Five Years of EMEJA: A SCALABLE MODEL FOR GIRL'S EDUCATION IN RURAL AFRICA

Dr. Ann Njeri, AfAS 2026

Disclaimer: Images of minors - consent has been granted by their parents.

Elimisha Msichana Elimisha Jamii

na Astronomia

www.elimishamsichana.org

Statistics:

- In Kenya, although 70.4% of girls (15-19yrs) achieve some sort of primary education only 32.9% complete secondary education *-WB, 2022.*

- **86.5% of girls aged 9-13 years** live in rural Kenya with 80.8% of them attending primary school but only 14.3% enrolling for secondary *(UNESCO, 2012).*

- Only 3.5% of women (aged 15+) have completed tertiary education-WB, 2015.

- 1M children in Kenya were still not in school, 9th highest in the world-UNESCO 2010

Socio-Economic Issues

- **Poverty:** -1/3 Kenyans live below international poverty line $2.15/day

- Period poverty-girls missing school every month

- **Teenage Pregnancies:**
- 1/4 of Kenyan women give birth by the age of 18, ~ *Rutger International*

- 13,000 teenage girls drop out of school every year due to pregnancy – GoK 2017

- Teenage motherhood major threat rural women.

- **Early Marriages:** -1 /3 girls in developing countries is married before 18, and 1 in 9 is married before turning 15- UNFPA
- Kenya has the 20th highest absolute number of child brides in the world (527,000)-*UNICEF 2014*

- **Female Genital Mutilation (FGM), lack of role models/mentorship, etc**

africanews. EN NEWS

NEWS BUSINESS SPORT CULTURE SCIENCE & TECHNOLOGY NO COMMENT PROGRAMMES CORONAVIRUS

Close to 4,000 school girls impregnated in Kenya during Covid-19 lockdown

GLOBAL CITIZEN ISSUES TAKE ACTION REWARDS PARTNERS STORE VAX LIVE ENGLIS

NEWS DEMAND EQUITY

Rise in Teenage Pregnancies in Kenya Linked to COVID-19 Lockdown

Movement restrictions and school lockdowns make it harder for girls to access sexual health care.

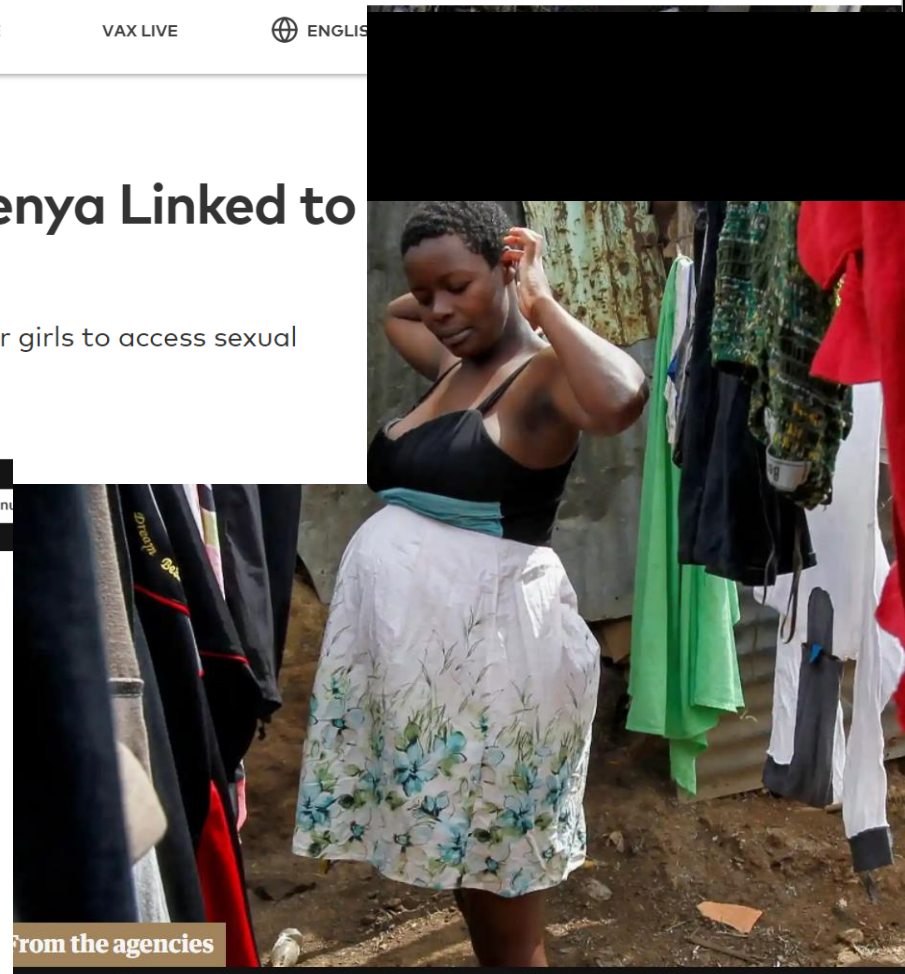
REUTERS World Business Markets Breakingviews Video More

HEALTHCARE & PHARMACEUTICALS NOVEMBER 16, 2020 / 10:06 AM / UPDATED 7 MONTHS AGO

Teenage pregnancies rise in parts of Kenya as lockdown shuts schools

By Ayenat Mersie 3 MIN READ

NAIROBI (Reuters) - Jackline Bosibori wept when she found out she was pregnant. The 17-year-old's mother, who is raising six kids alone, collapsed in their one-room home. They had been repeatedly threatened with eviction and couldn't afford another mouth to feed.



