



AIMS

African Institute for
Mathematical Sciences

NEXT EINSTEIN INITIATIVE

AIMS: A CATALYST FOR THE TRANSFORMATION OF AFRICA





AN ECOSYSTEM OF INNOVATION AND TRANSFORMATION

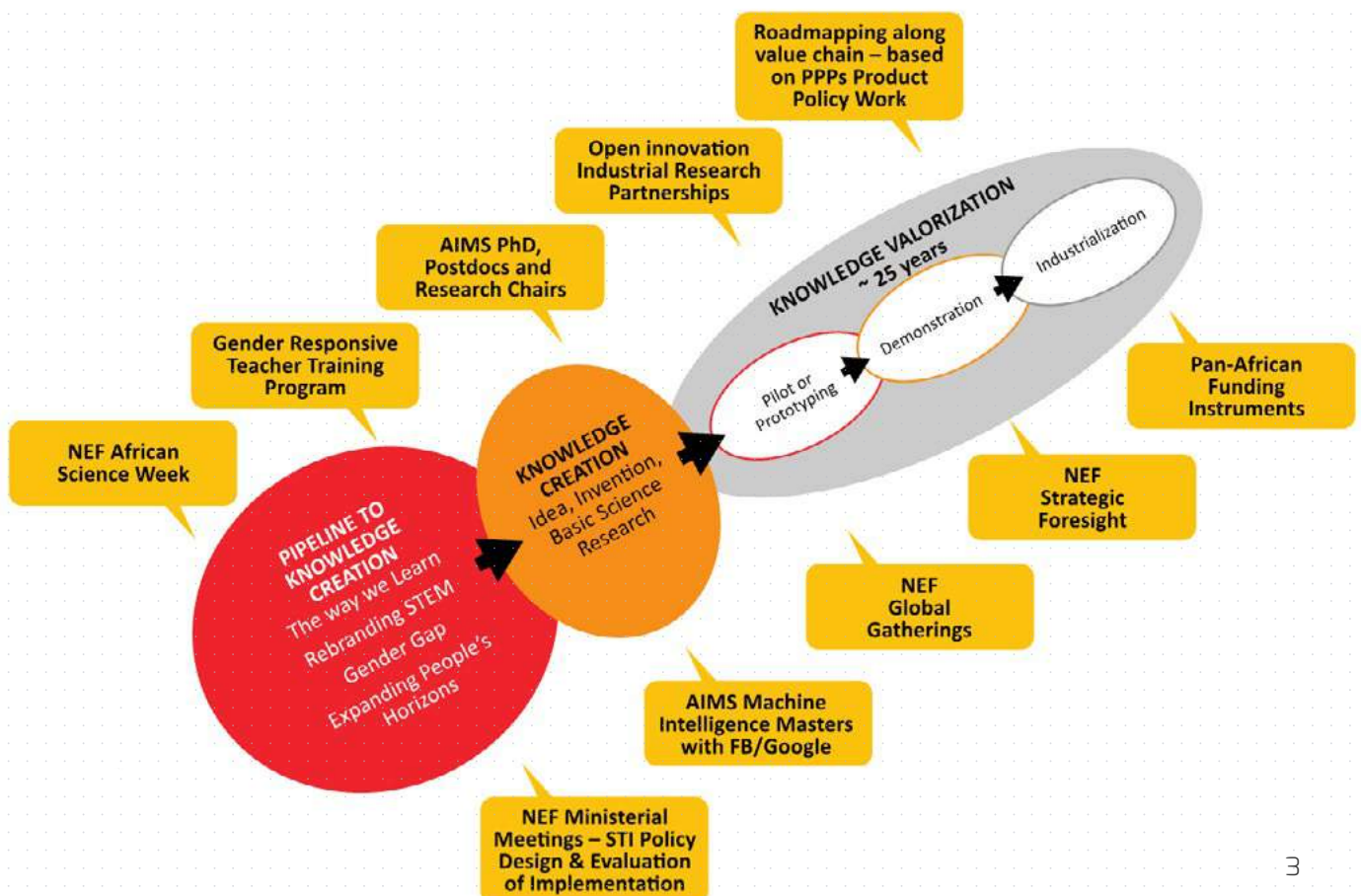
The African Institute for Mathematical Sciences (AIMS) is a pan-African network of centres of excellence for post-graduate training in mathematical sciences, research and public engagement in science, technology, engineering and mathematics (STEM). Founded in 2003, AIMS is leading Africa's socio-economic transformation through:

1. Innovative scientific training (the development of human capital);
2. Facilitating technological advances and cutting-edge scientific discoveries;
3. Scientific foresight, policy design and public engagement for the continent's scientific emergence.

