

AWARDS, HONOURS AND ACHIEVEMENTS

- Honorary Doctor of Science from Durham University in recognition of his contribution to science and higher education (2015)
- Foundation for Research Development President's Award (1991)
- His matriculation results during the divided South Africa. Coming from a small-town school, he was surprised to find himself ranked first among Indian South Africans

DEFINING MOMENTS

A theoretical physicist at heart, Bawa enjoys having experimental physicists validate theoretical calculations. His interactions with his professors as a young physicist, and in turn seeing the progress of his own young students, have defined his career.

WHAT PEOPLE MIGHT NOT KNOW

He and his wife, Rookaya, have been together for 42 years and they have two daughters. Their two grandsons, now six and eight, have completely changed their lives.

SCIENCE DESIGNED AS A MIRROR TO SOCIETY

"I think of theoretical physics the same way other people think of poetry: it helps us understand who we are, our place in the universe, and how we relate to each other."

Having worked at universities for most of his life, Ahmed Bawa asserts that we can't have a well-functioning society unless it admits the importance of enterprises like theoretical science.

As a young student of mathematics and physics in the early 1980s, he wondered if it would be sacrilegious to ask: "Does theoretical physics speak to the South African reality?" A decade prior, he had matriculated with distinction at what was then the Greytown State Secondary School, a state school in KwaZulu-Natal that did not even offer physics as a subject. Bawa started his working life in sales until his political activism landed him in prison for some years during which time he was able to complete a BSc in physics and mathematics from the University of South Africa.

As he worked his way up to an MSc in theoretical physics and eventually a professorship at the then University of Durban-Westville (UDW), Bawa wondered if his field could contribute to national development or help address race and gender imbalances in society. "It is too easy for science systems to become locked into the institutions where the work is done, without facing realities and context. For example, it really bothers me that after 24 years of democracy, we still use apartheid race categories to describe ourselves – it is like a failure of the humanities and social sciences to challenge social constructs. I'm not suggesting nothing has happened or changed, but I think science has let us down."

In the field of physics, Bawa regrets that South Africa has not made sufficient progress with racial transformation. South Africa has had some success in training young graduates to contribute to industry and thus to national development, and during his tenure as Vice-Chancellor of the Durban University of Technology (DUT) from 2010 to 2016 he was particularly proud of the engineering graduates who went on to work at the massive Square Kilometre Array (SKA) astronomy project in the Northern Cape. "As a spin-off, that project is building capacity in areas like data science, which is also applicable to social issues," he adds.

"Look at how well we've done in renewable energy – it depends a lot on research in physics and on young people who are passionate about understanding how the South African environment lends itself to enterprise in renewable energies. But on the subject of nuclear energy there has been no decent national conversation. If you want a strong democracy you must increase the capacity of the public and scientists to engage, otherwise big decisions are left solely to politicians. For me, a new interest and fascinating challenge is how to bring young people into conversations on science and knowledge."

SCIENCE INTO THE CONVERSATION

He suggests one way to bring scientists into the conversation is for government to support the universities' use of their resources to solve large and small



development and reconstruction challenges, as was done during the apartheid nuclear programme. "Engagement should permeate through research and teaching, and South Africans of all communities should be able to see their realities, cultures and arts reflected in the work of universities."

Bawa mentions an example of researchers studying how fermentation evolved in food preparation in Durban communities: "They spoke to women of different ages about food preparation, then tested and published those methods. A group from China saw the publication and reached out to collaborate on the research. That knowledge, deeply embedded in a local community, now has global relevance and the women who participated in the study feel that their knowledge was taken seriously."

A number of local and international research, development and higher education organisations rely on Bawa for this kind of insight. As he puts it, he brings "knowledge of South Africa's knowledge systems" to several boards and to Universities South Africa, in his role as its current Chief Executive Officer.

"It's about how our knowledge systems work, how they are built and funded, and how they relate to national development and innovation. And it's about growing an understanding of how important research is in building a globally competitive and socially coherent society," he explains. Much of his experience in the sector came from his time as the Programme Officer for Higher Education and Scholarship for the Ford Foundation in the early 2000s. He was tasked with strategic grant-making to help develop universities in southern Africa and the continent.

"I had to learn that higher education systems across continents are very different and there is no solution that applies to all systems and countries. Universities are expensive and as social institutions we have to fund them properly. Even in South Africa, the level of funding could be improved, and we have to be concerned about that" he remarks.

He adds that academics should be paid adequately: "The best academics will go where they will be paid the best; otherwise they need to moonlight and that comes at a cost for research".

Regarding the more alluring opportunities abroad that has resulted in a 'brain drain', he says we have to encourage students to return, and if they do not,

we should at least encourage them to remain connected to the South African knowledge project. The solution has to be deliberately designed, by building world-class research programmes that will attract students from all over the world.

He mentions the astrophysics group at the University of KwaZulu-Natal (UKZN) and the particle physics group at University of Cape Town (UCT) as success stories: "No-one leaves those groups because they are doing so much good work; they attract other nationalities and retain South Africans."

Recalling his own experiences as a theoretical physics researcher and lecturer in KwaZulu-Natal and abroad, he adds that the most wonderful thing, still, is doing a range of calculations and seeing experimental physicists test and validate them. "That is particularly gratifying."

He appreciated the influence of his physics professors during the early stages of his career and enjoyed the opportunity to influence MSc and PhD students during his tenure at City University of New York.

Since his return to South Africa in 2010, Bawa contends that the biggest challenge local universities face is alienation. He explains that during the #FeesMustFall campaign, for instance, no-one came to the defence of universities except themselves.

"Why did communities not say, 'We have to protect our universities'? We have to think hard about how universities can engage with society so that there is a kind of ownership of these important social institutions by communities at large.

"For this, citizens have to see themselves and their communities represented in those institutions, particularly in their knowledge production and dissemination projects. The same applies to industry, government and other constituencies. This is not to suggest that universities should lose their right to perform teaching and research in an unfettered fashion; only that they should also be firmly located in the contexts in which they find themselves," he states.

In the same way that poets' works speak to and reflect the communities they find themselves in, Bawa hopes his work with universities will continue to cultivate a culture of science that serves society.

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