**Xiaomin Chen,** Assistant Professor, Department of Atmospheric and Earth Science, UAH (CV)

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## EDUCATION

2015, **Ph.D. in Meteorology**
School of Atmospheric Sciences, Nanjing University, China
2010, **B.S. in Meteorology**
School of Atmospheric Sciences, Nanjing University, China

## EMPLOYMENT

Dec 2022–present, **Assistant Professor**
University of Alabama in Huntsville, Huntsville, AL
Sep 2021 – Dec 2022, **Research Scientist I**
Northern Gulf Institute & NOAA/AOML/Hurricane Research Division, Miami, FL
Nov 2020 – Aug 2021, **Postdoctoral Research Associate**
Northern Gulf Institute & NOAA/AOML/Hurricane Research Division, Miami, FL
Nov 2018 – Nov 2020, **NRC Postdoctoral Research Associate**
NOAA/AOML/Hurricane Research Division, Miami, FL
Aug 2015 – Nov 2018, **Postdoctoral Assistant Researcher**
Nanjing University, China

## PROFESSIONAL AFFILIATIONS

2014 – Present, American Meteorological Society
2020 – Present, American Geophysical Union

## FUNDED PROJECTS

RAISE: CHIRPP: Wind and Hazards Investigation for Resilience to Landfalling Tropical Cyclones. NSF, Aug 2025–Jul 2028, $999,604 (**PI**)

MRI: Track 1 Acquisition of a Ka-band Dual Polarization Radar for Atmospheric Process Studies. NSF, Sep 2023–Aug 2026, $779,640 (**co-PI**)

Unification of Boundary-Layer and Shallow Cumulus Mass Fluxes under Vertical Wind Shear for the Unified Forecast System Models. NOAA, Aug 2023–Jul 2025, $530,140 (**PI**)

Toward Improved Understanding and Modeling of Boundary Layer Processes in Tropical Cyclones Using Large-Eddy Simulation**.** NOAA, Nov 2021–Sep 2024, $293,428 (**PI**)

Examination of HWRF at the Land and Ocean Interface. NOAA, Oct 2019–Dec 2021, $116,365 (**PI**)

## AWARDS & HONORS

2025, **University Distinguished Research, Creative Achievement, & Scholarly Performance Award**, UAH
2025, **College Outstanding Faculty Award**, UAH
2025, **Faculty Research Excellence Award**, UAH/College of Science
2022, **NGI Research Competitive Award,** MSU/Northern Gulf Institute
2021, **Editor's Award**, Advances in Atmospheric Sciences
2021, **AOML Outstanding Paper Award,** NOAA/AOML
2018, **National Research Council (NRC) Postdoctoral Fellowship,** NOAA/AOML/HRD
2015, **Graduate with Honors**, Nanjing University

