Celebrating a century of Research

The Indian Institute of Science, Bangalore, which is celebrating its centenary year, has emerged as one of India's pre-eminent higher education institutes, writes **Shivkamal.**

THE prestigious Indian Institute of Science (IISc), one of India's premier research institutions, located in Bangalore, the IT hub of the country, has just entered its centenary year in May. The last 100 years have seen world-class research activities being undertaken at the IISc, some of which have brought it worldwide fame.

Not many research and academic institutes have reached the level attained by IISc, which is known for its resulted-oriented academic programmes. The Institute has been able to make many significant contributions primarily because of the uniqueness of its character. It is neither a national laboratory – concentrating solely on research and development (R&D) and applied work – nor a conventional university – concentrating mainly on teaching.

> The IISc is involved with research in frontier areas and education in technologically important areas.

The IISc is involved with research in frontier areas and education in contemporary technologically important areas. It was the first Institute in India to introduce innovative integrated PhD programmes in biological, chemical and physical sciences for science graduates.

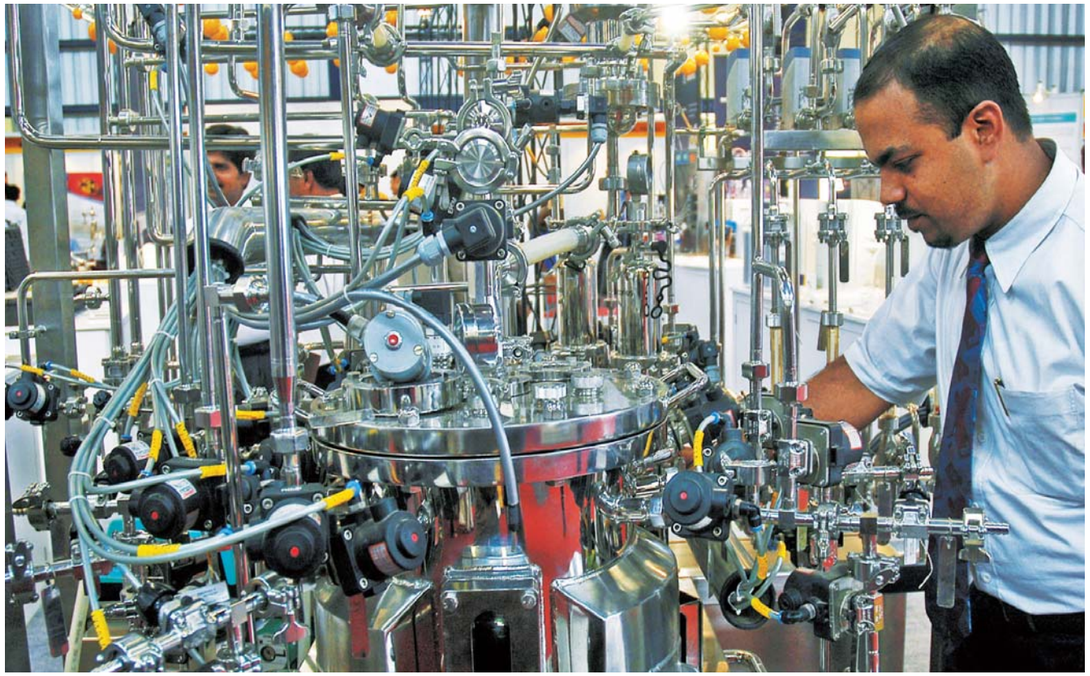
The IISc was the brainchild of Jamsetji Nusserwanji Tata, the founder of the house of Tatas, who envisaged the Institute to promote original research into all branches of learning. It was on May 27, 1909 that the constitution of the IISc was approved by the then viceroy Lord Minto and the necessary vesting order signed.

Prof P. Balaram, director, IISc, has planned several initiatives to commemorate the centenary celebrations. According to him, the celebrations will include the setting up of five state-of-the-art laboratories, a modern international visitors' hostel, international seminars, a special IISc centenary conference, lecture series and a documentary film, in association with the Union Ministry of Information and Broadcasting, to capture the history and achievements of the Institute during the last 100 years. The celebrations will officially commence with the release of a postage stamp featuring IISc.

With Bangalore emerging as a hub of aviation research and support related activities, IISc has planned to expand its facilities in this area. Work has already commenced on a new building-cum-lab for the existing department of aerospace engineering. This apart, the biological sciences and physical sciences laboratories are also being expanded.

After achieving worldwide fame as a global destination for investments in information technology and biotechnology, Bangalore is gradually gaining attention as a potential nanotechnology hub. Recognising this, the IISc is opening a new centre for excellence in nano-electronics as well as a modern library. Both facilities are coming up near the National Institute of Advanced Studies (NIAS) wing in the 443-acre campus.