From the agencies

Student pregnancies rise in Kenya's lockdown - in

Project Goals:

Overarching objective is to ensure 100% transition between primary-to-secondary education for schoolgirls in rural areas of Kenya & Uganda

Using Astronomy-themed events & Activities:

1. Engage local communities & discuss socio-economic issues and positive ways of tackling them
2. Increase the number of girls completing secondary education, especially in rural areas
3. Increase the number of girls selecting Physics/STEM subjects in high school
4. Develop resources for often underfunded rural secondary schools
5. Create computer literacy among high school students

I. Outreach & Mentorship:

Leadership & m'ship Aimed for girls in Primary School (12-16yrs)

Meetings & discussions with Girls (Mentees), parents, teachers & key stakeholders

- Paired Mentees with mentors
- ~20 Schools

Small peer groups for discussions


MANCHESTER 1824
Newcastle University
Certificate of Participation
awarded to
Elimisha Msichana
Elimisha Jamii

II. Tracking & Monitoring:

Aimed for girls (EMEJA Mentees) in Secondary School (14-18yrs)

1. Pair each class 8 girl (Mentee) with a mentor/role model

2. Long term mentorship through secondary school ~4yrs

3. Long term tracking & monitoring in Secondary school: Phone calls and one-on-one/ 2 x per year

~4,500 Girls tracked annually

III. Tuition Fee Scholarships:

Aimed for girls (EMEJA Mentees) in Secondary School (14-18yrs)

1. Aimed for genuinely economically disadvantaged girls

2. Secondary tuition fees ~350£ per year

3. Working with local day secondary schools

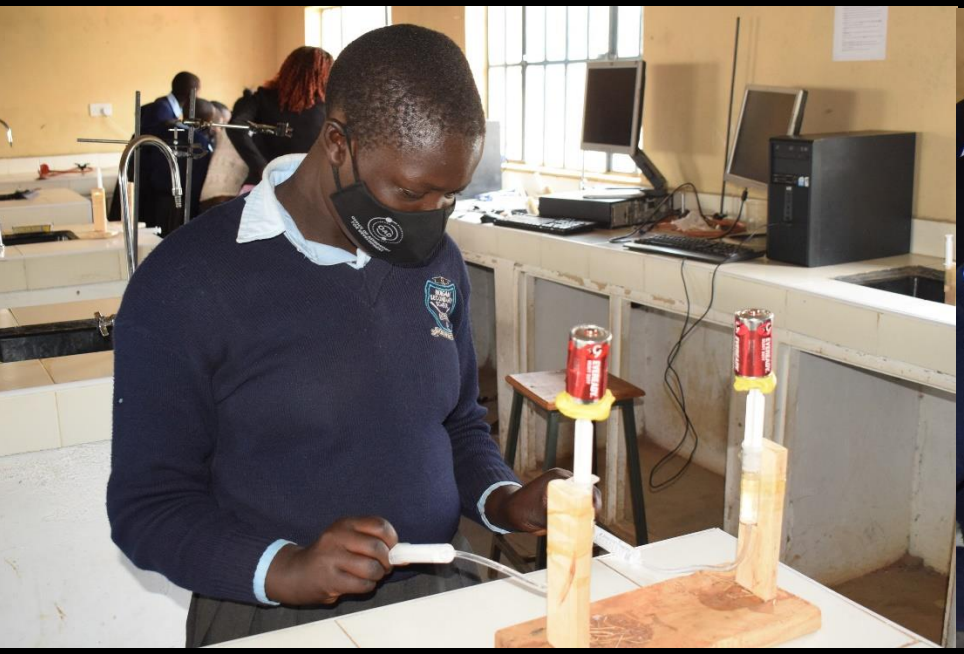
IV. Astro-STEM Workshops & Mentorship:

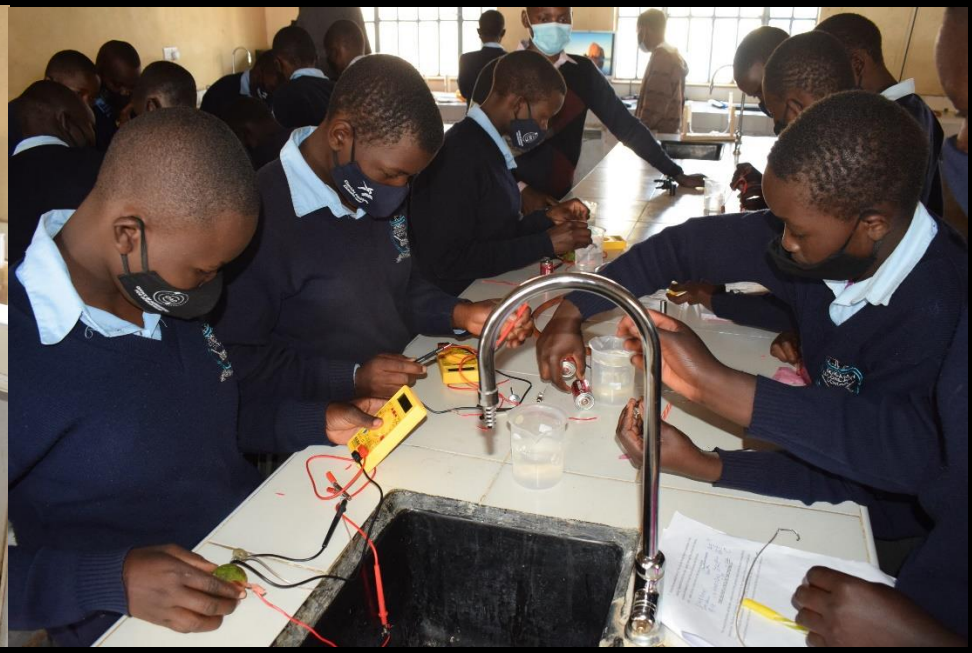
Aimed for Years 1&2 Secondary schoolgirls (14-16yrs)

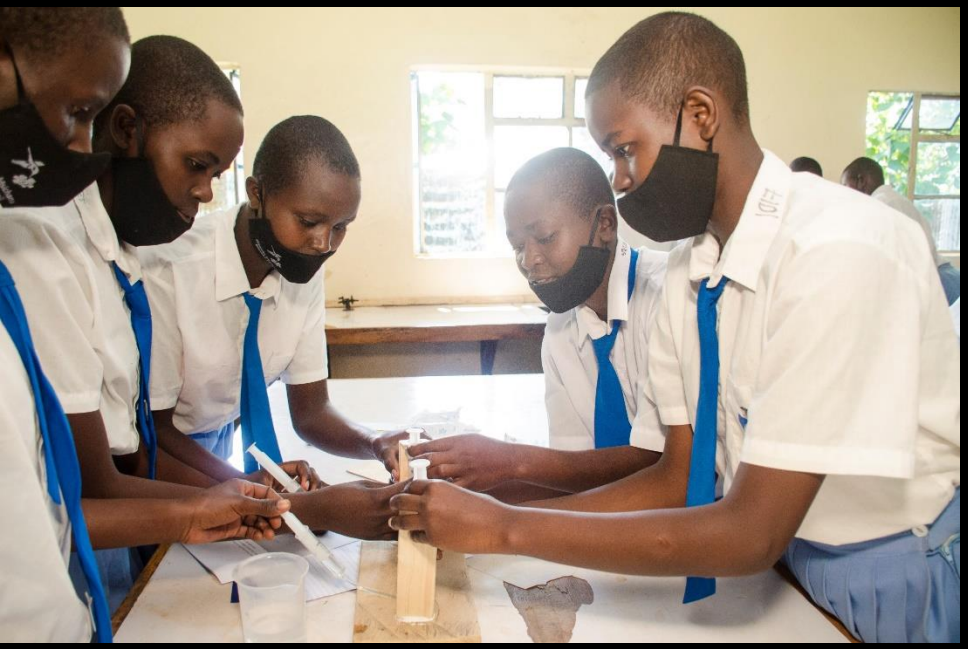
1. Change misconceptions about STEM subjects among schoolgirls.