## REFEREED PUBLICATIONS

1. **Chen, X.** and C. M. Rozoff, 2025: Large-eddy simulation of internal boundary layers and near-surface wind estimation during hurricane landfalls. *Geophys. Res. Lett.*, 52, e2025GL114816.
2. **Chen, X.** and F. D. Marks, 2024: Parameterizations of boundary layer mass fluxes in high-wind conditions for tropical cyclone simulations, *J. Atmos. Sci.*, 81, 77-91.
3. Rios-Berrios, R., P. M. Finocchio, J. J. Alland, **X. Chen**, et al., 2024: A review of the interactions between tropical cyclones and environmental vertical wind shear. *J. Atmos. Sci.*, 81, 713-741.
4. Hazelton, A., **X. Chen**, G. J. Alaka, et al., 2024: Sensitivity of HAFS-B tropical cyclone forecasts to planetary boundary layer and microphysics parameterizations. *Wea. Forecasting*, 39, 655-678.
5. Wang, W., J. Han, J. Shin, **X. Chen**, et al., 2024: Physics Schemes in the first version of NCEP Operational Hurricane Analysis and Forecast System (HAFS), *Frontiers in Earth Science,* 12.
6. Hazelton, A., …, **X. Chen**, et al., 2023: 2022 Real-Time Hurricane Forecasts from an Experimental Version of the Hurricane Analysis and Forecast System (HAFSV0.3S), *Frontiers in Earth Science*, 11.
7. Ko, M., **X. Chen**, M. Kubat, and S. Gopalakrishnan, 2023: The development of a consensus machine learning model for hurricane rapid intensification forecasts with Hurricane Weather Research and Forecasting (HWRF) data. *Wea. Forecasting*, 38, 1253-1270.
8. **Chen, X.**, C. M. Rozoff, et al., 2023: Research Advances on Internal Processes Affecting Tropical Cyclone Intensity Change from 2018–2022, *Tropical Cyclone Research and Review*, 12, 10-29.
9. **Chen, X.** et al., 2023: Performance of an improved TKE-based eddy-diffusivity mass-flux (EDMF) PBL scheme in 2021 hurricane forecasts from HAFS. *Wea. Forecasting*, 38, 321-336.
10. Fischer, M. S., P. D. Reasor, B. H. Tang, K. L. Corbosiero, R. D. Torn, and **X. Chen**, 2023: A tale of two vortex evolutions: Using a high-resolution ensemble to assess the impacts of ventilation on a tropical cyclone rapid intensification event. *Mon. Wea. Rev.*, 151, 297-320.
11. **Chen, X.,** 2022: How do planetary boundary layer schemes perform in hurricane conditions: A comparison with large-eddy simulations. *J. Adv. Model. Earth Syst.*, 14, e2022MS003088.
12. **Chen, X.** et al., 2022: Evaluation and improvement of a TKE-based eddy-diffusivity mass-flux (EDMF) planetary boundary layer scheme in hurricane conditions. *Wea. Forecasting*, 37, 935-951.
13. **Chen, X.** and G. H. Bryan, 2021: Role of advection of parameterized turbulence kinetic energy in tropical cyclone simulations. *J. Atmos. Sci.*, 78(11), 3559-3574.
14. **Chen, X.** et al., 2021c: A framework for simulating the tropical-cyclone boundary layer using large-eddy simulation and its use in evaluating PBL parameterizations. *J. Atmos. Sci.*, 78(11), 3593-3611.
15. **Chen, X.,** et al., 2021b: Boundary layer recovery and precipitation symmetrization preceding rapid intensification of tropical cyclones under shear. *J. Atmos. Sci.*, 78, 1523-1544.
16. **Chen, X.**, et al., 2021a: Effect of scale-aware planetary boundary layer schemes on tropical cyclone intensification and structural changes in the gray zone. *Mon. Wea. Rev.*, 149, 2079-2095.
17. Wu, D., F. Zhang, **X. Chen**, et al., 2021: Evaluation of microphysics schemes in tropical cyclones using polarimetric radar observations: Convective precipitation in outer rainband. *Mon. Wea. Rev.*, 149.
18. Cione J. J., G. H. Bryan, …, and **X. Chen**, 2020: Eye of the storm: Observing hurricanes with a small unmanned aircraft system, *Bull. Amer. Meteor. Soc.*, 101, E186-E205**.**
19. **Chen, X.**, J. A. Zhang, F. D. Marks, 2019: A thermodynamic pathway leading to rapid intensification of tropical cyclones in shear. *Geophys. Res. Lett.*, 46, 9241– 9251.