Prof C N R Rao, who headed the IISc in 1984, has been promoting the cause of nano-technology for the last one decade. As honorary president of the Jawaharlal Nehru Centre for Advanced Scientific Research, which is part of the IISc, he has



PIONEERING RESEARCH: The Indian Institute of Science is currently operating more than 350 projects and alliances with various partners

been pioneering research in this field.

The Institute has decided to organise a unique event, 'The IISc Centenary Conference' to mark 100 illustrious years of leadership in science, technology and innovation. The four-day conference would be held in the IISc campus in December.

According to Balaram, world-class researchers, including distinguished alumni of IISc and leaders of industry, will present papers at the conference. "The event will provide a splendid opportunity to be a part of the scientific vibrations at the Institute, listen to brilliant researchers, and interact with phenomenally accomplished scientists from all over the globe," he notes.

The Institute's centenary post-doctoral fellowship (CPDF), offered to coincide with the centenary celebrations, is receiving good response from across the world. It has attracted applicants from across the country besides Germany, Japan and the United States.

The IISc has signed a memorandum of understanding (MoU) with the Karolinska Institute in Sweden, one of Europe's largest medical universities, to work together in the areas of biosciences and bioengineering.

The MoU was preceded by a bilateral trade agreement between Sweden and India to forge partnerships in science and technology. The MoU includes exchange of scientists and PhD scholars, and exploration of possible research projects between the two Institutes.

In 1991, the IISc launched the Society for Innovation and Development (SID). Its mandate is to undertake research and development projects based on individual or joint proposals from the faculty and scientists of IISc in collaboration with industries, business establishments, national and international organisations.

It is currently operating more than 350 projects and alliances with various research institutes and corporates from across the globe. It includes Honeywell, Shantha Biotech, General Motors, Intel, Indian Immunologies, Tata Motors, Microsoft, Nokia, Daimler Chrysler, Samsung, Boeing, Cisco, Dabur Research Foundation, Pratt & Whitney, Motorola, FMC India, Texas Instruments, Ericsson, Nortel, Unichem Laboratories, HP Labs India and Cadila Pharmceuticals, among others.

> The IISc has signed a memorandum of understanding with the Karolinska Institute in Sweden, to work together in the areas of biosciences and bioengineering.

Some of India's top scientists and technologists have been associated with this prestigious Institute over the past century. They include C V Raman, H J Bhabha, Vikram S Sarabhai, J C Ghosh, M S Thacker, S Bhagavantam, S Dhawan and C N R Rao.

The Institute confers honorary fellowships on eminent scholars and scientists and on those who have made noteworthy and lasting contributions to the cause of science and industry in India. Among the 24 recipients of this distinction are Pandit Jawaharlal Nehru, M Vishveswaraya, C V

INDUSTRY INTERACTION: Many companies are keen on tie-ups with the IISc

A CHANCE ENCOUNTER GAVE BIRTH TO A GREAT INSTITUTION

THE birth of the country's foremost scientific research institute – the Indian Institute of Science – can be traced to a chance encounter between two of the leading lights of 19th century India. The 'Empress of India' was sailing from Yokohama in Japan to Vancounver in Canada in 1893.

Aboard the vessel were Jamsetji Nusserwanji Tata, the pioneering entrepreneur, and Swami Vivekananda, the eminent philosopher; both were headed to Chicago, the former to attend the World's Columbian Exposition (also called the Chicago World's Fair, to mark the 400th anniversary of the discovery of the New World by Christopher Columbus), and the latter to participate in the World's Parliament of Religions, where he made his historic speech.

Conversation veered around to Tata's proposed steel mill. Vivekananda pointed out to him that there were two aspects to the challenge of putting up a mill – manufacturing technology and the science of steel. The former could be imported, but the latter had to be researched at home, the philosopher told the industrialist.

About five years later, Tata wrote to Vivekananda: "I trust, you remember me as a fellow-traveller on your voyage from Japan to Chicago. I very much recall at this moment your views on the growth of the ascetic spirit in India…I recall these ideas in connection with my scheme of Research Institute of Science for India."

Tata noted that "If such a crusade in favour of an asceticism of this kind were undertaken by a competent leader, it would greatly help asceticism, science, and the good name of our common country; and I know not who would make a more fitting General of such a campaign than Vivekananda."