2. Improve grades in STEM subjects & early participation of girls in sciences.

3. Increase No. of girls selecting Physics in Year 3-4 & sitting for the Physics national exam in KCSE.



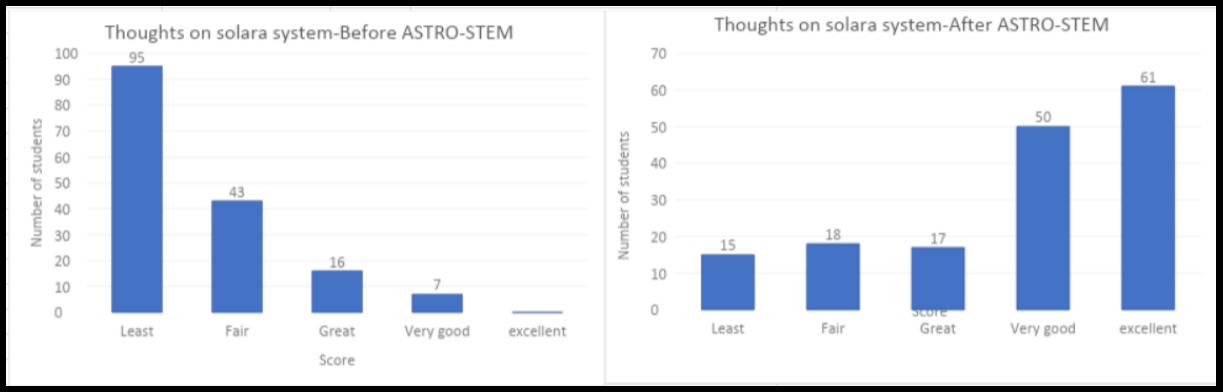




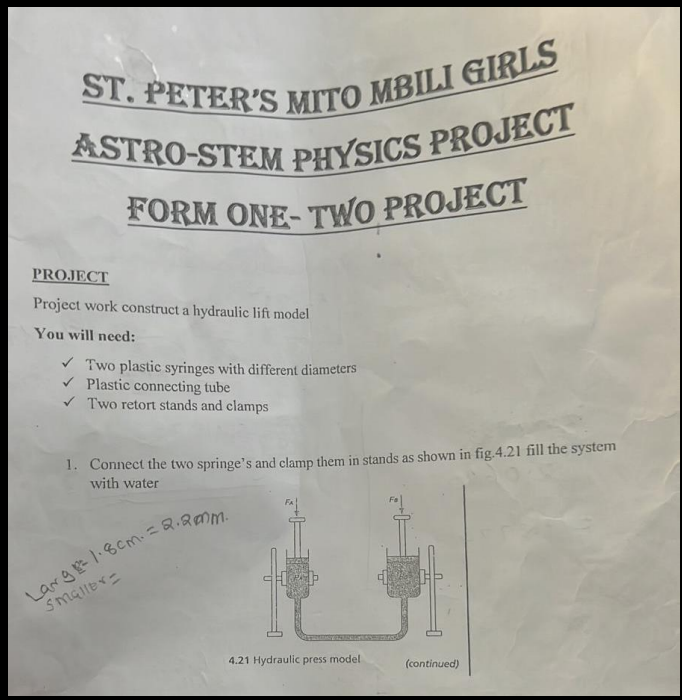
2-Day events: Delivered through lectures, presentations, hands-on practicals & direct engagement with students

Subjects: Physics, Astronomy/Geography, Computers, Mentorship & STEM Career guidance

STEM teachers, Astro-STEM tutors



Describe the solar system?



ST. PETER'S MITO MBILI GIRLS

ASTRO-STEM PHYSICS PROJECT

FORM ONE- TWO PROJECT

PROJECT

Project work construct a hydraulic lift model

You will need:

- ✓ Two plastic syringes with different diameters
- ✓ Plastic connecting tube
- ✓ Two retort stands and clamps

1. Connect the two springe's and clamp them in stands as shown in fig.4.21 fill the system with water

Larger = 1.8cm. = 2.2mm.

Smaller =

4.21 Hydraulic press model

(continued)

Underfunded & Underdeveloped: Create resources for the target 5 schools e.g physics lab equipment

Multimeters

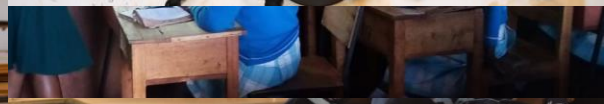
Tubings

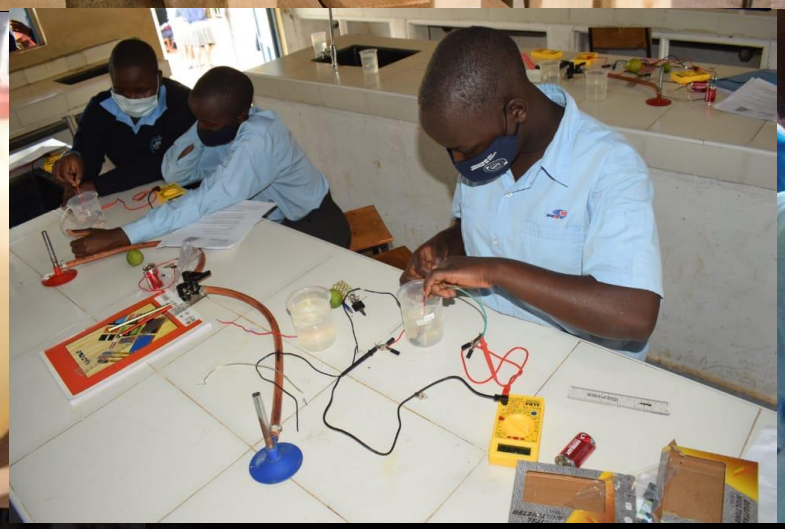
Copper, zinc wires, cables, crocodile clips

