

**DR. RICHARD CLIFFE SSENUNZI**

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**CURRICULUM VITAE**



**Name** : **Richard Cliffe Ssenyunzi**

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**Googlescholar:** <https://scholar.google.com/citations?user=8huR-9sAAAAJ&hl=en>

**Researchgate:** <https://www.researchgate.net/profile/Richard-Ssenyunzi>

**Scopus\_author\_ID:** 57209258321

**ORCID** : <https://orcid.org/0000-0002-9606-7386>

**PROFESSIONAL SUMMARY**

I am a physicist and educationist with over a decade of university teaching, research, and curriculum development experience. I joined Busitema University in 2010 and have progressed to the rank of Senior Lecturer. My expertise lies in atmospheric sciences, GNSS meteorology, and space physics, with strong integration of computational modelling and Earth Observation data. I have contributed significantly to competence-based curriculum development aligned with NCHE frameworks and institutional priorities. I am actively engaged in postgraduate supervision, interdisciplinary research, and the development of AI-enabled learning systems. I am also a member of the University Competence-Based Education (CBE) Task Force, contributing to curriculum transformation and policy implementation.

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**EDUCATION**

- **Doctor of Philosophy in Physics**, Makerere University, Uganda (2022)  
*Thesis:* Modeling Precipitable Water Vapour using Global Navigation Satellite System Data over East African Tropical Region
- **Master of Science in Physics**, University of Bergen, Norway (2009)  
*Dissertation:* Effect of Ultraviolet Radiation on Phytoplankton Photosynthesis using Fibre-Optical Oxygen Sensors
- **Bachelor of Science with Education (Physics & Mathematics)**, Makerere University, Uganda (2005)

**WORK EXPERIENCE**

**Busitema University, Uganda**

- Senior Lecturer of Physics (2024 – Present)
- Lecturer of Physics (2010 – 2023)
- Ag. Head of Physics Department, Busitema University (2014 – 2016)

**Ndejje Secondary School and St. Kizito S.S.S Kisule, Katikamu, Uganda**

- Physics Teacher (2006 – 2007)

**RESEARCH INTERESTS**

1. GNSS Meteorology and Atmospheric Water Vapour Modelling
2. Zenith Tropospheric Delay (ZTD) Modelling
3. Numerical Weather Prediction and Climate Systems
4. Ionospheric and Space Physics
5. Earth Observation and Artificial Intelligence Applications
6. Competence-Based Education and Digital Learning Systems

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**MSC SUPERVISION (COMPLETED)**

1. Mbayo Peter (Busitema University, Uganda) with Thesis entitled: “Weighted Mean Temperature Models for Estimating Global Navigation Satellite System Precipitable Water Vapour over East Africa” (2024).
2. Ekanyai John (Busitema University, Uganda) with Thesis entitled: “Evaluation of Radionuclide Levels in Selected Foodstuffs and Edible Animal Products from Tororo Markets and Their Impact on Human Health” (2025).

**Ph.D. EXAMINATIONS**

1. Nicholas Walter Nzala (Makerere University, Uganda) with Thesis entitled: “Developing Inverse Artificial Neural Network Algorithms for the Retrieval of Meteorological Parameters” (2024).

**MSC EXAMINATIONS**

1. Babirekere Hellen (Busitema University, Uganda) with Dissertation entitled: “Characterization of the Multipath Environment of Global Navigation Satellite System Receivers over Uganda” (2024).
2. Bakayana John (Makerere University, Uganda) with Dissertation entitled: “Predicting Global Solar Radiation Incident on Horizontal Surfaces in Kampala Using Markov Chain Model” (2023).
3. Basemera Shilindion (Mbarara University of Science and Technology, Uganda) with Dissertation entitled: “Evaluation of the Effect of Meteorological Factors on Seasonal and Diurnal Variation of PM<sub>2.5</sub> at a Site in Mbarara” (2024).
4. Chepkurui Jonah (Busitema University, Uganda) with Dissertation entitled: “Characterization of the Low Latitude Ionospheric Response to Geomagnetic Storms” (2025).
5. Izizinga Godfrey Samuel (Busitema University, Uganda) with Dissertation entitled: “Modeling and Simulation of Particulate Matter Dispersion from a Steel Rolling Industry: A Case Study of Jinja Steel Rolling Mills Ltd” (2025).