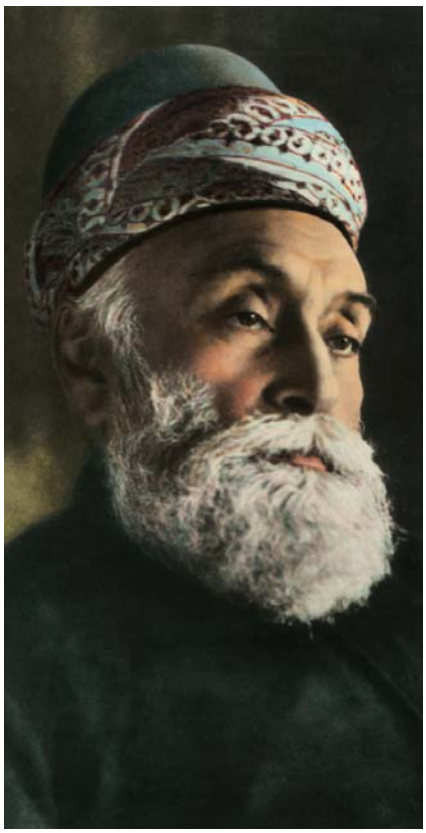
The renowned thinker and philosopher heartily endorsed Tata's proposal. Soon a provisional committee was set up to establish an institute of research and higher education, which presented its proposal to Lord Curzon, the viceroy-desginate, on the last day of 1898. Nobel Laureate Sir William Ramsay's help was sought by the Royal Society of London, and Bangalore was selected as the site. The Maharaja of Mysore offered 372 acres of land free of cost (the Karnataka government enhanced this to 443 acres during the Golden and Platinum Jubilee of IISc).

The constitution was approved by viceroy Lord Minto on May 27, 1909. The first batch of students was admitted in July 1911, to the departments of general and applied chemistry and electro technology. The institute is today ranked among the top research universities in the world. Some of India's topmost scientists and researchers have studied or taught at the institute. Nobel laureate C.V. Raman was a professor and later a director, while eminent nuclear scientists including Homi J Bhabha and Raja Ramanna, and renowned space scientists Vikram Sarabhai and Satish Dhawan have also been also associated with it.

While earlier the IISc was focussed on pure research, it has increasingly been opening its doors to interaction with industry. Nearly a score of international and Indian companies have set up research laboratories at the IISc and over a hundred projects have been taken up by scientists there. IISc is increasingly getting involved in research along with international auto and aircraft manufacturers. The Centre for Scientific and Industrial Consultancy (CSIC) and the Society for Innovation and Development (SID), two divisions within the institute, coordinate the interaction with industry.

China's Jiao Tong University, in its Academic Ranking of World Universities, 2007, has placed the IISc (along with the Indian Institute of Technology, Kharagpur, the only other Indian varsity in the listing) in the 305-402 world rank and 43-64 in Asia.

For the IISc, the centenary year marks the opening of a new chapter, as it gears to meet the challenges of the future.



DPA

HELPING ASCETISM, SCIENCE: The chance encounter between Jamsetji Tata and Swami Vivekananda led to the establishment of the IISc

> A hundred years hence, the institute has lived up to his dream and continues to do pioneering work in frontier areas of science.

Raman, J R D Tata, Vikram S Sarabhai and C N R Rao. Besides formal education and research, the Institute has been playing an active role in offering short-term courses to scientists and technologists. The Continuing Education Programme covers a wide range of topics and over 1,500 working scientists and engineers take up such courses every year.

The IISc also has a Centre for Scientific and Industrial Consultancy, through which the know-how generated in the Institute percolates to industries via industry-sponsored projects. The Jawaharlal Nehru Centre for Advanced Scientific Research through organic links with the Institute has been sharing facilities on its campus.

When Jamsetji Tata conceived the idea of setting up the IISc, it was with the aim of establishing a scientific institution that would emerge as a premier research body.

A hundred years hence, the Institute has lived up to his dream and continues to do pioneering work in frontier areas of science.

AIMING TO BE AT PAR WITH THE BEST

THE Indian government is committed towards furthering the transformation of the Indian Institute of Science into a premier world-class university at par with some of the best – Massachusetts Institute of Technology or the universities of Harvard and Stanford (in the US), or Cambridge and Oxford (in the UK).

To this end, the government announced a special grant of $25 million to the IISc a few years ago. Moves are also afoot to set up two other institutes on similar lines in Pune and Kolkata to meet the huge demand for quality post-graduate science education.

The IISc also has plans to double the size of its campus over the next few years. This is towards enhancing its interactions with industry and research laboratories around the globe. Part of the expansion plan has already begun and new laboratories for aerospace engineering, biology, physics, nano-electronics, nano-science and nano-engineering have been set up. The IISc is also toying with the idea of introducing under-graduate programmes.

And with its alumni spread around the world – many of them in key positions in top international corporates and research bodies – the IISc is seeking greater interaction with them. An alumni conference was held in Silicon Valley a few months ago, and alumni chapters are being set up across the US. Top American companies including IBM, Google, Boeing, Applied Materials and Monsanto were co-sponsors at the conference.

Some alumni members have contributed funds, setting up chairs in different faculties. Others are helping the IISc in recruiting scientists, who can be lured back home to India to head departments.