The Story of IISERs

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Institution Building:
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N Sathyamurthy
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Dedicated to

the people of India
Foreword

It is with pride and satisfaction that I write this foreword to the book on the Indian Institutes of Science Education and Research (IISERs). The idea of having a national institution or a university dedicated to science was not completely new. Some years ago, in the National Committee for Science and Technology chaired by Shri C. Subramaniam, I had brought up the idea of establishing such institutions for science which would be equivalent to the IITs in engineering. For some reason, it could not happen. I kept repeating this in many places, and the idea was even included in a Planning Commission document during 1989–90. It took the right set of people and circumstances eventually to make this happen.

When I was the Chairman of the Science Advisory Council to the Prime Minister, Dr. Manmohan Singh, I described the idea of IISERs to the Prime Minister. He thought that it was a very good idea and gladly endorsed establishing them. When I talked to the Education Minister, Shri Arjun Singh, he expressed complete support. Amazingly, within a few weeks after the initial discussions, an important meeting was arranged by the Ministry of Human Resources and Development to discuss this matter. The meeting was chaired by the Prime Minister and attended by the Deputy Chairman of the Planning Commission (Dr. Montek Singh Ahluwalia), Minister for HRD and so on. I was invited for this meeting. I assumed that the Minister of Education would make the presentation of the idea of IISERs to the Committee. Instead, Shri Arjun Singh asked me to make the presentation about IISERs. I had not formally prepared for such a thing to happen. I talked about the need for such IISERs and what they can do for science in India. Amazingly, at the end of the meeting, everyone present endorsed the idea of IISERs. Within a few weeks, the government decided to establish five IISERs. A small group was formed in the HRD ministry to make initial plans for the institutes. The government decided that they should be located in five different regions of India, north, south, east, west and central India. We have these five IISERs now. When I was asked to give an estimate of the costs required, I gave a rough estimate of ₹500 crores per institute for a period up to five years. A few more IISERs have been added recently.

I should thank Dr. Manmohan Singh, former Prime Minister, for having supported the idea of IISERs and let them come into being. The then HRD Minister Shri Arjun Singh gave full support and Mr. Banerjee, Secretary of HRD, took personal interest in the project.

I feel that IISERs have done remarkably well. They are becoming fountains of science in India. Many people tell me that IISERs are giving tough competition in science to
Foreword

well-established institutes in the country. I hope and pray that IISERs will excel in teaching as well as research in the years to come. They are indeed the hope for science in India. Long live IISERs!

C N R Rao
Linus Research Pauling Research Professor
Those of us who went to high school in the early 1960s grew up in the Sputnik era. Although we could not watch television in India at that time, we were excited about Neil Armstrong landing on moon. His famous statement, “That’s one small step for a man, one giant leap for mankind” echoed all over the world. Physics was a romantic subject. The realisation of the energy stored in the nucleus of atoms was overwhelming. Many of us dreamed of becoming scientists, although we did not know what exactly that meant. We were excited to make soap at home, use carbon rods from old batteries as electrodes and do experiments of various kinds. We were thrilled to generate hydrogen gas by adding dilute hydrochloric acid to zinc powder and watch the gas catch fire with a pop. Bell jar experiments were simple, but exciting.

National Science Talent Scholarship enabled many of us pursue studies in mathematics, physics, chemistry, botany, zoology and geology in some of the best places in the country. We were not worried about getting a job. We were excited about becoming scientists. Summer schools organized by the National Council of Educational Research and Training (NCERT) kindled the spirit of enquiry in us. We did not think about publications. It was curiosity-driven science, pursued with innocence and excitement.

All that changed in the 1980s. The Information Technology (IT) revolution brought about major changes in the society. The salary that accompanied the IT jobs and the prospect of making millions by software development lured the bright minds, particularly from the middle class, into studying computer science and related subjects. The boom that followed ensured that less and less number of students went for higher studies in science.

Policymakers and decision makers were a worried lot. Independent India was committed to its development through science. Jawaharlal Nehru, the first Prime Minister of India, knew that science was the route to progress and the way to uplift the masses. He gave a free hand to Homi Bhabha and Shanti Swarup Bhatnagar to do what was needed. While the former went about planning the atomic energy programme, the latter went about building CSIR laboratories. Bhatnagar was also the first Chairman of the University Grants Commission of India.

India had produced leading scientists like J. C. Bose, C. V. Raman, S. N. Bose, M. N. Saha and K. S. Krishnan before independence. It was time for India to produce leaders in science, who would stand shoulder to shoulder with the giants of global science.

The university system that had produced scholars in various fields was not keeping with the times. The laboratories therein were becoming outdated. Modern equipment was costly and required valuable foreign exchange. Although, considerable amount of money was put into the
system, the results were not commensurate. The burgeoning population demanded an increase in the number of universities and financial outlays.

Several committees were set up to come up with ways and means to attract talent to science and retain them in science. Kishore Vaigyanik Prtsahan Yojana (KVPY) and National Science Olympiads could identify students interested in science, but most of them ended up pursuing engineering, technology or medicine. Also, the number of KVPY scholars selected each year was too small to make a difference to the country. Some recommendations were made to set up new institutes dedicated to science, within the boundaries of existing universities. But then, the Science Advisory Council to the Prime Minister of India, in 2005, recommended setting up of two Indian Institutes of Science Education and Research (IISERs); one in Kolkata and one in Pune, with a financial outlay of ₹500 crores each. The government accepted the recommendations and IISERs were set up in Kolkata and Pune in 2006. Soon followed IISERs in Mohali (2007), Bhopal (2008) and Thiruvananthapuram (2008). A few years later, two more IISERs were set up, one in Tirupati (2015) and another in Berhampur (2016). This happened at a time when India was in a mood to expand. More IITs, NITs and Central Universities were set up. But the first five IISERs were different. They were on a mission mode.

The first five IISERs were set up as registered societies. There was a Detailed Project Report (DPR), approved by the Planning Commission. There was a beautiful Memorandum of Association for each IISER. It was a progressive document, prepared by the government officials. There was a system of Board of Governors along the lines of the existing IITs and the Government of India rules. Yet, the Directors of IISERs were given a free hand to build IISERs the way they wanted. Bright students joined the IISERs. There were no buildings, but there was a vision. There were no roads, but the road to success was evident. What happened in the next ten years was unprecedented in the history of modern India. It was as if the IISERs were self-assembling.

Each IISER went about recruiting outstanding faculty and building state-of-the-art facilities. Nothing could stop them from realising their goal. Outstanding research publications followed and the country and the world took note of the IISERs. A brand name was built in (just) ten years!

India showed what could be done, if it wanted to. Building IISERs was too important an experiment in institution building by India, to be simply forgotten. The need was felt to document how the five founding Directors and their successors went about building the IISERs and to document the lessons learned for posterity. A workshop was organized at IISER Mohali on 25 February 2017 to convey the agony and ecstasy of building the five IISERs by the seven men involved. What follows is a document that emerged.

The preamble provides the background to the building of the IISERs. The five chapters that follow document how each IISER was built and the epilogue tries to summarise the problems faced and the lessons learned.
It is important to place on record our sense of gratitude to Prof. C. N. R. Rao, the Chief Architect of IISERs, Dr. Manmohan Singh, the then Prime Minister of India and Shri Arjun Singh, the then Minister for Human Resource Development for founding IISERs. Subsequent ministers of HRD have been very supportive of the IISERs. It is difficult to mention by name all the officials of the state and central governments, who provided unstinted support to the growth of IISERs and helped us in converting the dream into reality. We remain grateful to them all.

When we were searching for a publisher to publish the story of IISERs, Prof. Ram Ramaswamy, President, Indian Academy of Sciences, Bengaluru readily agreed to the proposal. On behalf of all Directors of IISERs and the scientific community and on our own, we would like to express our gratitude to him for the same. We are grateful to Sudarshana Dhar and her team for doing a wonderful job in producing the document that is in your hand.

If you like the book, the credit goes to all the people that made it possible. If you find mistakes or something amiss, we take the blame.

N Sathyamurthy
Ritajyoti Bandyopadhyay
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“At IISER, science should be taught as it is practised and should be done as it is taught.”

N Kumar
First Chairman, Board of Governors, IISER Pune
16 August 2006
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India is a land known for its scholars and scholarship. As early as 4th century BC, Takshashila was renowned as the greatest learning centre in the world. Takshashila existed, as per the records, when Alexander the Great invaded India. Unfortunately, the nomadic Hunas destroyed the university in 5th century AD. Takshashila was a melting pot of knowledge-seekers that attracted bright minds from different parts of the country. It had teachers like Chanakya – the author of Arthashastra, and Charaka – the Ayurvedic Healer. Nalanda, the other centre of learning in this region was established in 427 AD and it flourished until the year 1197. Nalanda was focused on Buddhist studies and as Buddhism died with time, Nalanda died its death too.

In the West, several universities were established, the oldest being the Bologna University founded in 1088 AD in Italy. In the United Kingdom, Oxford University was established in 11th century followed by Cambridge University in 1209. It appears that the University of Paris was officially chartered by King Philippe-Auguste in 1200 AD and was recognized by Pope Innocent III in 1215. In 1290, The University of Coimbra was set up initially in Lisbon and it moved to its present campus in 1537. In the United States of America, Harvard, the oldest private university was established in the year 1636. Stanford University, yet another private university in the US, came into existence in 1885.

In India, the University of Calcutta was established on 24 January 1857. Scholars like J. C. Bose, C.V. Raman, S. N. Bose, M. N. Saha and K. S. Krishnan (co-discoverer of the Raman Effect) flourished in this university’s ambience. 5 September 1857 is when the University of Madras was established. C.V. Raman - the Nobel laureate, Sarvapalli Radhakrishnan – Philosopher and President of India and G. N. Ramachandran-well-known structural biologist were the students of this university. In the year 1909, Jamsetji N. Tata established the Indian Institute of Science, Bangalore. Swami Vivekananda, who envisioned that modern education was the only way to eliminate poverty in India, had apparently advised Jamsetji to build this science institute. Pandit Madan Mohan Malaviya established the Banaras Hindu University in the year 1916. He said, “The millions mired in poverty here can only get rid (of it) when science is used in their interest. Such maximum application of science is only possible when scientific knowledge is available to Indians in their own country.” In 1929, the Annamalai University was established by Annamalai Chettiar who made his money by lending. He established the Meenakshi College of Music and Tamil in his mother’s name to make noble use of the money he had made. It was the first private university to be established in India.

The Universities of Calcutta, Madras and Bombay were established by the British with an intent to generate Indian clerical workforce suited to run the British Empire. The natives
proved their mettle instead by performing creative experiments, and establishing themselves as leaders in the forefront of science. J. C. Bose was much ahead of his time when he invented the wireless. Unfortunately, the West gave the credit to Marconi and not to Bose. Raman, an Accountant General in the British Empire gave up his lucrative job and pursued research in science. He was ridiculed for his initial research on drums and violins, and was advised to take up research on X-rays and light. He started his early experiments by darkening a room and making a small hole in the window to let the sunlight in. He used a prism to study the characteristics of sunlight. He imported the first spectrometer in the country with the money donated by G. D. Birla, and discovered the Raman Effect. S. N. Bose understood the significance of the discovery of Raman Effect and told Raman that he would get the Nobel Prize for his work. Meanwhile, several other significant contributions from Indians were gaining prominence in the world map. S. N. Bose’s discovery in statistics was published with Einstein. Saha’s work on thermal ionization made him a global figure. Although these activities flourished in one part of the country, Calcutta (now Kolkata), there was something special that was happening in the country as a whole clearly establishing that Indians were no less than their English counterparts.

In independent India, Panjab University moved from Lahore to Hoshiarpur and eventually to Chandigarh. It was a leading university in the northern part of India. Thanks to Nehru’s vision, Indian Institute of Technology (IIT) Kharagpur was established in the year 1951. IIT Bombay, Madras and Kanpur followed in the years 1958, 1959 and 1959, respectively. IIT Delhi was established in 1961. IIT Guwahati was established as a result of Rajiv Gandhi’s agreement with the Asom Ganaparishad in the year 1994. Thomson Engineering College, which became the University of Roorkee, was converted into an IIT in the year 2001. During the years 2008–2009, eight more IITs were established and a few more have been established subsequently.

Although Takshashila and Nalanda flourished for a reasonable period, they disappeared over a period of time for historical reasons. In contrast to their Asian counterparts, Oxford, Cambridge, Harvard and Stanford continue to thrive and are among the top academic institutions in the world. They continue to focus on appointing quality faculty and admitting quality students. The former is essential for the latter.

In this country, the Universities of Calcutta, Madras, Banaras, Allahabad and Annamalai were leading academic institutions at one point in time. Unfortunately, they no longer continue to hold their ace positions. The Indian Institute of Science is more than 100 years old now with its share of vicissitudes. Yet, thanks to its continued emphasis on quality faculty, quality students and quality research, it continues to thrive.

While establishing an institute is a landmark event to set the ball rolling, it is equally important to induct people of high academic and administrative calibre to continue running
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an institution. When Malaviyaji went around scouting for talent for Banaras Hindu University, he succeeded in appointing Sarvapalli Radhakrishnan as his successor Vice-Chancellor (VC). Prof. A. C. Joshi was the first VC of Panjab University at Chandigarh. Joshi’s secret of success lied in the appointment of great scholars in the faculties, which gained Panjab University the name of a premier institution in the country. Prof. Ashutosh Mukherjee had done the same in the early part of the 20th century by appointing Raman as the Palit Professor even though Raman did not have a PhD degree. C. V. Raman, in turn, appointed young K. S. Krishnan over the reputed scientist Meghnad Saha. Academic disagreements notwithstanding, A. N. Jha of Allahabad University had sought advice from Saha while appointing Saha’s successor. Saha suggested the name of the Nobel laureate, E. Schrödinger for the job. Unfortunately, World War II broke out and Schrödinger could never join the university. Raman believed that the Indian Institute of Science would flourish only if it had faculty of Nobel class. He appointed Ludwig Prandtl and Max Born. Both the scientists stayed only for a limited period of time. In recent times, Gurbaksh Singh, who went from the Banaras Hindu University to set up the University of Hyderabad, paid much importance to appointing quality faculty. The University of Hyderabad was established in 1974 and Pondicherry University followed suit in 1985.

A country of India’s magnitude and the scaling need for education of the masses has been a humungous task to achieve. In 1947, India had a population of 300 million. Today (in 2018) we are a nation of about 1.32 billion people. Until the beginning of the 21st century, the increase in the number of academic institutions in the country was not in keeping with the increase in the population. The famous universities of Calcutta and Madras ceased to be leading centres of excellence, and the Banaras Hindu University and the University of Allahabad trailed behind. The reasons contributing to the decline of the universities are beyond the scope of this introductory piece. Over the years, the IITs became a brand name and were known globally, and yet their programmes in science were simply not enough to meet the growing needs of the nation. Students wanting to pursue science were not able to find good institutions that impart education at the forefront of science.

The gradual decline of science education in the country led the leaders in the field of science like Govind Swarup, V. V. Bhide and others in Pune to propose a centre of excellence in basic sciences within the Pune University. The Government of India agreed in principle to set up National Institutes of Science (NISs) in Pune, Allahabad, Chennai and Bhubaneswar. However, before these could be established, general elections were held and the government at the Centre changed. Although the efforts to establish the NISs continued, based on the advice of the Science Advisory Committee to the Prime Minister, IISER Kolkata and IISER Pune were established in the year 2006. IISER Mohali was established in 2007. IISER Bhopal and IISER Thiruvananthapuram were established in 2008. IISERs at Tirupati (2015) and Berhampur (2016) were established more recently. Incidentally, the National Institute of
Science Education and Research (NISER) was established in Bhubaneswar as a part of the Homi Bhabha National Institute and the Centre for Basic Sciences was established in Mumbai University Campus in 2007.

In the year 2009, 14 Central Universities were established and a few more have been established subsequently. Several regional engineering colleges were converted into the National Institutes of Technology (NITs) in the year 2002. At present, there is one NIT and there is at least one Central University in every state. Although the Government has set up several institutions (IITs, NITs and Central Universities) in the last 10 years, IISERs have been unique in their setup and what they have achieved within a span of 10 years. To take stock of the establishment of IISERs and their growth in the last ten years, a workshop was conducted at IISER Mohali on 25 February 2017. What follows is an attempt to document the initial efforts, the elements of success and the lessons learnt.

IISERs were initially set up as registered societies, with the Union Cabinet's approval of a detailed project report (DPR). The Memorandum of Association (MoA) with which the IISERs started functioning was a well-produced document and was instrumental in providing the guidelines with flexibility to take care of the changing needs of changing times. It is debatable if IISERS should have continued as registered societies. Due to the mounting public pressure, the Ministry of Human Resource Development was in a hurry to come up with an Act that would establish the IISERs as institutes of national importance. Although efforts were made to draft an IISER Act, the government went in for an amendment to the NIT Act (2012). Subsequently, this was modified into NITSER Act 2014.

The objectives and goals of IISERs were clearly stated in the DPR and this introductory piece to the IISER story is the most appropriate reading space for the documented version of the vision.

