Building STEM in Africa

Prince K. Osei AIMS Ghana & Quantum Leap Africa

New Directions in Theoretical Physics Edinburgh

January 11, 2023

Outline

- The AIMS Model as foundation for building STEM in Africa
- Programs @ AIMS Ghana
- Reinventing the University of the 21st Century in Africa

The AIMS Model

The Idea

- Gather the most talented graduates from all over Africa under one roof.
- Bring the best lecturers in the world to teach them.

The AIMS Model

The Idea - A Network of Centres of Excellence in the Mathematical Science across Africa



Signature Masters Program

MSc Mathematical Sciences

- Students selected from across Africa (At least 30% Female)
- Full Scholarship Flight, Accommodation, Food, Stipend, etc
- 25-30 courses in Skills and Review Phase + Research Project
- Visiting Lecturers
- Full time tutors
- 24/7 Learning Environment

African Masters of Machine Intelligence (AMMI) Best of AI Education @ AIMS

MSc Mathematical Sciences - AI

- Strong mentorship component
- Strong partnership with Industry (Facebook & Google)
- •Strong Foundational and Practical Components.
- Dissertation and or Internship
- •Over 7,000 applications

Teacher Training and Professional Development (TTDP)

MSc Mathematical Sciences for Teachers

- 30% In person, 70% Online, 2-year program
- Provide current teachers of Math with deeper understanding of the Mathematical foundations of core secondary school college curricula
- Primary focus is Math & areas of applications of modern math
- Challenge its students to brainstorm creative and dynamic ways of transmitting what they have learned into the classroom

Teacher Training and Professional Development (TTDP)

Helping Teachers Teach Math Conference

- In person + Online conference for Grade 7-12 Teachers
- Over 2,300 Applications from 7 Countries, 24% Female
- Run in Partnership with the Centre for Education in Mathematics and Computing (CEMC), University of Waterloo

Masters Program

MSc Mathematical Sciences

- Regular Masters 1,200 application per year
- Over 1,000 Applications per year for MMST





Graduation @ 10 - 100 Students

Class of 2022





Alumni Wall

https://aims.edu.gh/alumni-wall/



Abdoelnaser M. Degoot, Sudan Research Associate – AIMS Canada



AIMS Girls in Mathematical Sciences Program (GMSP)

9 Month of activities that will super-charges potential "Einsteins":

- 40 students Selected from Over 600 Applications
- Career Insight & Mentorship
- Online Master Classes

Residential Mini Courses

These short sessions provide a sound conceptual introduction to the profound and revolutionary ideas at the foundations of modern mathematical sciences

AIMS Girls in Mathematical Sciences Program (GMSP)





Areas - Stochastic analysis and its applications, Algebra & Quantum Geometry, Climate Change Science and Atmospheric Physics, Mathematical Biology

- Research Chair Program 4 Chairs
- PhD Program 10 PhD students

PhD Program Model

Goal - Train 100 PhDs in 5-7 Years

- International Supervisor propose projects
- Students apply for specific projects
- Selected students registered in Partner Universities
- International Visits
- Doctoral Training Program

New Programs in the Coming Year

Undergraduate Programs in Specialised field

- Data Science
- •Cyber Security & Cryptography
- Actuarial Science
- Computational Finance
- Mathematical Sciences
- Online Courseware in Mathematics and Computing for Grades 7-12

21st Century University and Capacity Building

- · It should be transnational bringing many countries and cultures together
- Admission at higher education solely on merit promotes equal access
- Must promoting excellence in the academic sense, in an ethical sense, in the sense of supporting others
- connecting people through advanced knowledge and the power to use it e.g. involving top scientists from all over the world with a student body which can bring about change
- Interactive teaching which promotes exploration and creativity on the part of the student, instead of rote learning
- Integrate Modern Technology both in training and discovery
- Promote diversity

Thank you!



Category 2 Centre of Excellence