Zhongjing Jiang

Research Scientist at the Institute for Sustainability, Energy, and Environment, University of Illinois Urbana-Champaign (UIUC); Center for Advanced Bioenergy and Bioproducts Innovation (CABBI)
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RESEARCH INTERESTS

Climate dynamics: Large-scale climate variability, ocean-atmosphere interaction, chemistry-climate interaction
Modeling & Methods: Earth system modeling, emulators, uncertainty quantification, Bayesian Inference
Earth system applications: land-atmosphere interaction, agrometeorology, air quality

RESEARCH EXPERIENCE

2024/08-present **Research Scientist, University of Illinois Urbana-Champaign** PI: Prof. Kaiyu Guan
2022/09-2024/08 **Postdoctoral Research Associate, Brookhaven National Laboratory**
Supervisor &PI: Chongai Kuang co-PIs: Nathan Urban, Shawn Serbin
2017/09-2022/08 **Graduate Research Assistant, Peking University** Advisor: Prof. Jing Li, Tzung-May Fu
2018/08-2018/09 **Visiting Ph. D. Student, University of Edinburgh** Advisor: Prof. Paul Palmer

EDUCATION

2017/09-2022/06 **Ph.D. in Atmospheric Physics and Atmospheric Environment, Peking University**
2017/07-2017/08 **Student in Summer Institute for China's Green Innovators, Tsinghua University**
2013/09-2017/06 **B.S. in Mathematics and Applied Mathematics, Beijing Normal University**

HONORS & AWARDS

2023 **Second Place in 2023 BNL Research SLAM Competition**
2022 **Outstanding Graduates of Peking University**
2021 Merit Student of Peking University, Tung Scholarship
2021 **Outstanding Student Presentation Awards (OSPA)** in the Fall 2020 AGU meeting
2020 Pacemaker to Merit Student of Peking University, Doctoral President Scholarship of Peking University
2020 **Second prize** for 2020WAIC Hackathon
2019 Merit Student of Peking University**,** Founder Scholarship
2019 **Third prize** for "Shenqi" challenge algorithm and application competition
2018 **Second prize** "Huawei Cup" The 15th China Post-Graduate Mathematical Contest in Modeling

PUBLICATIONS

Preprint:

Zhu, F., Torbunov, D., **Jiang, Z.**, Zhao, T., Yogarathnam, A., Ren, Y., and Yue, M., 2024. Diffusion Model-based Parameter Estimation in Dynamic Power Systems. *arXiv preprint arXiv:2411.10431*. https://doi.org/10.48550/arXiv.2411.10431. (submitted to Commun. Eng., in revision)

Peer-reviewed publications:

Jiang, Z., Isenberg, N. M., Subba, T., Woo, H.-M., Serbin, S. P., Urban, N. M., and Kuang, C.: A Framework for Parametric and Predictive Uncertainty Quantification in the E3SM Land Model: Assessing Site and Observable Generalizability, J. Adv. Model. Earth Syst., 18, e2025MS005562, https://doi.org/https://doi.org/10.1029/2025MS005562, 2026.

Jiang, Z., Li, J., Liu, G., and Zhang, C.: Impact of the Indian Ocean Dipole Mode on Planetary Boundary Layer Ozone in China, Geophys Res Lett, 51, https://doi.org/10.1029/2024GL110108, 2024.

Ye, X., Zhang, L., Wang, X., Lu, X., **Jiang, Z.**, Lu, N., Li, D., and Xu, J.: Spatial and temporal variations of surface background ozone in China analyzed with the grid-stretching capability of GEOS-Chem High Performance, Science of the Total Environment, 914, https://doi.org/10.1016/j.scitotenv.2024.169909, 2024.

Ying, T., Li, J., **Jiang, Z.**, Liu, G., Zhang, Z., Zhang, L., Dong, Y., and Zhao, C.: Increased aerosol scattering contributes to the recent monsoon rainfall decrease over the Gangetic Plain, Sci. Bull., https://doi.org/10.1016/j.scib.2023.08.052, 2023.

Dong, Y., Li, J., Yan, X., Li, C., **Jiang, Z.**, Xiong, C., Chang, L., Zhang, L., Ying, T., and Zhang, Z.: Retrieval of aerosol single scattering albedo using joint satellite and surface visibility measurements, Remote Sens. Environ., 294, https://doi.org/10.1016/j.rse.2023.113654, 2023.