**Objectives**

- To create world-class institutions for under-graduate and post-graduate education in sciences with an intellectually alive atmosphere of research.
- To create a unique research university in the country where education will be integrated with state-of-the-art research.
- To create, therefore, an Integrated Master’s programme in sciences following ten-plus-two curriculum.
- To create a cadre of high-calibre, internationally well-known faculty members devoted to teaching as well as research activities in sciences.
Goals

- To strive to arrest the declining trend of young people in joining basic sciences.
- To match the quality and brand equity, extant in engineering (IITs) and management (IIMs), also in basic sciences.
- To impart science education that will nurture creativity.
- To provide education and training in order to charter new grounds and break compartmentalization of traditional disciplines of biology, chemistry, computer sciences, mathematics and physics.
- To make possible a flexible, border-less curriculum in which a student, say interested primarily in biology, should have no difficulty in taking courses in, say mathematics in the first two years.
- To strengthen the base of the pyramid of basic sciences and gradually build up its apex of inter-disciplinarily.
- To create awareness in career opportunities for well-rounded Master’s degrees in all aspects of basic sciences, followed by specialized training during the last three years of the curriculum.
- To expect that about 20% of the graduates of the Master’s programme will carry-on in pursuit of a doctoral stream in focused sectors, while the rest will leave with a quality stamp to join other organizations.
- To plan to provide such preparatory training to about 80% of the final year class such that the graduates will be ready to join a plethora of career opportunities that exist for scientists in government organizations such as the Department of Atomic Energy (DAE), Council of Scientific and Industrial Research (CSIR), Indian Space Research Organization (ISRO), Defence Research & Development Organization (DRDO), teaching profession in colleges and universities and other sectors of the society at large.
- To network IISER with the existing institutions, laboratories, universities and colleges in the neighbourhood in order to make optimal utilization of resources, both in terms of expensive laboratory facilities as well as teaching talents.
- To develop a doctoral programme which will admit students with Bachelor’s degrees making possible a parallel entry of select group of students who have had their undergraduate science education elsewhere.
- To develop a doctoral programme that will also admit students with Master’s degrees either from IISER or from elsewhere.
- To build a strong core faculty that will be able to synergize research with teaching and education.
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- To develop first-class teaching and research laboratories in order to emphasize the point that science is ‘experimental’; the focus on experimental research would be to charter uniquely novel areas, not found elsewhere in the country, applicable to technology and industry; the development of research programme should be such that theorists would be naturally inclined to carry out collaborative research in conjunction with experimentalists.

It was remarkable that in a span of about ten years, the first five IISERs have done extraordinarily well in meeting the objectives and goals. In fact, the IISERs have emerged as a brand name at the international level. What follows is an account of how each IISER came into existence.
IISER Kolkata
Campus Road
Mohanpur, Nadia
West Bengal
Preamble – the Genesis

Sometime in the summer of the year 2005, I was designated Programme Coordinator, for the IISER project, by the Ministry of Human Resource Development (MHRD). I enjoyed the wonderful experience of working, from Kolkata and Delhi, with the strongly supportive participation of then-Secretary Shri Sudip Banerjee (since deceased), then-Joint Secretary Shri Ravi Mathur, and then-Director Srimati Irina Garg, under the overall and caring guidance of Prof. C. N. R. Rao, then-Chairman of the Science Advisory Council to the Prime Minister (SAC-PM). A Coordination Committee was formed with myself as convenor, and Shri Sudip Banerjee, Dr. S. Sivaram (then-Director, National Chemical Laboratory (NCL), Pune), Prof. S. Dhande (then-Director, Indian Institute of Technology (IIT), Kanpur) and Prof. P. Balaram (then-Director of the Indian Institute of Science (IISc), Bengaluru), as Members. Our mandate was to formulate a Vision Document, a Detailed Project Report (DPR) and to approve a curriculum that was generally agreed upon by a congregation of nearly fifty scientists, drawn from universities, institutes and research establishments of the country that was enthusiastically hosted by Dr. Sivaram, at NCL, Pune.

The Vision Document spelt out the very concept of IISER. The need to stem, after high school, the exodus of our bright youth to technology institutes, by offering an alternative; to avoid early over-specialization, as is extant in the Honours programmes in colleges, by providing a broad-based education in the first two years of an integrated Bachelor’s-Master’s (BS-MS) curriculum, wherein all basic science subjects were equally emphasized; and to build-in, at the outset, a research component. It was recognized that proper science education is tantamount to strengthening the base of a pyramid comprising all sciences, and lets inter-disciplinary research and technological applications spin-off from the apex. It was therefore decided that after two years of general science studies, followed by another two years of specialized courses in Major areas, students would have to write a Master’s thesis on a research project. From the third year onward, the students were encouraged to carry out short research stints in various institutes of the country, during recesses. The idea of inculcating an early research outlook had a two-pronged objective – to initiate bright candidates into research (concomitant to coursework), and to lower the average age of Indian PhDs, as the Master’s thesis could itself be utilized as a stepping-stone to a doctoral pursuit. The apparent reason for an increased Indian
PhD-age is the repetitious nature of plus two, BSc and MSc syllabi. The inclusion of research into the undergraduate programme was an important step – cognizant with the discernible beneficial effect of the undergraduate participation in research publications, especially in the American university system. The world is gradually moving to inter-disciplinary research, be it in Materials Science – crucial to development; Biological Sciences – essential for life; and Environmental Sciences – critical for grappling with the contemporary issues of agriculture, climate and natural calamities. An initial exposure to all basic science subjects of biology, chemistry, mathematics and physics, for two years, was thought to be important to inculcate in young minds the significance of inter-disciplinary education.

The next step for our Coordination Committee, after writing the vision document, was to put forward a DPR that had to include a budget proposal for campus construction, equipment-purchase – for teaching and research laboratories, faculty and staff recruitment and overall development of the project. Initially, ₹500 crores were asked for, that contained ₹100 crores for construction work as well as provision for hiring up to 200 faculty members over a period of five years. As the project moved on, these figures started getting modified. The rationale behind the number 200 was based on the stipulated faculty: student ratio of 1:10, since the total student-strength over a period of five years was estimated to be 2000–1000 for the integrated BS-MS curriculum and another equal number for a research programme, involving post-BSc and post-MSc students (from outside the IISER system), in addition to post-doctoral scholars. It may be stressed that faculty hiring has remained a slow and deliberate process and no IISER to-date has appointed more than 120 faculty members, even after ten years of existence.

In all the DPR-related deliberations, carried out in the MHRD and the Finance Ministry, we received unstinted support from the concerned senior officials of the parent Ministry, namely the MHRD. We could overcome initial misgivings of Ministry officials about the need for procuring research equipment, which we argued was essential for attracting good young Assistant Professors, with doctoral and post-doctoral experiences in reputed institutes of the world. A sympathetic and supportive Ministry also recognized that the formula of 1:10 could not be implemented at the beginning.¹

Having discussed the homework that went in at the inception of IISERs (through the mid-2005 to the mid-2006), I now come to narrate the trials and tribulations of the formative years of IISER Kolkata.

¹It may be pointed out that no IISER was able to induct, in the first year, more than 45 odd students for various reasons of space, infrastructure, etc. This, going by the 1:10 dictum, would have meant less than five faculty members in the first year. This figure is woefully shorter than what was required for successfully running teaching and laboratory classes spread over two semesters!
IISER Kolkata – the Journey Forward

Once the necessary approvals of relevant government departments were obtained we were told by the MHRD that the first batch of integrated (BS-MS) students had to be enrolled by August 2006, in Kolkata and Pune. A joint Board of Governors (BoG) was created with Prof. C. N. R. Rao at the helm of affairs. The Ministry helped us to latch-on to the IIT-JEE list of eligible candidates for selecting our input. We set out in earnest, at the beginning of 2006, the process of getting started on a five-pronged approach. How did we cope? Well, we had to invite a few retired professors, most of whom had distinguished themselves in their teaching and research career, and part-time teachers from neighbouring colleges and universities as well as IIT’s, to help the process. Again, MHRD gave us a free hand and trusted our judgement without having to go through red tapes.

In the case of IISER Kolkata, the Ministry further found a mentor institute in the form of IIT, Kharagpur, in order to channelize funds, and made its Director Prof. Sisir Dube the Project Director. Prof. Dube was kind enough to allow us to use their Salt Lake, Kolkata premises for hosting a few key offices. In addition, we could build an annexe-structure for housing teaching laboratories, a small computer centre and a functional library. Concurrently, we found with the help of MHRD, another of its organizations, viz., the National Institute of Technical Teachers’ Training & Research (NITTTR), in nearby Salt Lake area, for establishing rudimentary research laboratories.

Somewhere along the line, I learnt through casual conversations that my name was recommended by a Search-cum-Selection Committee as the Founder Director of IISER Kolkata! While I had to cool my heels, waiting for the formal approval to arrive from the Appointments Committee of the Cabinet (ACC) via the Department of Personnel & Training (DoPT), Prof. Dube, his administration colleagues and I persisted with making ready the infrastructure.

I was informed over the telephone, by none other than the MHRD Secretary Shri Sudip Banerjee, of the letter appointing me as the (first/founder) Director of IISER Kolkata, on 24 July 2006. I handed-in my joining letter, addressed to Prof. C. N. R. Rao, on 26 July 2006, at the office of Shri Banerjee. We started our classes on 16 August 2006, after a formal inauguration at the NITTTR auditorium by then-Governor of West Bengal: Shri Gopal Krishna Gandhi. A total of 38 students, drawn from the JEE list, began their journey in the hitherto unchartered territory, with lots of expectation, hope and enthusiasm, mixed with some trepidations. The challenging days of agony and occasional ecstasy were nonetheless not devoid of excitement!

Following my appointment as the Director, we succeeded in inducting by the end of 2006 about 25 quality faculty members at the levels of professors and assistant professors, in different areas of biology, chemistry, mathematics and physics. (By the time I left in September 2011 the faculty strength grew to more than 80). IISER Kolkata was also the first to initiate
a faculty member in earth sciences, taking into account the huge importance of that subject in the studies of the environment. I had the very good fortune of working under two extraordinary visionary scientists as Chairperson of BoG – first Prof. C. N. R. Rao and then Dr. R. A. Mashelkar.

Meanwhile the leadership at IIT, Kharagpur changed and we were made to realize that we had to vacate the transit campus in Salt Lake and plan on moving to our designated campus on a sprawling 220 acres of land, generously gifted to us by the Government of West Bengal. The allocated land was however about 50 kms north of Kolkata, near the township of Kalyani. By today’s standards 50 kms is not a large distance but because of the dismal state of the National Highway 34 and the parallel Barrackpore-Kalyani expressway, the distance appeared longer than it actually was! Nevertheless, the allocated area had several attractive features: (a) it would have been impossible to acquire such a vast area near Kolkata free of cost; (b) the campus had in its proximity a good state university in Kalyani, a proposed Department of Biotechnology-aided National Institute for Biomedical Genomics (now established in full form) and the planned campuses of the West Bengal University of Technology and the Netaji Subhas Open University; and (c) a fortuitous stroke of luck – a series of buildings deserted by the West Bengal University of Animal and Fishery Sciences. The Government of West Bengal very kindly helped us acquire these buildings on a ten-year lease, in a lovely lush green location, adorned by beautiful water bodies, just adjacent to our designated campus. We set about the task of refurbishing the dilapidated structures to make them usable.

While we moved to our second transit campus on the National Science Day of 28 February 2009, through an inaugural ceremony in the J. C. Bose building, conducted by the Governor Shri Gandhi, we began in parallel the construction of our own campus in the adjoining land of ours. Here, however, we met with a roadblock – the contractors selected by our chosen agency, viz., the Central Public Works Department (CPWD) ran away, abandoning construction activities halfway. Looking at the construction work carried out by CPWD at IISER Mohali, I am tempted to observe that each of the IISERs has been uniquely situated in the socio-political context of India, and it is not far-fetched to state that CPWD in West Bengal is not the same as CPWD in Punjab! Thwarted by this setback we had to construct pre-fabricated structures for facilitating research laboratories in our main campus. But for the farsighted decision behind the creation of these pre-fab buildings research would have badly suffered.

We also had to innovate once again – a bunch of one-storey structures, left behind in the main campus, were repaired to create a Library, a state-of-the-art and one of its kind Seismological Observatory, a Behavioural & Ecology Field Station, a Climate Studies Centre, a Materials Science Laboratory, a Polymer Research Centre and an Engineering & Estate Office. Considering the remoteness of our main campus we also built – thanks to the generous support of the Government of West Bengal – a liaison-cum-guesthouse adjacent to the City Centre I of Salt Lake that contains meeting and guest rooms for the convenience of transiting visitors. My
successor Prof. R. N. Mukherjee, the present Director of IISER Kolkata, will no doubt describe how under his leadership the problems of construction have been alleviated and the main campus has now been made almost fully functional, at least for teaching and administration purposes.

Notwithstanding the slow progress of the campus construction it is fair to say that IISER Kolkata has done very well in research, teaching and student-placements, as is borne out by several analyses, foremost of them being an article in Current Science,\(^2\) proving the point that concrete alone does not make academic programmes! The makeshift seismological observatory is credited with GPS-assisted detection of tremors including those which lead to Tsunamis and is now engaged in the national projects on detection of gravity waves – and through four field stations spread across Kashmir – earthquakes in that sensitive region. The Advanced Materials Laboratory of the Materials Science Centre featured in newspaper articles for their significant work on porous carbon nanomaterials for drug delivery and cathodization of human hair for solar cells. This group also developed a novel material called *soft oxometalates* for photocatalytic applications based on a process quite akin to the much familiar photo-synthesis in plants. The Polymer Research Centre is credited with generating more than 100 research papers, 10 PhD theses and 20 Master’s theses. The work done in this Centre on *Arsenic Sensing and Trapping by Norbornene-based Polymers* and *Nerve Agent Sensing* was recognized through National Awards for Technology Innovation (2016 & 2017). Similarly, after the offices shifted out from the erstwhile Engineering & Estate Office in the main campus, re-built from a dilapidated structure, the building now houses the NKN hub of the National Knowledge Commission for campus-wide internet connectivity, a computer lab, a scanning electron microscope and also a high-pressure diamond anvil set up, supported by the Ministry of Oceanographic & Earth Sciences (MOES). It is gratifying to see that MOES has conferred the high-pressure facility the status of a National Centre.

I am just pleased to record here how we trudged along, undeterred by all odds, by creating in the Raman Building of our transit campus an array of sophisticated research facilities in the form of Magnetic Property Measurement System (MPMS) and Pulsed Laser Deposition (PLD) setup, a Magneto-Optic Kerr Effect (MOKE) and Single Crystal X-Ray Systems, a Micro Raman and a 500 MHz Nuclear Magnetic Resonance (NMR) instruments (in addition to another 400 MHz NMR machine), a Glove Box and Powder X-Ray facilities, and others. The J. C. Bose Building of the transit campus further housed Optical Tweezers, a Confocal Microscope, an Atomic Force Microscope (AFM), Time-Resolved Laser Spectroscopy, and in the adjacent (so-called) *LEL Building*, an innovative *Integrated Biology Lab* (for promoting collaborative research work), a small Animal House and a computer lab.

It is gratifying to record that using the above facilities in temporary structures, including the pre-fabricated labs, and the renovated buildings in the main campus and the transit

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campus, IISER Kolkata distinguished itself by winning several laurels: the faculty received Ramanujan, Ramalingaswamy, and Wellcome Trust Fellowships, in addition to the prestigious Fellowship of the Royal Society of Chemistry; the students were endowed with Rhodes and SPIC Photonics scholarships, Multiple Sclerosis Society Award, etc. In the makeshift auditorium of the J. C. Bose Building, we would hold Institute Colloquium once every month with distinguished speakers drawn both India and abroad including our own very accomplished Visiting and Honorary Professors. We also hosted several important symposia, e.g., *Frontiers in Biological Sciences* seminar and the annual meeting of the Indian National Sciences Academy. These are the events that I could recall but I am sure, there were many others which I have missed mentioning. Similarly, my selective mention of contributions made from temporary structures was only illustrative of how top-class research could still be carried out from ramshackle edifices if there was a will!

**Looking Forward**

While we continue to conduct the following teaching programmes in IISER Kolkata:

- Integrated 5-year BS-MS
- Post-BSc-integrated PhD
- Post-MSc-PhD
- Post-BTech – MS, by thesis (in order to give the opportunity to engineering students to re-enter basic sciences)

I would like to raise a few points by way of introspection:

- We debated quite a bit, at the inception of IISERs, on the dichotomy of a five-year MS and a four-year BS curricula. The idea behind a four-year schedule was to bring uniformity with BTech structure prevalent in our premier technology institutes. We prevailed with the five-year formula, for reasons articulated in the opening section of this article, in addition to our not wanting to fall out-of-equilibrium with the existing MSc programmes in Indian Universities. Now that IISc in Bengaluru is running a four-year BS curriculum, seemingly successfully, is there a room for reopening the debate and for possibly considering an exit option after four years, with a terminal BS degree?

- I have been witness to discussions, especially among my mathematics and physics colleagues, on whether two years for general science education at the beginning of the integrated BS-MS syllabus were not a bit too long for brighter theoretically-minded students, eagerly wanting to march-on with their already-chosen major topics! The argument is: perhaps one and a half years would suffice for students to make up their minds on what they would like to major on. We may ponder on this issue.
• Today’s admission process into the integrated BS-MS programme includes the 1% of toppers in different Board Examinations of the country. Given the country’s size, is 1% inclusive enough? Could there be room to expand this window, in order to provide an opportunity to a larger cross-section of students, especially from remote areas of the country?

