

Prof. Florence MUTONYI D'UJANGA



Department: Physics
Designation / Rank: Professor of Physics.
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Email addresses: Florence.dujanga@mak.ac.ug / fdujanga@gmail.com
Qualifications: PhD (Physics-Mak); MSc (Physics-Mak); BSc./Dip. Educ. (Physics/Math-Mak).
Research Interests: Materials Science & Space Physics.

Academic/Administrative Responsibilities:

Responsibility	Dates
Head of Physics Department, Makerere University.	2004 - 2013
Supervised Teaching Practice for Undergraduates	2003 - 2004
Coordinator for 1 st Year Physics laboratory	1995 – 1996
In-charge of 1 st Year student registration	Oct. 1996
Coordinator for 1 st Year Physics laboratory	2001 – 2004
Instructor for both graduate and undergraduate programmes	Ongoing

Research Projects (Current)

Title	Period
Makerere Research & Innovations Fund (Mak-RIF): “Using Astronomy and Space Science to promote Science Education in Schools” as Principal Investigator . (Grant: Sh.149,620,760/=)	July 2021 – June 2022
TWIGA (Transforming Water, weather, and climate information through In situ observations for Geo-services in Africa) Project (<i>Operating in Physics and Zoology</i>); as Co-PI with Prof. John Baptist Kaddu in Zoology. (Grant: EUR 4,979,622.50)	Feb. 2018 - 2022
Research Projects (Previous)	
MSI Project with UNCST funded by World Bank, as Principal Investigator ; 7 other members. (Grant: US \$1,191,203)	2008 – 2010
Spearheaded the setting up of Space Science Research and teaching in the Department, which led to the acquisition of a GPS	2009

receiver and VHF antennas, situated on the roof of the Physics Department.	
NUFU project, funded by Norwegian govt.; as coordinator for Physics Dept; together with 4 other departments.	2004 – 2008

Community Outreach Programmes

- Chairperson of one of the Technical Committees at the Uganda National Bureau of Standards (UNBS)
- Member of the Natural Sciences Programmes Committee of the Uganda National Committee for UNESCO (UNATCOM).
- **Promotion of Learning and Teaching of Science in Schools:**
Role model to schools to encourage study of science subjects, particularly to girls, in partnership with various bodies such as UNCST, UNESCO and the Academic Registrar's Dept., Makerere University.
- Member of the supervisory committee of FIC (St. Francis Sacco)
- Member of the supervisory committee of Nabumali Old Students Association (NOSA)

Teaching Areas

Undergraduate: Generally all undergraduate Physics.

Graduate level: Materials Science, Space Physics, Quantum Mechanics, Classical Mechanics.

Supervision of Graduate Students (*completed*):

TITLE	STUDENT NAME	DATE COMPLETED
Diurnal and seasonal variability of total electron content observed at Kampala-Uganda in the Equatorial region.	Sulayi Oron 2010/HD13/531U	2013 (MSc)
Concentration levels of radon in mines, industries and dwellings in selected areas of Tororo and Busia districts, Eastern Uganda.	Biira Saphina 2008/HD13/13493U	2012 (MSc)
L-band and VHF response to scintillation activity during the ascending phase of sunspot cycle 24 in the Equatorial region of East Africa.	Stephen Taabu 2011/HD13/2845U	May 2014 (MSc)
Measurement of ionospheric variation along the different latitudes of the African sector using GPS TEC data for the year 2011.	Phillip Opio 2011/HD13/2846U	April 2014 (MSc)
Detection of quiet time disturbances (Q-disturbances) in Kampala using vertical total electron content (VTEC) data during a year of low solar activity.	Paul Ecuru 2009/HD13/17869U	Nov. 2014 (MSc)
Total electron content prediction in low latitude region of East Africa using NeQuick model.	Francis Twinomugisha	June 2016 (MSc)

