B. K., Turner, A. J., **Zhu, Q.**, Jin, X., & Cohen, R. C. (2021). Development of a Solar-Induced Fluorescence Canopy Conductance Model and Its Application to Stomatal Reactive Nitrogen Deposition. ACS Earth and Space Chemistry.

6. Laughner, J. L., **Zhu**, **Q.**, & Cohen, R. C. (2019). Evaluation of version 3.0B of the BEHR OMI NO2 product. Atmospheric Measurement Techniques, 12(1), 129-146.

5. Laughner, J. L., **Zhu, Q.**, & Cohen, R. C. (2018). The Berkeley High Resolution Tropospheric NO2 product. Earth System Science Data, 10(4), 2069-2095.

4. Wang, H., Lu, K., Chen, X., **Zhu, Q.**, Wu, Z., Wu, Y., & Sun, K. (2018). Fast particulate nitrate formation via N 2 O 5 uptake aloft in winter in Beijing. Atmospheric Chemistry and Physics, 18(14), 10483-10495.

3. Guan, T., Hu, S., Han, Y., Wang, R., **Zhu, Q.**, Hu, Y., ... & Zhu, T. (2018). The effects of facemasks on airway inflammation and endothelial dysfunction in healthy young adults: a double-blind, randomized, controlled crossover study. Particle and fibre toxicology, 15(1), 1-12.

2. Mak, H. W. L., Laughner, J. L., Fung, J. C. H., **Zhu**, **Q**., & Cohen, R. C. (2018). Improved satellite retrieval of tropospheric NO2 column density via updating of air mass factor (AMF): case study of Southern China. Remote Sensing, 10(11), 1789.

1. Wang, H., Lu, K., Chen, X., **Zhu, Q.**, Chen, Q., Guo, S., ... & Zhang, Y. (2017). High N2O5 concentrations observed in urban Beijing: Implications of a large nitrate formation pathway. Environmental Science & Technology Letters, 4(10), 416-420.

PRESENTATIONS

Invited talks:

2024 NOAA Climate and Global Change Summer Institute

2024 University of California, Irvine, Department of Earth System Science

2024 Georgia Institute of Technology, Department of Civil and Environmental Engineering

2024 University of Washington, Department of Atmospheric Sciences, Paul G. Allen School of Computer Science & Engineering

2024 Peking University, College of Environmental Science and Technology

2023 Ninan University, College of Environment and Climate

2023 University of HongKong, Department of Geography

2023 Nanjing University, College of Atmospheric Sciences

2023 MIT, SENSE.nano Symposium

2023 NOAA, Chemical Sciences Laboratory

2023 Atmospheric Chemistry Colloquium for Emerging Senior Scientists (ACCESS) XVII, Brookhaven National Lab

2022 Statistical Learning in Atmospheric Chemistry

2022 Civil and Environmental Engineering Rising Stars, Carnegie Mellon University

2022 NASA Goddard Space Flight Center

2021 NASA Goddard Space Flight Center

Selected conference presentations:

2024 Composition Air quality Climate inTeractions Initiative (CACTI) Workshop, Oral

2024 AMS Meeting, Oral

 $2023~\mathrm{AGU}$ Fall Meeting, Oral

2023 AGU Fall Meeting, Poster

2023 The 10th Conference on Air Benefit and Cost and Attainment Assessment, Oral

2023 Meteorology and Climate - Modeling for Air Quality Conference, Oral

2023 Composition Air quality Climate inTeractions Initiative (CACTI) Workshop, Oral

2023 CESM Atmosphere / Whole Atmosphere / Chemistry-Climate working group meeting, Oral

2022 RECAP-SUNVEX field campaign workshop, Invited Talk

2022 Atmospheric Mechanisms Conference, Invited Talk

2022 AGU Fall Meeting, Invited Talk

2022 TEMPO Annual Meeting, Invited Talk

2022 AMS Annual Meeting, Oral

2021 TEMPO Science Team Meeting, Poster

2021 AMS Annual Meeting, Oral

2020 AGU Fall Meeting, Oral

2019 AGU Fall Meeting, Poster

2018 AGU Fall Meeting, Poster

Grants

Co-I, Spark's Exploratory Grants (\$300K)

Methane loss rate sensitivity to emissions, climate change and variability, and key uncertainties

Kaufman Teaching Certificate Program, MIT Completion of teaching certificate	Feb - May 2024
12.306 Atmospheric Physics & Chem, MIT Guest lecturer for graduate-level writing class	Apr 2024
Summer Research Program, MIT Mentor for a summer intern on an independent research project	Jun - Jul 2023
EPS 50 Planet Earth, UC Berkeley Graduate student instructor for a first-year undergraduate lab class	Jan - May 2020
Atmospheric Chemistry Elite Scholars (ACES) Program, Berkeley Mentor undergrad students conducting research using atmospheric data collected in the field.	Jul - Aug 2021
Bay Area Scientists in Schools (BASIS) Teaching sciences lessons with elementary students in Bay Area	Oct 2017 - May 2022
Academic Writing in English, Peking University Teacher Assistant for a graduate-level writing class	Jan - May 2017
IDL Programming in Atmospheric Sciences, Peking University Teacher Assistant for a graduate-level programming class	Jan - May 2016
Research Advising	
Vanessa Sun, Master, MIT Investigating tropospheric hydrogen peroxide trends from 1950-2014	2023 - 2024
Angelica Stewart, Undergraduate, Howard University The pollutant hour: a new metric to quantify cumulative impacts of air pollution at levels belo	2023 w the NAAQS
Jennifer Grant, Undergraduate, UC Berkeley Machine learning to improve satellite NO ₂ retrieval efficiency	2020 - 2022
Wei-Shan Huynh, Matthew Kihiczak, Ronald Wang, Undergraduates, UC Detecting the signal of soil NO_x emissions from satellite	Berkeley 2022
Monica Wang, Undergraduate, UC Berkeley Comparison between BEHR and PANDORA data at the Richmond Site	2019 - 2020
PROFESSIONAL ACTIVITIES	
Session Convener A086. Sources and Fate of Volatile Organic Compounds (VOCs) and NOx in Human-	Made

A086. Sources and Fate of Volatile Organic Compounds (VOCs) and NOx in Human-Made Environments,AGU 2022; A098. Multi-scale Air Quality Modelling: Development and Application, AGU 2023 **OSPA Judge** AGU Fall Meeting (2022, 2023) **Co-organizer** Statistical Learning in Atmospheric Chemistry (SLAC) group MIT PAOC Colloquium **Reviewer** ACS Earth and Space Chemistry; Atmospheric Chemistry & Physics; Atmospheric Environment; Atmospheric Measurement Techniques; Environmental Science & Technology; Environmental Research Letters; Environmental Research; Environmental Pollution; Geophysical Research Letters; Journal of Geophysical

Research: Atmospheres; Remote Sensing of Environment