• I have noticed a propensity, particularly amongst my young colleagues, just back from successful post-doctoral stints abroad, to view IISER as another research institution. I would like to remind one and all that the words Science Education precede the word Research in the acronym: IISER! IISERs were created keeping in mind the vision of undergraduate science universities wherein teaching was to be equally stressed as research was – after all, teaching and research are just the two sides of the same coin! In that respect, IISERs, with its strong emphasis on basic sciences, are not the same as IITs, nor are they to be equated with IISc. Yet, it would be an oxymoron to call IISERs science universities. A university cannot be a science university or a humanities university (a more outlandish coinage of name) a technical university – a university connotes to the universe and hence must have universality of subjects – not just science, but ought to embrace all topics including humanities, arts, music, philosophy and social sciences. The present structure of IISERs is far from achieving that goal.

• In hindsight, I consider it a mistake to have agreed to tag the IISER Act on to the NIT Act. Maybe we were in a hurry, as there were pressures from the students and the media to hasten the IISER Act, as doubts were raised in the media on the possibility of the first batch of students not getting a proper degree! It seems, the juxtaposition with the NIT Act has given rise to an erroneous impression in certain quarters that IISERs are like technology institutes, as is perhaps reflected in the choice of BoG Chairs. India has outstanding educationists in its plethora of academic institutions who, like our pioneer Chairpersons, would be able to grasp the ethos of the IISER system better and guide them to the future. After all, ten years is nothing in the lifetime of a good institution.
Sushanta Dattagupta

About the Author


Dattagupta has been an academic administrator, as two-term Dean, JNU (during 1987–99), Director, S. N. Bose National Centre for Basic Sciences (1999–2005) and Vice-Chancellor, Visva-Bharati (2011–2016). He has contributed to the growth of the IISER system as Programme Coordinator (2005–06) and Founder Director of IISER Kolkata (2006–2011).
Figure 1. A seismological observatory built out of a dilapidated structure in the designated campus. The observatory serves as a unique component of several field stations located elsewhere in India, for earthquake and Tsunami detection.

Figure 2. A makeshift functional library constructed in the north-east fringe of the designated campus.
Figure 3. Behavioural and Ecology field station built out of a dilapidated structure in the designated campus.

Figure 4. Centre for Climate Studies built out of a dilapidated structure in the designated campus.
Figure 5. Advanced Material Research Centre built out of a dilapidated structure in the designated campus.

Figure 6. Centre for Polymer Sciences built out of a dilapidated structure in the designated campus.
Figure 7. Integrated laboratory for Biology faculty and research students – a unique idea of shared resources – located in the renovated ‘Old Anatomy Building’.
Very few people are bestowed with an opportunity to build and lead an institute of national importance. I was rather fortunate to be one among them. On 12 January 2012, I was informed of my appointment as the Director of IISER Kolkata. I was happy that I would be a part of one, of five, new basic science institutes of national importance in the making. I planned to meet Dr. Mashelkar, the then Chairperson, Board of Governors (BoG) of IISER Kolkata, at his National Chemical Laboratory (NCL), Pune office on 29 January 2012; the meeting was coordinated by my colleague, Prof. K. N. Ganesh, Director of IISER Pune. Dr. Mashelkar advised me very cordially on how to lead an institute like IISER Kolkata. That interaction-meeting set the stage for me to take up the position.

Additionally, I got some updates on IISER Kolkata from my colleagues Professors K. N. Ganesh, N. Sathyamurthy, Director of IISER Mohali, Vinod K. Singh, Director of IISER Bhopal and E. D. Jemmis, Director of IISER Thiruvananthapuram. It was disheartening to note that construction of the permanent campus at Mohanpur (Dist. Nadia), Kolkata had not gathered the expected momentum.

I reached Kolkata on 31 January 2012. There, I was welcomed by Prof. Somnath Dasgupta, the then Director-in-Charge and Mr. Joydeep Sil, Registrar of IISER Kolkata. After spending the night at the VIP Guest House in the transit campus, I took charge as the Director on 1 February 2012. To teach, research and administer an Institute was indeed a new innings, different from the teaching-research platform I was accustomed to for so long at IIT Kanpur.

The IISER transit campus at Mohanpur was in the premises of the Animal Resources Development Department, Bidhan Chandra Krishi Viswavidyalaya, and the West Bengal University of Animal and Fishery Sciences. Later that day I went to see the permanent campus. It consisted of a handful of small renovated buildings and several under-construction buildings.

The first Chairperson, BoG, of IISER Kolkata was Prof. C. N. R. Rao and the second Chairperson, BoG was Dr. R. A. Mashelkar, during whose tenure I joined this Institute. The Institute takes special pride for being guided by such stalwarts during its formative years. I participated as a member of the 12th Finance Committee and 18th BoG meetings, under the chairmanship of Dr. Mashelkar, on 9 March 2012 at Vigyan Bhavan in New Delhi.
Shri Pankaj R. Patel, CMD of Zydus Cadila, Ahmedabad, took over as Chairperson, BoG at the end of 2012. The current Chairperson, BoG is Dr. Prathap C. Reddy, Chairman, Apollo Hospitals Group. The guidance and support I received from Dr. Mashelkar, Mr. Patel and Dr. Reddy have been phenomenal.

I started with (i) 362 BS-MS students, 41 Integrated-PhD (Int. PhD) students, 1 MS-by-Research candidate, 154 PhD scholars and 1 Post-doctoral research associate, (ii) 82 faculty members distributed over five departments (Biological Sciences, Chemical Sciences, Earth Sciences, Mathematics and Statistics, and Physical Sciences) and (iii) 34 non-teaching staff members. The community was impatient that IISER Kolkata was still functioning from the transit campus. I chaired the 5th Senate meeting at the transit campus on 17 February 2012.

Immediately after my taking over, the focus of the Institute was directed to (i) construction-related activities to build a campus-based institute vis-à-vis creation and strengthening of infra-structural facilities and (ii) well-structured system (guidelines) for the smooth and transparent functioning of the administration and academics – inclusive of both teaching and research. I present below the achievement of the Institute in the said directions from 2012 till date.

Construction Activities

IISER Kolkata’s fully residential campus is on 201.65 acres of land at Mohanpur, Dist. Nadia (~50 km north of Kolkata). Unfortunately, due to many reasons its work came to a standstill in mid-2011. The main hostel-block was half-complete, and the Lecture Hall Complex and Research Complex were in a preliminary stage with the foundation, a few pillars and some basic casting. Only the electrical sub-station 1 was in a slightly advanced stage. The campus was strewn with the remnants of old constructions of West Bengal Government establishments. Therefore, the Building & Works Committee decided to discontinue the non-performing contractor, M/s Unit Construction Company, who had been at it from October 2009 and decided to start afresh with new contractors. The new construction activity started in October 2012. It is appropriate to mention here Mr. Bhaskar Chandra Layek, OSD who stood by me in this highly challenging phase. The Electrical Sub-Station, the first building constructed in the permanent campus was energized in July 2013. The first hostel-block of IISER Kolkata – Netaji Subhas Chandra Bose (NSCB) Hall – which accommodates 400 students and a dining-hall were inaugurated on 8 July 2013 by Shri M. K. Narayanan, the Hon’ble Governor of West Bengal, the Chief Guest of our first convocation, in the presence of Shri Pankaj R. Patel, Chairperson, BoG of IISER Kolkata. NSCB Hall was occupied on 26 July 2013, and the other block – Ishwar Chandra Vidyasagar (ICV) Hall – to accommodate an additional 400 students, was occupied on 29 November 2013. The basement of the dining-hall started being used for essential commercial shops for the hostel-dwellers.

Happily, in June 2014 the Foundation Stone was re-laid in the permanent campus and the Administrative Offices were shifted from the transit campus to the second floor of the newly-built
Lecture Hall Complex (LHC) on 5 September 2014. Soon most of the classes also moved to this state-of-the-art LHC, which marked a major shift of academic activities from the transit to permanent campus. The students, faculty and non-teaching staff were very supportive. The formative years of the institute are always difficult, but they also establish milestones and landmarks and embed several institutional processes. The experience was mixed but we were on the move.

The construction of the permanent campus gave a sense of security and certainty of release from functioning from the transit campus since 2008. Keeping in mind the MHRD-approved area of 1,17,000 sq.m., the construction of LHC, Research Complex (RC), Teaching and Research Complex (TRC), Students’ Hostels (Boys’ 800 and Girls’ 400), Director’s Residence, Visitors’ Hostel (30 rooms), Centre for Students’ Activities, Campus School have all been completed and are now in use. To provide an encouraging environment for teaching and learning, the existing video-conferencing facility and e-classroom were further strengthened. The Utility Complex and Administrative-cum-Academic Complex also was completed. Construction of faculty and non-teaching staff housing (respectively, 56 and 20 in numbers) has been completed and allotments were made in July 2017. The Director’s Residence-cum-Office was completed in 2015, and I started staying on campus, in January 2016. Construction of the Auditorium (1000 capacity), Animal Facility and Biome is underway. It is expected that the construction-related activities will be over by the end of 2017. We have taken utmost efforts to make IISER Kolkata campus ‘Clean and Green’, through well-planned roads, planting of trees, and landscaping on our fertile soil.

Along with the Centre for Students’ Activity building, IISER Kolkata focused on establishing the sports facilities including a table tennis room, football ground, cricket ground, basketball and volleyball courts, throw-ball courts, tennis courts, squash courts and gymnasium hall, which are now in use.

The Indian Overseas Bank opened their branch inside the permanent campus of IISER Kolkata on 17 April 2017. There is already one SBI ATM-counter operational in the campus since 2016.

In a very moderate way, commercial establishments like a grocery store, gift shop, salon, food courts, etc., are planned in the pre-fabricated buildings in the campus.

The medical unit aims to provide comprehensive and quality healthcare to its students, non-teaching staff and faculty members. It is staffed by General and Specialist doctors including a psychiatrist and trained paramedical personnel, who provide OPD services and round-the-clock emergency coverage. It has a tie-up with leading medical facilities in nearby Kalyani and Kolkata for referral treatment. In addition, students are provided with cashless medical insurance up to ₹1 lac for emergencies requiring in-house treatment.

I note with gratitude that the construction activities envisaged by the Institute will be completed in a record time span of only 5 years.
Guidelines for a Well-Structured System

My emphasis was to establish a well-structured, efficient, collective decision-making administration (bottom-up approach). Ad hoc decision-making activities slowly and steadily were phased out. The Offices of the Deans (Academic Affairs, Faculty Affairs, Research and Development, Student Affairs) were reorganized and in 2017 a new Dean of International Relations and Outreach was appointed. The internal Institute-level committees, which are vehicles of collective decision-making process were restructured and given responsibility. To oversee and guide various institute-building activities Faculty-in-Charges (FiCs) were appointed. ‘Guidelines’ for the smooth functioning of the administration were put into effect with the approval of the BoG. An effective mechanism for grievance-redressal of students, faculty and staff was put into place.

Academic Activities

- To strengthen inquisitiveness-driven science teaching, integrated with curiosity-driven research
- To inculcate innovative and independent research (curiosity-driven, industry-driven, or of societal-relevance)
- High-Quality Researchers: Maximise enrolment of PhD students

IISER Kolkata has completed ten years and has entered its eleventh year. The then Hon’ble Minister, HRD – Smt. Smriti Zubin Irani – flagged off the ‘10 Year Celebration of IISER Kolkata’, triggering a year-long celebration.

So far, IISER Kolkata has held five convocations, all in the main campus. The first was held on 8 July 2013. The total number of students graduated so far are 654 (BS-MS: 490; MS (R): 7; Int. PhD: 9; MS: 36; PhD: 112). The first convocation conferred the honorary doctorate degree – Honoris Causa to Prof. C. N. R. Rao, the Chief Architect of the IISER system. Prof. Ashoke Sen and Prof. M. S. Swaminathan were conferred Doctor of Science – Honoris Causa in the second and third convocations, respectively.

As on date, IISER Kolkata has 660 BS-MS, 39 first-and second-year Int. PhD and 01 MS-by-Research students, comprising a total of 700 undergraduate (UG) students. Third-year onwards 100 Int. PhD students and 258 PhD students comprise our 358 PG students. We have 26 post-doctoral fellows, supported by external funding agencies and 1 Institute-supported post-doctoral fellow. Currently, we have a total of 1058 students and 102 regular faculty members (Assistant Professor 44, Associate Professor 51, Professor 7), against the sanctioned strength of 120 and 3 Assistant Professors (on contract). Up-gradation to higher positions and appointment of new faculty started from December 2012. This exercise has happened five-times (2012–2016) till date. To promote Government initiatives and to allow promising young faculty fellows to get an opportunity to be a part of IISER Kolkata academic fraternity in the starting phase of their career, we have with us 1 Ramanujan and 1 INSPIRE faculty fellows. After joining the Institute, they add
value to themselves and to the Institute. For a smooth running of the Institute, we have a total of 93 regular non-teaching staff members, against the sanctioned strength of 97. IISER Kolkata has initiated the disciplines of humanities and social sciences. The academic programme of IISER Kolkata provides a rounded-education to its students.

Eventually, the Institute’s target is to have 2000 students (1000 UG and 1000 PG), 200 faculty and 220 non-teaching staff members. The rate of progress thus far is satisfactory. In about 4–5 years from now, we will reach the full-capacity in terms of students. Faculty strength will also be enhanced accordingly, maintaining the student: faculty ratio of 10: 1.

To maintain steady performance in all aspects of its mandate, IISER Kolkata completed the first (till date) ‘Institute Appraisal’ and ‘Departmental Reviews’ to analyse our academic performance, core activities of teaching and research, governance, management structure, support systems and to create a roadmap for the future.

**Research Publications, Books and Book-Chapters**

The steady and positive growth in research being carried out by the IISER Kolkata faculty and students is evident from the quality and the quantum of high-quality research publications in respected peer-reviewed journals. The total number of research publications from the Institute is 1676 (2006–2011: 364, 2012-till date: 1312). Out of these publications, 255 have emanated during the FY 2016-17. Faculty members have also written six books, one edited-book and contributed forty-five book-chapters. The faculty have also made a sizeable number of presentations in national and international conferences.

**Special Initiatives to Strengthen Interdisciplinary Research**

*Creation of a New Centre*

The Centre for Advanced Functional Materials (CAFM) was established on 1 August 2016 to foster collaborative, interdisciplinary research and education in the science and technological applications of solid-state and soft materials. The Institute has a Centre of Excellence under Frontier Areas of Science and Technology sponsored by MHRD – Centre of Excellence in Space Sciences, India (CESSI) with an outlay of ₹4 crore. The centre aims to explore the Sun’s activity, generate the understanding necessary for space weather forecasting, hunt for gravitational waves, support national space science initiatives, participate in international capacity-building activities and pursue public-private partnerships in space science research. The Ministry of Earth Sciences recently sanctioned the National Centre for Laser-Heated Diamond Anvil Cell Facility for High Pressure and Temperature Studies (NC-LHDAC-HPTS) at IISER Kolkata. NC-LHDAC-HPTS aims to undertake research and training activities at extreme conditions of pressure and temperature in a multidisciplinary area of materials sciences and geosciences. The National Centre is headed by a faculty member from IISER Kolkata.
Special Seminars and Conferences

Several eminent scientists/scholars from India and abroad spanning different fields were invited to deliver special lectures on topics of wide interest to keep the students and the faculty members updated with recent scientific developments. A new in-house faculty seminar series was initiated. The first one in the series started on 9 April 2014. This gave us a platform to share the research accomplishments of a laboratory with other groups. It will also promote interdisciplinary research collaborations across various departments of the Institute. A few of them organised as a part of the IISER Kolkata’s 10 years celebration, are mentioned below:

- Special Lecture Series on Biological Inorganic Chemistry (12 January 2017) was organized. Notable speakers included A. S. Borovik, University of California Irvine (USA), Franc Meyer, George-August-Universität Göttingen (Germany), Michael T Green, University of California Irvine (USA), James Penner-Hahn, University of Michigan, Ann Arbor (USA), and Ebbe Nordlander, Lund University (Sweden).

- A conference on ‘Advances in Life Sciences’ (13–15 January 2017) showcased modern biology in its diverse glory over three main sessions – Disease Biology, Genomics and Evolution and Interdisciplinary Biology. This workshop was conducted with support from the Indo-US Science and Technology Forum (IUSSTF). Notable speakers included Ira A. Levine, University of Southern Maine (USA), P. Balaram, Molecular Biophysics Unit, IISc Bangalore and Payel Das, IBM TJ Watson Research Center, Yorktown Heights, New York (USA). Many more dignitaries/participants delivered lectures in this conference.

- A conference on ‘Recent Advances in Theoretical Chemistry and Theoretical Physics’ (20–21 January 2017) brought together deliberations on various aspects of chemistry and physics to the modern science and technology. Notable speakers included Deepak Dhar, Department of Theoretical Physics, TIFR (Mumbai), Amit Dutta, IIT Kanpur, N. Sathyamurthy, IISER Mohali, K. L. Sebastian, IISc Bangalore, K. Srihari, IIT Kanpur, Satrajit Adhikari, IACS, Kolkata, Amitabha Raychaudhuri, University of Calcutta and Pinaki Majumdar, HRI, Allahabad. Many more dignitaries/participants delivered lectures in this conference.


- A conference on ‘Smart Materials: Methods and Applications’ (20–22 April 2017) was organized. Notable speakers included D. D. Sarma, IISc Bangalore, S. Sivaram, IISER Pune, A. Ajayaghosh, NIIST, Thiruvananthapuram and T. Pradeep, IIT Madras.