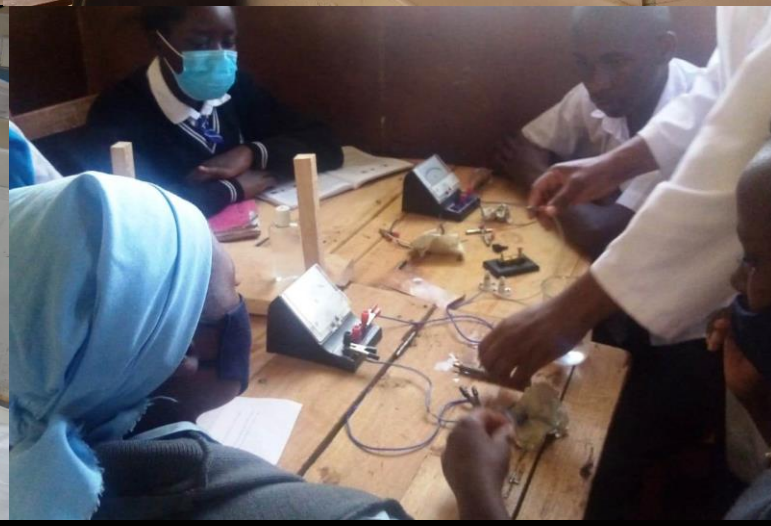
Bulbs

Syringes

Lab stands

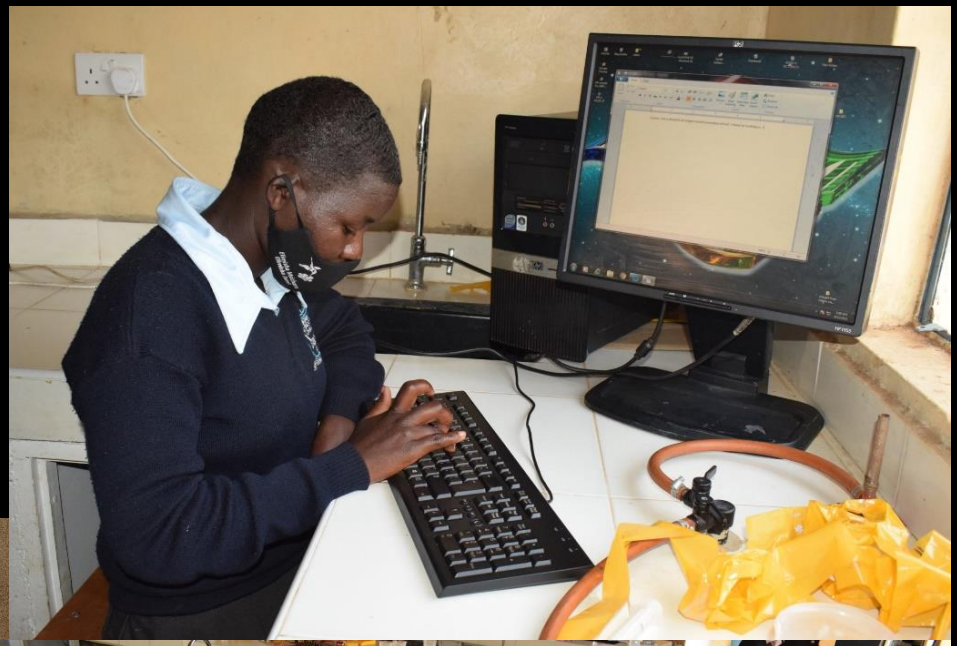


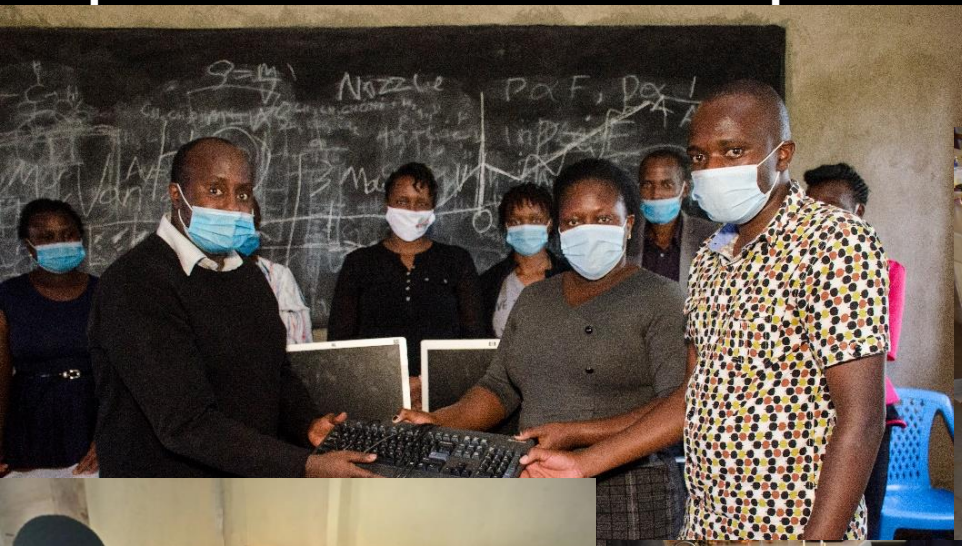


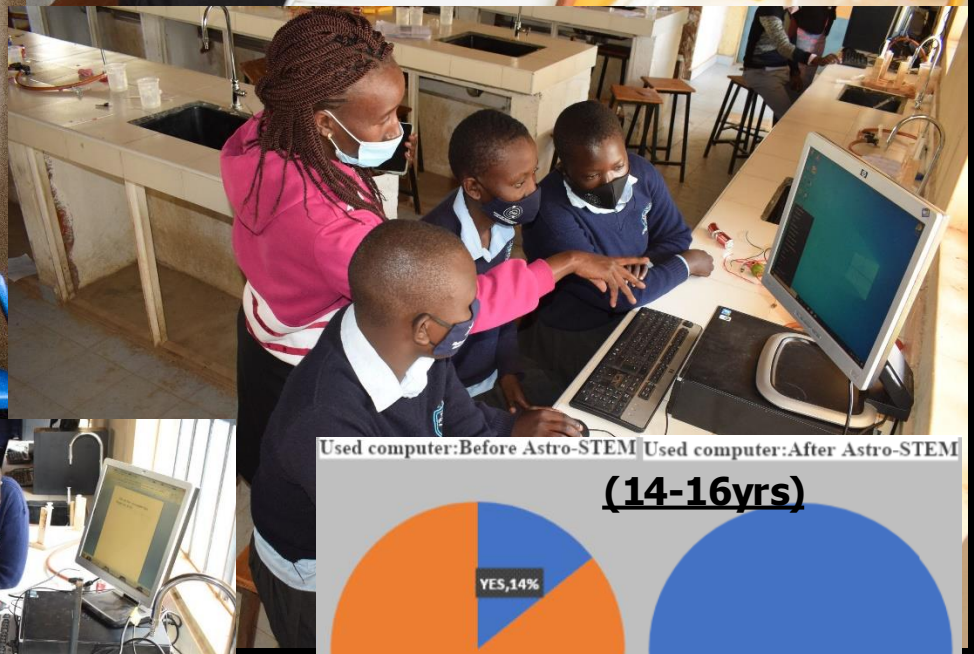


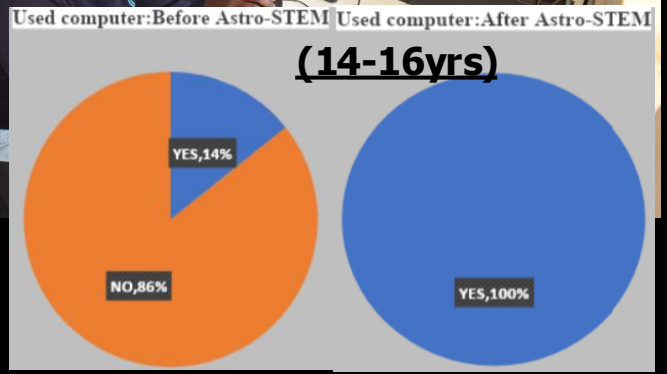
V. Computer Literacy:

1. Computer literacy non-existent
2. Lack of computer labs – create resources for underfunded/underdeveloped schools
3. Introduction to computers @ Astro-STEM
4. provided 5 schools with 30 computers









VI. Teacher Development Programme:

For secondary school teachers: Astronomy & STEM delivery in classroom

Uganda

Outreach, Mentorship, student tracking & STEM Workshops

Isidingiro District Schools:
1. Kitooma Pri. School
2. Birere Mixed Pri. Sch
3. Rutsya Pri. Sch
4. St. John's Rutsya: Deaf & hearing impaired

Outreach, Mentorship, student tracking & STEM Workshops


KITOOMA PRIMARY SCHOOL

TERM 1 YEAR 2023

CLASS	BOYS	GIRLS	TOTAL
PRIMARY 1C	38	36	74
1B	32	19	51
1A	37	22	59
2	34	44	78
3	35	39	74
4	33	34	67
5	13	32	45
6	24	22	46
7	19	17	36
TOTAL	265	265	530

Figure 1: School enrollment as per 2023

2023/2024 tracking

1. Kitooma sch:

Grade 1 = 77 girls

Grade 7 = 17 Girls

80% of girls already dropped out!!!

Grade 7 = PLE = 17 girls

11/17 = joined secondary

35% already dropped out of school

65% enrolled in Year 1 (not completed)

Results: 2019-2025

1. **Outreach, mentorship & community engagement:** ~40,000 schoolgirls (+boys) reached; hosted ~100s events in Kenya and Uganda

2. **Long-term student tracking & monitoring:** 5,000 girls tracked/mentored (2019,2020,2022,2023,2024,2025,2026)

