CURRICULUM VITAE



REV. DR. GEORGE ERICK OMONDI, Ph. D ORCID ID: https://orcid.org/0000-0002-5187-7895

1. PERSONAL DETAILS

NAME:	Omondi George Erick
DATE OF BIRTH:	10 th May, 1985
NATIONALITY:	Kenyan
MARITAL STATUS:	Married (has three children, two girls and one boy)
SEX:	Male
RELIGION:	Christian
DENOMINATION:	Anglican Church
OCCUPATION:	University Lecturer
LANGUAGE:	English, Kiswahili, Dholuo
HOME ADDRESS:	P.O Box 37-40612
	Sawagongo, Kenya
WORK ADDRESS:	P.O Box 333-40105
	Maseno, Kenya
E-MAIL:	omondigeok@yahoo.com
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geomondi@maseno.ac.ke

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2. RESEARCH INTERESTS: Space Physics

Research Topics

- Ionospheric Dynamics and electrodynamics using Magnetometers, Ionosondes, Global Positioning Systems (GPS) and its effects on ground and space based technological systems.
- Geomagnetically Induced Currents in the electric power grid.
- Variation of the equatorial electrojet (EEJ) and its role in the formation of the equatorial Ionization Anomaly (EIA).
- Detection of Equatorial Plasma Bubbles and their relationship with Total electron content (TEC) depletions in the ionosphere.
- Quantum entanglement/Quantum Optics/ Quantum Computing
- Computational Physics applications

3. EDUCATIONAL BACKGROUND

SEPT.2014-DEC. 2017	Maseno University
	Ph.D in Physics
SEPT.2010-TO DEC.2013:	Maseno University
	Master of Science in Physics
MAY.2018-NOV.2021	St. Paul's University
	Bachelor of Dvinity
S	Score: First Class Honours
SEPT.2005-NOV.2009:	Maseno University
	Bachelor of Education (Science with IT)-Mathematics
	and Physics major

Score: First Class Honours

2006:	I Choose Life (ICL) training
	Learnt HIV/AIDS awareness and peer education
2000-2003:	Horace Ongili Secondary School
	Score: KCSE-B+(plus) 73 points
1992-1999:	Uriri Primary School
	KCPE-477 marks out of 700 marks
	Score: B+ (plus)

4. WORK EXPERIENCE

15TH DEC. 2017-TO DATE: Lecturer, Maseno University, Department of Physics & Materials Science. Teaching and supervising undergraduate and postgraduate students.

Conducting research in Space Physics.

Postgraduate Courses taught:

Master of Science (MSc) (Physics) courses taught and examined

SPH 805: Statistical MechanicsSPH 821: Advanced Laboratory and Computational TechniquesSPH 822: Mathematical Methods for PhysicsSPH 851: AeronomySPH 853: Principles of Plasma Physics and Space Plasmas

Doctor of Philosophy (PhD) in Physics courses taught and examined

- SPH 911: Advanced Computational Physics
- SPH 914: Advanced Space Science
- SPH 915: Advanced Mathematical Methods for Physics
- SPH 917: Advanced Experimental Techniques

5TH JAN, 2015-TO 2021: Part time Lecturer Jaramogi Oginga University of Science and Technology, School of Biological and Physical Sciences. Has taught and examined:

SPH 3111: Physics I

SPH 3121: Physics II

SPH 2121: Physics II

SPH 103: Optics

SPH 104: Thermal Physics

SPH 202: Electricity and Magnetism II

SPH 203: Mathematical Methods for Physics I

SPH 206: Empirical Ideas of Quantum Physics and Relativity

SPH 302: Thermodynamics

SPH 303: Quantum Mechanics I

SPH 401: Solid State Physics

SPH 402: Statistical Mechanics

SPH 403: Quantum Mechanics II

SPH 410: Electrodynamics

1ST OCT.2013-TO 14TH DEC. 2017: Tutorial Fellow at Maseno University in the department

of Physics and Materials Science

I have taught and examined the following courses:

- (i) SPH101: Mechanics
- (ii) SPH 102: Electricity and Magnetism 1.
- (iii)SPH 203: Mathematical Methods for Physics I
- (iv)SPH 205: Mathematical Methods for Physics II
- (v) SPH 206: Empirical ideas of Quantum Physics and Relativity.
- (vi)SPH 213: Dynamics and Electromagnetism Lab