The objective of these conferences was to bring together eminent researchers and provide a platform for interaction on recent developments of basic sciences. Most of the topics of the lectures were directly related to high-quality science and to inspire young researchers to pursue science careers.
**Creation of Student Societies**

IISER Kolkata has established Physics and Chemistry Societies under the concerned Departments of Physical and Chemical Sciences. These societies mainly hold lectures by distinguished scientists for the PhD students and senior BS-MS students, introducing them to the current research in Physics and Chemistry. Students prepared posters and made brief presentations.

**Global Initiative of Academic Networks (GIAN)**

The Government of India programme GIAN in Higher Education is aimed at tapping the talent-pool of scientists and entrepreneurs internationally, to encourage their engagement with the Institutes of Higher Education in India so as to augment the country’s academic resources, to accelerate the pace of quality reform and to elevate India’s scientific and technological capacity to global excellence. Keeping with this mandate, IISER Kolkata has so far completed five GIAN courses.

Many eminent international dignitaries visited IISER Kolkata, as foreign experts through this GIAN programme. James A. Jackson, FRS, Cambridge University (UK), Sir Michael Victor Berry, University of Bristol (UK), Richard Bellerby, Norwegian Institute for Water Research (Norway) and SKLEC-NIVA Center for Marine and Coastal Research (China), Craig L. Hill, Emory University (USA) and Issac F. Silvera, Harvard University (USA) visited IISER Kolkata as foreign experts for the GIAN programmes.

**Internationalisation**

IISER Kolkata was honoured to be invited to be part of a road-show organized by ‘DWIH New Delhi – Excellence on Tour’ by the German House for Research and Innovation (DWIH) New Delhi in Science City, Kolkata during 22–28 March 2014. Student and faculty participation from IISER Kolkata made their presence felt in this roadshow. A German team visited our campus on 24 March 2014, as a part of our outreach activity. The Secretary-General of Alexander von Humboldt Foundation visited IISER Kolkata on 21 February 2015. Most recently, a French scientific delegation from the French Embassy, Mumbai visited the campus on 15 June 2017.

**Academia-Industry Interaction**

A one-day brainstorming session on ‘Academia-Industry Interaction’ was organized by IISER Kolkata on 8 November 2016 with participation from Unilever Industries Pvt. Ltd., Object SOL Technology, Kolkata, IACS, Kolkata, IIT Kanpur, NCL, Pune, etc., for a strong interaction with the Industry in a planned manner for nurturing innovation and incubation.

We wish to create an ‘Academia-Industry Interaction Cell’. This will be a platform from which interested students and faculty members would get opportunities to explore industry-directed manpower-training, self-employment leading to entrepreneurship potential. We would like to promote ‘networking support system’ bringing together academic institutions and Research & Development (R&D) organizations to foster entrepreneurship and self-employment.
IISER Kolkata has ongoing projects with Unilever which allow Doctoral and Masters students to work as trainees. Further, from 2017 onwards two students will be working as trainees at Unilever R&D centre for 6 months with a scholarship.

**Process of Setting-up an Incubation Cell**
IISER Kolkata has initiated the process of setting up an ‘Incubation Cell’ for promoting the entrepreneurial potential of our students and faculty members. The vision of IISER Kolkata for new age entrepreneurs and young minds is to transform budding entrepreneurs to start a business venture with minimum risk. It will ensure that incubatees have access to technical assistance, which will be generated through mentors with multidisciplinary expertise. We encourage young enthusiasts with creative pursuits with inherent zeal to be entrepreneurs to take advantage of this initiative. IISER Kolkata is in the process of applying for start-up support from DST and other Government agencies.

**Strengthening of Academic Infrastructure/Facilities**

**Central Library**
The library currently has a collection of around 18,500 books. This has been augmented by another ~19,000 e-books to serve its users in the changing scenario of digital delivery of educational materials. The library has access to around 3,000 online journals and databases. It also has a collection of more than 1,100 bound volumes of journals. The library ensures a check on plagiarism through ‘Turnitin’ software for the research scholars and the faculty. The E-Shodh Sindhu (ESS) programme of the MHRD has also helped the Institute to support the research activities of its users by enabling them to access several important online journals and databases. The library provides online access to its resources throughout the campus with the help of a campus-wide network.

**Computer Centre**
The Computer Centre at IISER Kolkata maintains a wide variety of state-of-the-art computing facilities for high-standard research and other academic work. The buildings in the entire campus are connected with High-Speed Optical Fibre Cable Network and the campus is WiFi-enabled. The Institute provides High-Speed Internet Facility of 1 Gbps bandwidth using the National Knowledge Network (NKN). The Institute has a well-equipped virtual classroom to conduct and participate in e-classes, offered by institutions across India. It also has a well-equipped Computer Centre of seating capacity of 75 for the users. All the entry gates of the Institute and other strategic locations are monitored by IP-camera-based surveillance system. The Institute offices, laboratories, gates and security checkpoints are equipped with IP-Telephony-based VoIP SIP Phones. To cater to high-performance scientific computing requirement of our researchers, the Institute has a high-performance Intel cluster with several terabytes of networked storage. The Institute also has several high-speed PC workstations distributed over the departments. We are committed to and
are closely working to have a paperless environment in the campus. Some progress has already been made in this direction. The Computer Centre maintains the following services in the campus: Mail, Web, LDAP, DNS, Gateway, Firewall, NFS, VPN, Data Storage & Backup Solution, Institute ERP, In-House Developed Academic ERP, Moodle-based Course Management System, Intranet, Internet, WiFi, etc.

State-of-the-art Research Infrastructure
The Institute has state-of-the-art research laboratories, equipped with sophisticated modern equipment, which are of paramount importance for doing cutting-edge research. Faculty members are given adequate support for setting up their laboratories and creating institute facilities. Specific need-based strengthening of experimental facilities in the laboratories in different areas and augmentation of computational facilities is a continuing process, requiring regular up-gradation. From the first major equipment procured by IISER Kolkata, a 400 MHz NMR spectrometer, we continue to add to our list of state-of-the-art experimental facilities.

Institute Ranking
IISER Kolkata has been ranked forty-fourth by the NIRF among the top 100 participating universities and institutions in the country by the National Institutional Ranking Framework (NIRF) under MHRD and second among the IISERs for the year 2016.

Memorandum of Understanding (MoU) and International Relations
IISERs are already a global brand name, from the perspective of student and faculty exchange programmes and fruitful scientific collaborations with some international institutes of repute. The Directors of all IISERs visited the Max-Planck Institutes, XLAB and PhyWe in Germany in the year 2012 and the Imperial Universities in Japan in the year 2015. At present, we have a sizeable number of national and international collaborations with MoUs: (1) Institute of Environmental Research, Faculty of Chemistry, TU Dortmund, Germany (18/02/2013 to 17/02/2018), (2) Lund University, Sweden (21/11/2013 to 20/11/2018), (3) Max Planck Gesellschaft (MPG), Germany (21/07/2015 to 06/10/2019), (4) Institute of Molecular Science (IMS) – Indo-Japan Collaborative Research Projects in Molecular Science and (5) Max-Planck Institute für Kernphysik, Heidelberg, Germany (12/09/2017 to 11/09/2022).

Research and Development Activities
Research and Development is the most important component of any National Institute’s activities. Research is being carried out in the Institute by the faculty members with PhD, Int. PhD and also BS-MS students. With 358 PhD students (including the Int. PhD students), clearly, the Institute is well-poised to make major contributions. We are aiming at increasing this number to our target of 1000 PG students. The Institute also undertakes research and development projects under the category of sponsored research projects and consultancy projects, in various areas of specialization.
The day I joined the Institute, 48 sponsored projects were being done in IISER Kolkata bringing in ₹-16 crores, now (July 2017) there are 223 with a sanctioned amount of ₹-100 crores. Currently, there are 79 ongoing research projects with a total sanctioned amount of about ₹-45 crores. The R&D projects are mainly sponsored by various Ministries/Departments of the Government of India. We also have a significant number of internationally-supported research projects from funding agencies worldwide.

Funds for the creation of research facility (start-up grant) are being provided to newly joined faculty members to establish their research facilities and to initiate independent research at IISER Kolkata. Matching-Grants are also provided to augment funding from external funding agencies towards setting up state-of-the-art research facilities. In addition, the Institute has provided generous research funds to the five departments to enable the faculty members to conduct cutting-edge research and to train students in expanding their skills and in critical thinking process in the milieu of sophisticated research infrastructure.

Two DST-FIST proposals from the Departments of Chemical Sciences and Earth Sciences were sanctioned in 2014 and 2015, respectively, to augment research facilities in the departments. ₹5.9 crores was sanctioned for the 200 kVA HR-TEM and ₹1.38 crores for X-Ray Fluorescence System.

IISER Kolkata has become a part of a multi-institutional project entitled, ‘Multi-Dimensional Research to Enable Systems Medicine: Acceleration using a Cluster Approach’ funded by Ministry of Science & Technology, Department of Biotechnology (DBT), Govt. of India. The major aim of this project is to develop inter-institutional cross-talk on components of Systems Medicine. IISER Kolkata’s role is to develop a state-of-the-art ‘Animal Facility’ in our campus towards ‘development of shared infrastructure for generation of basic and translational research’. For this project, an amount of ₹10.46 crores has been sanctioned to IISER Kolkata for procurement of equipment and laboratory set up.

The Institute has received a considerable number of projects through different faculty fellowship/award programmes. This year we received 4 new faculty fellowship/award projects with a sanctioned amount of ₹2.45 crores. The cumulative count of such ongoing projects is 16 with a sanctioned amount of ₹18.89 crores.

A total of 6 consultancy projects were carried out during the year 2016–17. The total value of consultancy projects undertaken is approximately ₹1 crore.

It is to be noted that IISER Kolkata provides an equal-opportunity research support to all faculty, creation of research facilities to a group of faculty and matching grant to encourage faculty to attract extramural fund. Performance-based incentives are given to faculty, students and non-teaching staff members.
Some Research Highlights

- A faculty member from the Department of Chemical Sciences, his students and the group of Jagadeesh Moodera from MIT, USA along with collaborators from Peter Grunberg Institute in Jülich and Universität Göttingen, Germany have demonstrated the use of chemically amenable phenalenyl-based molecules as a viable and scalable platform for building molecular-scale quantum spin memory and processors for technological development. This finding was reported in the prestigious journal *Nature* (2013).

- The ‘Special Breakthrough Prize in Fundamental Physics’ has been awarded for detection of Gravitational Waves, 100 years after Einstein’s prediction about the same. Also, the ‘2016 Gruber Foundation Cosmology Prize’ recognizes the entire Laser Interferometer Gravitational-Wave Observatory (LIGO) discovery team for the first observation of gravitational waves. A faculty member of the Department of Physical Sciences and his students are part of the LIGO team from IISER Kolkata, who participated in this global collaboration.

- Research work of a faculty member and his students from the Department of Chemical Sciences on ‘Arsenic sensing and trapping by norbornene-based polymer’ has been selected as joint Runner-Up at the 6th National Award for Technology Innovation under the Polymeric Materials category. The award has been presented by the Hon’ble Minister of Chemicals & Fertilizers, Shri Ananth Kumar, Government of India, in the presence of Shri Hansraj Gangaram Ahir, Hon’ble Minister of State for Chemicals & Fertilizers, Government of India, during the function at New Delhi on 20 January 2016. His group’s work on *Nerve Agent* Sensing has been selected as Joint Winner for the 7th National Award for Technology Innovation under the Polymeric Materials category. The award was presented by the Hon’ble Minister of Chemicals and Fertilizers, Shri Ananth Kumar, Government of India at New Delhi on 1 March 2017.

- The same faculty member participated in the festival on 8 March 2017 and presented a poster on the Innovation Club Activities at IISER Kolkata. This is a part of our initiative to get involved in socially-relevant projects. He also participated as an Institute representative on the occasion of the ‘Festival of Innovation 2016’ at Rashtrapati Bhavan on 15 March 2016 and presented a poster on his work on Arsenic removal.

Outreach Activities – Important Institute Events

Throughout the year, IISER Kolkata organizes a number of events to involve the Institute community in various national missions and initiatives.

- Dr. T. Ramasami – the then Secretary, DST, Govt. of India – delivered the first *Foundation Day* lecture of the Institute on 19 September 2013. The second, third, and fourth *Foundation Day* lectures were delivered by Ashoke Sen, FRS (HRI, Allahabad), Ashutosh Sharma (Secretary, DST) and Madhavan Nair Rajeevan (Secretary, MoES). These lectures were highly appreciated by the entire IISER Kolkata scientific community.
• Several eminent scientists/scholars from India and abroad spanning different fields were invited to deliver special lectures on topics of wide interest to keep the students and the faculty updated with recent scientific developments. The Institute Colloquium lectures have been delivered by distinguished scientists of international repute like Cedric Villani, University of Lyon (France) and the Director of the Henri Poincaré Institute; Goverdhan Mehta, FRS, National Research Professor and Jubilant-Bhartia Chair Professor at the School of Chemistry, University of Hyderabad; James Jackson, FRS, University of Cambridge (UK); Edward I. Solomon, Stanford University (USA); Dipankar Chatterji, IISc Bangalore, to name a few.

• We continue to support the UG and PG students attending national and international conferences. We also support summer research programmes for outside students, as a part of our outreach activity. Teaching Assistants from a pool of eligible 5th year BS-MS and PhD students are selected with appropriate remuneration, not only for helping the faculty members in conducting the tutorials effectively but also for giving these Teaching Assistants a platform to get trained through teaching assignments.

• IISER Kolkata has initiated comprehensive plans to bring selected school children and engineering college students from various parts of the country to visit and experience the scientific developments. Sixty school children from the North-East have participated in the Ishan Vikash Programme till-date.

• A student-organized outreach programme ‘Ek Pehal’ – is a part of our Outreach Activity, which empowers children of the underprivileged strata of the society. The students of IISER Kolkata organize Ek Pehal Programme to bring the children of the local area to learn about the excitement of science. IISER Kolkata students interact with the local children on a regular basis and teach them all branches of science and inspire them to learn and understand science education and research.

• Sports and other co-curricular activities are strongly encouraged at IISER Kolkata and the students are given every form of support to develop their talents in all fields. In the year 2016, IISER Kolkata had the privilege of hosting the 5th ‘Inter-IISER Sports Meet (IISM)’ for the second time. The first IISM was organised in Kolkata in 2012. In the 5th edition of IISM (2016) a total of 844 students and nine institutes including IISER Kolkata participated in the event. The guest institutes were other IISERs, NISER Bhubaneswar and CEBS, Mumbai. A total of twelve events such as athletics, badminton, basketball, chess, cricket, football, kabaddi, kho-kho, lawn tennis, table tennis, volleyball and throw-ball were conducted successfully.

• IISER Kolkata in association with KVPY and INSPIRE organised the DST-sponsored National Science Camp VIJYOSHI three years in a row, since 2014, with an average participation of more than 600 students. A series of scientific lectures was delivered by eminent scientists from India and abroad and a number of scientific experiments were demonstrated. IISER Kolkata has organised VIJYOSHI 2016 in its campus and is entrusted to organise the same again in 2017.
IISER Kolkata

- IISER Kolkata hosted the prestigious ‘Asian Academic Seminar and School 2015’ during 6–10 March 2015. The lectures were organised at the Indian Association for the Cultivation of Science, Jadavpur and EZCC, Salt Lake, Kolkata, and the last day event was at IISER Kolkata campus. There were 165 participants, including 41 speakers/poster presenters from Japan and 124 from India. The event was sponsored by the Department of Science and Technology (DST), Govt. of India and Japan Society for Promotion of Science (JSPS).

- INQUIVESTA is a unique science festival successfully celebrated by students of IISER Kolkata every year, since 2011. Many students from various colleges and universities take part in the festival. The major participation is from IIEST Shibpur, Jadavpur University, Techno India University, ISERC Visva Bharati and IIT Kharagpur. Eminent speakers like Uday Maitra (IISc Bangalore), Mayank N Vahia (TIFR) and Javed Iqbal (ILS, Hyderabad) were invited to deliver talks during INQUIVESTA.

We always keep in mind that interaction with the neighbours is essential for our growth. We take all necessary measures to make sure that we remain connected with our neighbouring institutes.

Since 2012 we have been celebrating an annual Department Day, with a lot of enthusiasm and excitement. The event has now matured into a major science and outreach activity.

Our brand of education does not have a narrow horizon; we believe in exposure. Our students and faculty members are encouraged to widen their knowledge base by expressing themselves through the student-/faculty-hosted magazine – Muse and Perception, respectively.

I am very happy to report that a short documentary on IISER Kolkata was broadcast on National Channel – Delhi Doordarshan-I on 13 October 2012. The next edition of the documentary was telecast on 24 January 2015.

Other Events

The frequency of department-and-institute level seminar/colloquia has increased over the years. Many distinguished personalities from various walks of life have visited the Institute during the year and expressed their satisfaction with the progress of the Institute, not only on academic matters but also on ‘campus building’ initiatives. Interaction with them gave opportunities, particularly to our students, for realizing the research opportunities in their fields.

National initiatives like the International Students Day, Good Governance Day, Swachh Bharat Abhiyan, Rashtriya Ekta Diwas, Bal Swachhta Mission, International Day of Yoga, Quami Ekta Week, Azaadi 70 and Independence 70, etc., are being observed with sincerity and enthusiasm.
Academic Achievements of IISER Kolkata

- IISER Kolkata was chosen as one of the participating institutions by the German House for Research and Innovation, New Delhi.

- European universities have shown immense interest in the academic programme of IISER Kolkata and their representatives have frequently visited and discussed with the IISER Kolkata authority.

- The Royal Society of Chemistry has accredited the Chemistry programme of the Institute in 2016.