To implement this vision, AIMS targets the brightest young African students, shaping them as independent thinkers, and problem-solvers capable of innovating and propelling Africa to economic prosperity. Africa's youth are at the heart of the innovation and transformation ecosystem which consists of a set of academic and non-academic programs expertly tailored to provide AIMS learners with a unique post-graduate training experience on the continent.



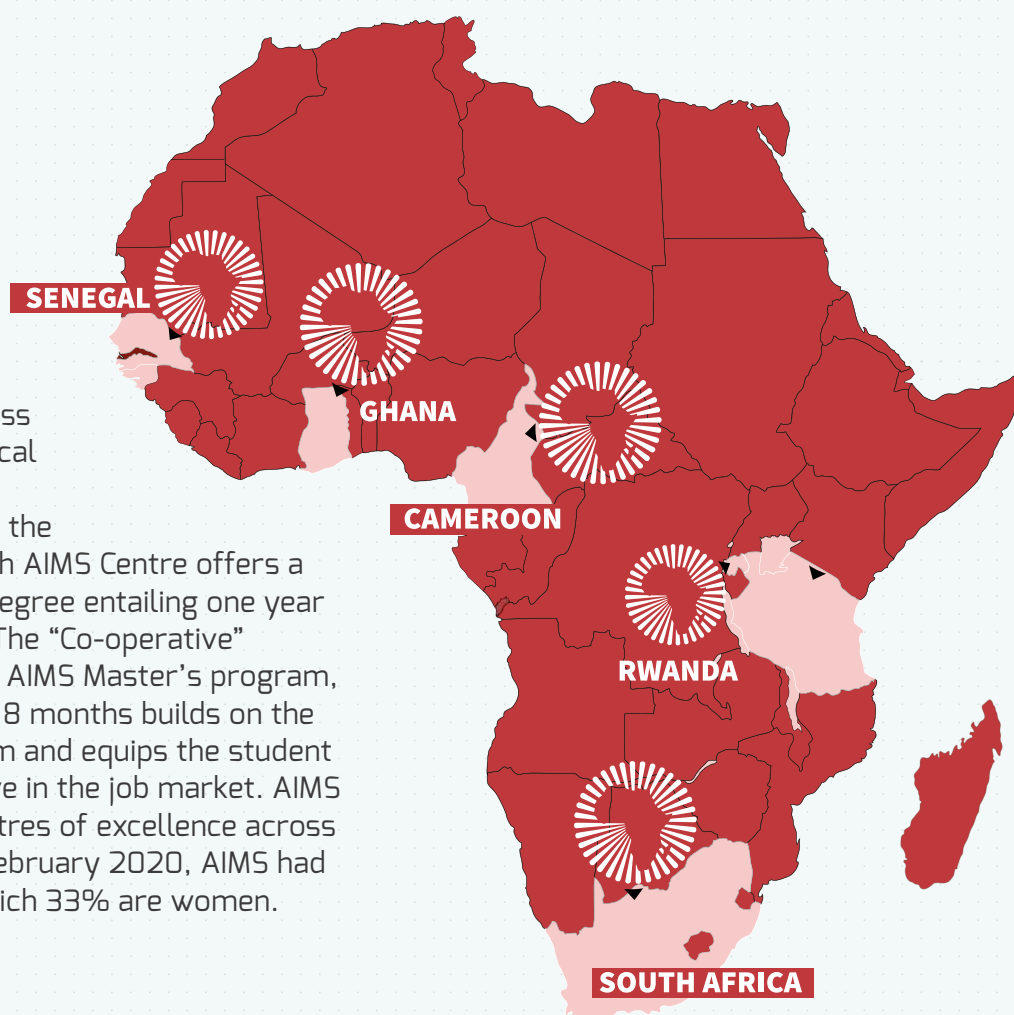
CONNECTING SCIENCE TO HUMANITY



THE ECOSYSTEM OF INNOVATION & TRANSFORMATION COMPRISES:

- a. Centres of excellence for cutting-edge post-graduate training

AIMS issues world-class degrees in mathematical sciences to students recruited from across the African continent. Each AIMS Centre offers a structured Master's degree entailing one year of intensive courses. The "Co-operative" (Co-op) version of the AIMS Master's program, which spans through 18 months builds on the core Master's program and equips the student to be more competitive in the job market. AIMS currently has five centres of excellence across the continent. As of February 2020, AIMS had 2015 graduates of which 33% are women.