SPH 303: Quantum Mechanics 1

- (vii) SPH 315: Introduction to Space Physics
- (viii) SPH 322: Space Weather

(ix)SPH 326: Thermodynamics and Solid State Electronics Lab

(x) SPH 402: Statistical Mechanics

1ST SEPT.2010-TO 30TH SEPT 2013: Graduate Assistant at Maseno University in the department of Physics and Materials Science

	Marked (graded) Undergraduate Physics laboratory
	Practical reports.
MAY 2010-SEPT.2010:	Teachers Service Commission
	Teaching station: Sirinde Secondary School
	Taught Mathematics and Physics
	Became class teacher Form 4.
JAN.2010-MAY 2010:	B.O.G teacher Maseno National School
	Taught Mathematics and Physics
	Became class teacher Form 2W
	Assisted in coaching the football team
SEPT.2009-JAN.2010:	B.O.G teacher Wang'apala High School
	Taught Mathematics and Physics
	Dormitory Master- Ng'oma dormitory
JAN.2004-AUG.2005:	Untrained teacher Horace Ongili Secondary School
	Taught Mathematics and Business studies

5. RESPONSIBILITIES

1ST AUGUST, 2024-TO DATE: Chairman, department of Physics and Materials Science
AUGUST 2023-TO DATE: Academic Leader, Bachelor of Science (Physics with IT) program.
1ST FEB.2015-TO DATE: Examination and Timetabling coordinator of the department of Physics and Materials Science of Maseno University.

DEC. 2017-TO DATE: Member of the departmental Post-Graduate Studies Committee Member of the departmental Curriculum Review Committee.

CHURCH MINISTRY

JAN2023 TO DATE:	Honorary Curate ACK St. Paul's Yala Parish
JUL. 2015-TO DATE:	Member, Kenya Anglican Men's Association (K.A.M.A)
OCT. 2012-TO DEC2022:	Lay reader at All Saints ACK-Maseno in Maseno Parish.
	Patron of Youth ministry at All Saints ACK-Maseno

COMMUNITY SERVICE

NOVEMBER 2021-TO DATE: Chairman, Board of Management, Horace Ongili Secondary School, Siaya County, Kenya.

MARCH 2019-TO DATE: Chairman, Board of Management, Huma Girls' Secondary School, Kisumu County, Kenya

MARCH 2019-TO OCTOBER 2021: Member of the Board of Management of Horace Ongili Secondary School, Siaya County, Kenya and Chairman of the Academic Committee

MARCH 2019 – TO DATE: Member of Board of Management, Maseno Girls Primary School, Kisumu County, Kenya

MARCH 2019-TO MARCH 2022: Member of Board of Management, Maseno Mixed Primary School, Kisumu County, Kenya

6. SCHOLARSHIPS AND OTHER GRANTS WON

- Workshop Grant amounting to 2,000 US dollars to conduct Space Weather and Upper Atmospheric Data Analysis Training Workshop for East African Community at Maseno University from 23rd September, 2024 to 24th September, 2024 awarded by SCOSTEP Predictability of the Variable Solar-terrestrial Coupling (PRESTO) meeting grant for 2024.
- Workshop Grant amounting to 5,000 US dollars to conduct workshop awarded by SCOSTEP Predictability of the Variable Solar-terrestrial Coupling (PRESTO) meeting grant for 2023: Meeting conducted at co-chair's institution, Muni University, Arua, Uganda from 25th-29th September, 2023.
- Scientific Committee on Solar Terrestrial Physics (SCOSTEP) Visiting Scholarship to South African National Space Agency (SANSA). Period of the Scholarship: 1st February, 2016 to 30th April, 2016 (Travel and Accommodation)

7. CONFERENCES AND WORKSHOPS PARTICIPATION

22ND -31ST OCTOBER, 2024: African Capacity Building Workshop on Space Weather and Ionospheric Research

Venue: The International Centre for Theoretical Physics (ICTP), Trieste Italy.

23RD -24 SEPTEMBER, 2024: Space Weather and Upper Atmospheric Data Analysis Training Workshop for East African Community.

