

# Francis Nkrumah (PhD)

## Curriculum Vitae

Department of Physics,  
University of Cape Coast,  
Cape Coast, Ghana  
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### Research Interest

Regional climate modeling  
Anthropogenic climate change and impacts at the regional scale  
West African Monsoon dynamics under climate change  
Extreme Events: Drought and High intensity precipitation events  
tropical Meteorology and Atmospheric Physics  
Hydro-climatology, Climate dynamics and Dynamical meteorology

### Education

2016–2020 **Doctor of Philosophy**, Department of Physics, University of Cape Coast, Cape Coast, Ghana  
2012–2014 **Master of Philosophy (Physics)**, University of Cape Coast, Cape Coast, Ghana  
2007–2011 **Bachelor of Science (Physics)**, University of Cape Coast, Cape Coast, Ghana

### Work Experience/Positions

December 2021–Date **Lecturer**, Department of Physics, University of Cape Coast, Ghana.  
November 2020–October 2022 **Postdoctoral Researcher**, AIMS Canada Postdoctoral Research Fellowship in Climate Change Science, AIMS Rwanda.  
January 2018–2021 **Principal Research Assistant**, Department of Physics, University of Cape Coast, Ghana.  
January 2013–2018 **Senior Research Assistant**, Department of Physics, University of Cape Coast, Ghana.  
2011–2012 **Physics Tutor**, Annor Adjaye Senior High School, Ezinlibo, Western Region, Ghana.

### Professional Experience

2022–Date Degrees Modelling Fund, funded by The Degrees Initiative, **Researcher**  
2018–Date The Coordinated Regional Downscaling Experiment (CORDEX) program. CORDEX Africa, **Researcher**  
2015–2019 AMMA 2050 under Future Climate For Africa, funded by DfID, **Researcher**  
2012–2014 PEER Science Project by NAS and USAID, **Researcher**

July 16-24, 2017 48th International Physics Olympiad, Yogyakarta, Indonesia, **Team Leader for Ghana**

## Reviewed for

- 1 review Remote Sensing (MDPI)
- 3 reviews Atmosphere (MDPI)
- 2 reviews Journal of Marine and Science Engineering (MDPI)
- 1 reviews Water (MDPI)

## Computer Skills

Programming PYTHON, R, FERRET, SHELL SCRIPTING, NCL  
Software L<sup>A</sup>T<sub>E</sub>X, LIBREOFFICE, MS WORD, MS EXCEL, MS POWERPOINT  
Code editing GEANY, JUPYTER  
System LINUX, WINDOWS  
Other tools NETCDF (NETWORK COMMON DATA FORM), GRIB (GENERAL REGULARLY-DISTRIBUTED INFORMATION IN BINARY FORM), CDO (CLIMATE DATA OPERATOR), NCO (NETCDF DATA OPERATOR)

## Languages

English Fluent  
Fante Fluent  
Twi Fluent

## Others

Music, Computers, Soccer, and Reading

## Selected Conferences/Workshops Attended

- Apr 2023 Online Cloud Tracking Workshop, Department of Physics, University of Oxford, UK. **(Participant)**
- Jan 2023 Degrees Modelling Fund (DMF) research planning workshop, Istanbul, Turkey. **(Participant)**
- Oct 2022 Building an African Alliance for Collaboration in Climate Science, Future Africa campus, University of Pretoria, Pretoria, South Africa. **(Participant)**
- Jul 2022 ICTP-Africa Joint School on Rainfall and Water Resources Management, The Abdus Salam International Center for Theoretical Physics, Trieste, Italy. **(Participant)**
- Jun 2022 Artificial Intelligence for Detection and Attribution of Climate Extremes, Online. **(Participant)**
- Jul 2020 TAMSAT Satellite Rainfall Estimation and Validation Workshop, TAMSAT Virtual Academy. **(Participant)**
- Aug 2019 Wikipedia edit-a-thon on Climate Change, SouthSouthNorth Office, Cape Town, South Africa. **(Participant)**

- Jul 2019 African SWIFT-YESS Summer School, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana. **(Participant)**
- Jun 2019 AMMA-2050 Annual Project Meeting, Somone, Senegal. **(Presentation)**
- Jun 2018 Ghana High-Performance Computing Workshop for Astronomers and Meteorologists, Ghana Space Science and Technology Institute, Ghana. **(Participant)**
- Feb 2018 AMMA-2050 Annual Project Meeting, Montpellier, France. **(Presentation)**
- Jun 2016 Eight ICTP Workshop on the Theory and use of Regional Climate Model, ICTP-Triesty, Italy. **(Poster)**
- May 2016 CORDEX International Conference on Regional Climate, ICRC-CORDEX, Stockholm, Sweden. **(Poster)**
- Jul 2015 International Scientific Conference on Our Common Future under Climate Change, UNESCO and UPMC, Paris, France. **(Poster)**
- Jun 2015 International conference on climate change and national development: Harnessing research for sustainability, University of Ghana-B4C project, University of Ghana, Legon, Ghana. **(Participant)**
- Jan 2015 Workshop on Developing Climate products to support climate change adaptation, Water Research Institute, Council For Scientific and Industrial Research, Ghana. **(Participant)**