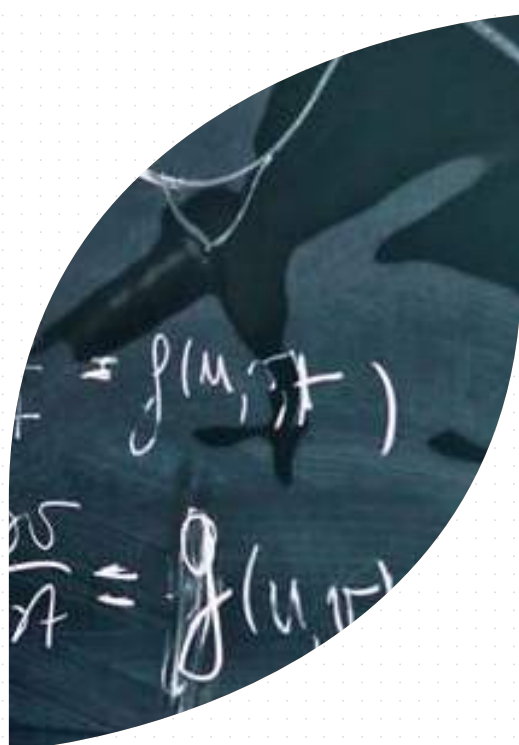


b. Research Chairs for innovation and development

AIMS Research Chairs are designed following international standards, providing the outstanding researchers who lead them with a working environment conducive to creativity and innovation. Each Research Chair develops areas of specialization in close collaboration with local authorities and local university partners. They give AIMS students and graduates the opportunity to interact with researchers in their fields of expertise and knowledge through research projects, post-AIMS fellowships and workshops.

To date, the progress made by AIMS researchers has been impressive. Together, they have:

- Worked on more than 1,200 research topics;
- Published more than 600 articles;
- Submitted 210 patent applications.



$$\sigma = (\sigma_A \otimes \sigma_B) \oplus \sigma_K$$

$$= J_A(\sigma_A) \otimes \sigma_B$$

$$\oplus K \quad R \circ \Sigma \circ P_{AB}$$

These technical advances and discoveries include:

In the field of renewable energy:

- The development of technology that improves the efficiency of solar by more than 20%.

In the health field:

- The demonstration that a parasite that causes schistosomiasis can increase the prevalence of malaria, suggesting that the fight against this parasite will help control malaria;
- Solving a 70-year-old immunological problem with implications for the development of better tools for the control of various infectious diseases.

In the field of biodiversity:

- A new method for estimating the abundance of biological species on a large geographical scale with implications for the design of improved policies and management strategies.

special case

noiseless subsystems (each $1/n$)