Venue: Maseno University, Maseno, Kenya

3RD -12TH OCTOBER, 2023: Eastern Africa Capacity Building Workshop on Space Weather and Low-latitude ionosphere.

Venue: Broglio Space Centre, Malindi, Kenya.

25TH-29TH SEPTEMBER, 2023: Space weather and Upper Atmospheric data analysis training workshop for East African community.

Venue: Muni University, Arua, Uganda

31ST OCTOBER-4TH NOVEMBER, 2022: United Nations/Azerbaijan Workshop on the

International Space Weather Initiative: The Sun, Space Weather and

Geosphere

Venue: Fairmont Baku Hotel, Baku, Azerbaijan

24TH -28TH OCTOBER, 2022: European Space Weather Week Conference

Venue: Zagreb, Croatia

Participated online through the daily links.

3RD -14TH OCTOBER, 2022: African Capacity Building Workshop on Space Weather Effects on

GNSS

Venue: Abdus Salam Institute for Theoretical Physics, Trieste, Italy: A Hybrid event.

Participated online through the link:

https://zoom.us/w/97178779374?tk=M-H0m7N8nloxe19vm_UWvHqbUtxjWWCwBvj-

Dj5URhc.DQMAAAAWoE5-

3RD -10TH JULY, 2022: Second Summer School on Space Research, Technology and Applications

for young scientists and PhD students.

Venue: National Astronomical Observatory Rozhen, Bulgaria.

Participated online.

15TH -17TH JUNE, 2022: Kenya Space Expo and Conference

Venue: Sarit Expo Center, Nairobi, Kenya 9TH -13TH MAY, 2022: Regional Workshop on GNSS and Space Weather

Venue: Faculty of Science, Mohammed V University, Rabat, Morocco

24TH MARCH, 2022: Kenya Space Agency Space Weather Capacity Assessment

Workshop

Venue: Park Inn by Radisson, Nairobi in Westlands.

21ST -25TH FEBRUARY, 2022: 15th Quadrennial Solar Terrestrial Physics Symposium

(STP-15). A Virtual Event Hosted by the Indian Institute of

Geomagnetism, India. Platform : webEx virtual platform.

2ND - 3RD NOVEMBER, 2021: The International Space Weather Initiative

Workshop on Space Weather: Science and Applications.

Venue: Online "Microsoft Teams Meeting"

29TH MARCH, 2021: Workshop on Machine Learning based reconstruction of the inner Magnetosphere.

Venue: Online. Link: <u>https://us02web.zoom.us/w/87388701921?</u>

28TH JANUARY, 2021: Workshop on GNSS for Policy and Decision Makers.

Venue: Online. Microsoft Teams Meeting

19TH -21ST JANUARY, 2021: Workshop of GNSS Data Processing for High-

Accuracy Positioning using Low Cost Receiver Systems

Venue: Online "Microsoft Teams Meeting"

- 5TH -6TH OCTOBER, 2020: African Workshop on GNSS and Space WeatherVenue: Online "Microsoft Teams Meeting."
- 10TH-14TH JUNE, 2019: Economic Development through Radio Astronomy Workshop.

Venue: Goonhilly Earth Station, Cornwall, England, United Kingdom

27TH-31ST MAY, 2019: Workshop on Ionospheric Forecasting for GNSS Operations in Developing Countries: Findings and Challenges

Venue:	Abdus Salam International Centre for Theoretical Physics (ICTP),
	in Trieste, Italy
20 TH -24 TH MAY, 2019: Inter	national Space Weather Initiative Workshop
Venue:	Abdus Salam International Centre for Theoretical Physics (ICTP),
	in Trieste, Italy
4 TH -8 TH FEB. 2019: United	Kingdom International Conference on Optical Observatory for
Astron	omical Research.
Venue: Pri	de Inn Hotel, Raphta Road, Nairobi, Kenya.
23 RD APR 4 TH MAY. 2018	: Workshop on Space Weather Effects on GNSS Operations at
	Low Latitudes
Venue:	Abdus Salam International Centre for Theoretical Physics (ICTP),
	in Trieste, Italy
11^{тн}-15^{тн} SEP. 2017 Т	he Second International School on Equatorial and Low Latitude
I	onosphere.
Ven	ue: Covenant University, Ota State near Lagos, Nigeria.
7 TH -17 TH NOV. 2016-	The SCOSTEP/ISWI International School on Space Science.
V	enue: Smt. Kasturbai Walchand College of Science & Arts,
	Rajnemi Campus, Timber Area, Sangli, India.
21 ST -25 TH SEP.2015-	African Geophysical Society Conference
	Venue: Kenya Institute of Curriculum Development
	(KICD), Nairobi, Kenya.
4 TH -8 TH MAY, 2015	African workshop on Space Science Research
	Venue: SANSA, Hermanus, South Africa

