

African Institutes for Mathematical Sciences: Experiences and opportunities for statistics and mathematics capacity building in Africa

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What is AIMS?

AIMS is a network of Centres of Excellence

- For tertiary mathematical education and research
- To promote mathematics and science in Africa
- To recruit and train talented students and teachers
- To build capacity for African initiatives in education, research, and technology
- Including support for mathematics teaching in schools (Warwick in Africa)

Brief history of AIMS

“The idea that Neil unfolded seemed quite simple, very laudable and entirely unrealistic”

Chris Brink, VC University of Stellenbosch(2001-2007)¹

- courses taught by visiting academics
- resident tutors to support visiting lecturers
- self-contained residential centres with excellent computer and lecturing facilities.

AIMS was established in 2003, in Muizenberg, South Africa

Founders: Neil Turok & Fritz Hahne, maths physicists.

Partnership project: Universities of Cambridge, Cape Town, Oxford, Paris Sud XI, Stellenbosch, Western Cape.

¹[1] AIMS: the first decade

Brief history of AIMS: the centres

- AIMS SA - 2003
aims.ac.za
- AIMS Senegal - 2011
- AIMS Ghana - 2013
- AIMS Cameroon - 2013
- AIMS Tanzania- 2014
- AIMS Rwanda- 2016



Figure: AIMS South Africa

Students

- Graduates in maths areas from most African countries
- Main first languages are English, French, Malagasy, Arabic
- At least a third are women
- Fewer than a third from country of AIMS centre
- 12 to 20 nationalities in each cohort
- have often struggled to get an education in countries where only primary education is mandatory
- often older than UK graduates, leave families behind, and try to save their allowances to send home
- **Motivation and commitment is high**
One student walked from Angola to Cape Town.

Course structure

- Instruction is in English.
- Intensive language teaching for French, Malagasy or Arabic speakers.
- Introductory skills courses, then
- Series of 6 three-week review courses:
 - Students choose two from three courses
 - Taught by visiting lecturers, often senior professors
 - Volunteers from Asia, Africa, Europe, North America
 - 30 hours contact time, 10 per week
 - about 15 to 18 hours lecturing
 - about 12 to 15 hours for tutorial work
 - Tutors assist with tutorials and do the marking.
- Research essay

My experiences with AIMS

- AIMS South Africa: Lifetime data analysis; statistical inference; intro to stats and prob (2008-2026)
- AIMS Ghana: Probability & Statistics (2014)
- AIMS Tanzania: Statistical inference (2017, 2017)
- AIMS Cameroon: Statistical inference; GLMs for health care (2019-2025)
- M.Sc Rwanda & Cameroon Mathematical epidemiology development discussions, 2025.
- African Data Science Degrees: design and implementation Workshop spring 2023, AIMS Rwanda.
- International Statistics and Epidemiology Project

African statistics and data science degrees

Why do I promote statistics and data science?

Sustainable development goals:
Statisticians is essential.

Employment and enterprise opportunities

- Data science stream Cameroon
- Machine learning Senegal
- African Data Science Degrees: design and implementation
- International Statistics and Epidemiology Project: links
- **Courses** Statistical skills, inference, GLM, time series, maths finance, spatiotemporal, epidemic, climate modelling, ...

What about your area of mathematical sciences?

Your opportunities and benefits

- Lecturers for 3 week courses. Propose topic, live and work with students.
- Resident tutors for 5 to 11 months. Support students and lecturers, and do research.
- Supervisors. Provide topics and supervise research essays 6-8 weeks
- Resident tutors for 6-8 weeks of research essay block.

Travel and subsistence can be covered.

An honorarium is offered to lecturers and supervisors

Tutors also receive a stipend.

Should I?

“We need a course in Analytical Mathematical Biology”

aims.ac.za

aims.ac.rw

aims.edu.gh

<https://aims-senegal.org/>

<https://aims-cameroon.org/>

The worst excuse?

‘I don’t like the heat.’ A white British colleague.