Supporting emerging astronomers across Africa

We appreciated reading "More Africans are pursuing STEM graduate studies in the US" by Toni Feder in the January 2024 issue of Physics Today (page 19). The report describes initiatives, such as the African School of Physics and the African Institute for Mathematical Sciences, that support African university students in gaining STEM skills and experience that can prepare them for attending graduate school in the US and other countries.

We would like to highlight the Pan-African School for Emerging Astronomers (PASEA), which we codirect. Formerly known as the West African International Summer School for Young Astronomers, our program consists of a week-long course intended to help African university students develop their STEM skills and interests and learn about careers in astronomy. Founded in 2013 and held every two years, it is designed and taught by an international collaboration of astronomers. PASEA's vision is to build a critical mass of astronomers in Africa and to exchange teaching ideas across continents. PASEA has been held in Nigeria, Ghana, and Zambia, and PASEA 2024 will be held in Tunisia this September.

PASEA has several notable aspects:

- ▶ Our curriculum, based in inquiry and education research principles, in which students ask and investigate their own mini research questions in small teams.[1]
- ▶ "Paired teaching," in which international partners coteach to learn new strategies.
- ▶ Our alumni community.
- ▶ Our evaluations of student learning.

Half of our instructors are women (unusual for physics and astronomy), and we hold special events to support women students and discuss gender-based barriers to participating in science. (More details on PASEA can be found at www.paseaafrica.org and in reference 2.)

PASEA now has almost 300 alumni from 20 African countries. Almost all continue in STEM. About one-third are pursuing astronomy; most of them did not have an astronomy program at their university, and PASEA helped bring them into the field. Nearly 90% of alumni say that their involvement with PASEA was a big influence on them when choosing what career to pursue or subject to study. Five alumni have returned to PASEA as instructors because they want to give back to the program and their fellow students from around the African continent. Two alumni instructors are now graduate students in Canada, and one is a postdoctoral researcher in France. Other alumni are graduate students in African countries, including Zambia, South Africa, and Mauritius. Some of them are supported by the Development in Africa with Radio Astronomy (DARA) program and the PanAfrican Planetary and Space Science Network (PAPSSN).

While many of our alumni have strong scientific backgrounds and would like to apply to graduate school, they need support in navigating the process—for example, figuring out where to apply, understanding the differences between master's and PhD programs, learning how funding for graduate students works in different countries, and writing competitive research statements. These are significant barriers for talented students around the African continent who are otherwise well qualified for graduate school. We would like to create a mentorship program to support PASEA alumni and other African students with guidance on careers and graduate-school applications, and we are currently seeking funding for such a program.

STUDENTS Niza Gladys Kamanga, Joseph Mukuka, and Martha Nambela (left to right) designing a way to measure the distance to a star cluster, facilitated by Pan-African School for Emerging Astronomers instructor and alumna Margaret Ikape (far right), in the inquiry activity at PASEA 2022 in Livingstone, Zambia. (Courtesy of Linda Strubbe/CC BY-NC 4.0.)

References

1. L. Strubbe et al., "Distances in the Universe: An Inquiry Lab Sequence Taught in West Africa and North America," CourseSource (2023).
2. L. Strubbe et al., *Nat. Astron.* **5**, 217 (2021).

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