

Where the twain meet

The International Centre for Theoretical Physics in Trieste is a continuing tribute to the vision of Nobel Laureate Abdus Salam

A Ghanaian scientist writes to Nobel Laureate Abdus Salam, "For the past several years I have been working in quantum mechanics. Lack of literature and improper academic conditions do not permit me to publish my work. If you do not help, years of my hard work will be lost." Lubuma does not receive a personal reply from Dr Salam — ill-health prevents the latter from even holding a pen. But Salam's brainchild, the International Centre for Theoretical Physics (ICTP), reaches out to Lubuma in the true 'Salam' spirit. It invites him to attend a workshop of his interest where he can interact with leaders in the field, read the latest journals and do research. Lubuma is just one of over 25,000 third world scientists who have been saved from stagnation by ICTP.

Funded by the International Atomic Energy Agency (IAEA), UNESCO and the Italian government, ICTP is located at Trieste in north-eastern Italy. Physicists walk and talk science in a picture-postcard setting, among pine trees facing the Adriatic Sea. In October this year, ICTP completes 30 years of its existence. And for the first time since inception, it will have a new director, Praveen Chaudhuri, a US national of Indian origin. (Founder-director Salam, who is presently at Cambridge, has been elevated to president.) Chaudhuri faces the challenge of bringing in a whiff of fresh air and introducing new scientific pursuits, without jettisoning the old objectives of excellence and service. For it is these values that have made ICTP unique, a truly international centre where North meets South.

Convincing the UN that such a centre was needed was not easy. Says Salam, "People thought developing countries needed bullock carts, not Rolls Royces." Salam's firm conviction, however, was

that the North-South divide could be eliminated only by the transfer of basic scientific knowledge from North to South, not technology. He cited the case of Japan, which invested heavily in basic sciences and only then experienced a technological revolution.



Abdus Salam, father of scientific interaction

Salam had himself experienced the woes of scientific isolation. At 25, with a doctorate from Cambridge, he returned as a lecturer to Government College, Lahore, with rosy dreams. But there were no libraries and no other kind of communication, and his only concrete contribution was as a football coach! After three frustrating years, he returned to Cambridge. He could have immersed himself in his chosen line, like other non-resident physicists. But he was determined that others should not have to make the painful choice between country and profession. From such an experience

emerged the blueprint for a centre where scientists could periodically recharge their batteries and go home refreshed. In 1960, at the age of 34 and already a distinguished professor at Imperial College, Cambridge, Salam mooted his idea to a distinguished audience in Vienna.

"This was a tremendous task. Physics was hardly a fashionable subject to attract investment," points out Dr Hamende,

who has been with Salam at ICTP from the very start. The centre became a reality in 1964, with a grant of \$55,000 from IAEA and \$22,000 from UNESCO. Several countries made a bid for the venue — which went Italy's way following its offer of \$300,000 and a building. Initially, only plasma, nuclear, particle physics and condensed matter were the subjects introduced. Subsequently, with additional grants from the Swedish International Developmental Agency (SIDA) and Ford Foundation, other subjects like mathematics, the physics of oceans, atmosphere and energy, and experimental physics were added.

Says Professor Luciano Bertocchi, deputy director of the centre, "Isolation in experimental sciences is more acute because equipment is expensive." So ICTP tied up with over 200 Italian labs, besides having its own microprocessor centre and laser and fibre optics labs.

Simultaneously, a wide gamut of activities, workshops, Adriatic conferences, seminars and training courses was introduced. Nobel Laureates like Anderson and Shrieffer rubbed shoulders with budding talent from developing countries. Incidentally, in the Cold War days, it was the only platform where American physicists could meet their Russian counterparts. Its catalysing role led Nobel Laureate J. R. Oppenheimer to remark, "The centre has encouraged, stimulated and helped talented visitors from developing countries who after long periods of silence have begun to

write and publish at ICTP." And in the words of physicist John Ziman, Salam's institute became a 'bustling railway junction of ideas'.

One of the most successful schemes of ICTP has been the associate membership programme. Scientists undertake six to twelve-week stints thrice over a period of six years, for which travel and local expenses are borne by the hosts. According to Dr. Arun Jayannawar from the Institute of Physics, Bhubaneswar, "This gives me an opportunity to discuss with the best in the field. Such cross-fertilisation of ideas is not possible back home." Points out Professor Egede Ntawirumyara of Rwanda, "In the first visit itself, we formed a society of African physicists and mathematicians." Says S. N. Tiwari, Bihar University, "I have a heavy teaching load and inadequate computer facilities. ICTP helps me recharge my batteries." In fact, the stream of Indian visitors led *The Economist* to jocularly write, "It is said every Indian physicist has gone, is on the way, or wants to go to ICTP."