## Publications

### Peer-reviewed publications

- [1] **Nkrumah, F.**, Klein, C., Quagraine, K. A., Berkoh-Oforiwaa, R., Klutse, N. A. B., Essien, P., Quenum, G.M.L.D., Koffi, H. A. **(2023)**: "Classification of large-scale environments that drive the formation of mesoscale convective systems over southern West Africa". *Weather and Climate Dynamics*, 4(3), 773-788. <https://doi.org/10.5194/wcd-4-773-2023>
- [2] Essien, P., Figueiredo, C. A. O. B., Takahashi, H., Klutse, N. A. B., Wrasse, C. M., Afonso, J. M. D. S., ... **Nkrumah, F. (2022)**: "Intertropical Convergence Zone as the Possible Source Mechanism for Southward Propagating Medium-Scale Traveling Ionospheric Disturbances over South American Low-Latitude and Equatorial Region". *Atmosphere*, 13(7), 1836. <https://doi.org/10.3390/atmos13111836>
- [3] **Nkrumah, F.**, Quagraine, K. A., Quagraine, K. T., Wainwright, C., Quenum, G. M. L. D., Amankwah, A., Klutse, N. A. B. **(2022)**: "Performance of CMIP6 HighResMIP on the representation of onset and cessation of seasonal rainfall in Southern West Africa". *Atmosphere*, 13(7), 999. <https://doi.org/10.3390/atmos13070999>
- [4] Braimah, M., Asante, V. A., Ahiataku, M. A., Ansah, S. O., Otu-Larbi, F., Yahaya, B., **Nkrumah, F. (2022)**: "Variability of the minor season rainfall over southern Ghana (1981–2018)". *Advances in Meteorology*, 2022 <https://doi.org/10.1155/2022/1861130>
- [5] Quenum, G.M.L.D., **Nkrumah, F.**, Klutse, N.A.B.; Sylla, M.B. **(2021)**: "Spatiotemporal Changes in Temperature and Precipitation in West Africa. Part I: Analysis with the CMIP6 Historical Dataset". *Water*, 2021(13), 3056. <https://doi.org/10.3390/w13243506>

- [6] Klutse, N. A. B., Owusu, K., **Nkrumah, F.**, Anang, O. A. (2021): "Projected rainfall changes and their implications for rainfed agriculture in northern Ghana". *Weather*, 99 (99). <https://doi.org/10.1002/wea.4015>
- [7] Klutse, N. A. B., Quagraine, K. A., **Nkrumah, F.**, Quagraine, K. T., Berkoh-Oforiwa, R., Dzrobi, J. F., Sylla, M. B. (2021): "The Climatic Analysis of Summer Monsoon Extreme Precipitation Events over West Africa in CMIP6 Simulations". *Earth Systems and Environment*, 5(1), 25-41.
- [8] Klein, C., **Nkrumah, F.**, Taylor, C. M., Adefisan, E. A. (2021): "Seasonality and Trends of Drivers of Mesoscale Convective Systems in Southern West Africa". *Journal of Climate*, 34(1), 71-87.
- [9] Quagraine, K. A., **Nkrumah, F.**, Klein, C., Klutse, N. A. B., Quagraine, K. T. (2020): "West African summer monsoon precipitation variability as represented by reanalysis datasets". *Climate*, 8(10), 111.
- [10] Dunn, R. J., Alexander, L. V., Donat, M. G., Zhang, X., Bador, M., Herold, N., ... Bin Hj Yussof, M. N. A. (2020): "Development of an updated global land in situ based data set of temperature and precipitation extremes: HadEX3". *Journal of Geophysical Research: Atmospheres*, 125(16), e2019JD032263.
- [11] **Nkrumah, F.**, Vischel, T., Panthou, G., Klutse, N. A. B., Adukpo, D. C., Diedhiou, A. (2019): "Recent Trends in the Daily Rainfall Regime in Southern West Africa". *Atmosphere*, 10(12), 741.
- [12] Klutse, N.A.B., Ajayi, V., Gbobaniyi, E.O., Egbebiyi, T.S., Kouadio, K., **Nkrumah, F.**, Quagraine, K.A., Olusegun, C., Diasso, U.J., Abiodun, B.J., and Lawal, K.A.A., (2018): "Potential impact of 1.5°C and 2°C global warming on consecutive dry and wet days over West Africa". *Environmental Research Letters*
- [13] Quagraine, K.A., Klutse, N.A.B., **Nkrumah, F.**, Adukpo, D.C. and Owusu, K. (2017): "Changes in Rainfall Characteristics in Wenchi and Saltpond Farming Areas of Ghana". *International Journal of Geosciences*, 8(03), 305. DOI: 10.4236/ijg.2017.83015
- [14] **Nkrumah, F.**, Klutse, N. A. B., Adukpo, D. C., Owusu, K., Quagraine, K. A., Owusu, A., Gutowski, W. (2014): "Rainfall Variability over Ghana: Model versus Rain Gauge Observation". *International Journal of Geosciences*, 5, 673-683.
- [15] Klutse, N. A. B., Owusu, K., Adukpo, D. C., **Nkrumah, F.**, Quagraine, K. A., Owusu, A., Gutowski, W. (2013). "Farmer's observation on climate change impacts on maize (*Zea mays*) production in a selected agroecological zone in Ghana". *Research Journal of Agriculture and Environmental Management*, 2(12), 394-402.