$$J_A(\sigma) = \bigoplus_{k=1}^n \sigma^{B_k}$$

Theorem

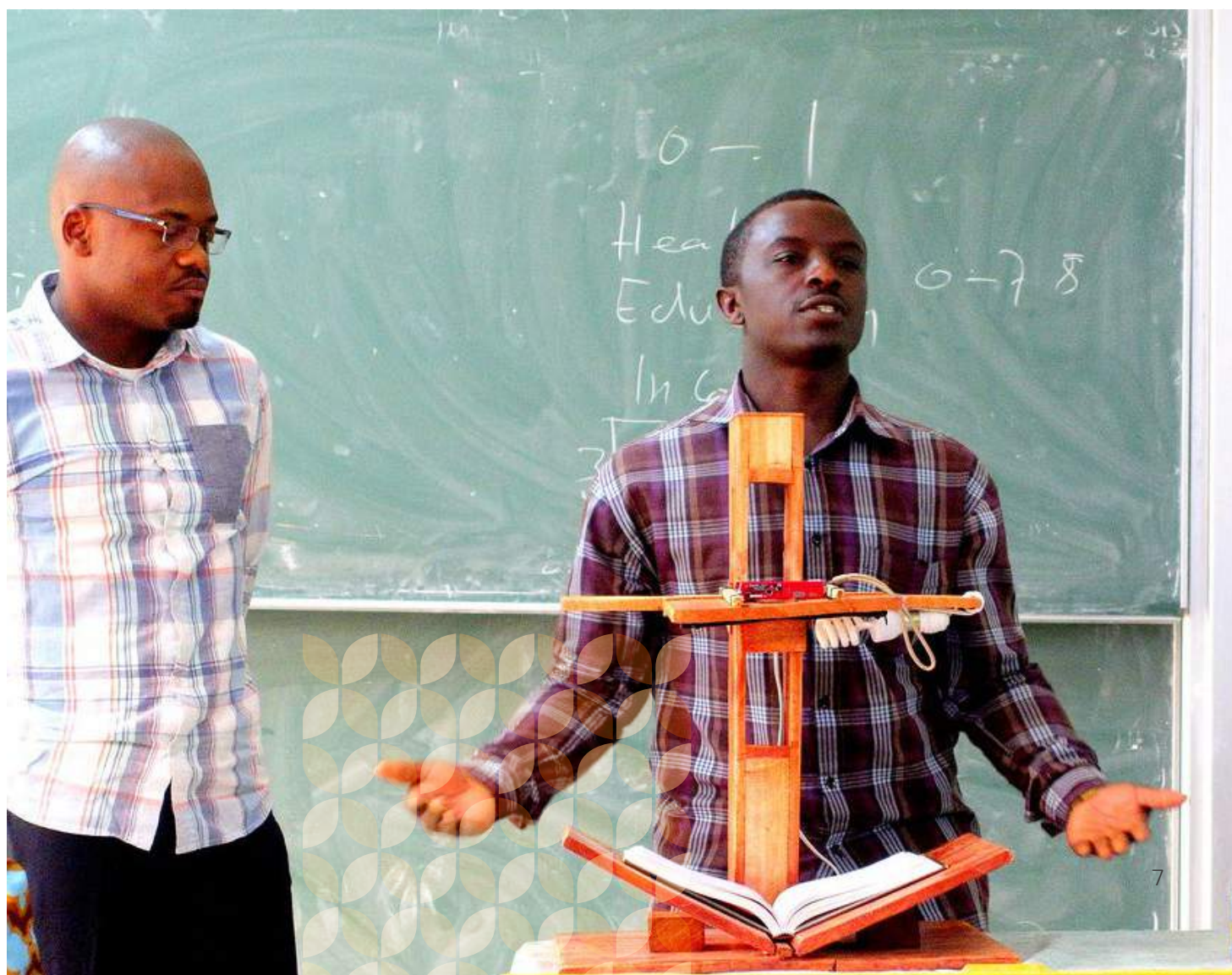
unitarily correctable for Σ

noiseless for E^+

c. The AIMS Industry Initiative

The AIMS Industry Initiative is leveraging the mathematical sciences towards the economic promotion of AIMS host countries, through the provision of quality human capital, knowledge transfer and research applied to development. AIMS industry partners are real laboratories in which AIMS students test innovative solutions to boost company performance.

The AIMS Industry Initiative aims to expand and diversify the organisation's partner base to propel greater direct industry involvement in our training model. Our industry partners recognise AIMS as a viable pool of home-grown talent where they can access expertise in big data, computer security, data science and problem-solving competencies with relevance to their business sectors.

