

EDUCATION

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- **University of Wisconsin-Madison** Madison, WI
Ph.D. - Mathematics
Advisor: Prof. Nan Chen
Jul 2023 - present
 - **Nanjing University** Nanjing, China
M.S. - Atmospheric Science
Advisor: Prof. Lili Lei
Sep 2020 - Jun 2023
 - **Nanjing University** Nanjing, China
B.S. - Atmospheric Science
Sep 2016 - Jun 2020

RESEARCH EXPERIENCE

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- **Research Assistant** University of Wisconsin-Madison
Nonlinear data assimilation methods for multi-layer flow fields
Unified digital twins framework for stochastic modeling, forecast, and data assimilation
Feb 2024 - present
 - **Research Assistant** Nanjing University
Machine learning localization methods for ensemble-based data assimilation
Hybrid ensemble-variational assimilation methods
Sep 2021 - Sep 2023
 - **Undergraduate Research Assistant** Nanjing University
Evaluating large-eddy simulation of traffic-related air pollution with mobile sensors
Jul 2019 - Sep 2019
 - **Undergraduate Innovation Training Program** Nanjing University
Cluster analysis of flow regimes related to weak stratospheric polar vortex using SOMs
Mar 2018 - Mar 2019

PUBLICATIONS

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- **Wang, Z.**, Nan, C., and Di, Q. "A Closed-Form Nonlinear Data Assimilation Algorithm for Multi-Layer Flow Fields", *paper submitted to Monthly Weather Review*, 2024
 - **Wang, Z.**, Lei, L., Anderson, J. L., Tan, Z., and Zhang, Y. "CNN-based adaptive localization for an ensemble Kalman filter", *Journal of Advances in Modeling Earth Systems*, 2023
 - **Wang, Z.**, Sun, H., Lei, L., and Tan, Z. "The importance of data assimilation components for initial conditions and subsequent error growth", *Science China Earth Sciences*, 2023
 - Lei, L., **Wang, Z.**, and Tan, Z. "Integrated Hybrid Data Assimilation for an Ensemble Kalman Filter", *Monthly Weather Review* 149, 12, 4091-4105, 2021.
 - Wang, S., Ma, Y., **Wang, Z.**, Wang, L., Chi, X., Ding, A., Yao, M., Li, Y., Li, Q., Wu, M., Zhang, L., Xiao, Y., and Zhang, Y. "Mobile monitoring of urban air quality at high spatial resolution by low-cost sensors: impacts of COVID-19 pandemic lockdown", *Atmospheric Chemistry and Physics* 21, 7199–7215, 2021.
 - Zhang, Y., Ye, X., Wang, S., He, X., Dong, L., Zhang, N., Wang, H., **Wang, Z.**, Ma, Y., Wang, L., Chi, X., Ding, A., Yao, M., Li, Y., Li, Q., Zhang, L., and Xiao, Y. "Large-eddy simulation of traffic-related air pollution at a very high resolution in a mega-city: evaluation against mobile sensors and insights for influencing factors", *Atmospheric Chemistry and Physics* 21, 2917–2929, 2021.

CONFERENCES

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- SIAM Conference on Applications of Dynamical Systems on nonlinear and stochastic dynamics in weather and climate science, Denver, USA, 2025 (invited talk, upcoming)
 - The Institute for Foundations of Data Science (IFDS) ideas forum, Madison, USA, 2025 (invited talk)
 - The American Geophysical Union (AGU) Annual Meeting, Washington, D.C., USA 2024 (poster)
 - 102nd American Meteorological Society (AMS) Annual Meeting, 26th Conference on Integrated Observing and Assimilation Systems for the Atmosphere, Oceans, and Land Surface (IOAS-AOLS), 2022 (talk)
 - 4th National Symposium on Mesoscale Meteorology, Hangzhou, China, 2022 (poster)

TEACHING

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- **Teaching Assistant** Nanjing University
Course: Dynamic Meteorology
Fall 2021
 - *Course: Math 114* University of Wisconsin-Madison
Fall 2023

PROGRAMMING

Python(numpy, scipy, Tensorflow, Pytorch)/MATLAB/linux/C/fortran