

AFRICAN INSTITUTE IN MATHEMATICAL SCIENCES: A CAPACITY-BUILDING INITIATIVE IN WHICH IUTAM HAS AN ACTIVE INVOLVEMENT

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Summary The African Institute for Mathematical Sciences (AIMS) is a new educational centre recently established in Cape Town, South Africa, with the goal of strengthening scientific and technological capacity across the African continent. This lecture will summarize the background to this initiative, and the first year of its activity.

In February 2003, IUTAM [with the support of IUGG, IMU, IUPAP, IUPAC, IAU, TWAS, and four National Scientific Members of ICSU (South Africa, UK, Netherlands and Brazil)] submitted an application to ICSU under the ICSU 2004 Grants programme for support for an important new initiative in capacity building in science education. This initiative was designed to provide an Africa-based solution to African problems, facilitated by the international scientific community; it was to be realised in South Africa and would have a primary impact there, but its influence and benefit would extend throughout the African continent. The initiative, which had already received the support of the South African National Research Foundation, and the endorsement of the Nelson Mandela Foundation, was to establish an African Institute for Mathematical Sciences (AIMS) in Muizenberg, a suburb of Cape Town, where an outstandingly well-adapted building had been donated for this purpose. Here, ‘Mathematical Sciences’ was to be understood as mathematics together with its applications in such diverse fields as mechanics, physics, chemistry, geophysics, astrophysics, engineering, information technology, biology and medicine. AIMS is an initiative stemming from an international collaboration between three South African Universities (the Universities of Cape Town, Stellenbosch and the Western Cape) and the University of Cambridge Faculty of Mathematics, UK. Association with the University of Paris XI (Orsay) is in progress, and further institutions may be involved as the project develops.

The goals of AIMS were two-fold: first to offer a one-year diploma course specially designed for mathematics and science graduates of African Universities, which would be taught by a team of internationally renowned lecturers in close collaboration with South African academic staff; the course would give the students the mathematical and computing research skills needed to address important modern areas of application of mathematics, and would inspire a new generation of African students to undertake scientific research of great practical importance. AIMS would serve to elevate the general level of education in the mathematical sciences in Southern Africa, and would provide a beacon that would attract school students to careers in science and mathematics.

The second goal of AIMS was to provide the base for a Schools Enrichment Centre (AIMS-SEC), whose objectives were (i) to support African educationists, teachers and students, especially those from the formerly disadvantaged communities, in raising the standards of teaching, learning and attainment in mathematics in African schools; and (ii) to raise aspirations and enable all students, especially mathematically talented students, to achieve their full potential. AIMS-SEC would provide opportunities and assistance to both teachers and students of mathematics, working to achieve the highest possible standards in the subject. Strong links would be forged in particular with the 102 schools in South Africa that the government has identified for specialisation in the teaching of mathematics and science. [It is relevant here to note that the South African Government has an agreement with IBM for the provision of computers for schools, and that it has recently established a partnership with Microsoft for the provision of software to every school in the country; the SA Government is committed to have every school online by 2010. The AIMS-SEC initiative is therefore extremely timely.]

IUTAM’s application to ICSU was successful, the full grant requested (US\$100k) being awarded. IUTAM generously agreed to supplement this grant with a further \$20k from its own resources. The total annual budget of AIMS is approximately \$750k, substantial funds having been secured from a wide range of other sources. AIMS was inaugurated at a launch meeting in September 2003, and its first diploma course, involving some 30 graduate students from all over Africa is currently in progress. This course includes a strong element of application of mathematics to the physical and biological sciences, in which of course mechanics, both solid and fluid, plays a fundamental role. The IUTAM grant is being applied during 2004 (i) to support a Workshop at AIMS on Capacity Building in the Mathematical Sciences, to be held during April 2004; (ii) to support AIMS-SEC; and (iii) to contribute to the support of the students enrolled for the 2003/4 and 2004/5 sessions. This lecture will report on the operation of AIMS (and AIMS-SEC) during its first complete year of activity (September 2003 – August 2004), and on the outcomes of the above Workshop, which will involve representatives from many African States and representatives of IUTAM and other supporting International Scientific Unions and related ICSU bodies.

Two tributes to AIMS:

"We have been informed of the African Institute for Mathematical Sciences (AIMS) and find it one of the most interesting projects presented to us. Mr Mandela has repeatedly declared his concern about the advancement of science teaching and research in South Africa. This initiative is an outstanding instance of concrete collaboration between leading scientists in the advanced countries and our own scientists. This Foundation enthusiastically supports AIMS in the name of the former President Mandela."

[John Samuel, Chief Executive, The Nelson Mandela Foundation]

"Our country and continent badly need a broad, concerted effort to improve the quality, participation and performance of South Africa and African researchers and learners in the mathematical sciences. The African Institute for Mathematical Sciences is destined to become a flagship institution, giving concrete expression to this need and ensuring that Africa's contribution to the mathematical sciences receives the recognition that it deserves. The in-service training of mathematics teachers is indeed a top priority of the Government's educational transformation plan, TIRISANO – hence my unequivocal support for the establishment of this Institute."

[Mosibudi Mangena, Deputy Minister of Education, South Africa.]

AIMS website: <<http://www.aimsforafrica.org>>