Bernard Asare Owusu

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Research Interest

Geophysical-petrological modelling, surface wave tomography, seismic monitoring of volcanic systems, geothermal energy exploration, machine learning.

Current Position

PhD Student — Dublin, IE
Geophysics Section, Dublin Institute for Advanced Studies — Sep 2024 – Present

Education

University College Dublin — Sept 2024 – Present
Ph.D. in Earth Sciences

- Thesis: Temperature determination beneath volcanoes using geophysical-petrological modelling.
- Supervisor: Dr Emma Chambers

Kwame Nkrumah University of Science and Technology — Jan 2022 – Nov 2023
M.Phil. in Geophysics

- Thesis: Seismic facies analysis with machine learning for reservoir characterization.
- Supervisor: Dr Cyril Boateng

Kwame Nkrumah University of Science and Technology — Sept 2016 – Aug 2020
B.Sc. in Physics

Research Experience

Research Assistant — Kumasi, GH
Kwame Nkrumah University of Science and Technology — Nov 2023 – May 2024

Graduate Research Assistant — Kumasi, GH
Kwame Nkrumah University of Science and Technology — Jan 2023 - Oct 2023

Research Assistant — Accra, GH
Ghana Atomic Energy Commission — Sept 2020 - Aug 2021

Publications

Manuscript in preparation

Peer-Reviewed Publication

- **Owusu, B. A.**, Boateng, C. D., Asare, V. -D., Danuor, S. K., Adenutsi, C. D., Quaye, J. A. (2024). Seismic facies analysis using machine learning techniques: a review and case study. *Earth Sci Inform.* 17, 3899–3924. https://doi.org/10.1007/s12145-024-01395-3

Conference Presentations

2025

- Chambers E. L., Fullea J., Kiyan D., **Owusu B. A.**, Bean C. (2025). Determining the subsurface conditions of the crust and upper mantle using joint geophysical-petrological-lithological inversion. *IAGA/IASPEI Joint Scientific Meeting 2025*, Lisbon. (Oral, Invited)
- Chambers E. L., **Owusu B. A.**, Fullea J., Kiyan D., Raine R., Blake S., Bean C. (2025). Joint geophysical-petrological-lithological inversion to determine geothermal potential and subsurface temperature. *EGU General Assembly 2025*, Vienna. https://doi.org/10.5194/egusphere-egu25-6881
- Chambers E. L., Fullea J., **Owusu B. A.**, Kiyan D., Bean C. (2025). Subsurface temperature models of Ireland - from joint geophysical-petrological-lithological inversion. *Irish Geological Research Meeting*, Trinity College Dublin, Ireland. (Oral)
- **Owusu B. A.**, Chambers E. L., Bean C. J. (2025). Determining the subsurface temperature at Krafla, Northern Iceland through joint inversion of seismic, elevation, heat flow, and thermal data. *Irish Geological Research Meeting*, Trinity College Dublin, Ireland. (Poster)

2024

- Chambers, E. L., Fullea, J., Kiyan, D., **Owusu, B. A.**, Grannel, J., Smith, P., Craig, D., Molhoff, M., Raine, R., Blake, S., Bean, C. J. (2024). MOD3LTHERM – MODelling the 3D thermal and Lithospheric Structure of geothermal regions. *GSI National Geothermal Summit*, Dublin Castle, Ireland. (Poster)

Research Projects

PhD Researcher, MOD3LTHERM Project — mod3ltherm.ie

Internship

Junior Geophysicist, *Ghana National Petroleum Corporation* — Summer 2023

Awards and Funding

SFI-IRC (Research Ireland) Pathway Programme PhD Scholarship

Service

Member, EGU Early Career Seismology Team

Technical Skills

Experience in seismic data processing and analysis.
Proficiency in programming with Python, Fortran, Shell scripting, and MATLAB.
Experience with CPU-based high-performance computation and Linux environments.
Experience with Generic Mapping Tools (GMT) and python-based PyGMT.
Experience with industry-standard seismic interpretation tools such as Petrel and IHS Kingdom Suite.
Excellent language proficiency in the English Language.

Memberships

European Geosciences Union (EGU)
Society of Exploration Geophysicists (SEG)
Geothermal Rising