Zhang, C., **Jiang, Z.**, Liu, M., Dong, Y., and Li, J.: Relationship between summer time near-surface ozone concentration and planetary boundary layer height in Beijing, Atmos. Res., 293, 106892, https://doi.org/10.1016/j.atmosres.2023.106892, 2023.

Liu, G., Li, J., **Jiang, Z.**, and Li, X.: Impact of Sea Surface Temperature Variability at Different Ocean Basins on Dust Activities in the Gobi Desert and North China, Geophys. Res. Lett., 49, https://doi.org/10.1029/2022GL099821, 2022.

Zhang, L., Li, J., **Jiang, Z.**, Dong, Y., Ying, T. and Zhang, Z.: Clear-Sky Direct Aerosol Radiative Forcing Uncertainty Associated with Aerosol Optical Properties Based on CMIP6 models, J. Clim., 35(10), 3007–3019, https://doi.org/10.1175/jcli-d-21-0479.1, 2022a.

Zhang, L., Li, J., **Jiang, Z.**, Dong, Y., Ying, T. and Zhang, Z.: Clear-Sky Direct Aerosol Radiative Forcing Uncertainty Associated with Aerosol Vertical Distribution Based on CMIP6 models, J. Clim., 35(10), 3021–3035, https://doi.org/10.1175/jcli-d-21-0480.1, 2022b.

Jiang, Z. and Li, J.: Impact of eastern and central Pacific El Niño on lower tropospheric ozone in China, Atmos. Chem. Phys., 22, 7273–7285, https://doi.org/10.5194/acp-22-7273-2022, 2022.

Jiang, Z., Li, J., Lu, X., Gong, C., Zhang, L., and Liao, H.: Impact of western Pacific subtropical high on ozone pollution over eastern China, Atmos. Chem. Phys., 21, 2601–2613, https://doi.org/10.5194/acp-21-2601-2021, 2021.

Jiang, Z., Jolleys, M. D., Fu, T.-M., Palmer, P. I., Ma, Y., Tian, H., Li, J., and Yang, X.: Spatiotemporal and probability variations of surface PM2.5 over China between 2013 and 2019 and the associated changes in health risks: An integrative observation and model analysis, Sci. Total Environ., 723, 137896, https://doi.org/10.1016/j.scitotenv.2020.137896, 2020.

Dong, Y., Li, J., Guo, J., **Jiang, Z.**, Chu, Y., Chang, L., Yang, Y., and Liao, H.: The impact of synoptic patterns on summertime ozone pollution in the North China Plain, Sci. Total Environ., 735, 139559, https://doi.org/10.1016/j.scitotenv.2020.139559, 2020.

Xu, X., **Jiang, Z.**, Li, J., Chu, Y., Tan, W., and Li, C.: Impacts of meteorology and emission control on the abnormally low particulate matter concentration observed during the winter of 2017, Atmos. Environ., 225, 117377, https://doi.org/10.1016/j.atmosenv.2020.117377, 2020.

In preparation:

Jiang, Z., Subba, T., Isenberg, N., Gasparik J., Urban, N., Serbin, S., Kuang, C., Towards Model–Observing System Co-Design: An OSSE-Based Bayesian Framework for Prioritizing Earth System Measurements

Jiang Z., Guan K., Li Z., Grant R., Qin R., Hartman T., Jia M., Peng B., Heaton E., VanLoocke A., Bernacchi C., Leaky A., Zhou L.: Physiological Controls on Carbon Fluxes and Biomass Production in Miscanthus: Insights from a Process-Based Agroecosystem Model

CONFERENCE & PRESENTATIONS

2025/12 American Geophysical Union 2025 (AGU), New Orleans, US
Poster: Towards Model–Observing System Co-Design: An OSSE-Based Bayesian Framework for Prioritizing Earth System Measurements

2025/12 American Geophysical Union 2025 (AGU), New Orleans, US
Oral: Modeling the major bioenergy crop Miscanthus in an agroecosystem model (Ecosys)

2025/03 2025 ARM/ASR PI meeting, UQ and OSSE breakout session
Oral (invited): A Novel Computational Framework for Model Uncertainty Quantification (UQ) and Observing System Simulation Experiments (OSSE)

2024/10 Micro2Macro Workshop, University of Wyoming, Laramie, WY
Oral: A Novel Computational Framework for Optimal Experimental Design for Climate Prediction

