

Institute nurtures African math and science graduate students

Africa is relying on graduate research and education initiatives to produce the new crop of young scientists the continent needs to build its technical base.

"Oh my God, I didn't dream to have a good opportunity like this," says Esra Khaleel, a physics student from the conflict-plagued region of Darfur in the Sudan. Last year Khaleel left a nonpaying national service position at the Sudan Atomic Energy Commission to attend the African Institute for Mathematical Sciences (AIMS) outside of Cape Town, South Africa, which runs a graduate-level education program and paid all of her travel and study expenses. Khaleel is now completing research on the structure of nuclei in high spin states with the physics department at the University of Cape Town and the iThemba Laboratory for Accelerator Based Sciences, a national facility near Cape Town that houses a 200-MeV cyclotron and a 5-MeV van de Graaff electrostatic accelerator.

Since AIMS was founded in 2003 by University of Cambridge cosmologist Neil Turok, 160 students from more than 30 African countries have graduated from its nine-month diploma-granting program and the majority have gone on to pursue master's and doctoral degrees in science-related fields. In 2005 the African Union designated AIMS as the hub for the creation of AMI-Net, an initiative chaired by Turok to set up a network of 10–15 mathematical institutes across Africa. This February, Turok won the 2008 TED (Technology, Entertainment, Design) Prize for his achievements in cosmology and his educational activism in Africa. Since then Turok has received more than \$2 million in financial pledges—most of it to provide scholarships for AIMS students and some to set up AMI-Net.

A strong family

A refurbished seaside hotel doubles as the living quarters and lecture halls for an average of 50 AIMS students and their international lecturers each year. Together, often for 16 hours each day, they solve math problems, practice computational techniques, and learn English. "We share our knowledge and we help each other," says Khaleel. "We have become a very strong family." After mastering those basic skills, each student chooses courses that will lead to a concentration in pure mathematics, applied mathematics, or physics.

"About 30% of our students this year are doing physics," says AIMS director Fritz Hahne.

On successful completion of a research thesis, AIMS students are awarded a diploma and receive special consideration by the graduate programs at six partner universities. "My biggest challenge was convincing my parents that AIMS was a good institute," says Zimbabwe native Tendai Mugwagwa, who was part of the inaugural class, "but their confidence was boosted by the links AIMS had to Cambridge University, Oxford University, and Université Paris-Sud 11 [in France]."

Prominent scientists, including Stephen Hawking, Nobel laureates

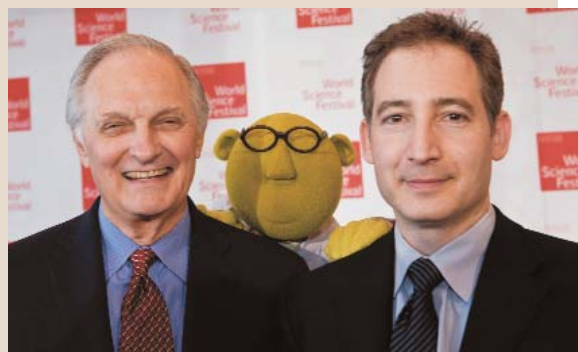
David Gross and George Smoot, and NASA administrator Michael Griffin, will attend the opening of the AIMS mathematical modeling research center this month. The new center will host postdocs and visiting researchers and will collaborate with regional universities and laboratories. "We will focus on projects in biomathematics, financial mathematics, astrophysics, and cosmology, but we plan to broaden the research to areas such as resource management, water, energy, and biological materials," says Hahne. AIMS is also planning an entrepreneurship training program to help students develop and implement wealth-creating projects. "I'm surprised by how fast things are moving," says Mugwagwa, who is completing her PhD in theoretical immunology at Utrecht University in the Netherlands. "When we came [in 2003], the books were still in boxes and there were leaks in the roof, but now everyone knows about AIMS."

World Science Festival in NYC

New York City turns into a science playground from 28 May to 1 June, when it hosts the first World Science Festival. Scattered around the city at 17 venues will be more than three dozen events that bring science—and artists, policymakers, educators, and, of course, scientists—to the public.

The lineup includes neurologist and writer Oliver Sacks speaking on the science of perception, Human Genome Project leader Francis Collins and other geneticists and ethicists talking about the extent to which genes determine our health and who we are, high-school students interviewing physics Nobel laureate Leon Lederman, and scientists telling about their miscalculations and experiments gone awry. Also featured will be a stage adaptation of Alan Lightman's *Einstein's Dreams*, dance works inspired by science, magicians, a street fair, and many other panel discussions, debates, performances, and multimedia presentations. The schedule of events is available online at <http://www.worldsciencefestival.com>.

The festival was the brainchild of string theorist Brian Greene and his wife, TV producer Tracy Day. "There are so many issues and opportunities—stem cells, genomics, pandemics, nuclear waste, nanotechnology, manned space travel—that we as a society can deal with far more effectively if people are engaged in a substantive way, and yet for so many, science is still intimidating," says Greene. "We want to take the tools that have been honed and refined in the broadcast medium and bring them to bear on the subject of science. Our motivation was to shift science from the fringe of culture to the mainstream." The "world" in the festival name refers to the global nature of science, Greene adds, but he envisions a future network of festivals that would create an annual worldwide celebration of science.



World Science Festival cofounder Brian Greene (right) with Muppet scientist Dr. Bunsen Honeydew and actor Alan Alda, who at the festival will play Richard Feynman in *QED* and, with Greene and others, explore the quantum world.

Toni Feder