20. **Chen, X.** et al., 2018b: Rapid intensification of Typhoon Mujigae (2015) under different sea surface temperatures: Structural changes leading to rapid intensification. *J. Atmos. Sci.*, 75, 4313-4335.
21. **Chen, X.**, Y. Wang, J. Fang, and M. Xue, 2018a: A numerical study on rapid intensification of Typhoon Vicente (2012) in the South China Sea. Part II: Inner-core processes. *J. Atmos. Sci.,* 75, 235-255.
22. Wu, D., K. Zhao, M. Kumjian, **X. Chen,** et al., 2018: Kinematics and microphysics of convection in the outer rainband of Typhoon Nida (2016) revealed by polarimetric radar. *Mon. Wea. Rev.,* 146.
23. **Chen, X.**, Y. Wang, K. Zhao, and D. Wu, 2017: A numerical study on rapid intensification of Typhoon Vicente (2012) in the South China Sea. Part I: Verification of simulation, storm-scale evolution and environmental contribution. *Mon. Wea. Rev.*, 145, 877-898.
24. Zhao, K., …, **X. Chen**, et al., 2017: Doppler radar analysis of a tornadic miniature supercell during the landfall of Typhoon Mujigae (2015) in South China. *Bull. Amer. Meteor. Soc.*, 98, 1821-1831.
25. **Chen, X.**, et al., 2015: Synoptic flow patterns and large-scale characteristics associated with rapidly intensifying tropical cyclones in the South China Sea. *Mon. Wea. Rev.*, 43, 64-87.
26. **Chen, X.** et al., 2013: The improvement to the environmental wind and tropical cyclone circulation retrievals with the modified GBVTD (MGBVTD) technique. *J. Appl. Meteor. Climatol.*, 52, 2493-2508.

## IN REVIEW/SUBMITTED

1. Fang, J. and **X. Chen**, 2025: High-wavenumber eddies in the eyewall of simulated Hurricane Earl (2010): Genesis and impact on near-surface strong winds. *J. Atmos. Sci.*, conditionally accepted.
2. Zebulon, L., **X. Chen**, L. Carey, K. Knupp, and W.-C. Lee, 2025: Boundary Layer Observations during the Landfalls of Hurricanes Ida (2021) and Zeta (2020), *Geophys. Res. Lett., in review.*

## SELECTED PRESENTATIONS & SEMINARS

1. Leffler, Z. and **X. Chen**: Ground-Based Radar Observations of Boundary-Layer Wind Profiles during the Landfall of Hurricane Ida (2021), *104th AMS Annual Meeting,* LA, Jan 2025.
2. **Chen, X.** and F. D. Marks: Parameterizations of Boundary Layer Mass Fluxes in High-Wind Conditions for Unified Forecast System models, *The 2024 UFS Physics Workshop*, NOAA/NSSL, July 2024.
3. **Chen, X.** and Z. Leffler: On the myth of the logarithmic surface layer during hurricane landfalls: Insights from observations and LESs, *36th AMS Conf. on Hurricanes and Tropical Meteorology*, CA, May 2024.
4. **Chen, X.** and F. D. Marks: Parameterizations of Boundary Layer Mass Fluxes in High-Wind Conditions for Unified Forecast System models, *36th AMS Conf. on Hurricanes and Tropical Meteorology*, CA, May 2024.
5. **Chen, X.** and F. D. Marks: Parameterizations of Boundary Layer Mass Fluxes in High-Wind Conditions for Unified Forecast System (UFS) models, *104th AMS Annual Meeting*, Baltimore, MD, Jan 2024.
6. **Chen, X.** et al.: Development of boundary layer parameterizations for HAFS using large-eddy simulations and aircraft observations. *2023 AGU Annual Meeting*, San Francisco, CA, Dec 2023.
7. **Chen, X:** A Framework for Simulating Hurricane Boundary Layers using Large-Eddy Simulation and Its Use in Developing PBL parameterizations for NOAA's Hurricane Analysis and Forecast System. *Unifying Innovations in Forecasting Capabilities Workshop (UIFCW)*, Boulder, CO, Jul 2023.
8. **Chen, X.**: A framework for simulating hurricane boundary layers using large-eddy simulation and its use in developing PBL parameterizations for NOAA's HAFS. UAH/AES & NASA Seminar, Mar 2023.
9. **Chen, X.** et al.: An improved PBL scheme in hurricane conditions using large-eddy simulations and its impact on hurricane forecasts from HAFS. *AMS 103rd Annual Meeting*, Denver, CO, Jan 2023.