21ST OCT.2013-1STNOV.2013: Attended ISWI/SCOSTEP School on Space Science.
Venue: Kenya Institute Of Education, Nairobi, Kenya.
23RD – 27TH SEPT.2013: Attended 2013 MAGDAS/ISWI School On Space

Weather.

Venue: Universite' Felix Houphouet-Boigny,

Bingerville, Cote d'Ivoire.

Presented a paper during the school whose details

are as follows:

Omondi G., Baki P. and Ndinya B., A study of

the East African Sector of the Equatorial

Ionosphere during selected magnetically disturbed

and quiet times.

26TH – 29TH SEPT.2011: Attended the Fourth African Leadership Conference on Space Science and Technology for Sustainable Development. Venue: Whitesands Sarova in Mombasa, Kenya.

8. PUBLICATIONS

- Uluma E., Chali I., Athwart D., Binod A., Sujan P.G., Ndinya B., Omondi G., Ashutosh G., Dessalegn T., Negasa B., Ashok S.(2024). Variability of Ionospheric Total Electron Content Over Morocco During the Godzilla Sand and Dust Storm of June 2020. International Journal of Astrophysics and Space Science 2024, Vol. 12, No. 1, pp. 1-16. https://doi.org/10.11648/j.ijass.20241201.11
- Uluma E., Chali I., Otoo S., Athwart D. Fashae J., Kouassi N., Muniafu W., Ndinya B. and Omondi G. E (2024). Observation of Travelling Ionospheric Disturbances over Morocco during the Godzilla Sand and Dust Storm of 15th to 26th June 2020 Using GNSS. International Astronomy and Astrophysics Research Journal Vol. 6, Issue 1, Pages 18-39, ; Article no.IAARJ.118250
- 3. Milimu H. Omondi G., Mungufeni P. (2023). The correlation between equatorial electrojet and equatorial ionization anomaly over the East African region during solar minimum period 2008-2009. EAJST vol4 issue 4 September 2023
- Mungufeni P., Migoya-Orue Y. Tshimangadzo M., Omondi G.E. (2022). Application of Classical Kalman filtering technique in assimilation of multiple data types to NeQuick model. Journal of Space Weather and Space Climate. Vol.12, Issue5. <u>https://doi.org/10.1051/swsc/2022006</u>
- 5. Uluma E., Ndinya B.O, **Omondi G.E. (2021).** Occurrence Characteristics of equatorial plasma bubbles over Kisumu, Kenya during solar maximum of Solar Cycle 24, International Journal of Advanced Astronomy, Vol 9. Issue1 pp.1-9.
- 6. Uluma E., Ndinya B.O, **Omondi G.E. (2020).** SCINDA-GPS derived TEC depletions and amplitude scintillations over Kisumu, Kenya during selected quiet and storm days of 2013 and 2014. International Journal of Advanced Astronomy, Vol 8. Issue no,1 pp.1-9