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6. John Bosco Murami (Busitema University, Uganda) with Dissertation entitled: “Investigating the Possibility of Coupling Between Equatorial Plasma Bubbles and Travelling Ionospheric Disturbances over the East African Region” (2024).
7. Kibiina Ronald Henry (Busitema University, Uganda) with Dissertation entitled: “Optimization of the Physical Properties of Paving Blocks Moulded Using Plastic Waste as a Binding Material” (2024).
8. Mugiimba Ronald (Busitema University, Uganda) with Dissertation entitled: “A Short-Term Weather Forecast Model Over Eastern Uganda” (2025).
9. Tumuhairwe Bruce (Busitema University, Uganda) with Dissertation entitled: “Analysing the Effects of the Time of Commencement of Geomagnetic Storms on Satellite Navigation” (2025).
10. Waibi Roggers (Busitema University, Uganda) with Dissertation entitled: “Two-Dimensional Imaging of the Ionospheric Total Electron Content over East Africa” (2024).
11. Waiswa Samilu (Busitema University, Uganda) with Dissertation entitled: “Analysis of the Radiological Content in Selected Floor Tiles and Cement Brands Commonly Used in Building Construction in Tororo, Uganda” (2024).

**PUBLICATIONS**

1. **Ssenyunzi, R. C.**, Oruru, B., D’ujanga, F. M., Realini, E., Barindelli, S., Tagliaferro, G., & van de Giesen, N. (2019). Variability and accuracy of Zenith Total Delay over the East African tropical region. *Advances in Space Research*, 64, 900–920.  
<https://doi.org/10.1016/j.asr.2019.05.027>
2. **Ssenyunzi, R. C.**, Oruru, B., D’ujanga, F. M., Realini, E., Barindelli, S., Tagliaferro, G., van de Giesen, N., & von Engeln, A. (2020). Performance of ERA5 data in retrieving precipitable water vapour over the East African tropical region. *Advances in Space Research*, 65, 1877–1893.  
<https://doi.org/10.1016/j.asr.2020.02.003>
3. **Ssenyunzi, R. C.**, Oruru, B., & D’ujanga, F. M. (2021). Linear regression models to predict tropospheric parameters at Global Positioning System sites over the East African

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region. *East African Journal of Science, Technology and Innovation*, 2(3).

<https://doi.org/10.37425/eajsti.v2i3.274>

4. Amabayo, E. B., Andima, G., & **Ssenyunzi, R. C.** (2021). Instantaneous ionospheric scintillation mapping over the East African region using GPS-derived amplitude scintillation proxy. *Asian Journal of Research and Reviews in Physics*, 4(2), 6–20.
5. **Ssenyunzi, R. C.**, Andima, G., Amabayo, E. B., & Realini, E. (2023). Performance of ray-traced VMF3 products in retrieving zenith tropospheric delay over the African tropical region. *Journal of Atmospheric and Solar–Terrestrial Physics*, 243, 106014.  
<https://doi.org/10.1016/j.jastp.2023.106014>
6. **Ssenyunzi, R. C.**, Andima, G., Amabayo, E. B., & Kiroe, A. J. (2024). Assessment of ERA5-derived zenith tropospheric delay data over the East African region. *Advances in Space Research*, 74, 695–710.
7. Andima, G., **Ssenyunzi, R. C.**, Amabayo, E. B., Mascitelli, A., & Realini, E. (2024). Modeling of zenith tropospheric delay using ERA5 data over the East African region. *Journal of Atmospheric and Solar–Terrestrial Physics*, 265, 106390.  
<https://doi.org/10.1016/j.jastp.2024.106390>

## CONFERENCE PROCEEDINGS

Realini, E., Mascitelli, A., Tagliaferro, G., Gatti, A., Fumagalli, A., **Ssenyunzi, R. C.**, Van De Giesen, N. (2022). Deployment and Operation of Low-cost GNSS Stations for Atmospheric Monitoring in the East Africa Tropical Region. In *Fall Meeting 2022*. AGU.

