

Kwesi Akumenyi Quagraine, PhD

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<https://scholar.google.com/citations?user=hol1ZjkAAAAJ&hl=en>

ACADEMIC QUALIFICATIONS

University of Cape Town, Private Bag X3, Rondebosch 7701, Cape Town, South Africa.

Date: 2016 - 2021

Degree: PhD Program in Environmental and Geographical Science

University of Cape Coast, Private Mail Bag, Cape Coast, Ghana.

Date: 2012 – 2014

Degree: M.Phil. Physics

University of Cape Coast, Private Mail Bag, Cape Coast, Ghana.

Date: 2007 – 2011

Degree: B.Sc. (Hons.) (Physics)

NAMES AND ADDRESSES OF PREVIOUS AND CURRENT EMPLOYERS

• Postdoctoral Research Fellow

Atmospheric Chemistry Observation & Modeling Lab & Climate & Global Dynamics Lab

National Center for Atmospheric Research

Date: 2023 – Till date

• Lecturer

Department of Physics,

University of Cape Coast, Private Mail Bag, Cape Coast, Ghana.

Date: 2020 – 2023

• Postdoctoral Research Fellow

Climate System Analysis Group, Department of Environmental and Geographical Science,
University of Cape Town, South Africa.

Date: 2020 – 2023

• Graduate Teaching Assistant

Department of Environmental and Geographical Science,

University of Cape Town, South Africa

Date: 2016 – 2021

• Senior Research Assistant

University of Cape Coast, Private Mail Bag, Cape Coast, Ghana.

Date: 2013 – 2021

• Junior Research Fellow

Centre National de Calcul èt Centre National D'Analyses, University of Felix Houphouet-
Boigny, Cote D'Ivoire

Date: 2016

- **Teaching Assistant**

Department of Physics,

University of Cape Coast, Private Mail Bag, Cape Coast, Ghana.

Date: 2012 – 2013

RESEARCH INTERESTS

1. Climate engineering
2. Regional climate modeling
3. Climate change impacts and adaptation
4. Climate resilience and vulnerability
5. Tropical meteorology and large-scale processes
6. Monsoon dynamics
7. Extreme climate events
8. Climate data analytics & machine learning approaches

SCIENTIFIC PUBLICATIONS

1. Nkrumah, F., Klein, C., **Quagraine, K. A.**, Berkoh-Oforiwaa, R., Klutse, N. A. B., et al. (2023). Classification of Large-Scale Environments that drive the formation of Mesoscale Convective Systems over Southern West Africa. *Weather and Climate Dynamics Discussions*, 1-8.
2. Essien, P., Figueiredo, C. A. O. B., Takahashi, H., Klutse, N. A. B., Wrasse, C. M., Afonso, J. M. D. S., ... & **Quagraine, K. A.**, "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(11) (2022) 1836
3. Nkrumah, F., **Quagraine, K. A.**, Quagraine, K. T., Wainwright, C., Quenum, G. M. D. L., 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, 1–20.
4. Klutse, N. A. B., **Quagraine, K. A.**, Nkrumah, F., Quagraine, K. T., Berkoh-Oforiwaa, 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*. 17.
5. **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.
6. **Quagraine, K. A.**, Hewitson, B., Jack, C., Wolski, P., Pinto, I. & Lennard, C. (2020). Using Co- Behavior Analysis to Interrogate the Performance of CMIP5 GCMs over Southern Africa. *Journal of Climate* 33(7). 2891–2905.
7. **Quagraine, K. A.**, Hewitson, B., Jack, C., Wolski, P., Pinto, I. & Lennard, C. (2019). A Methodological Approach to Assess the Co-Behavior of Climate Processes over Southern Africa. *Journal of Climate* 33(7). 2891–2905.
8. Egbegiyi, T., Lennard, C., Crespo, O., Mukwenha, P., Lawal, S. & **Quagraine, K. A.** (2019). Assessing Future Spatio-Temporal Changes in Crop Suitability and Planting Season over West Africa: Using the Concept of Crop-Climate Departure. *Climate* 7(9). 102.
9. Klutse, N. A. B., Ajayi, V. O., Gbobaniyi, E. O., Egbegiyi, T. S., Kouadio, K., Nkrumah, F., **Quagraine, K. A.**, Olusegun, C., Diasso, U., Abiodun, B. J., Lawal, K., Nikulin, G., Lennard, C. & Dosio, A. (2018). Potential impact of 1.5 deg.C and 2 deg.C global warming on consecutive dry and wet days over West Africa. *Environmental Research*

Letters 13. 055013.

10. **Quagraine, K. A.**, Klutse, N. A. B., Nkrumah, F., Adukpo, D. C. & Owusu. K. (2017). Changes in rainfall characteristics in Wenchi and Saltpond farming areas in Ghana. *International Journal of Geosciences* 8. 305–317.
11. Nkrumah, F., Klutse, N. A. B., Adukpo, D. C., **Quagraine, K. A.**, Owusu, K. & Owusu, A. & Gutowski, W. (2014). Rainfall variability over Ghana: Model versus Rain gauge observation. *International Journal of Geosciences* 5. 673–683.
12. Klutse, N. A. B., Owusu, K., Adukpo, D. C., Nkrumah, F., **Quagraine, K. A.**, Owusu, A. & Gutowski, W. (2013). *Research Journal of Agriculture and Environmental Management* 2(12). 394–402.