- Omondi G.E., Baki P. and Ndinya B.O. (2019). Total electron content and scintillations over Maseno, Kenya during high solar activity year. Acta Geophysica . DOI. 10.1007/s 11600-019-00354-7
- Omondi G. E., Baki P. and Ndinya B. (2017). Quiet Time Correlation Between Geomagnetic Field Variations and the Dynamics of the East African Equatorial Ionosphere. *International Journal of Astrophysics and Space Science*. Vol. 5, No. 1, pp. 6-18.doi: 10.11648/j.ijass.20170501.12
- Omondi G. E., Baki P. and Ndinya B. (2016). Quiet Time Geomagnetic Field Variations in the Equatorial East African Region During the Inclining Phase of Solar Cycle 24. *International Journal of Astrophysics and Space Science*. Vol. 4, No. 2, pp. 21-25.doi: 10.11648/j.ijass.20160402.11
- Omondi G.E. Baki P. Ndinya B. (2014). Signatures of low-latitude Geomagnetically Induced Currents effects on Transformers in Nairobi, Kenya. *Conference Paper, GIC Workshop*, CapeTown, April 2014.
- 11. Omondi G., Ndinya B and Baki P. (2014). Astudy of the Equatorial ionosphere over Nairobi during selected Magneticaly disturbed and Quiet times for the year 2009 Using Co-located instruments, *International Journal of Advanced Research in Physical Science*, vol1 issue 6 (18-26).
- Omondi G., Baki, P. and Ndinya, B.(2013). Characterization of Geomagnetically Induced Currents in the power grid in Nairobi, Kenya. *Lambert Academic Publishing*. 978-3-659-49839-8

BOOKS & MONOGRAPH

P. Baki & G.E. Omondi (2014). Correlation between post-sunset surface electric fields, TEC enhancements and scintillations at Low-latitude station, **Book chapter**, *American Geophysical Union*

8. CONFERENCE/ WORKSHOP PRESENTATIONS AND POSTERS

- 1. Omondi G.E. Solar wind, IMF data analysis and interpretation. *Space Weather and Upper Atmospheric data analysis training workshop for East African Community*. Maseno University, Maseno, Kenya 23rd September, 2024 to 24th September, 2024.
- 2. Omondi G.E. Occurrence of geomagnetic storms. *Space Weather and Upper Atmospheric data analysis training workshop for East African Community*. Maseno University, Maseno, Kenya 23rd September, 2024 to 24th September, 2024.
- **3. Omondi G.E.** Solar wind, IMF data analysis and interpretation. *Space Weather and Upper Atmospheric data analysis training workshop for East African Community*. Muni University, Arua, Uganda. 25th September, 2023 to 29th September, 2023.
- 4. Omondi G.E. Geomagnetically Induced Currents: The case of Kenyan electric power grid. United Nations/Azerbaijan Workshop on the International Space Weather Initiative: The Sun, Space Weather and Geosphere. Fairmont Baku Hotel, Baku, Azerbaijan. 31st October, 2022 to 4th November, 2022.
- Omondi G.E. Investigating the possibility of Geomagnetically Induced Currents in the Kenyan electric power grid. *European Space Weather Week 2022*. Zagreb, Croatia. 24th to 28th October, 2022: Poster abstract.
- 6. Omondi G.E. On geomagnetic storms and their impacts on electric power grids. *Kenya Space Expo and Conference*. Sarit Expo Center, Nairobi, Kenya. 15th June, 2022
- Omondi G.E. Space Weather Readiness: Maseno University Perspective. KSA Space Weather Capacity Assessment Workshop. Park Inn by Radisson, Westlands Nairobi. 24th March, 2022
- Omondi G.E. Effects of geomagnetic storms on equatorial geomagnetic field intensity and ionospheric total electron content at two stations in East Africa: 15th Quadrennial Solar Terrestrial Physics Symposium (STP-15). A Virtual Event Hosted by the Indian Institute of Geomagnetism, India. 21st -25th February, 2022.
- Omondi G.E, Baki, P. and Ndinya, B. Total electron content and Scintillations over Maseno, Kenya during high solar activity year. Workshop on Ionospheric Forecasting for GNSS Operations in Developing Countries: Findings and Challenges. Abdus Salaam International Centre for Theoretical Physics(ICTP), Trieste, Italy, 27th to 31st May, 2019

