

## Opinion Education Policy Briefing



South African physicist Neil Turok conducts a Soliton experiment with students from the African Institute for Mathematical Sciences.

# Canada is helping to find the next Einstein in Africa

\$20 million is going toward high-level training in scientific and technical fields through the African Institute for Mathematical Sciences.

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Progress can come from unexpected places.

For example, Viateur Tuyisenge lost his whole family in the Rwandan genocide. The former street kid is now on his way to becoming a medical computer imaging expert.

Nuclear engineer Esra Khaleel grew up in impoverished, embattled Darfur in Sudan. Her dream: to help solve South Africa's energy crisis.

The daughter of a poor South African domestic worker, Daphney Singo is completing her PhD in quantum physics. "Education," she says "is the husband that will never let you down."

These three rising stars, and hundreds more like them, have all benefited from a unique African institution: AIMS, the African Institute for Mathematical Sciences. The project is known as the "Next Einstein Initiative."

The belief is that the world's next genius could just as easily come from Africa as anywhere else—if the educational opportunities exist.

AIMS is the brain child of South African physicist Neil Turok, the executive director of the Waterloo-based Perimeter Institute for Theoretical Physics. The purpose of AIMS is to help Africa produce and use science and technology for its development. AIMS recognizes that nearly one million students graduate from African universities each year, but high-level training in scientific and technical fields is generally unavailable.

AIMS is beginning to change that. The first AIMS centre, which launched in 2003 in Cape Town, has already graduated more than 412 students, one-third women, from 33 countries. Over 87 per cent have entered advanced master's and doctoral programs.

The AIMS program puts students through a rigorous course in mathematical problem-solving that prepares them to earn advanced degrees in the sciences. Mathematical sciences are, after all, the backbone of a modern economy. Solutions

to complex challenges in health, agriculture, and finance, for example, all require advanced mathematical modelling skills.

From the beginning, AIMS has been about excellence. The best students from across Africa are accepted exclusively on merit, and pay no tuition fees. The teaching staff is made up of volunteers, drawn from some of the world's best universities, who are attracted by the talent and the passion of AIMS students. Among the professors are four Nobel Prize winners as well as several recipients of the Fields Medal, often considered the highest award in mathematics.

Not surprisingly, the program and its students have garnered international recognition. For example, Nigerian computer science student and AIMS graduate Oluwasola Fasan was selected as a L'Oréal-UNESCO women in science regional fellow for 2012-2013. She was also a finalist for Google's 2012 Anita Borg Memorial Scholarship. In 2010, three AIMS students received scholarships to attend a six-week program on exponential technologies at Singularity University on the NASA Research Park campus in California. AIMS' Schools Enrichment Centre won a 2012 UNESCO award for outstanding practice and performance in enhancing the effectiveness of teachers.

### Canada's connection

Canada was AIMS' first major donor: in 2010, Prime Minister Stephen Harper

committed \$20 million to help AIMS expand across Africa. A new AIMS campus opened in Senegal in 2011 and another was launched in Ghana last August. More are planned for Tanzania and Ethiopia. There should be 15 in all by 2020.

Canada's contribution is led by the International Development Research Centre. The AIMS model is consistent with IDRC's approach of seeking to help countries develop by building local, long-term capacity in science and mathematics.

By taking a pan-African approach and by training the best students across Africa at regional centres, AIMS will make it possible for students to stay close to their communities and apply their skills to local problems. Three-quarters of AIMS graduates have chosen to stay in Africa to help solve the continent's social and economic problems.

Investing in developing countries to improve people's lives is the right thing to do. It is also an investment in Canada's future prosperity. A more developed and equitable world is in Canada's interest. It means having highly-skilled partners with whom we can collaborate, trade, and innovate. That benefits our economy and theirs.

Also, we need global science co-operation to address shared challenges, such as food insecurity, infectious diseases, and climate change adaptation. It is in all of our interest for experts from all continents, including Africa, to work together to solve these problems. And whether it is modelling climate change adaptation, analyzing food and water scenarios, or tracking avian influenza, the solutions require experts with strong mathematical skills, the kind of expertise AIMS can help Africa develop.

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