PROJECTS & GRANTS

- The World Academy of Science (TWAS)/ DEGREES Initiative Solar Radiation Management Governance Socio-Political Research (2024 - 2026)
Assessment of knowledge and governance towards Solar Radiation Modification across Ghana: Implications for more efficient Ethical, Policy and Social Practices (Co-Investigator).
- The World Academy of Science (TWAS) Solar Radiation Management Governance Initiative (SRMGI) DECIMALS (2023 - 2024)
Solar Radiation Management With Stratospheric Aerosol interactions with Harmattan and associated impacts on some climate variables over Southern West Africa (Côte d'Ivoire, Ghana, Togo, Benin, Nigeria, Cameroon) (Co-Investigator).
- **Future Resilience for African CiTies And Lands, FRACTAL** (2016 - 2021)
Advance scientific knowledge about regional climate responses to human activities and work with decision-makers to integrate this knowledge into climate-sensitive decisions at a city & regional scale (Worked on the regional climate understanding package).
- **COR**ordinated **D**ownscaling **EX**periment, CORDEX (2018 - to date)
The CORDEX-Africa initiative has been developed to analyse downscaled regional climate data over the CORDEX-African domain, train young climate scientists in climate data analysis techniques and engage users of climate information in both sector specific and region/space-based applications.

CONSULTANCIES

- UNEP-Green Climate Fund; Ghana National Adaptation Project (2022 -2023)
Enhancing multi-sector planning and capacity for effective adaptation in Ghana.
- World Meteorological Organization (WMO) User Interface Project (WMO-UIP)
Developing of a UIP for worldwide use in Climate Services
- ICLEI Local Government for Sustainability (2022 - 2023)
Development of Climate Change Projections for Bo City, Sierra Leone and Cape Coast, Ghana.

FELLOWSHIPS, SCHOLARSHIPS & AWARDS

- **National Research Foundation (NRF) South Africa Research Chair in Climate Change (SARCHI) Scholarships (2016–2023)**
-Postdoctoral Fellowship (2020-2023) & Doctoral Funding Fellowship (2016 –2020)

- **German Academic Exchange Service (DAAD) (2022)**
Postdoctoral Researchers Climate Change Networking Tour Fellow
- **Newton Research Fellow (September 2017 – January 2018)**
Tyndall Climate Research Centre/Climate Research Unit (CRU)
University of East Anglia (UEA), Norwich, UK
- **Fall Meeting Student Travel Grant (2020)**
American Geophysical Union (AGU) Conference, Washington, USA
- **International/Refugee Scholarship (2017 - 2020)**
University of Cape Town, South Africa
- **University of Cape Town Travel Grant (2018, 2022)**
- **USAID Partnership for Enhanced Engagement in Research (PEER) Project (2012-2014)**
Funding for Graduate Studies
Department of Physics, University of Cape Coast, Cape Coast, Ghana

SUPERVISION

1. Hawa Djibril (B.Sc.) (2022)
Department of Physics
University of Cape Coast, Private Mail Bag, Cape Coast, Ghana.
2. Collins Fynn (B.Sc.) (2022)
Department of Physics
University of Cape Coast, Private Mail Bag, Cape Coast, Ghana.
3. Abdulai Shaibu Ndetega (B.Sc.) (2022)
Department of Physics
University of Cape Coast, Private Mail Bag, Cape Coast, Ghana.

PROFESSIONAL COURSES AND WORKSHOPS/CONFERENCES

- São Paulo School of Advanced Science on Ocean Interdisciplinary Research and Governance University of São Paulo, São Paulo, Brazil (13 August - 2 September 2019).
- R for Environmental Science Workshop (8 -10 January 2018) University of Kent, Canterbury, United Kingdom
- National Centre for Atmospheric Science (NCAS)
Introduction to Scientific Computing Course for Environmental Scientist
Leeds, United Kingdom (11 – 17 November 2017)
- COordinated Regional Climate Downscaling Experiment (CORDEX) (2 – 6 February 2016) Africa Phase 2 Workshop 3, University of Cape Town, South Africa
- COordinated Regional Climate Downscaling Experiment (CORDEX) (16 – 20 November 2015) Africa Phase 2, Workshop 2, University of Cape Town, South Africa