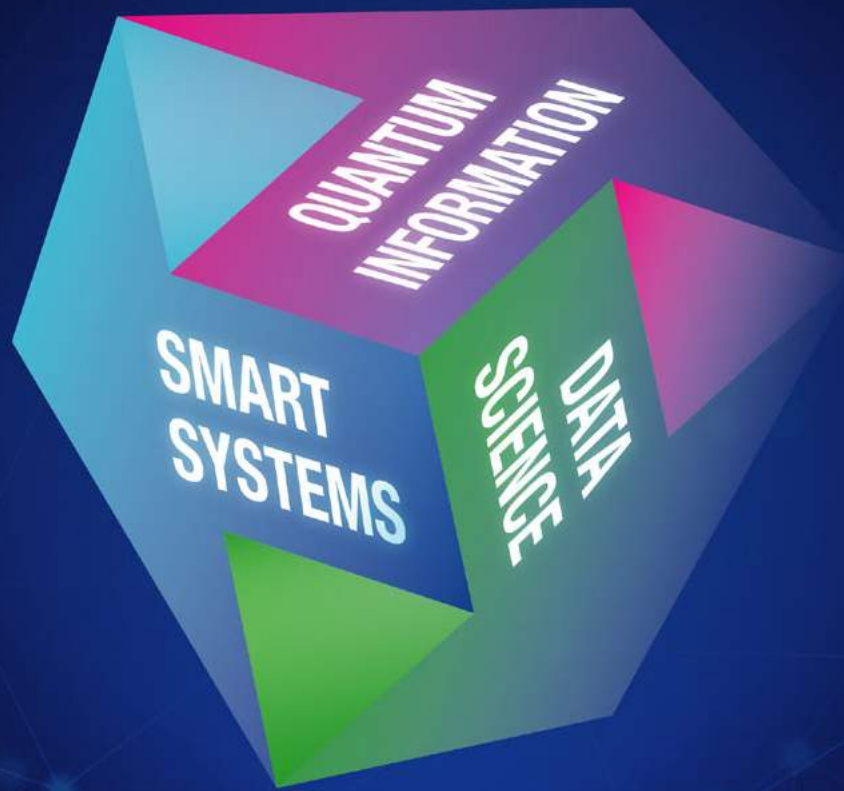


d. Next Einstein Forum (NEF)



The NEF believes that Africa's contributions to the global scientific community are critical for global progress. By connecting science, society and policy in Africa and the rest of the world, the NEF is leveraging science for human development.

The biennial NEF Global Gatherings are the NEF's marquee event. Far from an ordinary science forum, the NEF Global Gatherings position science at the centre of global development efforts. In the presence of scientists (Nobel Prize and Field Medal laureates), political and industry leaders, civil society and media, and with a strong focus on youth and women, the voices of global science leaders have the opportunity to be heard and to have a significant impact on Africa's scientific future. The inaugural NEF Global Gathering 2016 took place in Senegal, the 2018 edition in Rwanda. The NEF Global Gathering 2020 will be held in Nairobi, Kenya.

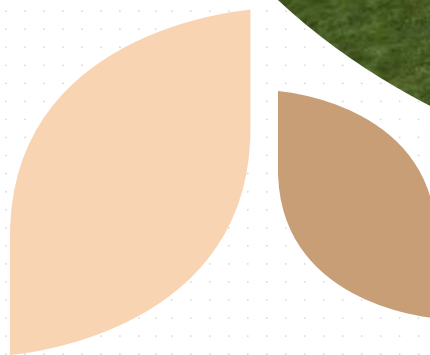


e. Quantum Leap Africa

Quantum Leap Africa is a high-level interdisciplinary research program focused on data analytics, engineering, smart systems and quantum science, created to place Africa on the leading edge of quantum science and the technologies of the future.

Based in Rwanda, QLA is developing expertise in the understanding of data to:

- Serve as a magnet for African and global talent – scientific, technical and entrepreneurial;
- Conduct theoretical and practical research with reach and impact across Africa and the world;
- Attract excellent global partners;
- Grow into one of Africa's most prominent scientific centres.



f. Teacher Training Program

The AIMS Teacher Training Program (TTP) implemented in Cameroon (4000 schools and 1.7 million students reached in five years), and Rwanda was developed to improve learning outcomes in mathematics and STEM for secondary school students. Through professional development courses, high-quality classroom resources and technology-driven Smart Classrooms, TTP is empowering teachers to improve their pedagogy and increase the transition to tertiary STEM education. Teachers are trained to be aware of and counter stereotypes that push girls out of mathematics and science.



A GLANCE AT THE AIMS CENTRE MODEL

Governance

Each AIMS centre is autonomous but interdependent within a model of efficient and sophisticated network governance. The AIMS Secretariat, appointed by the AIMSNEI Foundation in the United Kingdom, acts as a coordination mechanism to ensure the consistency and quality of standards across the AIMS network.

Each AIMS centre collaborates with local and international universities while receiving financial and in-kind support from host governments, the private sector, and the scientific community to ensure local ownership, cost-effectiveness and sustainability.