Besides, the centre has 294 worldwide federated departments, including 18 in India, to enable junior scientists in isolation to be sent for 40 to 120 days per year to Italy. ICTP also has book and equipment donation programmes whereby donations from international organisations to ICTP are distributed to libraries and labs in developing countries. Its Office of External Affairs was established to help organise conferences and workshops in Third World countries. Since 1986, 600 such programmes have been actively supported by ICTP.

Over the years, the centre has logged 38,906 visits from developing countries and 11,933 visits from industrialised countries for participation in its research and training activities. The core faculty of the institute, however, remains just a dozen.

According to Bertocchi, after 30 years the centre has inevitably reached a plateau — "a high plateau though." A quantum increase in funds is the need of the hour. At present, of its \$30 million budget, \$27 million comes from the Italian government, in recognition of Salam's stature and the fact that ICTP has created a scientific spirit in Trieste. In fact, a research complex, modelled on the centre, has come up in its vicinity. This includes UNIDO's International Centre for Genetics and Biotechnology with its research activities divided between Trieste and Delhi. But all said and done, it is obvious that the Italian government cannot raise its contribution much more.

The incoming director, Praveen Chaudhuri, plans to steer the centre into new directions like computational

over some of the conferencing activities of ICTP. It has reached a level where it contributes as much as ICTP gives it," points out Dr Hamende. On the other hand, it is Russian scientists who now need help. "The number of Russian scientists applying to visit ICTP is so many that if we accept them all, we could well become a research centre," says a senior spokesman. Adapting to the changing environment will imply changes in the present management structure. Plans are also being discussed for setting up similar centres elsewhere — eg, Iowa in the US for the Latin American countries.

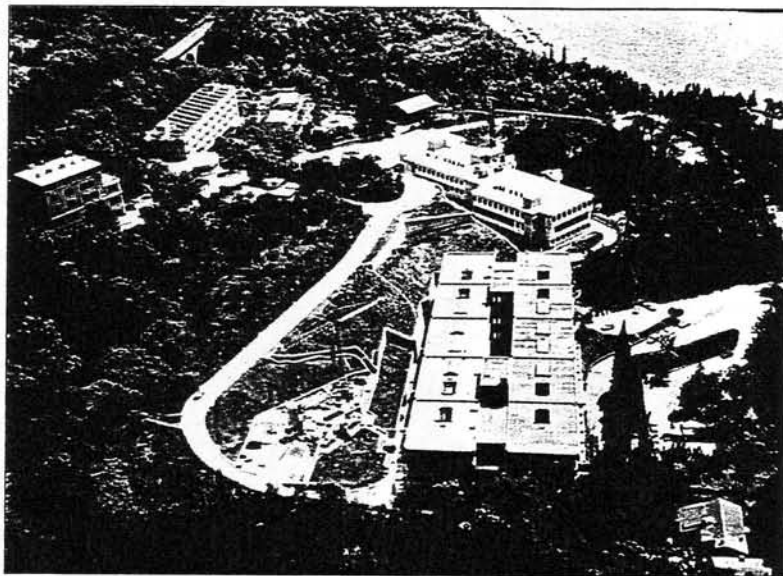
But for Salam, ICTP is not an end in itself. He envisages a worldwide network of 20 research centres in developing countries, each concentrating on a subject of greatest importance to the country concerned.

The structure would be akin to that of CGAIR (Group of International Agricultural Research) with its network of 13 international centres which include ICRIASAT, Hyderabad. Part of the money would come from a central pool, eg, the World Bank, and part from the developing countries themselves. (Every developing country should put aside at least 1 per cent of its GNP for science and technology, according to Salam). Rather than set up new centres, the plan is to upgrade existing ones in developing countries

to international levels, a task requiring an investment of \$5 million per centre. The overall coordinator would be the Third World Academy of Science — another Salam creation.

The first meeting to make this idea a reality will take place in Pakistan on 4 October, to which science policy makers of all developing countries have been invited. Abdus Salam is unlikely to be well enough to attend. But if the network does come into being, it will be a tribute in absentia to the indefatigable capacity of one individual of high ideals to inspire change.

■ MEERA SHENOY



ICTP's picture-postcard setting in Trieste

physics with its applications in atmospheric science, ecology studies, brain research, and even such practical ventures as helping developing countries in computer networking. Environment, on which the centre presently spends just \$400,000, will be emphasised. It is estimated that a comprehensive environment programme will require an outlay of at least \$7 million. Possible funding sources, according to Bertocchi, could be UNESCO or industry.

The centre will also have to adapt to the current environment. For instance, the concept of developed and developing countries is fast changing. "India can take