Francis Osei Tutu Afrifa (Ph.D. candidate)

Graduate Teaching and Research Assistant

Department of Atmospheric Science

College of Engineering and Applied Sciences

University of Wyoming

1000 E. University Avenue

Laramie, WY 82071 USA

email: fafrifa@uwyo.edu

phone: 1-508-202-8013

GitHub: https://github.com/OT-Afrifa

EDUCATION

Ph.D., Atmospheric Science, The University of Wyoming, Expected 2026

- Dissertation: *Cold-Season Convection Embedded within or Emergent from Stratiform Clouds (CESC) and its Impact on Precipitation*
- Dissertation Adviser: Bart Geerts

M.S., Atmospheric Science, The University of Wyoming, December 2024

- Thesis: *A Case Study of Cold-Season Emergent Orographic Convection and Its Impact on Precipitation. Part I: Mesoscale Analysis*
- Thesis Adviser: Bart Geerts

B.S., Meteorology and Climate Science, The Kwame Nkrumah University of Science and Technology (KNUST), November 2021

- Honors Thesis: *Assessing the Year 2016 Pre-monsoon, Monsoon and Post-monsoon Behaviour of Nocturnal Low-level Jets over West Africa*
- Honors Thesis Adviser: Jeffrey N.A. Aryee

RESEARCH INTERESTS

- Orographic precipitation and cold-season convection

- Convection-permitting modeling and storm organization
- Precipitation efficiency, heavy precipitation and flood risk
- Satellite-informed, process-oriented model evaluation
- Weather-energy interface, grid resilience, and environmental applications

ACADEMIC PRESENTATIONS

- 2024 AMS Mountain Meteorology Conference, Boise, ID – Poster on "*Cold-season Embedded Orographic Convection and its Impact on Precipitation: Observations and Large-eddy Simulations*"
- 2023 Young Scientist Symposium on Atmospheric Research (YSSAR), Colorado State University – Poster
- 2022 University of Wyoming STEM Carnival – Poster
- Oral Presentations at NCAR SNOWIE Research Applications Laboratory (RAL) annual meetings, *Boulder, January 2023, February 2024*

PROFESSIONAL EXPERIENCE

The University of Wyoming

- Graduate Research Assistant, 2022 – Present
- ATSC 4009 & ATSC 5009 Machine Learning & Data Analysis Graduate Teaching Assistant, Spring 2025

The Kwame Nkrumah University of Science and Technology (KNUST)/ National Service Personnel

- Undergraduate Research Assistant, 2021 – 2022
- MET 451 Aviation Meteorology, Teaching Assistant for 4th Year Meteorology and Climate Science undergraduate students
- Physics with Computing, Teaching Assistant for 3rd Year Physics undergraduate students
- PHY 257 Experimental Physics III, Teaching Assistant for 2nd Year Physics and Meteorology and Climate Science undergraduate students
- MET 256 Programming with Fortran II, Teaching Assistant for 2nd Year Meteorology and Climate Science undergraduate students

SERVICE AND CONTRIBUTION TO THE RESEARCH COMMUNITY

Reviewer for the following scientific journals:

- AMS Weather and Forecasting (WAF) Journal
- AMS Journal of Applied Meteorology and Climatology (JAMC)

- Copernicus EGUsphere

American Meteorological Society

- 21st AMS Conference on Mountain Meteorology (2024): Co-chair, Dynamics and Physics of Orographic Clouds and Precipitation I session

Supervision And Mentorship

- Mentored Danielle Brynn Jones under the 2023 NSF's PROmoting Geoscience Research, Education, and SuccesS (PROGRESS) mentorship program, *funded by the NSF (award #'s: DUE-2013318, 2013333, 2013323, 2013312, 2013326)*
- Supervised interns to launch KNUST 24-hour campus weather forecast (daily forecast for campus and environs), *2022*

The Ghana Meteorological Agency

- Meteorology Intern at the Marine/Numerical Weather Prediction, AgroMet and Forecasting Units, May 2019 – *June 2019*

PEDAGOGICAL AND PROFESSIONAL DEVELOPMENT

- University of Wyoming Inclusionary and Global Leadership Program (IGLP), *2023*
- University of Wyoming Scholarly Writing Practices Program, *2023*

HONORS AND AWARDS

The University of Wyoming

- Atmospheric Science Sutter Award for Graduate Teaching Assistant, *2025 Spring*
- School of Computing Graduate Scholar, *2023 - 2024*
- Graduate Assistantship, *2022 – Present*

TECHNICAL SKILLS

Programming

- Python (*advanced*)
- FORTRAN 90 (*basic*)
- LaTeX (*good*)
- HTML (*good*)
- CSS (*good*)

Numerical Models

- Weather Research and Forecasting models (WRF)

- Regional and Large Eddy Simulations (LES)

Data Science

- Machine Learning
- Statistical Analysis
- Data Visualization

HPC and Utilities

- Linux
- Git
- JupyterHub; NCAR Casper/Derecho usage

Languages

- English (*Fluent*)
- French (*Basic*)

PENDING PUBLICATIONS

Zaremba, T. J., McMurdie, L. A., Blossey, P., Rauber, R. M., Xue, L., Geerts, B., Friedrich, K., Tessendorf, S. A., French, J., Chen, S., Afrifa, F. O.T. (2026). Dominant modes of terrain-tied vertical motion variability over the Payette River Basin of Idaho: results from SNOWIE. *In prep for submission to the Journal of Applied Meteorology and Climatology*

Afrifa, F. O., Geerts, B., Xue, L., Chen, S., Hohman, C., Grasmick, C., ... & Zaremba, T. (2026). A Case Study of Cold-Season Emergent Orographic Convection and Its Impact on Precipitation. Part II: Mesoscale Analysis. *Accepted for publication to Monthly Weather Review*.

PEER-REVIEWED PUBLICATIONS

Butler, Melissa, Alisha Khan, Francis Afrifa, Yingjie Hu, and Dane Taylor. "Multilayer networks characterize human-mobility patterns by industry sector for the 2021 Texas winterstorm."arXivpreprintarXiv:2509.03642 (2025). https://doi.org/10.48550/arXiv.2509.03642

Aryee, J. N. A., Quagraine, K. T., Davies, P., Afrifa, F. O. T., Agyapong, G., Annor, E. G., ... & Poku, L. P. (2025). Spatial and Temporal Rainfall Patterns in the Little Dry Season Over the Guinea Coast: Case Assessment of Historical Observations, Associated Drivers and Future Projections. Meteorological Applications, 32(6), e70125. https://doi.org/10.1002/met.70125

Afrifa, F. O., Geerts, B., Xue, L., Chen, S., Hohman, C., Grasmick, C., ... & Zaremba, T. (2025). A Case Study of Cold-Season Emergent Orographic Convection and Its Impact on Precipitation. Part I: Mesoscale Analysis. Monthly Weather Review,153(10),2229-2250. https://doi.org/10.1175/MWR-D-24-0241.1

Aryee, J. N. A., Afrifa, F. O. T., Agyapong, K. H., Frimpong, N. G., Quagraine, K. T., & Davies, P. (2024). Quantifying climatic heavy-precipitation-induced floods in West Africa using multiple precipitation indices. Scientific African, 25, e02309. https://doi.org/10.1016/j.sciaf.2024.e02309

<u>REFERENCES</u>

Available upon request