

JOHANNE AYELEY EKUE

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KEY COMPETENCES

- **Computational and Statistical tools:** C/++, R, Python, Physics Informed Neural Network, Machine Learning , MATLAB.
- **Microsoft Office Suite :** MS- Excel, MS Word, MS PowerPoint
- **Data visualization:** Matplotlib and Seaborn
- **Geospatial Analysis:** ArcGIS, Geopandas

EDUCATION

Aristotle University of Thessaloniki, Greece – Department of Physics

Host Institution: National Observatory of Athens

MSCA DUST-DN Project DC10- New scattering database for desert dust, with realistic size, shape and refractive index measured in-situ

PhD Atmospheric Physics

2025 to Present

Instituto Nacional de Pesquisas Espaciais (INPE) - Sao Jose dos Campos (Brazil)

Masters in Space Geophysics (Atmospheric Science)

May 2023 to May 2025

University of Ghana (UG), College of Basic and Applied Sciences - Department of Physics
Accra, Ghana.

Bachelor of Science in Physics

2016 to 2022

WORK EXPERIENCE

- **Research Assistant** – September 2022 to July 2023
University of Ghana, College of Basic and Applied Sciences -Department of Physics.
- **Analyst Intern** – April 2022 to September 2022
Research Institute for Innovation and Sustainability, Johannesburg, South Africa.
- **Teaching Assistant** – September 2021 to 2022
University of Ghana, College of Basic and Applied Sciences - Department of Physics.

AWARD AND HONOURS

- Space Generation Leader Award (SGLA) – **Scholarship** (2024)
- Conselho Nacional de Desenvolvimento Cientifico e Tecnologico (Cnpq) – **Msc.Scholarship** (2023-2025)
- African Institute for Mathematical Sciences Climate Modeling tools and programming skills
- Egyptian Space Agency Africa Training in Satellite (EGSA) – **Scholarship** (2022)

- African Institute for Mathematical Sciences **Honorarium award** (2022)
 - Development in Africa with Radio Astronomy – **Scholarship** (2020 to 2021)
 - 5th African Space Generation Workshop (DARA Award)- **Scholarship** (2021)
 - Physics Students Association of Ghana (PHYSAG)- Citation of Honor for **Hard work** and **Determination** (2020)
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CERTIFICATION

- Neural Network and Deep Learning (Deeplearning.AI) (2023)
 - Data Driven Astronomy (University of Sydney Coursera) (2023)
 - Basic Space Technology and Satellite System (EGSA) (2022)
 - Development in Africa with Radio Astronomy(DARA) (2022)
 - 6th edition of the African School of Physics and Application (ICTP) (2021)
 - Climate Change: Challenges and issues for the earth sciences (Institute Pierre-Simon Laplace (IPSL), France) (2021)
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ACADEMIC PRESENTATION

Ekue J. (2023) Identification of non-linear systems: Climate system uncertainties, World Climate Research Program Open Science conference, Rwanda 23 – 27 October 2023 [Oral Presentation]

Ekue J. (2023). Physics Informed data-driven system identification of non-linear systems for space exploration, International Astronautical Congress, Baku, Azerbaijan 2 – 6 October. [Interactive Presentation]

Ekue J. (2023) A potential solution to challenges of machine learning in Astrophysics: Physics Informed neural networks applied to a damped pendulum case study, European Astronomical Society Annual Meeting, 10 – 14 July 2023, Ice Kraków, Poland. [Contributed Talk]

CONFERENCES AND WORKSHOP

- Short Course on Magnetic storms and substorms, INPE's Space Geophysics Postgraduate Program and NASA/CUSIA Grant, Sao Jose dos Campos, Brazil (2024)
 - Semina Academica da Geofisica Espacial (SAGE) (2023)
 - Climate Modeling Workshop and gender training, Rwanda (2023)
 - World Climate Research Program Open Science conference (2023)
 - Gender Analysis Toolkit for Prioritizing SDG goals and Targets (2022)
 - International Astronautical Congress(2022)
 - Space Generation Congress, France (2022)
 - 5th African Space Generation workshop (2021)
 - 4th African Space Generation Workshop (2021)
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RESEARCH PROJECTS AND CONFERENCE PAPERS

- **Ekue, J.A**, Naccarato, P, K and Hammond D: Generation of High-Resolution Lightning Maps from Lightning Imaging Sensor and World-Wide Lightning Location Network, XVIII SIPDA International Symposium on Lightning Protection (SIPDA 2025), 21 - 26 September, Thessaloniki, Greece [Conference Proceeding Paper IEEE].
 - Naccarato, P, K., **Ekue, J.A.**, and Hammond D: Urban Lightning Enhancement over Brazil using Corrected WLLN Stroke Data, XVIII SIPDA International Symposium on Lightning Protection (SIPDA 2025), 21 - 26 September, Thessaloniki, Greece [Conference Proceeding Paper IEEE].
 - **Ekue, J. A.**, Hammond, D., and Agyei-Yeboah, E.: Envisioning the Role of Physics-Informed Neural Networks in Atmospheric Science: Advancements, Challenges, and Future Prospects, EGU General Assembly 2025, Vienna, Austria, 27 Apr–2 May 2025, EGU25-243, <https://doi.org/10.5194/egusphere-egu25-243>, 2025.
 - **Ekue. J.** (2024) analysis of urban effects over lightning in Brazil using high-resolution maps [master's Thesis]
 - **Ekue. J.** (2023). Exploring the dynamics of geomagnetic activity: a comprehensive analysis of linear, nonlinear, and time-lagged correlations with solar wind parameters, submitted **Monography Project for Plasma physics** at INPE, Brazil.
 - Physics Informed neural Network: A simple Pendulum Case Study (2023)
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LEADERSHIP ROLES

- Speaker and moderator at SG Brazil and Space and Drone Br Show (2025)
- Moderator of 22nd Space Generation Congress Working Groups (2024)
- Mini Physics school – Organizing team member (INPE)- Sao Jose dos Campos (Brazil) (2023)
- Programming Instructor - Tutor python programing (Ghana, Remotely)
- Executive Secretary- Space Generation Advisory Council (SGAC) (2022 to date)
- 20th Space Generation Congress- Organizing team member ,Delegate team (France, Paris) (2022)
- 5th African Space Generation Workshop -Organizing team member , delegate team (2021)
- 4th African Space Generation workshop- Wrote a report on Big data and Astronomy (2021)