3. **Tuition fees scholarships:** 30 girls taken through highschool (tuition fees + upkeep, medical care, child care, etc)

4. **Astro-STEM Workshops & Mentorships:** 23 workshops hosted; ~7,000 girls (+boys) engaged

5. **Lab infrastructure development:** donated 100s of lab equipment to participating schools

6. **Computer literacy:** trained ~ 7,000 girls (+boys) in basic computer usage, donated 30 computers to 5 schools

7. **Teacher development program:** trained 20 teachers in STEM padagogies

Outcomes/Impact: 2019-2025

- **Outreach, mentorship & community engagement:** more girls enrolling for secondary education; capped school absenteeism; reduced teen pregnancies (0 in one school); massive community support.

- **Long-term student tracking & monitoring:** Increased no. of girls completing secondary education; a large number enrolling for college than previously; Classes of 2019 & 2020 now EMEJA mentors.

- **Tuition fees scholarships:** 4 completed now in college; 25 still in school

- **Astro-STEM Workshops & Mentorships:** Improved STEM grades; Physics now best performed subject in these schools; more girls are now selecting Physics

- **Lab infrastructure development:** Physics labs now well equipped thus improved delivery of Physics across 5 schools

- **Computer literacy:** increased computer literacy; forced schools to set up computer labs; schools now offering computer studies as part of the curriculum (previously not offered due to a lack of computers)

