

[REGISTER NOW!](#)
[GO ▶](#)
[ABOUT US](#)
[CONTACT US](#)
[ABOUT THIS SITE](#)

HOME	▶
EDITORIALS	▶
NEWS	▶
FEATURES	▶
OPINIONS	▶
REGIONAL GATEWAYS	▶
DOSSIERS	▶
LETTERS TO THE EDITOR	▶
BOOK REVIEWS	▶
ANNOUNCEMENTS	▶
EVENTS	▶
JOBS	▶
GRANTS	▶
LINKS	▶

E-GUIDE TO SCIENCE COMMUNICATION
ENGLISH
ESPAÑOL
PORTUGUÊS

WHAT'S NEW
ENGLISH
ESPAÑOL
FRANÇAIS
中文

SIGN UP FOR EMAIL ALERTS
: enter email :
<a href="#">UPDATE YOUR DETAILS</a>

SEARCH
: enter search :
<a href="#">ADVANCED SEARCH</a>
<a href="#">SITE MAP</a>

## FEATURES

[◀ back to features](#)
[print format](#)
[email article](#)
[comment](#)

### Physics centre for the developing world turns 40

Christina Scott  
1 October 2004  
Source: SciDev.Net

[CAPE TOWN] Last century, a charismatic Pakistani scientist had to make a terrible decision: choose between a potentially brilliant career abroad, or remain at home in relative poverty and obscurity.

At that time Pakistan offered no scope for postgraduate work. So Abdus Salam joined the brain drain, went to England, and eventually shared the 1979 Nobel Prize in Physics for groundbreaking research that remains at the heart of today's high energy physics.

Salam vowed that no other colleague from the developing world should have to face the same grim choice. So 40 years ago, he did something for which a wide range of scientists from the developing world can be profoundly grateful.

In 1964, Salam persuaded the United Nations Educational, Scientific and Cultural Organisation (UNESCO) and the International Atomic Energy Agency (IAEA) to help him set up the International Centre for Theoretical Physics (ICTP) in Trieste, on Italy's Adriatic coast.

The ICTP was to be a home from home for the crème de la crème of developing-world physics. Up-and-coming doctoral students could attend summer schools run by the world leaders in their field. Lecturers could take three-month breaks from the grind of teaching, and prepare their papers, lay the groundwork for fresh research with new colleagues, and immerse themselves in the latest developments in their subject. And each could then return home.

In this way, therefore, Salam helped plug the brain drain in his speciality. Since the foundation of the ICTP, some 70,000 scientists from more than 150 countries have benefited. And many have singled out the centre's infrastructure — even something as humble as a working photocopier — as invaluable.

"My calculations have to be done at the centre, due to a lack of computer facilities and library at home," says Bernard M'passi-Mabiala, who works on condensed matter at the Marien Ngouabi University in Brazzaville, in Congo, heading a department with more than 300 undergraduates.

M'passi-Mabiala says he would not have got his professorship without the help of the ICTP. In fact, he doubts if he would have had the courage to submit papers to well-known journals without assistance from the centre in the early stages.

Even though there is no post-doctoral programme for physics students in Congo, M'passi-Mabiala is now doing his bit, with the help of the ICTP, to foster the country's next generation of physicists. He teaches one Masters student and two PhD students by collaborating with the universities of Douala in Cameroon and Strasbourg in France through ICTP's sandwich training educational programme — or STEP — which offers fellowships to PhD candidates.

But the ICTP's biggest strength seems to lie in being able to mix and match students and lecturers with the world's top researchers in their specialised fields of interest.

Physicists are particularly dependent on collaboration, according to Ahmed Bawa, of the department of physics and astronomy at Hunter



Professor Abdus Salam, Nobel Laureate in Physics in 1979, had to choose between two loves, physics and Pakistan

## REGIONAL GATEWAYS


[LATIN AMERICA](#)
[SUB-SAHARAN AFRICA](#)
[MIDDLE EAST AND NORTH AFRICA](#)
[SOUTH ASIA](#)
[CHINA](#)
[SOUTH-EAST ASIA](#)

## DOSSIERS

[BIODIVERSITY](#)
[BRAIN DRAIN](#)
[CLIMATE CHANGE](#)
[ETHICS OF RESEARCH](#)
[GM CROPS](#)
[HIV / AIDS](#)
[INDIGENOUS KNOWLEDGE](#)
[INTELLECTUAL PROPERTY](#)
[RESEARCH AND DEVELOPMENT](#)

## BOOK REVIEWS

**Read SciDev.Net's selection of book reviews**

## BIODIVERSITY FEATURES

SciDev.Net explores the role that 'peace parks' could play in sub-Saharan Africa and between India and Pakistan.

College, City University of New York. Bawa says "physics research is intensely social in its construction".

Because of this, the ICTP may be of most importance to Africa. Vast distances and stunted budgets have isolated many African lecturers and researchers: the Democratic Republic of Congo alone is the size of Western Europe.

The dilapidated state-owned communication infrastructure in some regions is being sidestepped by new advances in cellular, satellite and Internet telephony; but the developed world still has the lion's share of landlines, and African physicists often found themselves in a kind of intellectual solitary confinement. Until Trieste, that is.