AIMSWIS

African Institute for
Mathematical Sciences
WOMEN IN STEM INITIATIVE

HOW ARE WE PROMOTING GENDER EQUALITY IN STEM?



Gender Inclusion & Promoting Women in Science

AIMS applies a hard quota (30 %) in recruiting top female talent to level the playing field for women. Our Teacher Training (TTP) Program in Cameroon & Rwanda is training teachers to tackle counter-cultural attitudes & stereotypes that push girls out of mathematics & science. Through the introduction of Smart Classrooms, AIMS is empowering teachers to support girls through technology. Our Skills for Employability program supports women-led businesses & industry partners to improve their organizational culture through specialized gender training. AIMS students and staff benefit from regular gender, inclusion & diversity training, mentoring & access to strong women role models to encourage paradigm shifts.



Research

AIMS research programs work to retain women in research by providing necessary support for dependents and caregivers to enable mothers to conduct meaningful research and freely travel to regional and international conferences. We encourage our researchers to address issues that affect African women. AIMS also has prestigious women-only Chairs.



Next Einstein Forum (NEF)

Through our Next Einstein Forum, Africa's global forum for science, we are taking the next step. The NEF Fellows Program, which recruits and showcases Africa's top scientists under 42 from all sciences, social sciences included, has a 40% requirement for women. The NEF also organizes Africa's largest science and innovation conference every two years and applies a strict quota to have no manels or men-only presentations.



Public Engagement & Outreach

At AIMS, we partner with women in STEM organizations through a range of activities: profiling successful African women in STEM, including AIMS students & alumni, disseminating publications, promoting visibility at conferences & targeted outreach at secondary schools. We observe women-centered international celebrations such as the International Day of Women & Girls in Science, International Women's Day & the International Science Day for Peace & Development.



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WOMEN IN STEM INITIATIVE

WOMEN IN STEM SPOTLIGHT



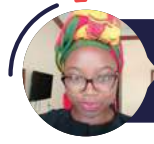
Dr. Chika Yinka-Banjo
AIMS South Africa, 2010 – **Nigeria**

In her research at AIMS, Chika developed a model that ensures that autonomous robots can detect and avoid obstacles as they carry out various tasks assigned to them. Similarly, at the University of Cape Town (UCT), she developed a model that can guide multi robots to perform a pre-entry safety inspection in underground mines/tunnels, to curtail exposure of miners to accidents and disasters such as inhalation of dangerous gases and exposure to mine roof fall. After graduating from AIMS in 2010, she completed her PhD in Computer Science at the University of Cape Town, South Africa, before returning to Nigeria to establish a research group in the area of Robotics and Artificial Intelligence at the University of Lagos.



Dr. Rosita Endah Epse Yocgo
Researcher, AIMS Rwanda – **Cameroon**

Rosita documents plant-interactions to investigate the influence of environmental change drivers (climate). She studies the molecular machinery mounted by plants to overcome adverse conditions, in a bid to exploit these findings in crop improvement programs. Her multidisciplinary approach involves working with biotechnologists, farmers, mathematical modellers, industry partners and policymakers. Holder of a PhD in Plant Biotechnology from the University of Pretoria, with post-PhD experience from the University of Gent and the University of Stellenbosch, She believes that research is a critical ingredient for development.



Andree Mentho Nenkam
(AIMS Ghana, 2014) – **Cameroon**

As Scientific Officer at the International Crop Research Institute for the Semi-Arid Tropics, Bamako, Mali, she uses crop modelling and climate analysis to advise farmers on strategies to mitigate climate change, seasonal risks and increase crop yields. Her research assesses the effect of climate change on agriculture and the impact of new approaches to improve farmers' resilience to climate variability.



Dr. Nana Ama Browne Klutse
Ghana

An AIMS-NEI Climate Change Science Fellow (2018), Nana is a Senior Research Scientist at the Ghana Space Science and Technology Institute of the Ghana Atomic Energy Commission, where she is the manager of the Remote Sensing and Climate Centre. A climatologist, she has a background in physics and holds a PhD from the University of Cape Town. Her current research focuses on climate modelling and climate impact assessments on society, health, and food security. Dr Klutse has received several awards and was celebrated as a female icon on Intellectual Property Day 2018, a program by the Registrar General's Department to honor successful women in Ghana.