Teacher development program: now 1,000s of students benefiting

Outcomes/Impact: 2019-2025

1. Improved grades in STEMs & early participation of girls in sciences

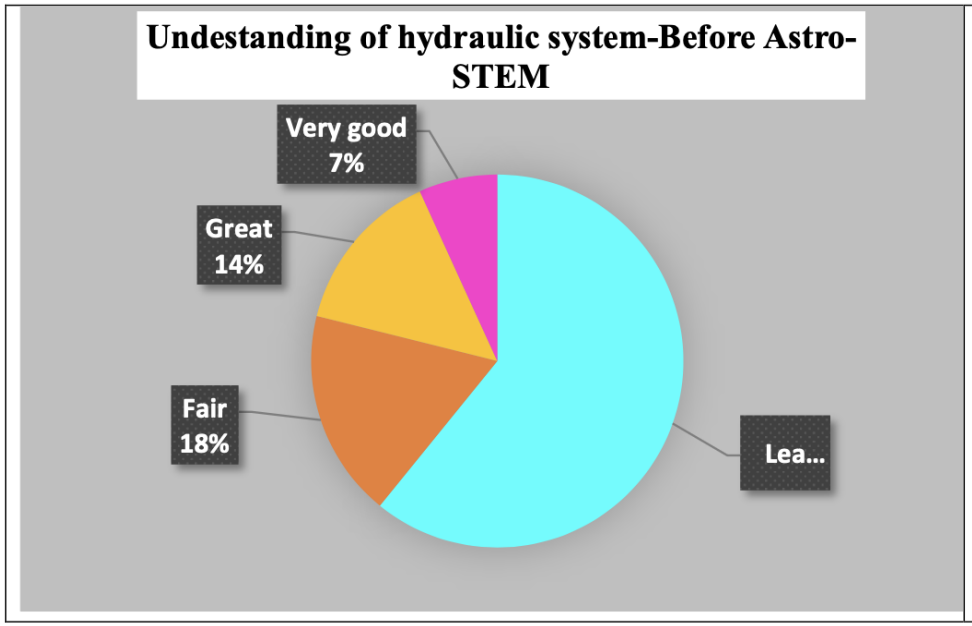
-Improved average grades in Physics, Mathematics & Geography across all the 5 schools.

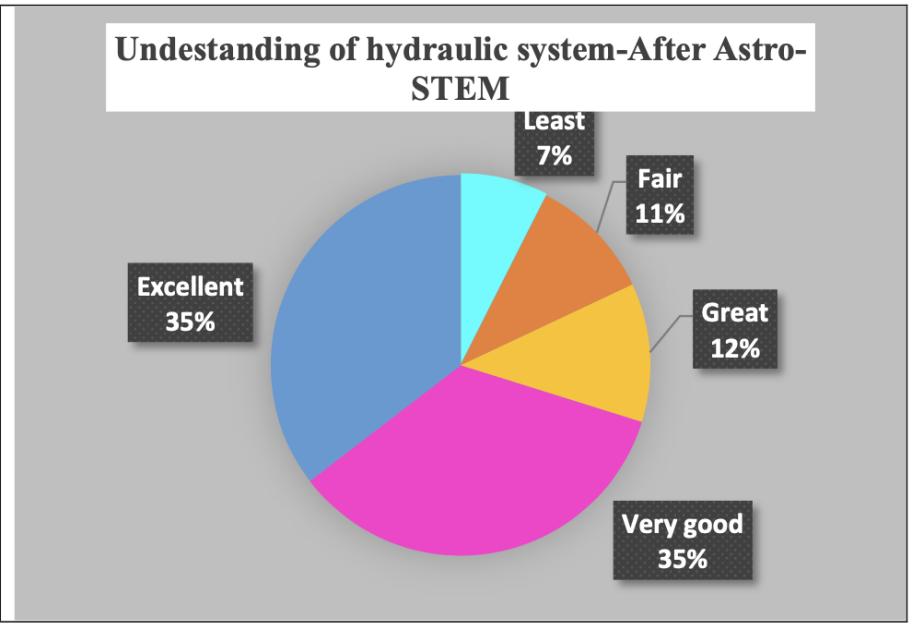
-No. increase, e.g in Year III: 1 Female Physics student before Astro-STEM to 17 girls after Astro-STEM! 1600%

2. Change misconceptions about STEM subjects among schoolgirls

-Attitudes have changed, more girls involved in STEM activities across the schools.

ST PETERS MITO MBILI GIRLS HIGH SCHOOL BEFORE AND AFTER ASTRO-STEM FEEDBACK





Outcomes/Impact:

0 Computers – 30 Computers – To 5 Computer Labs – Now offering Computer studies as part of Kenya curriculum; Equipped physics labs

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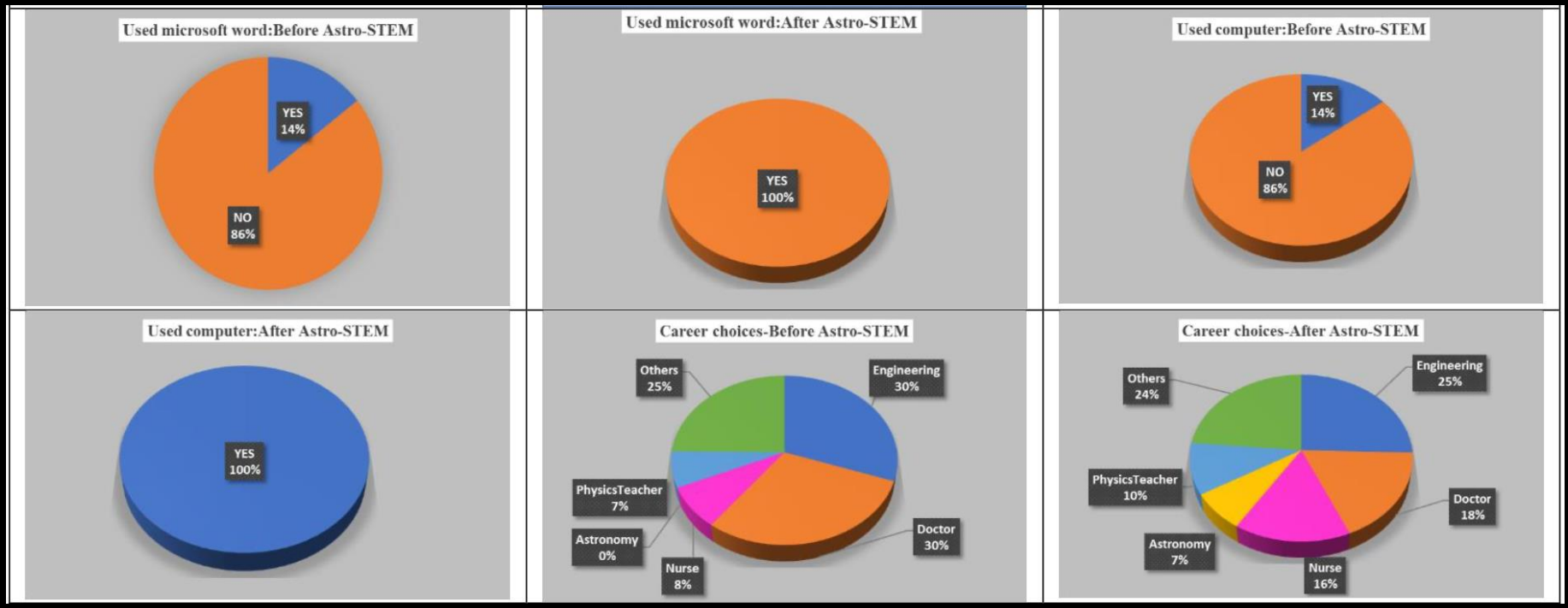


