

## ICTP: the next 40 years

The director of the Abdus Salam International Centre for Theoretical Physics (ICTP) looks to future challenges as the institution celebrates its 40th anniversary.

CERN is 50 years old this year, just as ICTP turns 40. Both are international institutions of advanced scientific research with similar aspirations and, understandably, their histories are intertwined. Two members of the CERN theory division, Jacques Prentki and Léon Van Hove, took part in panels of experts that encouraged the setting up of an international centre for theoretical physics. After the formation of ICTP in Trieste, its scientific council has been served, at various times, by Van Hove, Victor Weisskopf and Herwig Schopper, all at one time director-generals of CERN; Alvaro De Rújula, a young researcher at ICTP during its early years who later became director of CERN's theory division; and Abdus Salam, founding director of ICTP who served for several years on CERN's scientific policy committee.

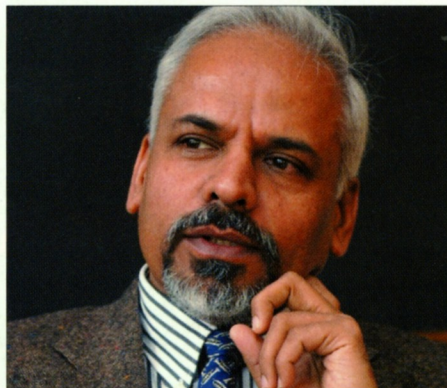
ICTP's creators intended to raise the level of science in developing countries by reducing scientific isolation through any means possible. The centre has been an institution run by a few scientists for the benefit of many. It operates on the principle that it can make a difference to the levels of science of individual scientists independent of the level of their home institutions.

These principles have remained unchanged, though it has become necessary for ICTP to adapt itself to changing circumstances. In particular, the unevenness of the progress made by developing countries has made it necessary to adopt different types of programmes for different regions of the world.

Forty years on, what exactly has ICTP accomplished? A brief list includes:

- Around 2000 scientific activities – from introductory schools to advanced workshops – organized on ICTP's premises.
- Around 100 000 scientific visitors – about half of whom come from developing countries and many of whom regard ICTP as a scientific home away from home.
- Thousands of research papers that have been published by the ICTP community in scholarly international journals.

Some of ICTP's scientific staff and many of its visitors are among the best in the world. During



the Cold War years ICTP was where the best scientists from both sides of the iron curtain met. It has also spun off intellectual centres elsewhere in the world, where they were needed most, and nurtured bright young scientists when their careers needed a boost. It has helped create new scientific institutions in Trieste, adding substance to the city's claims of caring for global science, and has rightly earned itself a high standing as a unique institution. We are indeed proud of our accomplishments.

But the magnitude of what remains to be done is immense. If we assume that a viable ratio of scientists to the overall population is a modest 1 in 1000, and that a third of these belong to physical sciences – which is ICTP's domain, despite the name – we ought to be connected to about two million scientists. By this measure, we fall short by a factor of 20, even on a cumulative count.

How do we motivate well-meaning scientists to be engaged in their work if they have to wait several days to download a four-page article in *Physical Review Letters*, or see the library in their university burn down in political conflict? Without working at some point at an institutional level how do we help create a cadre of adequate scientific capacity in countries where it's needed most? If scientists aren't suitably engaged, who shall advise governments across the world about the opportunities and responsibilities science affords in shaping the economic and physical well-being of their populations?

We must be involved in these issues, not simply as a moral imperative but because no part of the world today can prosper in exclusion, and if we leave some parts too far behind the consequences can be both adverse and unforeseen. This is the lesson forcefully inflicted upon us in the 21st century.

As ICTP celebrates its 40th anniversary (see p30), these concerns weigh on our minds. While we shall continue, as now, to support first-rate scientists individually, we have to develop several new avenues. Despite the continuing and generous support of the Italian government, we have neither the physical facilities nor the financial resources to arrange for every needy scientist to visit ICTP, or to support them in their own countries. So we have to work with the few outstanding and like-minded institutions to raise regional levels of science, in part through "South-South" co-operation. Where scientific traditions are great but resources scant, new centres must be created by raising money from all countries. We have to go beyond our support of individuals to groups of scientists who can be mutually supportive and multiply ICTP's effect. Taking advantage of our sponsoring institutions, namely UNESCO and the International Atomic Energy Agency, and others such as the International Telecommunication Union, we should strive to provide fast access at least to major research institutions throughout the world. At the same time we should work with scientific publishers to provide access to electronic publications and encourage distance learning.

The spirit of what we do is to spread the notion of scientific excellence. Obviously what we don't have ourselves we cannot impart to others. To support diversity without losing sight of quality is not easy: we cannot demand the same accomplishments from all those we support, but there can be no compromise on personal excellence and commitment to learning. In the end this is what matters most and will be most telling of ICTP's effectiveness. *Katepalli Sreenivasan, Abdus Salam honorary professor and director, ICTP.*