	2012/HD13/682U	<i>(for viva)</i>
Precipitable water vapour estimation using GPS in Uganda: A study on obtaining the zenith tropospheric wet delay.	Mariska A. Koning (Delft Univ. of Tech.)	Nov. 2016 (MSc)
Precipitable water vapour estimation in Uganda: Measuring and modelling the precipitable water vapour using single and dual frequency GNSS receivers.	Eva M.J. Stierman (Delft Univ. of Tech.)	Nov. 2016 (MSc)
Comparison of ionospheric scintillations during storm and non-storm periods over the East African region using GPS and ionosonde data.	Geofrey Lugonvu 2013/HD13/77U	May 2017 (MSc)
Exploring the use of LandSat imagery in monitoring chlorophyll-A and lake surface temperature in Lake Victoria.	Esther Kataate Namakula 2014/HD13/817U	August 2017 (MSc)
Modeling and simulation of thermal residual stress in porcelain made from locally sourced raw materials in Uganda.	William Ochen	June 2021 (PhD)
Estimation of the tropospheric water vapor using propagation delay in GNSS signal.	Richard Cliffe Ssenyunzi	November 2021 (PhD)

Supervision (*in progress*):

TITLE	STUDENT NAME	PROGRESS
X-ray properties of black hole binaries V4641 Sagittarii and V1033 Scorpii from Chandra data	Dickson Okello	MSc
X-ray Characteristics of narrow line seyfert 1 Galaxies from <i>NuStar</i> data	Juma Kamulali	MSc
Effect of sintering temperature and sintering time on the strength of bricks from local clays.	Josephine Akello	MSc

Graduate Students that completed earlier: James Mubiru (PhD – 2007); Joseph Anthony Owalu (MSc – 2013); Gertrude Ayugi (MSc – 2013).

Publications

Publications: (*in refereed journals*)

1.	Influence of residual stress on the mechanical behavior of ceramics with various quartz sizes. Ochen W., D’ujanga F.M. , Oruru B. <i>Scientific African</i> 11 (2020).
2.	The first track of cultural astronomy in Uganda: Perspectives of the Baganda, Bagisu, Banyoro and Langi. Oruru B., Najjemba H., Zawedde A.Z., Nteziyaremye R, Nayibinga M. and D’ujanga F.M. <i>AJHC</i> , 12(2), p. 35-48 (2020)
3.	Performance of ERA5 data in retrieving precipitable water vapour over East African tropical region. Ssenyunzi R.C., Oruru B., D’ujanga F.M. , Realini E., Barindelli S., Tagliaferro G., Engeln A., Giesen N. <i>Advances in Space Research</i> 65 1877-1893 (2020).
4.	Microstructure and residual stress effect on the flexural strength of porcelain tiles formulated from locally available materials in Uganda. Ochen W., D’ujanga