Outcomes /Impact:

Improved school infrastructure: equipped labs

Table 6: Building School Infrastructure

Year	2021		2023		2024	
School	Item	Units donated	Item	Units donated	Item	Units donated
Noigam	Digital multimeters	19	-	0	Ripple tank	1 @ $600
	Syringes (10ml)	63				
	Syringes (20ml)	63				
	3V bulbs	31				
	Crocodile clips	126				
	Silicone as plastic glue	2 tubes				
	Cable (black and red)	28m				
	Nails	0.6kgs				
	Copper wire	1.3m				
	Dilute Sulphuric acid	3l				
	Tubing	16m				
	Computers	2	Computers	2	Computers	1
St. Peters Girls	Digital multimeters	16	Convex lenses	25	Stop watches	20
	Syringes (10ml)	54	Concave mirrors	25	Meter Rule	20
	Syringes (20ml)	54	Cross-wire	5	Spring with pointer	20
	3V bulbs	27	White screen	5	Retort stand	10
	Crocodile clips	107	Lens holder	10	Clamps+bosses	10
	Silicone as plastic glue	2 tubes	Meter rule	5	100g masses	20
	Cable (black and red)	25m			50g masses	20
	Nails	0.5 kgs				
	Copper	1m				
	Dilute Sulphuric acid	3l				
	Tubing	13m				
	Computers	2	Computers	2	Computers	1
UPEC Girls	Digital multimeters	7	Weighing balance	1	Pendulum bobs	10
	Syringes (10ml)	23	Vernier calipers	5	Thread (m)	100
	Syringes (20ml)	23	Boiling tubes	20	Meter rules	10
	3V bulbs	12	250 ml beaker	10	Stop watches	15
	Crocodile clips	46				
	Silicone	1 tube				
	Cables (black+red)	10m				
	Nails	0.3 kgs				
	Computers	5				
Igikiro Mixed	Digital multimeters	18			Resistor wire SWG-28	100
	Syringes (10ml)	60			Meter rules	10
	Syringes (20ml)	30			Dry cells (1.5V)	12
	3V bulbs	30			Two-cell hold	12
	Crocodile clips	121			Voltmeter (0-5V)	5
	Silicone tubes	2			Ammeter (0-1A)	5
	Cables (m)	27			Connecting wireS (roll)	1
	Nails (kg)	0.6			Micrometer guage (25mm)	5
	Copper (m)	1.2			Pliers	2
	Sulphuric acid (ltr)	3			Graph papers (reams)	1
	Tubing (m)	15			Switch key	12
	Computers	-	Computers	10	Computers	-

How the project runs: the Team

100s of volunteers
Mentors

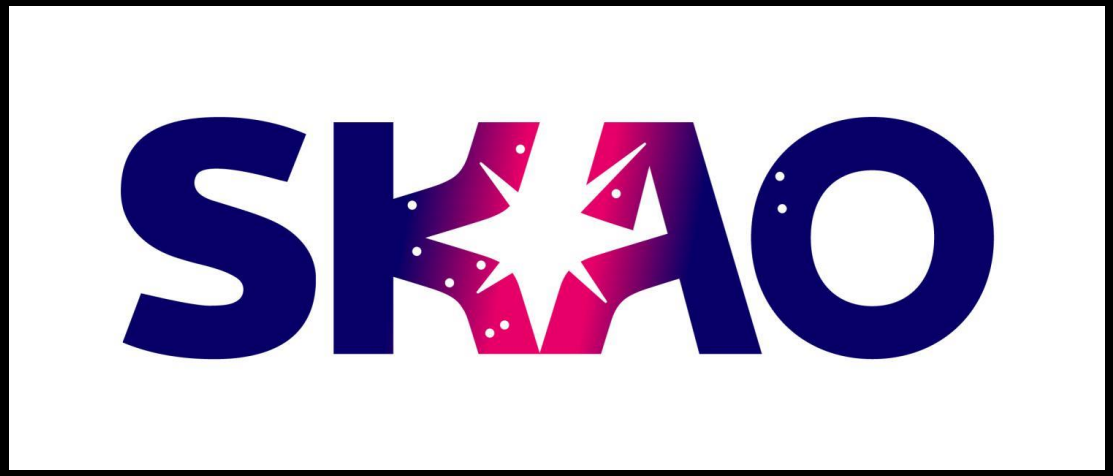
Astro-STEM tutors and mentors
100s of local teachers

mentors+tutors+local university students

Locations:
Murang'a, Nairobi &
Kitale counties
+(Isidingiro)Uganda

Data collection: quizzes, questionnaires/feedback student's details Qualitative+quantitative

Future/Sustainability



45,000 Euros 2026-2028

Using OAD-funding model

Same project model:
Kenya & Uganda
Covering more/new schools/new regions
Expanding into Tanzania

EMEJA Contributing to UN SDGs:

'Secondary education completes the provision of basic education that begins at the primary level, and aims to lay the foundations for lifelong learning and human development' - **The World Bank.**