2023/12 American Geophysical Union 2023 (AGU), San Francisco, US
Poster: A Novel Computational Framework for Optimal Experimental Design for Climate Prediction

2023/07 Gordon Research Seminar & Conference (GRC), Radiation and Climate, Maine, US
Poster: A Novel Computational Framework for Optimal Experimental Design for Climate Prediction

2022/07 The 19th Annual Meeting Asia Oceania Geosciences Society (AOGS), Online
Oral: Impact of Eastern and Central Pacific El Niño on Lower Tropospheric Ozone in China

2021/12 American Geophysical Union 2021 (AGU), Online
Poster: Impact of East and Central Pacific El Niño on Lower Tropospheric Ozone in China
eLightning: Impact of Western Pacific Subtropical High on Ozone Pollution in China (Invited)
eLightning: Response of surface ozone concentration in China under different anthropogenic emission scenarios in future climate (Invited)

2020/12 American Geophysical Union 2020 (AGU), Online
Poster: Impact of Western Pacific Subtropical High on Ozone Pollution in China **(OSPA)**

2020/11 Graduate Forum of Global Alliance of Universities on Climate, Beijing, China
Poster: Spatiotemporal and probability variations of surface $PM_{2.5}$ over China between 2013 and 2019 and the associated changes in health risks: An integrative observation and model analysis

2020/09 The 1st GEOS-Chem Europe meeting (GCE1), online
Oral: Spatiotemporal and probability variations of surface $PM_{2.5}$ over China between 2013 and 2019 and the associated changes in health risks: An integrative observation and model analysis

2019/12 Symposium on atmospheric science of universities across the Taiwan Strait (Zhu Kezhen Forum), Taibei, Taiwan, China
Oral: Impact of Western Pacific Subtropical High on Ozone Pollution in China

2019/06 The 16th Annual Meeting Asia Oceania Geosciences Society (AOGS), Singapore
Oral: Impact of Meteorology and Western Pacific Subtropical High on Ozone Pollution in China

2018/12 American Geophysical Union 2018 (AGU), Washington D.C., US
Poster: Interpreting the spatial and temporal variation of $PM_{2.5}$ over China during 2013 to 2018: an integrative data and regional 3-D model analysis

TEACHING EXPERIENCE

Instructor Watershed Hydrology (Course for undergraduate & graduate students), Department of Natural Resources and Environmental Sciences, University of Illinois Urbana-Champaign (2025/09-2026/01)

Teaching assistant *Introduction to Atmospheric Science* (Course for undergraduate students), Department of Atmospheric and Oceanic Sciences, Peking University (2018/09-2019/01)

Teaching assistant *Numerical Weather Prediction* (Course for undergraduate & graduate students), Department of Atmospheric and Oceanic Sciences, Peking University (2021/09-2022/01)

Software training lecturer *MATLAB* (training for undergraduate & graduate students) School of Physics, Peking University (2021/03)

ACTIVITIES & SERVICES

Primary Convener& Session Chair of AGU25 session: Advances in Approaches for Earth System Model Uncertainty Quantification: Integrating Models and Observations to Enhance Predictability (Co-conveners:

Gregory Elsaesser, Duncan Watson-Parris, Die Wang)

Editorial Board Member (2026/01 -) Communications Earth & Environment (Nature Portfolio)

Vice President of the Brookhaven National Laboratory Association of Students & Postdocs (2023/01-2024/08)

Panelist of Brookhaven OEP's Speaker Series Panel (2023/07) and Career and Graduate Discussion Panel (2024/07)

Chair of the "Azure Space" Graduate Student Forum of the Department of Atmospheric and Oceanic Sciences, Peking University (2018/09-2020/09)

MODELING & METHODOLOGICAL EXPERTISE

Earth System & Numerical Modeling

- Community Earth System Model (CESM), Energy Exascale Earth System Model (E3SM)
- Atmospheric chemistry transport models (GEOS-Chem, WRF-Chem)
- Process-based agroecosystem modeling (ecosys)

Uncertainty Quantification & Probabilistic Modeling

- Ensemble simulation design and large-scale sensitivity analysis (Morris, Sobol)
- Bayesian calibration and parameter inference (MCMC-based methods)
- Statistical emulation and surrogate modeling (Gaussian Process–based frameworks)
- Observing System Simulation Experiments (OSSE) and model–observation co-design

LINKS

Website: https://zhongjingjiang.github.io

Google Scholar: https://scholar.google.com/citations?user=73N_824AAAAJ