"The problem is that many African scientists work in isolation or in very small groups," notes Bawa, who came first to the ICTP decades ago as a doctoral student ("an exceptional experience"), then as a researcher, and finally as deputy vice-chancellor of what is now the University of KwaZulu-Natal, South Africa.

One of the world's leading relativistic cosmologists, George Ellis, a professor of applied mathematics at the University of Cape Town, agrees. "You need a critical mass of people to make science happen," he says. "Places like Trieste can give such local groups encouragement and support."

"We need to resist the view that Africans can only imitate and cannot do primary research work — we can and we do," says Ellis, who taught in Trieste for four years. "We need better science education but we also need somewhere for the youth to go when they graduate from school and then from university. We need people who can understand and tackle local problems from a physics and engineering viewpoint — for example energy, resource and water issues in Africa."

And that is just what is happening. A brief scan at the list of ICTP's junior associates uncovers Teferi Dejene improving seasonal climate prediction in Ethiopia, Kenya's Vincent Sakwa exploring the impact of doubled carbon dioxide on the East African climate, and Mahlomola Nchodu researching medical physics in South Africa.

In Nigeria, junior associates include engineer Hyginus Ubabuike Ugwu, geophysicist Olatunde Popoola and Babatunde Abiodun, who models atmospheric physics over complex terrain.

The sheer variety of physics done in Africa — and the amount that has been boosted by the centre — is mind-boggling. In English-speaking Africa, regular associates include Kenyan high energy physicist Akeyo Omolo, while in Zambia, Katongo Kanyanga does synoptic analysis of biomass-burning smoke and haze over the southern tip of Africa.

There are three regular associates from Ghana: Kwame Robert Nkum looks at the dielectric and transport properties of polycrystalline sodium nitrate, John Tawiah digs through soil physics and Alexander Asante works in digital communications.

In Nigeria, Debo Adeyewa deals with satellite meteorology and Asi Afiesimama does West African climate prediction. In Francophone Africa, regular associate David Monkam is based in a laboratory of atmospheric physics in Cameroon while in Senegal, Daouda Badiane looks at the thermal properties of convective systems at the sea-land interface of the westernmost coast of Africa.

Senior associates are also a diverse lot, ranging from Kofi Oduro-Afriyie, who works on power spectrum analyses of annual rainfall in West Africa at the University of Ghana, and M. M. Elmissiry, who works in non-conventional energy sources in Zimbabwe, to two colleagues from Brazzaville — climatologist Clobite Bouka Biona, who researches the exchange of particles and gases between the atmosphere and tropical forest, and M'passi-Mabiala.

These days, researchers don't even have to leave Africa to benefit from the centre. Ernesta Meintjes, who works in medical imaging in Cape Town, is a junior associate, even though she has not yet made it to Trieste. After surviving the gruelling selection process, Meintjes can now buy books that were once beyond her budget, for example.

"The benefits are that in the five years of membership, you are allowed three fully paid study visits to Trieste, either to attend courses or to spend time in their laboratories," Meintjes explains. "And we have a book allowance of 400 euros [US\$500] every year to purchase books, which is very nice."

Two researchers from countries that bookend Africa are in Trieste right now: Tania Douglas and Jamila Douari. Douglas works in the growing

field of medical imaging. By running digital pictures of children's faces through a computer, for example, her team can diagnose foetal alcohol syndrome, a heartbreakingly common local cause of mental retardation. This achieves two goals: it eliminates the need for an expensively trained specialist, and is less frightening for small children than having their face measured with callipers and rulers.

In this, her first visit to Trieste, Douglas has found out much that will help her students back home. She has just completed a medical imaging course and is now on a two-week neurophysics course.

Douglas, who was a finalist in the young black researcher category of South Africa's National Science and Technology Forum awards this year, is also designing a smart microscope with an automated slide dispenser which has imaging capabilities to detect tuberculosis infection in saliva.

Douari works in the same field — high energy physics — as the centre's founder. She seems an obvious candidate for the centre. But she also highlights another problem: Africa's internal brain drain.

Douari was born in Morocco, but she now works at the Institute for Advanced Study, at the University of Stellenbosch in South Africa. The same holds for a significant number of junior and regular associates, hailing from Cameroon, Cote d'Ivoire, Democratic Republic of Congo and Kenya.

Some argue that it is better for African scientists to work in southern Africa if the alternative is Europe or North America. But that does not necessarily augur well for the future.

Preventing the brain drain from the developing to the developed world was one of Abdus Salam's key concerns; dealing with the continent's internal brain drain to South Africa is a relatively new development, but no less a minefield. Perhaps it will be something for the next four decades to resolve.

"ICTP was and is an important institution for providing isolated scientists with the opportunity of feeling as if they are part of global enterprise," says Ahmed Bawa. "This was Abdus Salam's great dream. Everything else follows from that."

"The fact that these scientists return to their home institutions with new projects, exposure to new techniques, new collaborations, all contribute to the improvement of science at their institutions ... and it is always a powerful influence to be with other first-rate researchers."

Indeed, Abdus Salam's spirit should rest easy. How many teachers can boast of 70,000 students during their career?

#### **Related links:**

[International Centre for Theoretical Physics](#)

**Photo Credit:** the abdu salam international centre for theoretical physics

[back to features](#)

[to the top](#)

[print format](#) 

[email article](#) 

[comment](#) 