2025 Science Outreach shortlist

Ann Njeri, Elimisha Mischana Elimisha Jamii

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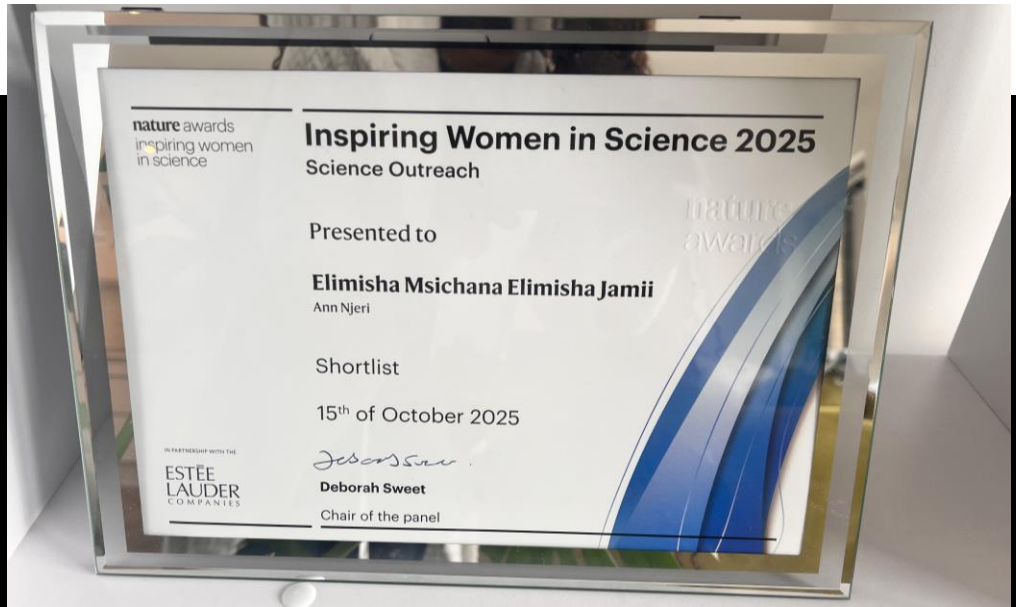
Elimisha Mischana Elimisha Jamii (Swahili for "Educate a girl, educate the entire community") is a grassroots initiative founded by Ann Njeri. She is advancing STEM education and mentorship for schoolgirls in rural Kenya and Uganda. Through workshops, computer literacy, teacher training, and science lab development, she equipped students with skills, confidence, and opportunities to excel in STEM subjects and careers.



OAD

OFFICE OF ASTRONOMY FOR DEVELOPMENT

science & innovation
Department:
Science and Innovation
REPUBLIC OF SOUTH AFRICA

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NRF SAAO
National Research Foundation | South African Astronomical Observatory

MANCHESTER 1824

The University of Manchester

Newcastle University

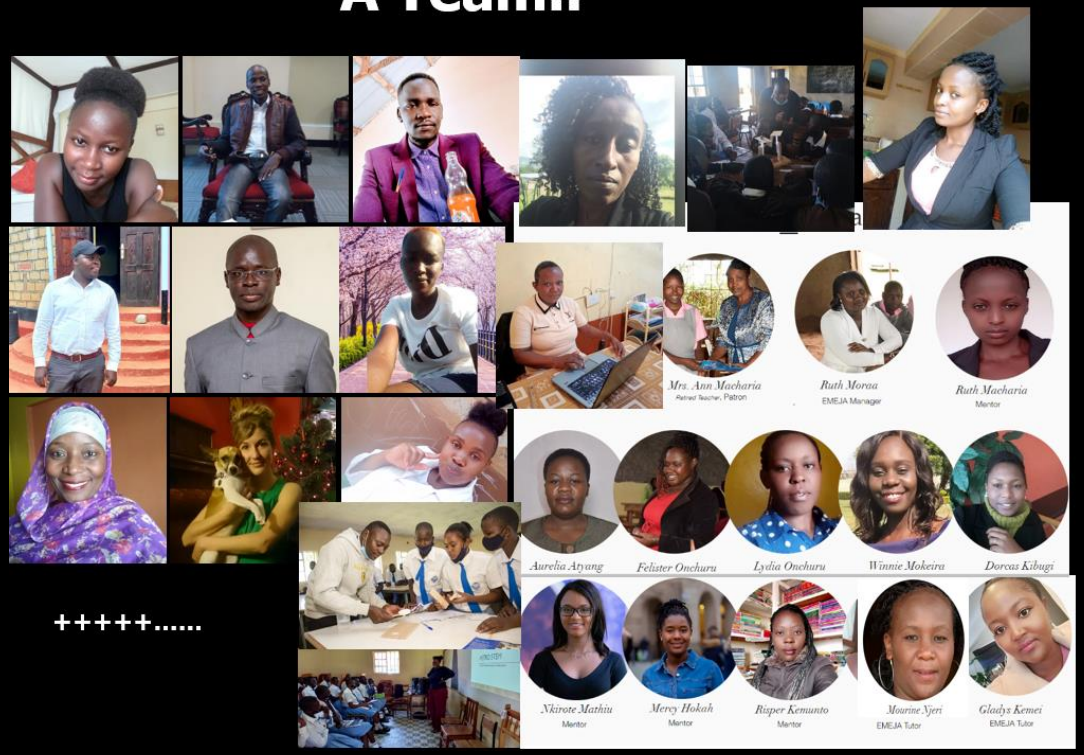
JUMPING JIVE
Joint Institute for VLBI ERIC

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

MERLIN

IAU OFFICE OF ASTRONOMY FOR EDUCATION
OAE

A Team..



+++++.....

With Thanks...

AGN ON THE BEACH II

A multi-scale view of jetted AGN

21–25 September 2026
Diani, Kenya

Confirmed Invited Speakers

Prof. Raffaella Morganti · RUG/ASTRON
Prof. James Chibueze · University of South Africa
Prof. Stas Shabala · University of Tasmania
Dr. Kristina Nyland · US Naval Observatory
Dr. Marisa Brienza · Istituto Nazionale di Astrofisica
Prof. Melvin Hoare · University of Leeds/DARA

Local Organizing Committee

Ann Njeri - Newcastle University - Chair
Isaac Mutie - Technical University of Kenya (TUK)
Paul Baki - TUK
Jack Radcliffe - University of Manchester
Dorcus Nthoki - TUK
Webber Chemonges - Kenya Space Agency
Shirley Aokoo - TUK
Winnie Wahome - University of Nairobi

Scientific Organizing Committee

Ann Njeri -Newcastle University - Chair
Anelise Audibert - IAC
Clive Tadhunter - University of Sheffield
Dipanjan Mukherjee - IUCAA
Ilaria Ruffa - INAF
Isaac Mutie - Technical University of Kenya
Isabella Prandoni - INAF
Leah Morabito - Durham University
Martin Bourne - University of Hertfordshire
Rob Beswick - University of Manchester
Sthabile Kolwa - University of South Africa