Academic Recognitions

The work of our faculty is getting recognized by their peers nationally and internationally. Over the ten years, the Institute boasted of six Fellows of Indian National Science Academy, New Delhi, four Fellows of the Indian Academy of Sciences, Bangalore, four Fellows of National Academy of Sciences India, Allahabad, two Fellows of The World Academy of Sciences, Trieste, two Shanti Swarup Bhatnagar awardees and three J. C. Bose National Fellowship awardees.

Among the younger colleagues, the Institute hosts one Energy Bioscience Overseas Fellow, one Harvey Prize winner of the American Astronomical Society, one Swarnajayanti Fellowship awardee, two National Geosciences awardees, six INSA Young Scientists, four Young Associates of the Indian Academy of Sciences and one NASI Scopus Young Scientist awardee. The Institute has five Ramanujan and five Ramalingaswami Fellowship awardees, three INSPIRE Faculty awardees and three DBT-Wellcome Trust Intermediate Fellows. Apart from these, some faculty members have been awarded Fulbright Senior Research Fellowship and Early Career Research Awards. The Institute has one faculty member participating in a DST-Max Planck Partnership Group. Several faculty members are associate editors/part of the advisory/editorial board members of research journals of international repute, such as, Dalton Transactions, RSC Advances (Analytical), RSC Advances (Polymer Chemistry), CrystEngComm (Royal Society of Chemistry). One faculty member served and one is serving as Editorial Advisory Board Member of Organometallics and Inorganic Chemistry (American Chemical Society), respectively. A faculty member has been appointed Vice-Chairman of Space Weather Panel of Committee on Space Research (COSPAR) during 2012–2016. Three faculty members are involved in the INDIGO project.

I sincerely hope and wish that every single faculty member of IISER Kolkata will rise in scientific prominence in the years to come, making the Institute and the nation proud.

Students’ activities and achievements

Our alumni are doing exceedingly well. It is a matter of great satisfaction that most of our BS-MS graduates have found their places in some of the world’s best institutes – Cambridge,
Oxford, Harvard, Stanford, Cornell, Max-Plank Institutes (Jena, München, Göttingen) and in premier research institutes in India – IISc, TIFR, NCBS, IISERs, IITs and IIMs. They have received prestigious scholarships/fellowships like Rhodes, Fulbright, Commonwealth, Alexander von Humboldt, etc. A number of students have received awards and brought accolades for the Institute. Some of them are: SPIE Optics and Photonics Education Scholarship (USA), DuPre, Multiple Sclerosis International Federation Award (UK), DAAD – Working Internships in Science & Engineering (WISE), Germany, Khorana Programme for Scholars, S. N. Bose Scholars Programme, Charpak Research Internship Scholarship, France, Kupcinet-Getz Summer Programme at the Weizmann Institute of Science, Israel, Water Advanced Research and Innovation (WARI) Fellowship Programme, Newton-Bhabha PhD Placements Programme, Bhaskara Advanced Solar Energy (BASE) Internship Programme, etc.

**Student Activities at IISER Kolkata**

Along with their regular academic engagements, our students participate in various other extra-curricular activities in the Institute. These include regular sports, cultural and science-based activities through various students’ clubs, and extend to the student-conducted Science Fest INQUIVESTA, celebration of Matribhasha Diwas, Swachh Bharat Pakhwada, Celebration of Independence Day Fortnight, Commemoration of Quit India Day, Candle Light march, Independence Day Run, Literary and Art competition, Celebration of International Day of Yoga, Freshers’ Welcome, Folk programmes, etc.

In association with SPICMACAY chapter of IISER Kolkata, concerts by Padma Vibhushan Pandit Hariprasad Chaurasia and Shri G. J. R. Krishnan were organized.

**Constitution of the Students’ Affairs Council (SAC) of IISER Kolkata**

The Students’ Affairs Council (SAC) of IISER Kolkata is a democratically-elected representation of the student community. The purpose of the SAC is to serve as a legislative body and help the institute administration in framing policies and decisions for the benefit of the student community. The elected members of the SAC also represent the student community in the Academic Senate.

**Students’ Counselling Cell**

The Students’ Counselling Cell has been introduced for the benefit of the students to help in developing a cordial relationship among faculty, students and non-teaching staff. This cell has been set up by the Institute to provide the campus community with a forum for personal exploration, self-awareness and professional growth. It aims to help students develop effective skills for addressing real-life situations, engage in self-exploration and awareness, and address concerns in academics, interpersonal relationships, identity issues and professional development.
Anti-Ragging Vigil Programme

As mandated, it has been our practice for the past few years that, following the new admission, there is an anti-ragging vigil in the hostels. In spite of the fact that there have been no serious ragging-related complaints ever made in the Institute, we still have a very structured system in place, which promotes healthy mixing of all students eliminating the possibility of ragging.

Alumni Relations

IISER Kolkata alumni base is growing every year. The Institute organized its first ‘Alumni Meet’ during 22–23 December 2016. The objective of the meet was to reconnect the alumni with their alma mater. Many events were organized like, Alumni awards, interaction of current students with our alumni, discussion about formation and function of Alumni Association, etc. The alumni got an opportunity to visit the campus, walk through the corridors and recollect the impressions that they left. They also gave positive inputs to the progress of the Institute.

Staff Achievements

Mr. Prakash Hazarika, the then Deputy Registrar (F&A), participated in the International Accounting and Financial Analysis Seminar, organised by UNESCO, Paris in 2014.

Mr. Shahid Ali Farooqui, System Administrator, was appointed the Registry Authority of Indian Grid Certification Authority by C-DAC, Bangalore. He has also been elected for Mozilla Reps Council for a period of one year and he chaired the council during Jan–Feb 2016 and participated in the ‘Open Source Leadership Summit’ held in Singapore during 22–24 January 2016.

Mr. Joydeep Sil, Registrar, IISER Kolkata was awarded ‘Erasmus Mundus, India 4EU II’ scholarship for participating in a professional development programme at the University of Porto, Portugal, during the month of April 2014. He has also been offered a fellowship to attend the prestigious Fulbright-Nehru International Education Administrators Seminar (2017–2018) to be held from 30 September to 14 October 2017 in USA.

Final Remarks

To target a self-sustained campus-based institute, IISER Kolkata needs the following additional buildings: (i) a hostel to accommodate 800 more students, (ii) increase in the capacity of visitors’ hostel from 30 to at least 80 and (iii) increase in faculty housing from 56 to about 150 and non-teaching staff housing from 20 to 40. As the campus-building activities have almost been completed, the focus of our efforts should now be directed to (i) complete unfinished construction work(s), (ii) strengthening of infrastructural facilities, (iii) raise the academic activities to next higher level and (iv) agree to abide by The Guidelines.
Conclusion

We have entered a new phase of growth and development. With the combined efforts of the faculty, non-teaching staff and the student community, I am confident that we will do better in the years to come. This year (2017), like the previous few years, has also seen major improvements in the overall activities and the Institute’s infrastructure.

Our prime objective is to raise the level of our research both in quality and quantity. We are fortunate that our faculty members are young and they will be able to put in the extra effort to make this Institute a world-class one.

I would like to thank the members of various selection committees, who have given the Institute excellent faculty and non-teaching staff members that have made IISER Kolkata, what it is today. Thanks are also due to a number of internal committees, which are a vehicle of collective decision-making.

The Heads of the Departments, Deans, and the Registrar and his team have collectively put in hard work to run the Institute on a structured-mode.

The MHRD has provided excellent advisory and financial support to enhance the Institute’s programmes and infrastructure. Their exemplary support has to be matched by unstinting devotion from the IISER Kolkata community. I express my deep sense of gratitude to the members of the Board of Governors, Building & Works Committee, Academic Senate and Finance Committee for their constant guidance and cooperation.

It is gratifying to note that the financial resources provided to us have been optimally used and also accounted for through both internal and statutory audit.

I also like to thank the CPWD-team, the Government of West Bengal and others for helping us on different occasions. I would like to have their continued support for making the campus a notable one.

IISER Kolkata continues its exemplary performance in all aspects of its mandate. Our accomplishments, since inception in 2006, reflect the strength of our vision, mission and core values. IISER Kolkata is doing well and growing every year, as expected. Today, IISER Kolkata is positioned to become a knowledge-centre for value-addition in the country.
About the Author

R. N. Mukherjee, Emeritus Fellow, Department of Chemistry, IIT Kanpur was the Former Director, IISER Kolkata. He received PhD degree from the University of Calcutta (working at IACS, Kolkata) and post-doctoral training at Harvard University, USA.

He was a Faculty member at IIT Kanpur for more than thirty years. He has authored/co-authored about 150 research papers in the areas of coordination chemistry of transition metal ions and bio-inspired coordination chemistry, synthesizing a diversified class of interesting metal-ligand complexes and investigating their structural, electronic and reactivity (including redox) properties. He was a J C Bose National Fellow.

He is a Fellow of the Indian Academy of Sciences, Bengaluru, the Indian National Science Academy, New Delhi and the Royal Society of Chemistry (UK). Prof. Mukherjee is a member of the Editorial Advisory Board of *Inorganic Chemistry* (ACS) and Advisory Board of *Dalton Transactions* (RSC). He was one of the Editorial Board members of *Inorganica Chimica Acta* (Elsevier) and *Indian Journal of Chemistry – Section A* (CSIR-NISCAIR, New Delhi).
Figure 1. Inauguration of Lecture Hall Complex by Dr. K. VijayRaghavan, FRS.

Figure 2. Inauguration of Research Complex by Prof. C. N. R. Rao, FRS.

Figure 3. Playgrounds.

Figure 4. Students’ Hostel and the basketball court.
Figure 5. Lecture Hall Complex.

Figure 6. 1st Convocation of IISER Kolkata (2013).

Figure 7. 4th Convocation of IISER Kolkata (2016) (Smt. Smriti Z. Irani, Hon’ble HRM, Director and Registrar, IISER Kolkata with a degree recipient).

Figure 8. 5th Convocation of IISER Kolkata (2017) (Dr. R. A. Mashelkar, FRS with a degree recipient).
Figure 9. One-Day Brainstorming Session on Academia-Industry Interaction (by Prof. Animesh Chakravorty).

Figure 10. Research Complex; PhD students carrying out research work.
Figure 11. Visitors’ Hostel and Campus Housing.

Figure 12. Ek Pehal class in progress.
IISER Pune
Dr. Homi Bhabha Road
Pashan, Pune
Maharashtra
IISER Pune
Krishna Ganesh

The Beginnings

On the basis of the strong recommendations of the Science Advisory Council to the Prime Minister, which met on 4 March 2005 under the Chairmanship of Prof. C. N. R. Rao, the Government of India took the pathbreaking decision to create new institutions devoted to Science Education and Research named as ‘Indian Institutes of Science for Education & Research (IISER).’ The first two would be located at Pune and Kolkata and subsequently, more such institutions are to be set up at different locations. The financial requirement for each of these institutions was recommended at a level of ₹500 crores over a period of five years. On 18 March 2005, MHRD constituted an expert committee consisting of Dr. S. Sivaram (Director, NCL, Pune), Prof. P. Balaram (Director, IISc, Bangalore), Mr. Sudip Banerjee (Secretary, MHRD), Prof. Sanjay Dhande (Director, IIT Kanpur) and Prof. Sushanta Dattagupta (Former Director, S N Bose National Centre for Basic Sciences, Kolkata) to prepare the Charter of IISER and define the objectives, goals and modalities of their establishment.

The main objective of the establishment of IISERs was to ensure India’s position as a leading nation in the emerging knowledge economy and to train young students in the fields of basic, natural and interdisciplinary sciences. The academic model of the proposed institutions would be unique and different from either the traditional university system or the technical education institutions. IISERs have been envisaged to foster education and research in interdisciplinary areas without any boundaries or constraints of conventional academic departments. These institutions were to offer five-year integrated master’s level and doctoral programs, with the spirit being research-led learning. The students would be intensively exposed to laboratory work from the first year, getting involved in research to explore their ideas.

It is becoming inevitable that India emerges as a preferred destination for scientific research in years to come, with several national and international R&D organizations (engineering, pharma, IT, etc.) setting up their units in India. India’s own needs in the fields of space, energy and health sciences are enormously increasing with huge demands for excellent science graduates for research and developmental portfolios. IISERs will play a pivotal role in crystallizing the development of India as a hub for scientific education and research.

IISERs: From idea to reality

Immediately after the preparation of the charter and vision document by the expert committee and its acceptance, MHRD on 30 June 2005 constituted two local committees for IISER Pune and Kolkata to deliberate on strategies for implementation of the charter of IISERs. The feasibility
report on ‘Setting up of IISER’ was submitted to the Planning Commission by the expert committee on 20 July 2005. On 31 August 2005, the first meeting of IISER Pune Local committee was held at National Chemistry Laboratory (NCL) under the chairmanship of Dr. S. Sivaram, who became the designated Project Director for IISER Pune.

**IISER Pune Committee** consisted of Dr. S. Sivaram (Chairman), Dr. K. N. Ganesh (Convener), Dr. S. Pal, Prof. V. G. Bhide, Prof. G. Swarup, Prof. A. S. Kolaskar, Prof. D. Balasubramanian, Prof. R. Nityananda, Prof. N. Karmarkar, Prof. S. Dattagupta (by invitation), Mr. Ravi Mathur (Joint Secretary, MHRD), Prof. D. Chatterjee, Prof. J. Iqbal, Prof. J. B. Joshi and Prof. M. S. Raghunathan.

The committee deliberated on several issues, ranging from academic structure and curriculum planning to the registration of society, framing byelaws, student admissions, strategies for faculty recruitment and site location of IISER at Pune. Thanks to the visionary offer of Dr. R. A. Mashelkar, the then Director General, CSIR and Dr. S. Sivaram, a major decision approved was that IISER Pune would be located on 98-acre land on NCL campus. The committee also recommended holding a special teachers workshop to frame the syllabus for the IISER programs. The first meeting of IISER Kolkata local committee held on 14 September 2005 in Kolkata, also endorsed a joint meeting to frame the syllabus.

**Curriculum planning:** A workshop was held at NCL, Pune during 16–18 October 2005 to draft the syllabus framework for five years and detailed syllabus for the first four semesters. Almost 40 invited teachers and researchers in physics, chemistry, biology and mathematics participated in the meeting and intensely discussed on the novelty of the syllabus to promote interdisciplinary training of students. Each sub-group after their discussion presented the curricula to joint groups to optimize the logistics of concept flow and internal consistencies. Separate sub-groups were constituted to define the practical experiments for physics, chemistry and biology courses, identify the required equipment, design the laboratory layouts and compile a list of essential textbooks. On 9 March 2006, MHRD appointed a committee comprising Prof. S. K. Dube, Director IIT Kharagpur (Project Director, Kolkata), Prof. S. Dattagupta, Programme Co-ordinator and Dr. S. Sivaram, Director, NCL, Pune (Project Director, Pune) to take steps for advertising for admission to IISERs and requested Dr. Sivaram to set up a website hosted by NCL on IISER and to invite senior academics to be Adjunct professors in charge of implementation and setting up of laboratories: Physics (Prof. K. Srinivasan, S N Bose National Centre for Basic Sciences, Kolkata), Chemistry (Prof. Debashis Mukherjee, Director, IACS, Kolkata), Biology (Prof. D. Chattopadhyaya, Calcutta University) and Mathematics (Prof. Gadadhar Misra, ISI, Bangalore).

**Society registration:** The Memorandum of Association for society registration of IISER Pune was prepared in December 2005 with the help of MHRD and NCL administration, with several
valuable inputs from Prof. V. G. Bhide and Prof. Govind Swarup. Subsequently on 29 March 2006, the Society was registered in Pune as per the Societies Registration Act 1860 (Act 21) with the following Reg. No: Maharashtra/555/2006/Pune.

Admissions: A meeting of Mr. Ravi Mathur, MHRD with Dr. Sivaram, Dr. K. N. Ganesh and Dr. S. Pal was held on 17 March 2006 at NCL to discuss the preparatory arrangements for starting the course in August 2006. With the help of NCL, IISER Pune website was launched to create visibility and awareness about IISER Pune, its vision, mission, the courses to be offered, admission procedure, syllabus, lab modules, etc. The joint Advertisement for admission to the five-year integrated BS-MS Program at IISERs Pune and Kolkata appeared on 1 April 2006 in major Indian newspapers.

Board of Governors: On 24 March 2006, MHRD constituted separate Board of Governors for IISER Pune and IISER Kolkata as per the rules of the society (MHRD OM F.No.22-8/2006-TS.I dated 24 March 2006). With this, the future responsibilities for IISER governance were shifted to the governing bodies. The first joint meeting of the Board of Governors of both IISERs was held on 28 April 2006 at Indian Institute of Science, Bangalore under the chairmanship of Prof. C. N. R. Rao, along with the Project Directors of IISER Kolkata and Pune. In this historic meeting, several decisions were taken, which laid the path for shaping the IISERs during the next 5 years.

