

Physics in Africa Questionnaire

Instructions:

- Please complete the questionnaire in the spaces provided; the spaces are not limited add more details and table rows when needed.
- Please feel free to add any additional information about the state of physics in your country and emphasizing/prioritizing where support is most needed.
- If you have any questions regarding the intent/content of any question in questionnaire email **Dr. J. E. Gubernatis** jg@lanl.gov
- Email completed questionnaires and any additional documents to physafrica@saip.org.za

1. Name and contact information of the lead respondent.

Title:	Prof
First Name:	George
Surname:	Amolo
Institution Name:	The Technical University of Kenya
Address:	PO Box 52428 - 00200
City:	Nairobi
Country:	Kenya
Email Address:	georgeamolo862@gmail.com
Phone Number:	
Mobile / Cell:	+254-(0)729 401249

2. Names and email addresses of any others to acknowledge with respect the preparation of this response.

Name & Surname	Institution	Email Address
Dr Nicholas Makau	University of Eldoret	wambua@uoeld.ac.ke
Dr Ken Kaduki	University of Nairobi	kaduki@uonbi.ac.ke
Dr George Manyali	Masinde Muliro University of Science and Technology	gmanyali@mmust.ac.ke

3. Does your country have a physical society?

YES	X	NO	
-----	---	----	--

a. If YES please complete the details below

i.	Physical Society Name:	Physics Society of Kenya
ii.	Contact Person:	Prof George Amolo
iii.	Phone:	+254-(0)729 401249
iv.	Web site	http://physicsocietykenya.org/
v.	Contact Email	georgeamolo@physicsociety.org
vi.	Society	Prof Paul Baki

	President Name:	
vii.	Society President Email:	paulbaki@physicsociety.org
viii.	How many members does it have?	Over 150
ix.	How frequently does it meet?	At least twice a year.
x.	Are there any other regularly occurring or special activities?	Conference presentations by various research groups
xi.	Does it have a focus on any specific fields of physics?	Astronomy, Optical and Laser Physics, Condensed Matter Physics, Solar Energy

b. If not,

i.	Are there plans to establish a physical society? Please explain	N/A
ii.	Is assistance needed in doing so? Please explain	N/A

c. Does your country have an Astronomy Society and programmes if yes give details below

Yes it does. The East African Astronomical Society - <http://www.astronomy-eastafrika.org/>

4. What universities in your country grant bachelor, masters, and doctoral degrees in physics? On average, how many degrees does each university

grant per year at each level? Please provide your answers in the table below

University Name	website	Number of Degrees Granted / Year			
		Bachelors	Hons	Masters (MSc / MPhil)	Doctoral (PhD/DPhil)
University of Nairobi	www.uonbi.ac.ke		70	10	4
University of Eldoret	www.uoeld.ac.ke		30	6	2
Kenyatta University	www.ku.ac.ke		40	8	1
The Technical University of Kenya	www.tukenya.ac.ke		30		1
Moi University	www.mu.ac.ke		15	2	
Technical University of Mombasa	www.tum.ac.ke		20	6	1
Pwani University	www.pwani.ac.ke		20	4	
Masinde Muliro University of Science and Technology	www.mmust.ac.ke		20	6	2
Jomo Kenyatta University of Agriculture and Technology	www.jkuat.ac.ke		20	3	2

a. Upon receiving a bachelor's degree in physics, does the student typically seek an advanced degree/qualification in physics?

YES	X	NO	
-----	---	----	--

b. About what percentage obtain these advanced degrees/qualifications in the country?

40%

c. If the degree/qualification is sought outside the country, in which countries (over the last five years)?

South Africa and Europe (under a sandwich arrangement)

d. Do post-doctoral opportunities exist within the country?

YES		NO	X
-----	--	----	---

i. If not, in which countries do graduates undertake post-doctoral opportunities?

South African and Europe

5. If any university has a major research institute, center, or specialized program, please identify the activity and university. If yes approximately how many physicists (students and faculty) are associated with each activity. Please complete table below

University Name	Research Center/Programme Name	Approximate Number of Physicists
University of Eldoret	Materials Modeling	2 staff; 3 PhD
The Technical University of Kenya	Materials Science and Materials modeling	4 staff; 6 PhD
University of Nairobi	Optical and Laser Spectroscopy	3 staff; 3 PhD
University of Nairobi	Solar Energy Laboratory	4 staff; 2 MSc

6. If there are government or industrial sponsored major research institutes, centers, or specialized physics programs not part of the above, please list them below including the approximate number of physicists associated with each?