## PROJECTS AND GRANTS

- **Principal Investigator:** Activity-Based Learning and Teaching Approach, STI-OP Uganda (2024–2025)
- **Principal Investigator:** Industrial Science Skills Development Program for Advanced Science Students and Pharmaceutical Human Capital, STI-OP Uganda (2025–2026)
- **Member:** Space Weather Early Warning Tool Project, STI-OP Uganda (2024–2025)

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**SCHOOLS, WORKSHOPS AND TRAININGS**

- **3rd–4th October 2011:** *Licensing and Inspection Training* – Organized by the Government of Uganda in collaboration with the International Atomic Energy Agency (IAEA) through the Ministry of Energy and Mineral Development, Uganda.
- **21st October – 1st November 2013:** *Space Science School* – Organized by the Scientific Committee on Solar-Terrestrial Physics (SCOSTEP) at the Kenya Institute of Education, Nairobi.
- **6th–9th August 2018:** *Writing for Publication Training* – Makerere University, Uganda.
- **10th–21st September 2018:** *Advanced Research Methods Training* – Makerere University, Uganda.
- **19th–23rd August 2019:** *Scholarly Writing and Communication Skills Training* – Makerere University, Uganda.
- **4th November – 4th December 2020 and 16th August – 15th September 2021:** *Instructional Materials Workshop for the Revised Lower Secondary School Curriculum* – Organized by the Ministry of Education and Sports, Uganda.
- **15th–26th March 2021:** *Philosophy of Methods Training* – Makerere University, Uganda.
- **13th–14th December 2022:** *Curriculum Development Skills Enhancement Workshop* – Organized by the National Council for Higher Education (NCHE), Uganda.
- **27th June – 17th July 2023:** *Seminar on New Technology of Satellite Navigation* – Wuhan Research Institute of Posts and Telecommunications, China.
- **29th November 2024:** *National Uganda Geodetic Reference Frame (UGRF) Stakeholders Workshop* – Organized by the Ministry of Lands, Housing and Urban Development with support from the World Bank under the UGRF-2 Project; held at Four Points by Sheraton, Kampala, Uganda.
- **1st–2nd April 2026:** *Two-Day Residential Technical Consultative Meeting on Strengthening Higher Education Institutions' Capacity for Transition to Competency-Based Education (CBE)* – Organized by the Ministry of Education and Sports, Uganda in collaboration with the African Institute for Capacity Development (AICAD); held at Esella Country Hotel, Wakiso District, Uganda.

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**COMMITTEES**

- Member, University Competence-Based Education (CBE) Task Force, Busitema University (2025 – Present)
- Member, Space Science Research Group (2024 – Present)
- Member, TWIGA Research Project (2018 – 2021)
- Member, Faculty School Practice Committee (2018 – 2021)
- Coordinator of Undergraduate Research Projects and Outreach (2013 – 2014, 2023-present)
- Member, Curriculum Review Committee (2010 – 2012, 2026)

**SERVICES**

- Reviewer: Advances in Space Research
- Reviewer: Acta Geophysica
- Reviewer: International Journal of Climatology
- Reviewer: Survey Review
- Reviewer: Remote Sensing

**COMMUNITY ENGAGEMENT**

- Member, Rotary Club of Buloba
- Participation in curriculum reforms and science outreach

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**REFEREES**

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2. Dr. Andima Geoffrey  
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3. Prof. Florence D'ujanga  
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