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<th>Board of Governors, IISER Pune: (Term 3 years)</th>
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<tr>
<td>Chairman: Prof. N. Kumar, Raman Research Institute, Bangalore</td>
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<tr>
<td>Members: Ex-officio: (1) Secretary, Department of Secondary &amp; Higher Education, MHRD, New Delhi – Shri Sudeep Banerjee (2) Director, IISER Pune (3) Director, National Chemical Laboratory, Pune – Dr. S. Sivaram (4) Director of the Indian Institute of Science, Bangalore – Prof. P. Balaram (5) Director, IISER Kolkata (6) Director of one of the IITs – Prof. S. G. Dhande – (IIT Kanpur) (7) Three secretaries to Govt. of India representing scientific or industrial ministries – Dr. G. Madhavan Nair (Space), Dr. Anil Kakodkar (Atomic Energy) and Dr. P. S. Goel (Ocean Development) (8) Chief Secretary, Government of Maharashtra (9) Two Professors of the Institute to be nominated by the Senate (10) Four eminent Scientists to be nominated by the Central Government (Prof. D. Chatterjee, Indian Institute of Science, Bangalore; Prof. R. Parimala, School of Mathematics, Tata Institute of Fundamental Research Mumbai; Prof. Arup Raychaudhuri, Physics, S. N. Bose National Centre for Basic Sciences, Kolkata; Prof. K. VijayRaghavan, Director, NCBS, Bangalore, (11) Registrar, Ex-officio secretary.</td>
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MHRD authorised Mr. M. S. Vidyanathan, Controller of Administration, NCL, Pune to be the Acting Registrar of IISER Pune with immediate effect.
In May 2006, Dr. S. Sivaram, Project Director, IISER Pune constituted the following IISER task force with the responsibility of making all necessary arrangements for starting the First semester (Lectures & Practicals) on 1 August 2006 at 900, NCL, Innovation Park, Dr. Homi Bhabha Road, Pune 411007.

The task force worked on all necessary steps required to start the academic course from August 2006. These involved (1) compiling and ordering textbooks and other teaching aids and planning library, (2) drawing specifications of equipment required for practicals in the first two semesters, identifying vendors and placing orders (3) empaneling of adjunct teaching faculty, assigning syllabus topics, planning the conducting of lab courses, (4) designing the internal building plans at NCL Innovation park and processing work contracts, etc., (5) preparing the internal laboratory layout for practicals (physics, chemistry, life sciences), (6) arranging the computer lab and internet facilities, software, etc., (7) hostel facilities for boys and girls, and (8) electrical supply to the building. The not so good condition of the allocated building and the continuous rains posed technical challenges to the engineers to bring it to shape.

Appointment of Director: In July 2006, I was appointed as the First Director of IISER Pune. Accepting the position, as the full-time Director was not only exciting but also meant great responsibilities and challenges. It was solid support and encouragement from Dr. Sivaram and backing from NCL, which made me accept the position. NCL/CSIR gave me lien initially for two years, which was then extended up to 5 years, and allowed me to retain my research lab facilities at NCL. During 19 years of my career at NCL, 22 PhD students graduated from my group and more than 130 publications emanated from our research work. The academic freedom that NCL offered for its scientists is unparalleled and this sustained me in my research career and the academic peer recognition that I received.

Admissions 2006: The first major task that Prof. Sushanta Dattagupta, Director IISER Kolkata and I had to address immediately was to formulate and execute admission procedures. The support that we received from Prof. S. K. Dube, the then Director of IIT Kharagpur and the assistance provided by Prof. B. Mathur and Registrar Dr. D. Gunasekaran in conducting the admissions is gratefully acknowledged. The first ever counselling session for IISER admission was held at IIT Kharagpur, Kolkata campus, at Salt Lake (where IISER Kolkata began) for about 200 students
(IIT JEE), followed by counselling for KVPY and Olympiad students at NCL Pune. The result was the selection and joining of 45 students at IISER Pune and 38 students at IISER Kolkata as the historic first batch of IISER students for the BS-MS program.

### Inauguration of IISER Pune

The day of 16 August 2006 will forever remain a historical and memorable day for IISERs, as on that day, two IISERs were inaugurated, one at Pune and another at Kolkata. At Pune, Dr. R. A. Mashelkar, the then Director General, CSIR New Delhi along with Prof. N. Kumar (Chairman, First BoG) inaugurated the IISER Pune academic building in the presence of Dr. S. Sivaram, Director, NCL at 900, NCL Innovation Park to the thumping joy of the first batch of students and the faculty. Inspiring addresses by both Dr. Mashelkar and Prof. Kumar set the tone for IISER faculty and students to steer their future course. At a more elaborate function in NCL auditorium attended by more than 500 participants, Prof. Kumar gave an exciting inaugural address declaring, “At IISER, science should be taught as it is practised and should be done as it is taught.” It was a great experience to see the young faces of the newly admitted first batch of students who took the risk of joining IISER in the very first year, unconsciously realizing that they have become part of the history.

A classroom with a blackboard, the students, the faculty, the library and the laboratories – all primary ingredients for an academic pursuit were in place to start the classes. Here I must acknowledge the hard and committed work of the first 5 faculty members of IISER Pune: Dr. Gouri Ambika (Physics), Dr. Ramakrishna Bhat (Chemistry, famously known as RGB), Dr. Vikram Athale (Physics), Mr. Sameer Chauhan (Maths, PhD thesis submitted) and Mr. Nilesh Dahanukar (Biology, PhD student of Prof. Milind Watve) during the initial period of the first semester, to launch the academic program. New relationships started emerging among the students, between the students and the faculty and among the faculty, all of whom commenced a ‘tryst with destiny.’ For me, every day, every hour and every moment became a joyful experience to see the right things happening – the successful and timely conduct of classes and practicals, the rush-in and rush-out buzz of students and the regular tea time discussion with the faculty, where each one transgressed their own subjects to discuss the unforeseen circumstances and search for immediate solutions – all resulting in a completely different, but a satisfying experience for me.

### IISER Pune Logo

Every institute needs a logo, which symbolizes its vision and mission. In September 2006, IISER Pune commissioned the National Institute of Design (NID), Ahmedabad to design a logo for IISER Pune. After seeking answers for about 100 questions from me, NID provided a potpourri of logos from which a committee headed by Dr. Sivaram selected the logo for IISER Pune. A variation of this logo incorporating the DNA double helix was adopted by IISER Kolkata. Unlike the classical logos, the logos of IISER Pune and Kolkata are modern and abstract symbolizing education and unconstrained growth, without losing their fine structure when miniaturized for different purposes of branding the Institutes.
The immediate challenge by the end of the first year was recruiting new faculty in the four disciplines Physics, Chemistry, Mathematics and Biology and planning a transit campus for immediate growth. IISER Pune was most fortunate to attract Dr. L. S. Shashidhara from the Centre for Cellular and Molecular Biology (CCMB), who informally worked with us since March 2007 and finally joined IISER Pune by August 2007. It was not easy under the prevailing government rules at that time to hire a private building (by paying a security deposit), but got educated on bureaucratic rules to finally convince the finance committee to allow leasing of six floors totaling 10,000 sq. m. academic area in ‘Sai Trinity’ building in 2008. This helped us to create all the required teaching and laboratory facilities at this site to meet our growth for the next four years by which time the main campus was planned to be ready. The designing of space for necessary lecture rooms (Raman and Ramanujan lecture halls), office space, library, administration and research work (wet labs and advanced instrument facility) was done by the faculty (especially Prof. L. S. Shashidhara) with the help of the Central Public Works Department (CPWD), led by engineer Mr. Yogiraj Rajput, who later relocated as the project engineer at IISER Pune. CPWD executed the work with remarkable efficiency and quality. The facilities were of such high class that it enabled us to attract excellent high-quality faculty, who could start their research almost immediately in the new labs. Even high-tech facilities such as cold atom lab, jet cooled spectroscopy, high-end mass spectral facilities, DNA sequencing, High Performance Computing, etc., were established in the transit campus, without suffering from any sense of temporariness of the site. This enabled the Institute to quickly change gear to publishing very good quality research papers from the transit campus. An important issue that we faced was about the accommodation for yearly increasing number of students and we had to hire several flats in adjoining housing societies, who were unwilling to accommodate students. So, our goal was to immediately build a hall of residence in the main campus, without waiting for the master plan to be completed. Thanks to Dr. Sivaram, who offered the structural plan of a student hostel made for NCL available for
IISER Pune

instant use by IISER Pune. This project was given to CPWD, who completed the multipurpose (128 double occupancy rooms – total capacity 256 students, warden flat, dining hall, reading room, class rooms, etc.) building by 2010. The first batch of students moved into the campus by late 2009, experiencing the campus life for the first time – with dining hall, sports facilities, lecture halls, reading room, etc., all in one building. This has now become an activity center, not only as IISER Pune guest house, but also as a hub of meetings and outreach activities since it now holds a 100-capacity auditorium, several discussion rooms, gym, media center, etc.

During Sai Trinity days, the Institute was actively involved in several different types of initiatives, the Boardroom being the beehive of all these activities. Foremost among these were the planning of main campus, several sittings with the architect to plan the interiors of labs, offices, lecture halls, library, student hostels, faculty housing, etc. While the architects work on the forms, the users impart functions. Most architects have not given lectures or worked in labs and hence lack knowledge about the functional requisites. The Institute ensured that the end-users were involved in as many campus-planning activities as possible. Based on our experience, I would like to emphasize the importance of involving a professional laboratory (chemistry, biology, physics, computer, etc.) design consultant at the early stages, along with the main architect, so that appropriate structural engineering aspects are taken care of at the initial stage. The second important activity was optimizing academic requirements, curriculum planning, designing new courses and evaluation methods, etc., which were done through several sessions of curriculum committee, academic committee, deans, chairs and senate meetings. Each faculty member was made a member of some committee, to inculcate a sense of ownership of the Institute. Finally, Sai Trinity days also saw screening, shortlisting and recruitment of new faculty, with several hours of time investment as IISER Pune strongly believed that the faculty were key to success of any academic institute, as they performed two of the most important functions of an institute: teaching and research.

To meet the rapidly expanding demands of research labs in chemistry, physics and biology, transit labs on campus were built with pre-engineered buildings (PEBs). These greatly alleviated the space and technical needs of the research community in all disciplines. They were given innovative names: Mendeleev (Chemistry, established in 2011, 150 years of Mendeleev’s Periodic Table), h-bar (Physics, Planck’s constant, 2012) and G-1 (Biology, 1st phase of cell cycle, Jeewan – life), given with the objective of moving away from conventional discipline names such as chemistry, physics, biology, etc. The physics labs have very advanced features including vibration free floors needed for very sensitive work such as cold atom lab, SEM, STM, etc. and high quality earthing points, which are critical to get ‘pure electricity’ needed for high end measurements. The G-1 labs provided the much-needed cell culture and microscopy facilities.

In addition, Sai Trinity days also saw the emergence of a strong PhD program in all disciplines and the establishment of various student club activities. The flagship activities of the students are (i) Mimamsa – a national science quiz competition, which is considered to be one of the tough ones in academic circles and (ii) Karavaan – the cultural festival of IISER Pune, a melting pot of all forms
of music, dance and entertainment and (iii) Kalpa, the student magazine. Over the years these have established high standards of creativity, quality and novelty that everyone at IISER Pune eagerly looks forward to these activities every year, entirely organized and managed by students.

**The Campus days (2012–2017)**

The then Prime Minister Dr. Manmohan Singh unveiled the Foundation stone of IISER Pune on 1 April 2010 at a function held in NCL Auditorium. The event coincided with the 65th anniversary celebrations of CSIR-NCL. This function rolled out the construction of the campus, which was completed by June 2014, when the then President Shri Pranab Mukherjee dedicated the campus to the Nation, while delivering the 3rd convocation address. The campus layout has a unique character with a combination of functional utility and aesthetic sense. The main architectural layout of the campus is that all buildings are situated in the outer periphery, with automobile access from the outer ring road, while all interior approach is by walk. It is a great pleasure to walk within the campus devoid of motor traffic. Further, all streetlights are solar and all the buildings have solar roofs, leading to generation of 700 KW electrical power. IISER Pune had the unique advantage of working from a transit campus, while building the permanent campus simultaneously. The availability of PEB labs, apart from providing space for a scale up of the number of PhD scholars, greatly boosted the research publications. The central dining hall is equipped with a large capacity modern kitchen and with the ground floor taking care of all students’ mess, the first floor hall for organizing conference meals and poster sessions and the top floor for faculty dining and executive dining hall for special meetings. The lecture hall complex consists of a 550-seater auditorium (CV Raman Auditorium), 12 lecture halls of different capacity (220, 100 and 60) equipped with the most modern teaching equipment including a National Knowledge Network (NKN) lecture hall and a computer classroom. The main building houses chemistry, physics and biology research labs, offices for faculty, administration and engineering staff, library, Director’s office complex, including Board room, etc. The pride of the campus is an ultramodern animal house supported as a national facility by the Department of Biotechnology (DBT), Government of India. The outdoor playgrounds include basketball, football and cricket stadium, equipped for night games as well. The campus has sewage and effluent treatment plants and the recovered water is used for horticulture purposes. A 100-ft flag-post majestically stands in front of the lecture hall. The campus construction is now almost complete.

The residential housing complex includes campus accommodation for 1200 students, faculty housing of 80 (3BHK), 60 (2BHK) and 20 (1BHK) apartments and a children’s park. The guest house is also planned to be a convention center enabling us to organize many conferences and outreach activities without interrupting the routine activities of the Institute. The main building houses a Ladies’ lounge on the third floor and a day care center. The Institute practices a liberal policy for child care leave and flexible timing for expecting women faculty and staff. A media center was established in 2012 to train students in audio-video technology for research, science popularization and to provide a platform for them to express their creativity. The institute has
a centralized dining complex for all students, faculty and staff with multiple eating (caterers) options. This helps in better management, hygiene, and mixing of students and all other members of the community. The dining complex is also designed to host conference lunches for 1000 participants and after lunch poster presentations. This was a much-needed facility for arranging conferences and together with the guest house and the lecture hall complex, IISER Pune is now developing into a preferred venue for holding scientific conferences.

**Academics**

The academic philosophy of IISER Pune is student-centric and is driven by the aspirations of students and the passion of the faculty. The academic rules were not taken from any other model institution and were devised from scratch. There was no finality of any rules in any semester and during the first 5 years, several formats were implemented and improvised. Dealing with attendance issues, academically weak students and “F” graders took much of the time as the aim was not to punish the first-time defaulters, but to give them institutional support to improve themselves. This approach did work out and several students improved after the initial hiccups. It was recognized that language/communication was a serious issue leading to lack of confidence and under performance and it was addressed by introducing an English language course. The broad spectrum of academic and scientific background of the students admitted to IISER Pune also posed teaching challenges to the faculty in adjusting their levels of pedagogy. Hence student feedback and academic counselling were important. The implementation of student academic module (SAM) – an on-line system of registration of courses by students and uploading of lectures/grades by the faculty went through several versions of improvement as the evaluation and grading system kept changing. After 10 years, the system has reached a good equilibrium point. Integrated PhD program was introduced in 2010, and our experience is that such an initiative attracts excellent students. The PhD and IntPhD students take the higher level UG courses (4th year), but do additional assignments and are differently evaluated. The scaling up of UG student intake to 200 was another challenge in terms of teaching and grading and the tutorial system involving Int. PhD and PhD students has greatly helped.

The Institute took a bold decision to move away from conventional major and minor disciplines and to make all 3rd and 4th year courses as electives. The Institute deliberately followed the policy of allowing students to choose courses without any restriction, purely out of their interests and abilities. The emphasis is on how to learn and develop problem solving abilities than what to learn and to prepare them better for an unknown future. This freedom of course choice was a challenge in planning the teaching time table and exam schedules, but a software developed by the faculty has streamlined this issue. Similarly, the unlimited choice for the 5th year project that can be carried out in any institution in India initially introduced problems in standardization of evaluation, but has successfully been overcome. The positive benefits of the freedom to choose courses and projects by students outweighed the administrative problems associated in implementation. The lab-theory courses and allowing substitution of registered courses are worth
mentioning. The research projects done by students during summers and the liberty to choose the
5th year project have led to several research publications by undergraduate (UG) students that the
Institute is proud of. The introduction of Earth and Climate Science in 2013 was a bit late but
it is already showing good results. The Humanities and Social Sciences at IISER Pune has a new
flavor compared to several conventional ones as it encompasses music, drama, painting, debates
and other fine arts as a medium of teaching. The curriculum committee constantly reviews exist-
ing courses and pro-actively identifies new courses. In fact, the BS-MS dual degree certificate
awarded by IISER Pune does not mention any specific discipline and the grade report is designed
to extract this information from the credits that the students have taken and this combined with
the nature of the 5th year project reflects the specialization of the student. Not mentioning a spe-
cific discipline enables students to pursue PhD program in any subject of their choice.

A not so well-recognized feature of IISER Pune is the number of academic visitors and the
conferences and symposia hosted by the Institute, due to its locational advantage as well as the
infrastructure that is available in terms of residence, dining and lecture hall facilities. These visi-
tors have been our ambassadors in recognizing and promoting the various virtues of the Institute.
It is routine that on any given day there are at least 3 lectures by visitors to different departments.

The Institute was ranked 29 for the year 2016 in the National Institute Ranking Framework
(NIRF) by MHRD on all India basis, which is creditable for a young Institute competing with
well-established IITs, IISc, Central Universities, etc. In the Nature Index 2017 ranking (that con-
siders only publication records in top journals), IISERs as a group are ranked 119 globally with
IISER Pune on the top among the 5 IISERs and IISER Pune stands at 81 among the Asia Pacific
chemistry departments. These are satisfying benchmarks for a 10-year old institute. It will take a
few more years to qualify for other international rankings such as Times and QS.

The Institute has Faculty who are Fellows of various national and International Academies:
Indian Academy of Sciences (8), Indian National Science Academy (6), The Academy of
Developing World in Sciences or TWAS (2), CSIR-SS Bhatnagar Awards (6), Young Associates
of IAS(9), Swarnajayanti Fellowships (5), which is a good reflection of excellent commitment and
abilities of the faculty. Such faculty also are role models for the younger faculty.