- Omondi G.E. On Equatorial Plasma Bubbles in Maseno. International Space Weather Initiative Workshop. Abdus Salaam International Centre for Theoretical Physics(ICTP), Trieste, Italy, 20th to 24st May, 2019.
- 11. Omondi G.E., Baki, P. and Ndinya B. Ionospheric Dynamics over Maseno, Kenya . *The Second International School on Equatorial and Low Latitude Ionosphere*. Covenant University, Ota State near Lagos, Nigeria, 11th to 15th September, 2017.
- Omondi G.E. An investigation Of Geomagnetically Induced Currents in the power grid in Nairobi, Kenya and its connection to unexplained power Failures. *African Geophysical Society Conference*, Kenya Institute of Curriculum Development (KICD), Nairobi, Kenya. 21st-25th September, 2015.
- 13. Omondi G. and Baki P., Correlation between geomagnetic field variations and the dynamics of equatorial ionosphere over Eastern Africa. African workshop on Space Science Research, SANSA, Hermanus, South Africa, 4th-8th, May, 2015
- 14. Baki, P., **Omondi, G.E**. and Ndinya, B.O. Signatures of Geomagnetically Induced Currents in the Power Grid in Nairobi, Kenya, *GIC Workshop*, University of Cape Town, South Africa, 1-2, April, 2014.

10. THESIS

 Doctor of Philosophy (Ph.D) in Physics: Correlation between geomagnetic field variations and the dynamics of the equatorial Ionosphere over East Africa (2017).
Master of Science in Physics: Characterization of geomagnetically induced currents in the power grid in Nairobi, Kenya

11. POSTGRADUATE THESIS SUPERVISION

 Uluma, Edward Nyongesa. Master of Science in Physics (Space Science), Masinde Muliro University of Science and Technology. Date of graduation: 18th December, 2020

- Obuya, Lucy. Master of Science in Physic (Space Science), Maseno University. Date of graduation: 15th December, 2023
- Anekha Hannington Milimu. Master of Science in Physics (Space Science), Maseno University. Date of graduation: 15th December 2023

12. ONGOING POSTGRADUATE THESIS SUPERVISION

- Uluma, Edward Nyongesa. Doctor of Philosophy in Physics (Space Science), Masinde Muliro University of Science and Technology
- 2. Obuya Lucy. Doctor of Philosophy in Physics (Space Science), Maseno University
- **3.** Anekha Hannington Milimu. Doctor of Philosophy in Physics (Space Science), Maseno University.
- **4. Muniafu Wilberforce.** Master of Science in Physics, Masinde Muliro University of Science and Technology.
- 5. Odhoch Edwin Odera. Master of Science in Physics, Maseno University

13. THESES EXAMINED

1. Patrick Muga Owiny (MSC/SC/00015/017). Photon-Anti-Bunching Properties of the Anti-Jaynes-Cummings Model. Master of Science in Physics, Maseno University.

2. Aduogo Peter Onyango (PG/MSC/00023/012). *The cooling effect of Air on Flat Plate Solar collectors*. Master of Science in Physics, Maseno University.

3. Christopher Mayero (PHD/SC/00015/016). 'Entanglement of Atom-Field states in the Anti-Jaynes-Cummings Interaction: Rabi Oscillations and Quantum Teleportation of Entangled Atomic Qubits. Doctor of Philosophy in Physics

MEMBERSHIP IN PROFESSIONAL BODIES

- 1. Member of the African Geophysical Society (AGS)
- 2. Member of the Physics Society of Kenya (PSK)

TRAINING IN HIGHER EDUCATION TEACHING

JUNE 2022 TO DECEMBER 2022: Centre for Postgraduate Studies, Rhodes University Strengthening Postgraduate Supervision Course

HOBBIES

Reading academic and Godly spiritual material Listening to Christian gospel music

REFEREES

1. PROF. PAUL BAKI DEPARTMENT OF PHYSICS AND SPACE SCIENCE TECHNICAL UNIVERSITY OF KENYA P.O BOX 52428-00200 NAIROBI, KENYA CELL:+254713784534/+254734524066 E-MAIL:paulbaki@gmail.com

- 2. PROF. ANDREW ODUOR DEPARTMENT OF PHYSICS AND MATERIALS SCIENCE MASENO UNIVERSITY P.O BOX 333-40105 MASENO, KENYA CELL: +254786603444 +254722334179 E-MAIL: andrewoduor22@gmail.com
- 3. PROF. RECCAB OCHIENG' DEPARTMENT OF PHYSICS UNIVERSITY OF ZAMBIA CELL: +254733792758 E-MAIL: reccabo@yahoo.com

4. PROF. BONIFACE OTIENO NDINYA DEPARTMENT OF PHYSICS MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY P.O BOX 190-50105 KAKAMEGA, KENYA CELL: +254728960153 +254733542065

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