	F.M., Oruru, B. E. <i>African J. STI</i> . Vol. 1 (1) https://doi.org/10.37425/eajsti.1.1 68-81 (Oct. 2019)
5.	Variability and accuracy of Zenith Total Delay over the East African Tropical Region. Ssenyunzi R.C., D’ujanga F.M. , Oruru B., Realini E., Barindelli S., Tagliaferro G., Giesen N. <i>Advances in Space Research</i> . DOI: 10.1016/j.asr.2019.05.027 (2019).
6.	Effect of Quartz Particle Size on Sintering Behavior and Flexural Strength of Porcelain Tiles Made from Raw Materials in Uganda. Ochen W., D’ujanga F.M. , Oruru, B. <i>Journal Materials Science</i> . 5 001-007, (2019).
6.	Probing the equatorial ionosphere using spread-F signatures and GPS scintillations at Maseno in East Africa. D’ujanga F.M. , Lugonvu G. & Ndinya B. <i>Advances in Space Research</i> . doi.org/10.1016/j.asr.2018.06.031 62 1753–1761 (2018).
7.	Variation of the total electron content with solar activity during the ascending phase of Solar Cycle 24 observed at Makerere University, Kampala. D’ujanga F.M. , Opio P. & Twinomugisha F. <i>Book Chapter in AGU Books on Ionospheric Space Weather: Longitude and Hemispheric Dependences and Lower Atmosphere Forcing, Geophysical Monograph 220</i> , Published by John Wiley & Sons, Inc. (2017)
8.	Study on the occurrence characteristics of VHF and L-band ionospheric scintillations over East Africa. D’ujanga F.M. & Taabu S.D. <i>Indian J. Radio & Space Phy.</i> 43 , 263-273, (2014).
9.	Ionospheric TEC variations during the ascending solar activity phase at an equatorial station, Uganda. Oron S., D’ujanga F.M.* . and Ssenyonga T.J. <i>Indian J. Radio & Space Phy.</i> 42 , 7-17, (2013). (*Corresponding author)
10.	Latitudinal Variation of the Ionosphere in the African Sector using GPS TEC Data. Opio P., D’ujanga F.M. & Ssenyonga T.J. <i>Advances in Space Research</i> . 55 , 1640-1650, (2015).
11.	TEC derived from some GPS stations in East African equatorial region and comparison with the TEC from NeQuick2 model. Twinomugisha F., Ssebiyonga N. and D’ujanga F.M. <i>Advances in Space Research</i> . 60 1905–1920, (2017).
12.	Investigation of TEC variations over the magnetic equatorial and equatorial anomaly regions of the African sector. Oryema B., Jurua E., D’ujanga F.M. , Ssebiyonga N. <i>Advances in Space Research</i> . 56 , 1939-1950, (2015).
13.	The Most Effective Methods for Delivering Severe Weather Early Warnings to Fishermen on Lake Victoria. Tushemereirwe R., Tuhebwe D., Cooper M.A. & D’ujanga F.M. <i>PLOS Currents: Disasters</i> . Feb. 2017.
14.	Concentration levels of radon in mines, industries and dwellings in selected areas of Tororo and Busia districts, Eastern Uganda. Biira S., Kisolo A.W., and D’ujanga F.M. <i>Advances in Applied Science Research</i> , 5(6):31-44 (2015).
15.	First Order Expectation Values of Electron Correlation Operators for Two-Electron Atoms. Ndinya B.O., D’ujanga F.M. , Oduogo J.O., Oduor A.O. and Akeyo J.O. <i>American J. Modern Phys.</i> 4 , No. 2, 70-74, (2015).
16.	A study of intense ionospheric scintillation observed during a quiet day in the East African low-latitude region. Ngwira C.M., Klenzing J., Olwendo J., D’ujanga F.M. , Stoneback K. and Baki P. <i>Radio Sci</i> , 48, 396-405 (2013).
17.	Total electron content of the ionosphere at two stations in East Africa during the 24-25 October 2011 geomagnetic storm. D’ujanga F.M. , Baki P., Olwendo J.O. and Twinamasiko, B.F. <i>Advances in Space Research</i> . 51 , 712-721, (2013).