Outreach and Public engagement activities

Right from its inception, IISER Pune has been conscious of the importance of outreach and
public engagement activities. There are several programs such as Joy of Science (Lecture series
in nearby colleges), Science is Fun (Science lectures in schools), Science Exciting Group (practi-
cal science experiments for kids, with NCL), Disha (reaching out to rural children and children
of construction workers on campus), Prarambh (once a week on campus for underprivileged
school kids), Little Scientists (supporting projects for rural school children – classes 8–10 in
summer followed by a mini conference where they present their project work, in collaboration with the Moving Academy of Sciences). The Institute also supports several public lectures on science topics of public interest by eminent speakers, which attract a lot of teachers and citizens. Under the scheme of Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNMTT), the Institute has reached out to more than 2500 teachers through programs in pedagogy. The Institute has conducted 4 Ishan Vikas workshops for north-east students and under Rashtriya Avishkar Abhiyan program, 4 batches of teachers from local schools have been trained. The Institute has attracted an endowment of 15 crores for construction of a dedicated center to continuously conduct these programs under one umbrella throughout the year. Promotion of culture is done through regular SPIC-MACAY programs by renowned artists.

**Gender support**

IISER Pune greatly values the equality of genders and strives to hire women scientists in general, and those with a career break in particular. It conducts various workshops to bring awareness of their importance to society. These include careers in grant management, science journalism, intellectual property and entrepreneurship. Several women with successful careers participate in such workshops to share their experience and mentor the participants in terms of re-igniting their careers. The day care center of the Institute encourages women participants in various conferences to bring their kids with them and takes care of them.

**Inter-IISER activities**

The importance of inter IISER co-operation was realized at the early stages and IISER Pune took the initiative of organizing the first inter-IISER chemistry meeting in 2009, by which time IISER Mohali, Bhopal and Thiruvananthapuram had begun their journey. This was inaugurated by Prof. C. N. R. Rao with the participation of the Directors and chemistry faculty of all other IISERs. The various sessions not only included scientific presentations by faculty, but also a session on chemistry pedagogy. This has now become a regular feature, with regular meetings of inter-IISER physics, biology and mathematics faculty, held by rotation at each IISER. It has now been extended to inter-IISER Registrar and Deans meetings. Inter-IISER students sports meet (IISM) has become another great and popular event held in December every year. These events have enabled the different IISERs to exchange and learn from the good scientific and administrative practices at various IISERs and has resulted in the promotion of IISER brand and in IISER communities to forge a healthy competitive spirit.

**International connections**

Right from the beginning, IISER Pune realized the importance of internationalization. Given its unique locational advantage, IISER Pune began to attract various international academic delegations visiting Mumbai. The earliest was a high-level delegation from the University of Göttingen,
which has led to a strong bilateral interaction in chemistry and biology, conferences and faculty research collaboration. The University of Göttingen has also established an educational exhibition center at IISER Pune. This was followed by IISER-UKEIRI joint project with Glasgow University in Pedagogy and with SE-partnership – consortium of 5 UK universities. Since then, a large number of MoUs and collaborations have been established with several universities from Singapore, Japan and USA. The highlight among these is the accreditation of the chemistry program of IISER Pune by the Royal Society of Chemistry (RSC) after a grueling evaluation procedure. IISER Pune was the first institution in India to receive such a recognition by RSC. Recently, IISER Pune has signed major exchange agreements with Temple University (Philadelphia, USA), ENS Lyon (France), Ohio State University (USA) and NSU (Singapore) allowing the 5th year students of IISER to conduct their projects in these institutions. A delegation of the Directors of all 5 IISERs visited certain Max Planck Institutes in Germany in 2015 that resulted in an IISER-Max Planck Society joint agreement to enable an umbrella co-operation of Max Planck Institutes and IISERs. Similar delegation visits to the 7 Imperial Universities in Japan in 2016 and the four ENS Institutes in France in 2017 have resulted in stamping IISERs’ international footprints. The virtues of science course patterns in IISERs are well-recognized internationally. In the Nature Index 2017, the IISER group of institutions figure in the top 100–150 range in terms of their research output.

Academic peer review of IISER Pune

On completion of its 10th year in 2015, IISER Pune decided to get itself subjected to a peer review by international standards. Later, MHRD also recommended such a review process. The following expert teams visited IISER Pune at different times, interacted with the faculty and the students (UG, PhD) and critically reviewed the research achievements and teaching programs, and submitted a report for each discipline. It was to the credit of the reviewers that they were very frank about pointing out the underperformance of some faculty with respect to their potential and inadequacies of the system. This was an excellent exercise through which the young faculty not only got academically peer reviewed, but also got critical inputs on their future research plans. It also enabled the IISER management to initiate several course corrections in administration, support and mentorship of the faculty. The committee’s recommendations on improvement of teaching and future recruitment of faculty was very useful to the Institute. Such an external peer review exercise once in 5 years is most desirable for IISER Pune to remain in the forefront. The implementation of the report of the committees is in progress.

Academic peer review committee

- **Physics**: Joseph Incandela (CERN and UCSB, Italy), Ashoke Sen (HRI, Allahabad), T. Senthil (MIT, USA), Ajay Sood (IISc, Bangalore), Gunter Werth (Mainz, Germany);
- **Chemistry**: Michael Klein (Temple University, USA), T Rajanbabu (Ohio State University, USA), MJ Finn, (Georgia Tech University, USA), Prashant Kamath (Notre Dame, USA), P. Seeberger (MPI, Colloids & Interfaces, Berlin) and D D Sarma, (IISc, Bangalore);
Industry interactions and endowments

IISER Pune recognized the importance of academy – industry relationship and encouraged the visit of various industries such as Shell R&D, BASF, Syngenta, CIPLA to campus for interaction with UG and PhD students seeking a career in industry. It has established good academic relationships with Leica (microscopes) and Perkin Elmer (bioanalytical instruments) leading to these companies opening their joint centers with IISER Pune on campus, which house their state-of-the-art equipment for use by the IISER Pune community. They also conduct training workshops frequently for users. An excellent outcome of such interactions is the endowment of ₹12 crores received from CIPLA for building a modern UG chemistry lab and interaction facilities with industry for students. A similar interaction with Bajaj Auto Ltd resulted in an endowment of ₹50 crores towards construction of residence for women scholars. Balan group has endowed ₹15 crores for establishing a science outreach center for training workshops for teachers and students, especially the less endowed ones from rural areas. Infosys has established an endowment of ₹5 crores, the interest from which is used to support international travel of students selected to present their research abroad and waiver of fees for economically weaker students.

Success of IISERs as a concept: IISER Tirupati

The success of IISERs as a concept was recognized in 2015 when two new IISERs were announced by the Government of India – one in Andhra Pradesh and another in Orissa. The Government of Andhra Pradesh identified Tirupati as the site for the 6th IISER and IISER Pune was asked by MHRD to mentor the establishment of an IISER at Tirupati. The foundation stone was unveiled by the then HRM, Smt. Smriti Irani on 28 March 2015 in the presence of Shri Chandrababu Naidu, the Chief Minister of Andhra Pradesh and Shri Venkaiah Naidu, the then Minister for Urban Development and Parliamentary Affairs and 50,000 audience at the site (Yerpedu), identified for the establishment of IISER Tirupati. The remarkable support from the state government in transferring 255 acres of land and help in identifying the place for the transit campus was instrumental in quick progress. 10,000 sq. m. building at Sri Rama Engineering College was leased and with the IISER Pune administrative team led by the Registrar Col. (Rtd.) Raja Sekhar and Engineer Mr. Yogiraj Rajput, the transit campus with all necessary facilities including students’ residence was established. The growth of the transit campus of IISER Tirupati in a way
mirrors that of IISER Pune in Sai Trinity. Today (2017–2018) IISER Tirupati has 250 BS-MS students, 30 faculty and 32 non-teaching staff.

**Excellence in educational institutes**

The common hallmarks of excellent international institutes are (i) outstanding people (faculty and students), (ii) focus on excellence in research at the highest international level, (iii) commitment to high-quality education, (iv) sustainable funding to ensure excellence and access to periodic academic peer review by experts and (v) international faculty and students. While modern buildings, excellent equipment, state-of-the-art laboratories and libraries are a must, most world class universities are defined by the quality of the minds – excellent minds sustainably working within it. Good competent faculty is the key to success of any institute. Therefore, attracting the best faculty based on merit and competitiveness, providing them the best infrastructure – creating ambience, and empowering academic freedom are essential in building institutes of excellence. A concentration of great minds, free to follow curiosity-driven research agenda, supported by high quality infrastructure, and constantly invigorated by regular influx of energetic students constitute the recipe for success. The time scales and the freedom of inquiry enable them in making fundamental contributions to the growth of knowledge. World-class universities require sustainable funding to achieve excellence and to ensure high quality facilities for their students. They should attract private endowments for secure funding and ability to support. Unfortunately, such philanthropy is far from realization in India. Creating excellence in institutions has a cost and should be considered an investment in future. History says it all – the things that survive the memory of times and cultures are only educational institutes – Nalanda, Taxila, Oxford, Cambridge, etc. Thus, IISERs as a concept, culture and institutions for future must be a success; they have already made an impact in terms of strong foundations in science education and research.

**Finally…**

IISERs, starting as an idea, have become a reality and begun to deliver the tasks for which they were established and there are 7 of them now. For me the successful creation of IISER Pune has been an extraordinary experience in life. It has been the culmination of wonderful support from the government, freedom of function, self-motivated faculty, who helped in institution building, ranging from design of life on campus from academics (teaching and research) to facilities (research labs and other ancillaries), the creative talent of students, dedicated engineering team and highly enabled support by the administration. IISER Pune motto says it all – where tomorrow’s science begins today and IISERs have become the places to be in. There has been a rapid growth in the number of applicants seeking admission and faculty positions at IISERs. It was important for me and my fellow Directors to make sure that IISERs succeed as a concept translated into institutes of national importance and international acclaim. It has been a great, wonderful and unique journey for all of us as a part of the historic process of ‘building new institutions’ – something which coming generations would need and cherish. This has been an opportunity for us to give back something worthy to the system, which has made us what we are today. There is no greater
satisfaction for us than to stand and watch the faculty accolades in academics and achievements of students, born out of institutions for which we laid the foundation.

For me the singular and lucky opportunity has been to be the Founder Director of two IISERs – Pune and Tirupati and the excitation of challenge is not over till the fructification of the campus at Tirupati in 5 years’ time from now.

**Acknowledgment**

I must place on record the tremendous support that we have received from several educationists and institutional heads in chalking the path of IISER Pune, especially Prof. Govind Swarup, Dr. R. A. Mashelkar, Prof. Jayant Narlikar, Dr. S. Sivaram, Dr. Sourav Pal and Dr. Sekhar Mande. I am highly indebted to Prof. L. S. Shashidhara for his constant and constructive criticism, responsible participation in all major decisions, faculty mentorship and above all steering me through his convincing academic philosophy rather than mere adherence to rules and regulations. We, at IISERs are highly indebted to Prof. C. N. R. Rao for his idea of creation of IISERs, constant inspiration and guidance.
My dear students and colleagues,

Do receive my warmest Greetings on this first Annual Day of IISER Pune. And here are some of my thoughts for the day, a Message if you like.

Let IISER PUNE be where science is to be taught as indeed science is done. This, of course, is embedded in its very name. Let the spirit of scientific enquiry prevail: why things are the way they are— in the domain of the small, the large and the complex. Where you may feel and touch the unity of physics, the diversity of chemistry and the complexity of biology; also, the subtlety of mathematics and the immensity of computability; and, you will have choices at the end of it. So, some of you will continue in the line of research and teaching—in research laboratories and academic institutions, here and abroad; some may move to science- and information—based industries, or even start one of your own and innovate; some of you may go on to build institutions and eventually advise the governments on science policy matters. And, hopefully, at least a few of you may turn to science writing, to inform the public at large about matters scientifique—in plain language. The point really is that no matter what you eventually decide to do, your IISER years will help you do it much better. Science really empowers as nothing else ever can. Thus empowered and secure in your quantitative understanding, you will have the courage and the competence to disagree, to be meaningfully different and, indeed, to stand at an angle to the universe!

Finally, I do not know if ethical values can be derived from science. As Poincare’ had noted, their moods are different, even grammatically: ethics is in the imperative, while science is in the indicative. Here you are on your own. But, know that the spirit of science does negate all falsehood.

So go forward with this passion for science within, as you pass these IISER years!

You have my best wishes,
About the Author

Krishna Ganesh is currently the Director of IISER Tirupati. He is the First and Founding Director of IISER Pune serving from July 2006 to October 2017 after which he took over as the First Director of IISER Tirupati since November 2017.

He received his PhD degree from the University of Delhi in 1977 and another PhD degree from University of Cambridge, UK in 1980. After his return, he joined as a Scientist at CSIR-CCMB, Hyderabad in 1981 and moved to CSIR-NCL in 1987 to set up a research group in bio-organic chemistry of nucleic acids and peptides. He served as the Head of Organic Chemistry Division from 1994 to 2006, till he was appointed as the first Director of IISER Pune. He has published more than about 160 research papers and has guided more than 45 students for their PhD degree. His research contribution related to design and study of novel chemically modified nucleic acids, in particular peptide nucleic acids (PNA) for their antisense drug properties and biophysical studies of collagen mimics and related polyproline peptides.

Prof. Ganesh is a Fellow of the Indian Academy of Sciences (Bengaluru), National Academy of Sciences, (Allahabad), the Indian National Science Academy, New Delhi) and the World Academy of Sciences (TWAS, Trieste). A recipient of the CSIR Bhatnagar Prize in Chemical sciences (1998), the TWAS (Trieste, Italy) Prize in Chemical Sciences and JC Bose Fellowship, he is currently a Member of the Editorial Advisory Boards of Chemistry: An Asian Journal (Wiley), ACS – Chemical Reviews and most recently (April 2016), Founding Co-Editor ACS Omega) – An Open Access Journal from American Chemical Society.
Figure 1. Joint BoG meeting of IISERs Pune and Kolkata held at Pune on 10 August 2007, along with faculty and staff of IISER Pune.

Figure 2. IISER Pune and Kolkata-Joint Board of Governors meeting at Pune. Prof. K. N. Ganesh, Prof. Dipankar Chatterji, Prof. Sushanta Dattagupta, Prof. M. R. S. Rao and Mr. Ravi Mathur, Joint Secretary-MHRD with IISER Pune students.
Figure 3. Exchange of NCL-IISER Pune MoU by Prof. K. N. Ganesh and Dr. S. Sivaram, in presence of Prof. C. N. R. Rao (Chairman, BoG, IISER Kolkata) and Prof. N. Kumar (Chairman, BoG IISER Pune).

Figure 4. The 124–room present guest house originally built in 2009 as hall of residence then converted into faculty house, now houses dining hall, meeting rooms, 100–capacity auditorium and media center.
Figure 5. The Directors of 5 IISERs during their joint visit to Max Planck Institutes 2015.

Figure 6. Passing the baton to Jayant Udgaonkar, 1 November 2017.
Figure 7. The main lobby, proclaiming the vision of IISER Pune.

Figure 8. Prime Minister Dr. Manmohan Singh unveiling the Foundation stone of IISER Pune Campus, 1 April 2010.
Figure 9. Inauguration of the IISER Pune campus by President Shri Pranab Mukherjee in the presence of Shri Shankarnarayanan (Governor, Maharashtra), Shri Prithviraj Chauhan (CM, Maharashtra), TV Ramakrishnan (Chairman, BoG) and Madam Smriti Irani (Minister, Human Resource Development).

Figure 10. Inauguration of the Main building and dedication of the campus to the nation by the Hon’ble President of India Shri Pranab Mukherjee, 15 June 2014.
Figure 11. The main building of IISER Pune housing all academic infrastructure.

Figure 12. Lecture Hall Complex, IISER Pune.
After the new Government was formed at the Centre in 2004, the Punjab Government wanted an Indian Institute of Technology (IIT) and an Indian Institute of Management (IIM) to be set up in the state. But the Prime Minister Dr. Manmohan Singh announced setting up of an Indian Institute of Science Education and Research (IISER) in Punjab. This was apparently due to a letter from his long-time friend Prof. S. V. Kessar of Panjab University, Chandigarh. By the 1990s, IITs had become a globally known brand name. Their alumni had gone all over the world and become entrepreneurs and industry leaders. The list of Who’s Who in India and abroad would include a number of alumni from the IITs. Many alumni got their BTech degree from the IITs and the MBA (diploma) from one of the leading IIMs (Ahmedabad, Bangalore, Kolkata). Their success in later years can be traced to the basic training in analytical thinking received from the IITs and the managerial skills imparted by the IIMs.

When the Prime Minister of India announced in a public rally in Amritsar that there would be an Indian Institute of Science Education and Research in Punjab, the public did not know what that meant. The state government allotted land in Kapurthala, near Jalandhar. But the PM insisted that the institute be located in a place with international air connectivity. Therefore, the state government acquired 400+ acres of land in Mohali to house the Knowledge City that would include IISER Mohali. This would be close to the new Chandigarh International Airport (that was yet to be announced). Chandigarh, the joint capital of Punjab and Haryana could not expand and it could not accommodate yet another academic institute within its geographical boundary. The choice of location naturally fell on Mohali, which was about to be developed in a big way. It had the advantage of being next to the City Beautiful and it could also expand in different directions.