Physics Related Institutions Name	Website	Approximate Number of Physicists
Kenyatta National Hospital	http://knh.or.ke/	2
Mines and Geology	http://www.environment.go.ke/	

Physics Related Institutions Name	Website	Approximate Number of Physicists
Kenya Bureau of Standard	https://www.kebs.org/	6
Kenya Industrial Reseach and Development institute	http://www.kirdi.go.ke/	5

7. How many people trained as physicists (at bachelors, masters, or Ph.D. levels), but do not identify as physicists in the sector in which they are currently working, are working in the following:

a. At universities or at institutions described in question 5,

None

b. At institutions described in question 6.

Bsc - about 10; Msc - about 6; PhD - 0.

c. Are they working in particular areas such as agriculture, medicine, energy, environment, etc.?

Medicine and Metrology

8. Do the Internet, and wireless services available at the major universities support live streaming, video conferencing, etc.?

YES

a. Are any physics courses taught online?

YES		NO	X
-----	--	----	---

b. If Yes, please provide course web link/s

9. Please list any physics conferences, workshops, and schools held in your country over the past 5 years. If not too onerous, please give the names, locations, dates, and identities of principal sponsors.

Conference/Workshop Name	Website	Location	Dates	Sponsors if Known
National Physics Forum		Eldoret, Kenya	February 2012	Kenya Government
2 nd African School on Electronic Structure Methods and Applications (ASESMA) School	https://sites.google.com/site/asesmasite/	University of Eldoret, Kenya	May/June 2012	ICTP, IUPAP, Kenya Government, DAAD, ICSU ICMR.
Materials Society of Solar Energy for East and Southern Africa		University of Nairobi;	August 2014	IPPS (Sweden)
Workshop on Nanotechnology		Kenyatta University;	September 2014	Kenya Government
Entrepreneurship skills for Scientists and Engineers		Nairobi;	December 2014	IOP and Kenya Government

10. Please feel free to add any additional information about the state of physics in your country and emphasizing/prioritizing where support is most needed.

Kenya has the potential to get matters related to physics actively going if there is a dedicated secretariat to oversee the administrative issues of the society. The support to establish an effective secretariat could begin with a grant for a specified period of time and later the society urged to create income generation channels as a way of continued sustenance. This is something that the secretariat of the PSK is currently considering.

There is need to lobby the Kenya Government on the importance of basic science and physics in particular. In the last couple of years physics has been seen as a difficult subject and relegated as an option in high school in the Kenyan education system. This calls for mentorship initiatives from the high school level to the early years of the undergraduate level, with improved states of laboratories as well as some incentives. Physics Teachers in high school need to be recognized and motivated to encourage their students to choose and pursue physics. There have been suggestions to the Kenya Government through the National Commission for Science, Technology and Innovation to create a national physical sciences laboratory to inspire and prepare the young as well as upcoming generation to handle activities related to the attainment of Kenya Vision 2030. The Kenya Government has accepted this suggestion but no movement has been seen with regard to implementation.

At the continental level, there is need to involve the African Union, which appears to be awakening in the last couple of years. Due to the large size of the continent, regional clusters may be considered in the short to medium term as a way of ensuring the activities are taking place in most regions of Africa. I would like to recognize the efforts created by the older generations of African scientists. However, it is vital that a new generation of Physics leaders be developed, supported as well as mentored to ensure continuity and the creation of a science and technology culture among the youth and upcoming young scientists.

I cannot grow tired of indicating that any initiatives to support Africa must be carefully placed in groups/activities that have been running by themselves through limited support but with inherent self-drive. Recently, a special interest group on Computational Modeling and Materials Science has been created in Kenya with the

support of the Kenya Education Network (<https://www.kenet.or.ke/>). Such a group needs support since the initiative is local and envelopes all Kenyan universities and research institutions. Africa has its own unique problems ranging from politics, ethnic challenges, among others. These sentiments come from experiences based even in Kenya alone where the National Commission of Science, Technology and Innovation, Kenya Government, decided to provide some new institutions with atomic absorption spectrometers, in the name of equity and regional balance, and left institutions where there was proven productivity in terms of graduate student training and research. To date, as I write complete this questionnaire, the equipment is lying unused as well as unserviced. It is not possible to help every part of Africa however ideal and noble the intention may be. Strengthening existing initiatives is likely to have a bigger impact since their models of operation can be duplicated to other African regions as practical and successful examples.

THANK YOU
--The End --