18.	Total Electron Content Variations in Equatorial Anomaly Region. D'ujanga FM , Mubiru J, Basalirwa C., Twinamasiko BF and Ssenyonga, TJ. <i>Advances in Space Research</i> . 50 , 441-449, (2012).
19.	Equatorial Plasma Bubbles and L-Band Scintillations in Africa during Solar Minimum. Paznukhov VV, Carrano CS, Groves KM, Caton RG, Valladares CE, Semaala GK, Bridgwood CT, Adeniyi J, Amaeshi LLN, Damtie B, D'ujanga FM , Ndeda JOH, Baki P, Obrou OK, Okere B, Tsidu, GM. <i>Annales Geophys</i> . 30, 675-682, (2012).
20.	Assessing the distribution of monthly mean hourly solar irradiation at an African Equatorial site. Mubiru J., Banda EJKB., D'ujanga FM . and Ssenyonga T. <i>Journal of Energy Conversion and Management</i> Vol. 48, pp. 380-383, (2007).
21.	Assessing the distribution of solar irradiation in Mbarara, Uganda. Mubiru J., Banda EJKB, D'ujanga FM , Otiti T., Karume K., Nyeinga K. and Okello D. and Katongole N. <i>Journal of Theoretical and Applied Climatology</i> , 90, No.1-2, 127-131 (2007).
22.	Assessing the performance of global and solar radiation empirical formulations for Kampala, Uganda. Mubiru J., Banda EJKB., D'ujanga FM . and Ssenyonga T. <i>Journal of Theoretical and Applied Climatology</i> . Vol. 87, No. 1-4, pp. 179-184, (2007).
23.	Using a regression model to estimate daily diffuse solar irradiation from cleanliness index in Mbarara, Uganda. Mubiru J., Banda EJKB and D'ujanga FM . <i>International Journal of BioChemPhys</i> , Vol. 14, No.1-2, pp.61-65. (2005)
24.	Dependence of Kaolinite Content on Particle Size Distribution in Uganda Kaolin Clay. Kaahwa Y. and D'ujanga F.M . <i>British Ceramic Transactions</i> , 103,143-144. (2004)
25.	The Polarizing Effects in Sintered Kaolin. D'ujanga F.M. , Kaahwa Y. and Atteraaas L. <i>Tanz. J. Sci</i> . 28,63-70. (2002).
26.	Dependence of Porosity on Compaction Pressure in Drypressed Samples. D'ujanga FM . <i>Kaolin International Journal of BioChemiPhysics</i> , Vol.10 (2001).
27.	High Field Conduction in Mica. Kaahwa, Y. & D'ujanga, F.M . <i>Discovery & Innovation</i> , 4 (1992).
28.	Construction of Ceramic Insulator from Uganda Clays. D'ujanga, F.M . <i>Discovery & Innovation</i> (1997).
	Books / Monographs / Modules):
1.	Properties of Matter (study notes for Distance Education). D'ujanga, F.M . Ins. of Adult & Continuing Educ., Makerere, Uganda (2003).
2.	First Year Physics Laboratory Manual. D'ujanga, F.M. , Kisolo, A., Okullo, W., Ssenyonga, T.J., Ireeta, W.T., Okello, D., Ayugi, G., Zawedde, A.E. and Banda, E.J.K.B. Dept. of Physics. (2011)
3.	Second Year Physics Laboratory Manual. D'ujanga, F.M. , Kisolo, A., Okullo, W., Ssenyonga, T.J., Ireeta, W.T., Okello, D., Ayugi, G., Zawedde, A.E. and Banda, E.J.K.B. Dept. of Physics. (2011)
4.	Third Year Physics Laboratory Manual. D'ujanga, F.M. , Kisolo, A., Okullo, W., Ssenyonga, T.J., Ireeta, W.T., Okello, D., Ayugi, G., Zawedde, A.E. and Banda, E.J.K.B. Dept. of Physics. (2011)

Membership to Professional Bodies / International & National Associations:

Mentorship of Emerging Females Academics to promote Gender Inclusive Participation in Science, Technology and Innovation (STI), and Leadership.	September 2021
Nominated as Technical Officer for National Consultation on Development of EAC Regional Space Strategy.	August 2021
Fellow of the Uganda National Academy of Sciences (FUNAS)	October 2014
Appointed to Busitema University Senate as a Government Representative.	May 2016 to date
Appointed to the Visitation Committee of Senate to Uganda Military Academy – Kabamba.	July 2016
Appointed to the Visitation Committee of Senate to Management Training and Advisory Centre (MTAC).	July 2015
Appointed to the Senate Anti-Sexual Harassment Committee (MASHC).	July 2015
Appointed to Makerere University Senate as a Representative of the School of Physical Sciences.	2015
Member of the ISO/TC 202 “Microbeam Analysis”	August 2014
Team Leader for Women in Physics in Uganda.	2010 to date
Member of Clerical and Secretarial Appointments’ Committee of Makerere University.	2006 to date
Women Engineers, Technicians & Scientists in Uganda (WETSU) – Vice-Chairperson.	2001 to date
Uganda Association of University Women (UAUW) – member.	
Forum for African Women Educationalists (FAWE) – Secretary Gen.	1996 -2000
Third World Organization for Women in Science - Member.	Ongoing
Christian Staff Fellowship, Makerere University - Member	Ongoing