10. **Chen, X.**: Toward improved planetary boundary layer parameterization schemes in high-wind conditions using large-eddy simulations and observations. NOAA/AOML seminar, Miami, FL, Dec 2022.
11. **Chen, X.**, A. Hazelton, and F. D. Marks: TC_PBL in HAFS-S and future work. *NOAA HFIP Annual Meeting*, Miami, FL, Nov 2022.
12. **Chen, X.**, G. H. Bryan, J. A. Zhang, F. D. Marks, and J. J. Cione: A framework for simulating the tropical-cyclone boundary layer using large-eddy simulation and its use in evaluating PBL parameterizations. *AMS 35th Conf. on Hurricanes and Tropical Meteorology*, New Orleans, LA, May 2022.
13. Ko, M., **X. Chen**, M. Kubat, and S. Gopalakrishnan: The development of a consensus machine learning model for hurricane rapid intensification forecasts with HWRF Data. *NOAA HFIP seminar*, Mar 2022.

## TEACHING

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|---|---|---|
| 2025–Present | UAH | AES 655: Boundary Layer Meteorology |
| 2024–Present | UAH | AES 690 ST: Tropical Cyclones |
| 2023–Present | UAH | AES 441/541 *Atmospheric Thermodynamics & Cloud Physics* |
| 2018 | Nanjing University | *Introduction to Earth Sciences & Environmental Resources* |
| 2016 & 2018 | Nanjing University | *Tropical Meteorology* |

## UNIVERSITY/COLLEGE/DEPARTMENT SERVICE

2023 – Present, UAH Faculty Senator
2023 – Present, Undergraduate Scholastic Affairs Committee
2023 – Present, CoS Strategic Plan Committee
2024, AES Representative proxy for the UCAR Annual Members Meeting
2024 – Present, AES Graduate Curriculum Committee
2024 – Present, AES PhD Program Committee
2024 – Present, Master's and Ph.D. Supervisory Committees for 10 students

## PROFESSIONAL SERVICE

Feb 2025, **Invited Speaker,** *Rocket City Weather Festival 2025, UAH*
May 2024, **Session Organizer and Chair,** *36th AMS Conference on Hurricanes and Tropical Meteorology*
Dec 2023, **Session Co-Chair,** *AGU Annual Meeting 2023*
Dec 2022, **Co-Rapporteur,** *10$^{th}$ International Workshop on Tropical Cyclones (IWTC-10), WMO*
Nov 2022 – Present, **Editor**, *Advances in Atmospheric Sciences*
May 2022, **Session Co-Chair,** *35$^{th}$ AMS Conf. on Hurricanes and Tropical Meteorology*
Sep 2021 – Present, **Associate Editor**, *Journal of the Atmospheric Sciences*
May 2021, **Poster Judging committee,** *34$^{th}$ AMS Conf. on Hurricanes and Tropical Meteorology*
2019 – Present, **Investigator**, *Hurricane Field Program,* NOAA/AOML/HRD
2024 – Present, **Peer Reviewer for NSF proposals**
2015 – Present, **Peer Reviewer for Scientific Journals**
*npj Climate and Atmospheric Science, Journal of the Atmospheric Sciences, Monthly Weather Review, Weather and Forecasting, Journal of Applied Meteorology and Climatology, Journal of Advances in Modeling Earth Systems, Geophysical Research Letters, Journal of Geophysical Research, Quarterly Journal of the Royal Meteorological Society, Atmospheric Chemistry and Physics, Advances in Atmospheric Sciences, Frontiers in Earth Science, Dynamics of Atmospheres and Oceans, and Atmospheric Research*