OUR PARTNERS

African Government Partners

-  Cameroon
-  Ghana
-  Rwanda
-  Senegal
-  South Africa

FUNDING PARTNERS



PROFILE OF AIMS ALUMNI



OVER
2,000
SINCE ITS ESTABLISHMENT
IN 2003



33%
ARE WOMEN

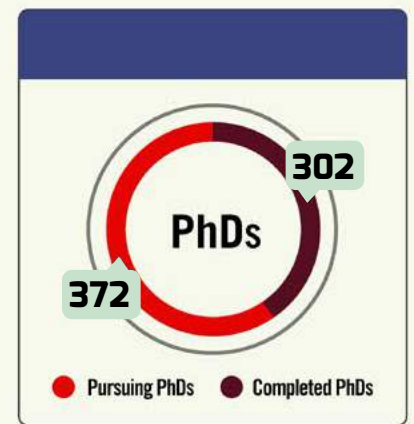
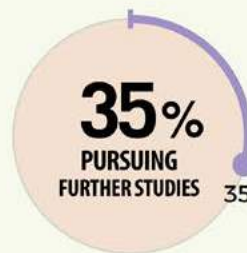


Over
70%
Alumni remain
on continent

ALUMNI ARE FROM **43** COUNTRIES



ALUMNI POST AIMS



49%
OF OUR ALUMNI
ARE WORKING IN
THESE TEN FIELDS



STATISTICS



ICT



EDUCATION



FINANCE



TRADE



ENGINEERING



ENERGY



DATA SCIENCE



COMMERCE



ENTREPRENEURSHIP

To date, 302 graduates have obtained their PhDs, with 372 currently pursuing a PhD. The three main areas of specialisation chosen by these doctoral students are applied mathematics, physics and theoretical mathematics.

Meanwhile, 862 are pursuing careers in higher education, research, information and communication technologies (ICT), financial services, trade, engineering, statistics, energy and data management, among others.

AIMS STUDENT ENROLLMENT FOR THE 2019-2020 ACADEMIC YEAR

For the 2019-2020 academic year, AIMS enrolled a total of 290 students in Machine Intelligence, Climate Change Sciences and Mathematical Sciences (structured and co-operative education), selected among 5,637 applicants for the AIMS Master's (structured and co-op) and 2,114 applicants for the African Master's in Machine Intelligence (AMMI) from 51 countries.



SOLVE AFRICA'S GRAND CHALLENGES

APPLY FOR THE AIMS WORLD-CLASS MASTER'S IN MATHEMATICAL SCIENCES

Requirements:

- Applicants should hold a 4-year degree in Mathematics, or any science or engineering discipline with a significant mathematics component.
- Women and those from economically disadvantaged backgrounds are highly encouraged to apply.

Why Study at AIMS:

- World-renowned lecturers from across Africa and around the world supported by a team of resident tutors.
- Students and lecturers live together in a 24 hour learning environment.
- Highly interactive and engaging classroom setting where students are encouraged to learn together through group work.
- Emphasis on programming and data science with 24/7 access to computer labs and high-speed internet.
- Pan-African student body.
- AIMS graduates go on to pursue PhDs and secure employment at universities, research institutes, government, and the private sector across Africa and around the world.
- Selected candidates will get a full scholarship.

How to apply:

Visit nexteinstein.org/apply

APPLY NOW

DECEMBER 1 TO MARCH 31 OF THE FOLLOWING YEAR



AIMS African Institute for
Mathematical Sciences
GHANA



AIMS African Institute for
Mathematical Sciences
RWANDA



AIMS African Institute for
Mathematical Sciences
SENEGAL



AIMS African Institute for
Mathematical Sciences
SOUTH AFRICA



AIMS African Institute for
Mathematical Sciences
CAMEROON

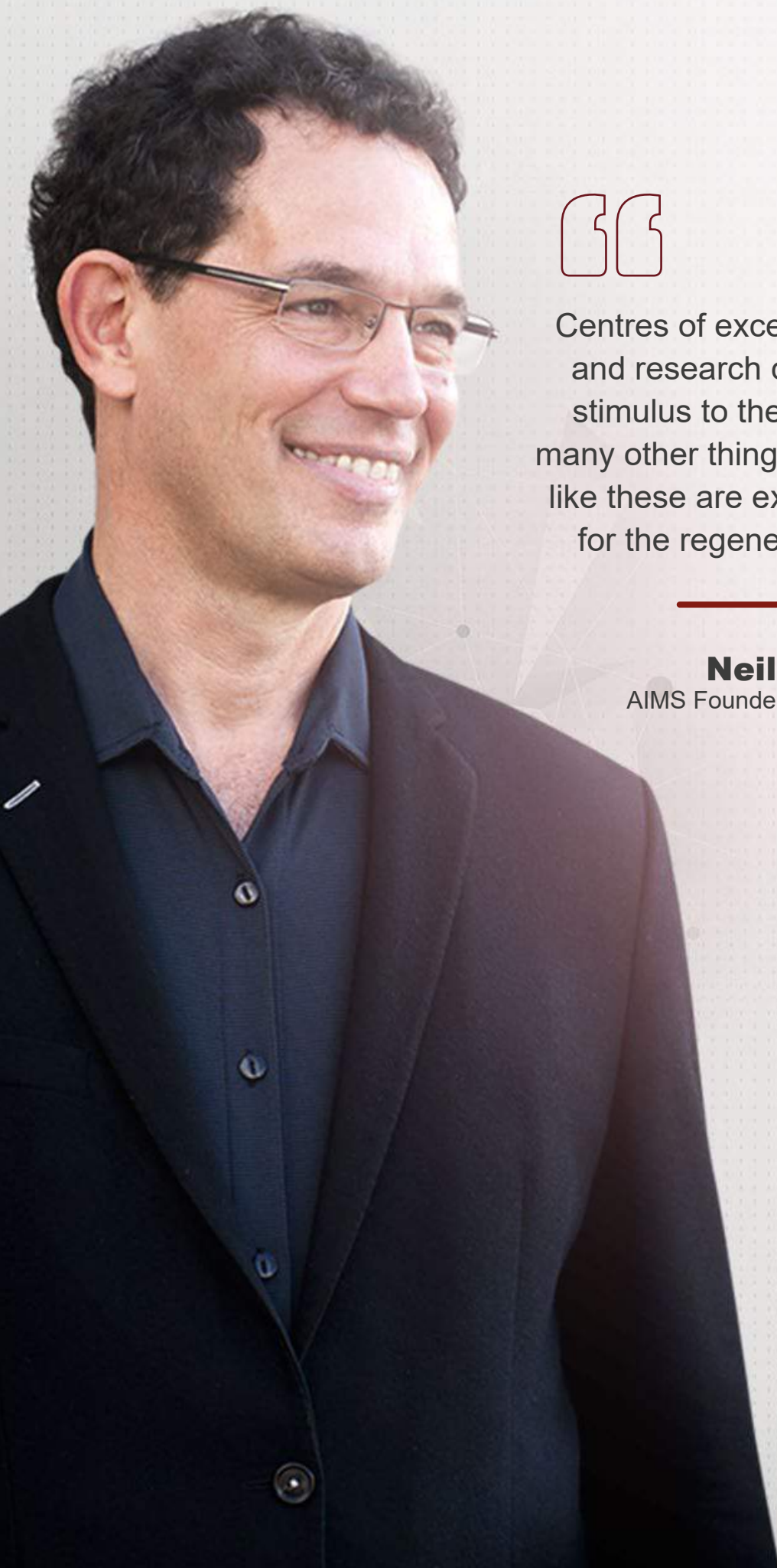
Open to all African Countries



African Institute for Mathematical Sciences - AIMS



@AIMS_Next



“

Centres of excellence for training and research can actually be a stimulus to the development of many other things in Africa. Centres like these are extremely important for the regeneration of Africa.”



Neil Turok

AIMS Founder and Board Chair

A young African woman with dark hair and a warm smile is the central figure in the foreground. She is wearing a brown and tan patterned shawl over a dark top and a silver chain necklace. She holds a white notebook with handwritten notes and two pens, one blue and one red. In the background, a young African man in a blue and white striped shirt is seated at a desk, focused on his work. The setting is a classroom with blue walls and a purple curtain. A white trash bin with 'TB- Out' written on it is visible in the lower right.

**WE BELIEVE THE
NEXT EINSTEIN
WILL BE AFRICAN!**



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NEXT EINSTEIN INITIATIVE



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