CONFERENCE PROCEEDINGS

- **Quagraine, K. A.**, Hewitson, B. et al. (2022): Developing a Simple High-Pressure Index. American Geophysical Union (AGU) Fall Meeting, Chicago, United States of America, 11 - 17 December 2022. (Poster),
<https://agu.confex.com/agu/fm22/meetingapp.cgi/Paper/1105319>
- 3rd Summer School on Theory, Mechanisms and Hierarchical Modeling of Climate Dynamics: Tropical Oceans, ENSO and their teleconnections, The Abdus Salam International Center for Theoretical Physics, Trieste, Italy. 18 - 29 July 2022 (Invited Participation)
<https://indico.ictp.it/event/9817/material/7/0.pdf>
- ICTP-Africa Joint School on Rainfall and Water Resources Management, The Abdus Salam International Center for Theoretical Physics, Trieste, Italy. 25 - 29 July 2022. (Invited Participation)
<https://indico.ictp.it/event/9814/other-view?view=ictp timetable>
- **Quagraine, K. A.**, Jack, C., Grigory, N., Hewitson, B. et al. (2019): Capturing Co-Behavior Modes in CORDEX regional climate models over Southern Africa. International Conference on Regional Climate-CORDEX, (ICRC-CORDEX), Beijing, China, 14-18 October 2019. (Poster), Abstract Proceedings Page 24.
https://icrc-cordex2019.cordex.org/wp-content/uploads/sites/2/2019/10/Poster_C1-1.pdf
- **Quagraine, K. A.**, Hewitson, B. et al. (2019): Assessing Co-Behavior of Climate Processes Over Southern Africa using CMIP5 Models. Coupled Model Intercomparison Project Phase (CMIP) 6 Workshop, Barcelona, Spain. 25 - 28 March 2019. (Paper Presentation), Abstract Proceedings Page 171.
<https://cmip6workshop19.sciencesconf.org/data/AbstractBook.pdf>
- **Quagraine, K. A.**, Hewitson, B. et al. (2018): The Dynamics of Co-Behavior of Climate Processes. American Geophysical Union (AGU) Fall Meeting, Washington D.C., United States of America, 10 - 14 December 2018. (Poster)
<https://agu.confex.com/agu/fm18/meetingapp.cgi/Paper/354810>
- **Quagraine, K. A.**, Hewitson, B. et al. (2016): Understanding Co-Behavior modes. 32nd Annual Conference of the South African Society for Atmospheric Sciences, Cape Town, South Africa. 31 October - 1 November 2016. (Paper presentation).
- 8th ICTP Workshop on the Theory and Use of Regional Climate Models, International Centre for Theoretical Physics, Trieste, Italy. 23 May - 3 June 2016. (Invited Participant).
<https://indico.ictp.it/event/7613/material/10/0.pdf>
- **Quagraine, K. A.**, Klutse Nana Ama Browne, Nkrumah, F (2016): Regional Climate Model Based Simulations of Interannual Rainfall Variability over the Guinea Coast of West Africa. International Conference on Regional Climate, CORDEX, Bolin Centre for Climate Research, Stockholm University, Sweden. 17 - 20 May 2016. (Invited Participant). Book of Abstract, Page 283.
https://www.icrccordex2016.org/images/pdf/Programme/Abstracts/CORDEX2016_Abstractbook_rev3.pdf
- Nkrumah, F, Klutse N. A. B., **Quagraine, K. A.** (2016): The Potential of CORDEX Models to Capture Present Extreme Events of the Guinea Coast. International Conference on Regional Climate, CORDEX, Bolin Centre for Climate Research, Stockholm University, Sweden. 17 - 20 May 2016. (Invited Participant). Book of Abstract, Page 271.
https://www.icrccordex2016.org/images/pdf/Programme/Abstracts/CORDEX2016_Abstractbook_rev3.pdf
- Nkrumah, F, Klutse N. A. B., **Quagraine, K. A.** (2016): Heavy Daily Rainfall

Characteristics over Agro-ecological Zones of Ghana. International Conference on Regional Climate, CORDEX, Bolin Centre for Climate Research, Stockholm University, Sweden. 17 - 20 May 2016.

(Invited Participant). Book of Abstract, Page 283.

https://www.icrccordex2016.org/images/pdf/Programme/Abstracts/CORDEX2016_Abstractbook_rev3.pdf

PROFESSIONAL AFFILIATIONS

- America Geophysical Union (AGU) – Member (2018 – present)
- South African Society of Atmospheric Science (SASAS) – Member (2018 – 2023)
- Ghana Science Association (GSA) – Member (2022 – present)

REVIEWER ACTIVITIES

- Journal of Climate
- Climate Dynamics
- International Journal of Climatology
- Meteorology and Atmospheric Physics
- Weather and Climate Extremes
- Theoretical and Applied Climatology

OUTREACH/COMMUNITY SERVICE

1. Lead Facilitator for Recycle Up! Ghana by Technik Ohne Grenzen e.V., Germany (2016- present)
-Training the youth on the benefits of reducing, reusing and recycling of plastics for the benefit of the climate.
2. Lead Trainer for Teaching Computer Basics by Technik Ohne Grenzen e.V., Germany for Nkanfoa community Junior High Schools (2016 – to present).
-Training youth in high schools on the use and opportunities attached to the use of computers.
3. Provision of Solar back-up power for Ekwe Catholic Hospital by Technik Ohne Grenzen e.V., Germany (2018)
-Set up a back-up solar system to facilitate easy and swift hospital operation.
4. Founding Member & Lead Facilitator for BarCamp Cape Coast and Cape Coast Connect (2014 – to present)
-Organising networking events in Cape Coast and its environs for the youth to share ideas, discuss interests and learn how to add values to their lives and make an impact in their communities.