The Prime Minister of India laid the foundation stone of IISER Mohali on 27 September 2006 in a function held in the campus of the National Institute of Pharmaceutical Education and Research (NIPER) Mohali.

The Science Advisory Council to the Prime Minister (SAC–PM) had recommended that the structure of IISER Mohali would be along the lines of IISER Kolkata and IISER Pune, which had been established a few months earlier. The Detailed Project Report (DPR) for IISER Mohali was similar to that of IISER Kolkata and IISER Pune. A society was registered in the name of the Indian Institute of Science Education and Research Mohali. The search for the founder Director for IISER Mohali began. The author of this document was identified as the Director designate and was sent on an exploratory visit to Chandigarh on 13 June 2007. Dr. Jagdeep Singh of the Department of Higher Education, Government of Punjab was deputed to receive the Director
N Sathyamurthy

designate. After the meeting with Shri KPS Sidhu, IAS, Principal Secretary, Higher Education and Shri Jaspal Singh, IAS, Special Secretary, Government of Punjab, a meeting was arranged with Shri R. I. Singh, IAS, Chief Secretary to the Government of Punjab. The Director designate wanted a place to start the institute, some accommodation for the students and the faculty. A meeting with Shri V. N. Ojha, IAS, Director General, Mahatma Gandhi State Institute of Public Administration Punjab (MGSIPAP) was arranged the same afternoon. It was agreed that a building under construction in MGSIPAP premises would be given to IISER Mohali to start its activities. The building was nowhere near completion. The Director designate promptly called Shri Ravi Mathur, IAS, Joint Secretary, MHRD and told him that there was nothing in place to start an institute and that he was going back to IIT Kanpur. The Joint Secretary was not amused; he told the Director designate that it was the PM’s commitment to the constituency and that he had to get started and that necessary support would be forthcoming. He was also told that the appointment letter had been issued and sent to IIT Kanpur. On return to IIT Kanpur, the author found the appointment letter waiting on his fax machine and he decided to accept the job. The Director and other officials of IIT Kanpur were very supportive. The Director designate met Shri R. P. Aggarwal, IAS, Secretary, MHRD in Shastri Bhawan, New Delhi on 18 June 2007 and gave his joining report as advised by Prof. P. Ramarao, Chairman, Board of Governors, IISER Mohali. The Secretary welcomed him and congratulated him and promised him full support. The Director was nervous as never before. In a telephonic conversation with Prof. C. N. R. Rao, Chairman, SAC-PM, the latter said, “Go ahead and get started; everything will work out.”

Dr. N. Sathyamurthy, the Founder Director, reached Chandigarh on 18 June 2007 and was put up in Punjab Bhawan as a State Guest for three months. With a back pack and a laptop, he went about setting up IISER Mohali. A dark room in the basement of the library of MGSIPAP was given to him to get started. There was a table and a chair and a peon from Punjab Government. Prof. S. G. Dhande, Director, IIT Kanpur had agreed to provide initial funds in a project mode, to get started. He had also told Dr. Sathyamurthy that Shri J. P. Singh, former Deputy Registrar (Finance) from IIT Kanpur had resigned from the position of the registrar from IIIT Jabalpur and that he might be willing to serve IISER Mohali. When contacted, Shri J. P. Singh readily agreed to help as the first Registrar of the new institute.

The Punjab Government agreed to complete construction of the building in MGSIPAP Complex and hand over 75000 sq. ft. in three floors in the coming months. The classes started on 16 August 2007 at 9:00 am with Prof. Ramesh Kapoor giving the first lecture in Chemistry. Hostel accommodation for 25 students and the workshop and the computing facility were provided by Dr. S. C. Laroiya, Director, National Institute of Technical Teachers Training and Research (NITTTR), Chandigarh.

Based on his experience as Lecturer/Assistant Professor/Professor, Head of the Department of Chemistry and Dean of Faculty Affairs at IIT Kanpur over the years (1978–2007),
Dr. Sathyamurthy had realised that the appointment of quality faculty was essential to the growth and development of an academic institute.

Certain decisions had already been taken:

- IISER Mohali would start a five-year BS-MS dual degree program in physics, chemistry, mathematics and biology.
- It would have the same curriculum as that of IISER Pune and IISER Kolkata, to start with.
- PhD program in all four subjects mentioned above would be started
- Admission for the year 2007 for all three IISERs would be done by IISER Pune and
- Classes would start in August 2007

MHRD had sanctioned \((20 \times 3 = 60)\) faculty positions for the Institute for the first three years. From the curriculum, it was clear that instructors would be needed for teaching the first set of courses in mathematics, physics, chemistry and biology. Teaching laboratories would be needed from day one.

Having known Prof. Ramesh Kapoor of the Chemistry Department, Panjab University (PU), Chandigarh over the years, Dr. Sathyamurthy called on him and requested his help in teaching CHM101, the first course in chemistry. Having retired recently, Prof. Kapoor was willing to consider the request and he also suggested that Prof. C. G. Mahajan of Physics and Prof. IBS Passi of Mathematics department of PU could also be approached. The next day, all three of them agreed to be associated with IISER Mohali: Prof. Kapoor and Mahajan as Professors and Prof. Passi as an Honorary Professor, to teach the first set of courses in their respective subjects.

Dr. Anand K. Bachhawat of the Institute of Microbial Technology (IMTECH) Chandigarh was an MSc student at IIT Kanpur (1978–80) and he agreed to help IISER Mohali teach the first course in Biology. Unfortunately, he fell down and sprained his ankle. Dr. Jagdeep Singh, the Coordinator from the Punjab Government had experience in teaching biology and he readily agreed to teach the first course in biology.

The students of IISER Mohali needed a Library with a collection of textbooks and some reference materials to start with. The Library collection of IISER Pune was used as the starting point and Universal Book Distributors, Chandigarh was asked to supply as per the same list. A list of books suggested by the first set of colleagues was also given to the vendor. A simple letter from the Director was the purchase order!

To get the academic program started, there was a need to recruit regular faculty as early as possible. Based on the inputs from their peers, Drs. Arvind and Kavita Dorai, Assistant Professors
in Physics at IIT Madras were invited as Visiting Faculty. There was a need to set up a meaningful computing facility with adequate internet access, to ensure smooth functioning of the Institute, and to give students initial education on computers. 25 computers were bought and the facility was set up by Dr. Arvind and Dr. P. S. Chandi, who would join as a Scientific Officer subsequently. To keep the morale of the students high, Mrs. Suguna Sathyamurthy agreed to serve as the Honorary Counsellor for the students. She had been a Counsellor for students at IIT Kanpur earlier.

To get the first telephone connection for the Institute, the Director had to stand in a queue and pay ₹500 as the initial deposit. To get the domain name www.iisermohali.ac.in registered online with ERNET of the Government of India was not a trivial task. It had to be followed by physical money transfer by sending a demand draft. As an interim measure, a domain name www.iisermohali.org was registered by payment of US $100. The Director had to seek the personal intervention of Mr. Agarwal, General Manager, BSNL, Chandigarh to get a good internet connection (1MB bandwidth). This was facilitated by Prof. M. M. Gupta of Panjab University. NITTTR Chandigarh was willing to provide interim computing facility and necessary faculty for teaching a course on computer programming. It is important to acknowledge the support given by Dr. Girish Sahni, Director, IMTECH, Chandigarh and Prof. P. Ramaraao, Director, NIPER, Mohali, at this stage.

The first meeting of the Finance Committee and the Board of Governors of IISER Mohali took place under the able leadership of Prof. P. Ramaraao, former Secretary, Department of Science and Technology, New Delhi on 18 July 2007. Shri R. I. Singh, IAS, Chief Secretary, Punjab Government attended the historic meeting to help kick start IISER Mohali. The rules and regulations and procedures followed at IIT Kanpur, an MHRD institution were adopted for a smooth functioning of IISER Mohali. Prof. K. N. Ganesh, Director, IISER Pune was a member of the Board and so was Prof. Dani from TIFR Mumbai. Profs. Kapoor and Mahajan were the Senate nominees for the Board.

The Senate was constituted as per the provisions in the Memorandum of Association (MOA) with Prof. P. Ramaraao, Director, NIPER, Prof. R. C. Sobti, Vice-Chancellor, Panjab University, Prof.s. S. V. Kessar and Ashok Sahni of PU as members. The first meeting of the Senate took place on 2 August 2007.

The computing facility was formally inaugurated by Dr. T. Ramasami, Secretary, Department of Science and Technology on 3 September 2007.

The Government of Punjab made sure that adequate space was available for IISER Mohali to function, by completing the construction work in the MGSIPAP complex. A classroom cum seminar room and teaching and research laboratories were set up. The transit campus was formally inaugurated by Shri R. I. Singh, IAS, Chief Secretary, Punjab on 13 November 2007.
To encourage academic excellence in the fledgling institute, Prof. C. N. R. Rao announced that the C. N. R. Rao Research Foundation would award ₹5000/- to the best student each semester in the first year of its BS-MS programme. The first C. N. R. Rao Education Foundation Prize went to Sameep Chandel and the same was awarded on 26 January 2008. The C. N. R. Rao Education Foundation Prize for the second semester went to Amol Deshmukh.

Soon, it became the tradition to award the C. N. R. Rao Education Foundation Prize semester after semester on Independence Day and Republic Day. The Senate wanted to make sure that each prize winner received ₹5000/- in case there was more than one student sharing the prize. Subsequently, Prof. C. N. R. Rao made a contribution of ₹1.4 lakhs to IISER Mohali to ensure that the C. N. R. Rao Foundation Prize gets awarded semester after semester without any break.

When the Government of India agreed to set up IISERs it was agreed to provide ₹3000 per month scholarship to every student joining the five-year BS-MS dual degree program. However, because of questions raised by the IITs against the awarding of scholarships to IISER students, the Government wanted to discontinue the practice. Fortunately for the IISERs, the Department of Science and Technology, New Delhi announced the INSPIRE fellowship to all the students joining the IISERs to pursue the 5-year-integrated Master’s program in science. Admission to IISERs was, until then, open to Kishore Vaigyanik Protsahan Yojana (KVPY) scholars and students eligible for joining the IITs. In addition, the INSPIRE scheme allowed the top one percent students of State and Central Boards (SCB) to become eligible for admission to IISERs. As a result, each student joining an IISER was assured of ₹5000 per month fellowship and ₹20,000/- per year mentorship grant to the Institute, unless he/she is a KVPY scholar.

The INSPIRE scheme ensured that the cream of the nation aspiring to become students of IISERs could do so regardless of their financial background. As a result, some bright students started joining IISERs and not the IITs. The SCB channel also brought in gender parity, equity and inclusiveness. The Department of Science and Technology arranged a function on 13 December 2008 to award the first set of INSPIRE fellowship cheques to a selected few. Sameep Chandel from IISER Mohali was one of them.

Once the initial conditions were set up for IISER Mohali and the Institute started functioning in its transit campus, it was time to plan for the future. The Punjab Government was ready to allot 125 acres of land in the Knowledge City in Sector 81, Mohali to IISER Mohali. The Institute for Nano Science and Technology (INST), National Agri-food Biotechnology Institute (NABI), Bio Processing Unit (BPU, later renamed as the Centre of Innovative and Applied Bioprocessing CIAB), Indian School of Business (ISB) would be the neighbours. A word of caution by Dr. Prasad Bharatam, NIPER Mohali and Prof. P. Ramarao, Director, NIPER Mohali about the choe and the high-tension line that went through the proposed land was timely and valuable. Thanks to the intervention of the Chief Secretary of Punjab and the support of the Chief Administrator, Greater Mohali Area Development Authority (GMADA), 125 acres of land that was easily accessible and
free of encumbrance was allotted to IISER Mohali. INST was co-located, in an adjacent piece of land (35 acres).

It was time to appoint the architect. The due process was followed and expression of interest was called. Shri D. S. Bhui of Cosmic Designs Pvt. Ltd., Lucknow was selected as the architect for IISER Mohali. The Board of Governors approved the Master Plan submitted by the architect for IISER Mohali.

It was decided to give the entire construction work to CPWD notwithstanding its record of not completing projects in time. Since CPWD was a Department of the Government of India, it would follow the laid down procedures and would absolve the Director and his team of difficulties and responsibilities of civil construction. The ground breaking ceremony took place on 29 December 2008.

It was clear that one could not wait for buildings and infrastructure to come up to start research activities. Knowing fully well that it would take time for the buildings to come up and for sophisticated equipment to arrive, it was decided to order 400 MHz and 600 MHz Nuclear Magnetic Resonance (NMR) Spectrometers. Although due process was followed and experts in the field were involved in choosing the right machines, MHRD wanted to know why so much money (₹5 crores) was being spent on NMR machines for an undergraduate institute. In a meeting of all the Directors of IISERs with the Secretary and the Financial Adviser (FA) of MHRD, the matter was clarified. It was pointed out how IISER Mohali was not just an undergraduate institute, but a science education and research institute, waiting to take off as a leading science university in the country. The first building in the new campus was getting ready while the NMR spectrometers arrived. It took some time to complete the construction of the Central Analytical Facility (CAF) that would house not only the NMR spectrometers but also the single crystal and powder X-ray diffractometers, Laser Raman and atomic force microscope facility.

The Central Analytical Facility was formally inaugurated on 27 September 2009 by Prof. P. Ramarao, Chairman BoG.

Right in the initial stages of the Institute, it was decided to have the Department of Earth and Environmental Sciences and to monitor the pollution (24x7) to study the environment of the campus and its vicinity and to maintain records for years to come. The blue eye in the sky was set up.

It has established clearly over the years not only the pollution level but also the major contributors to air pollution (the burning of the stubble of rice crops in November/December and that of wheat in April each year). The pollution load arising from the burning of crackers during Diwali leaves its fingerprints in the data collected at IISER Mohali. Dr. Vinayak Sinha, responsible for
setting up the facility and studying the pollution level received the NASI SCOPUS Award 2016 for Earth and Environmental Sciences.

The next building to come up in the campus was Hostel 5, which was formally inaugurated by Prof. C. G. Mahajan, Dean Students on 3 December 2010.

The students, who were used to sharing rooms in the hostel of NITTTR and MGSIPAP complex were excited to move into single rooms with balcony in the new campus. There was hardly anything else in the vicinity: no shopping complex, no movie theatre and no means of recreation. The students who bore the brunt of joining a new institute which had nothing to start with continued to stay there and not lose sight of what they came to IISER Mohali for. Dr. Patta Yogendra was kind enough to be the resident warden in the initial months to make sure that the students were taken care of. He got a temporary basketball court and a temporary volley ball court constructed. The latter would serve as the ground for Lohri and other functions organized by the students now and then.

Soon the Lecture Hall Complex and the Academic Block 1 started coming up. The lecture hall complex was formally inaugurated by Shri Kapil Sibal, Hon’ble Minister for Human Resource Development on 25 July 2012, the day of the first convocation at IISER Mohali.

The Master plan of the campus consisted of academic area, hostel area, sports area, residential area and the community centre. It was a conscious decision of the Institute to have the faculty from various areas of biology, chemistry, mathematics, physics, earth and environment and humanities and social sciences work in one building so that they could interact with each other and pursue research in science as a whole.

The inauguration of the hostels (5&7) paved the way for setting up of the Institute in its new campus. While the Director started functioning from the Central Analytical Facility, the Registrar and his office and the entire faculty occupied some of the student rooms in Hostel 7. Incidentally, the first classroom and the teaching and research laboratories in the new campus were set up in Hostels 5 & 7.

It took some time for the Informatics Centre to be ready to house the computing facility and the library. Until then the library started functioning in a building constructed for an electrical substation and the computer centre from a hall in CAF.

It was a conscious decision of the Institute to go in for subscription of online journals and a limited number of hard copies of books, mainly as textbooks at the undergraduate level. The informatics centre was designed along the lines of a public library providing an ambience for study, with easy access to online journals and books.
It was decided from the beginning that students would have hands-on experience regardless of the sophistication of the facility created. Self-help is better than help from outside. Students learned to assemble their own computers to increase the size of the existing facility.

Prof. C. N. R. Rao is fond of saying that brick and mortar could have a settling effect on the minds. He pointed out that a lot of creative work would get done while the buildings were still being built. Therefore, PhD students were admitted to IISER Mohali without waiting for the arrival of sophisticated equipment or setting up of research labs.

Prof. IBS Passi was keen to have the seminar series started. He gave the first seminar on “Evariste Galois (1811–1832) and his Theory of Equations” on 23 August 2007. He also emphasised the need to have workshops and symposia organized at IISER Mohali. He led the way to organize the first symposium, “Symmetry: A multi-disciplinary perspective” and followed it up by editing a volume on the proceedings of the workshop. It cut across disciplines.

Although it was agreed that all IISERs would follow an identical curriculum to start with, it was important to develop the curriculum that was appropriate for IISER Mohali. The curriculum committee was constituted with Prof. Arvind as the convener, Prof. S. V. Kessar (PU), Prof. IBS Passi, Prof. Ramesh Kapoor, Prof. C. G. Mahajan, Dr. Anand K. Bachhawat (IMTECH), Prof. Kapil Paranjape (IMSc, Chennai), Prof. Shobha Madan (IIT Kanpur), Prof. Uday Maitra, (IISc Bangalore), Prof. Amitabh Joshi (JNCASR, Bangalore) and Prof. N. Sathyamurthy as members.

The basic structure of the IISER curriculum was not altered. The first two years would be spent on learning mathematics, physics, chemistry and biology, regardless of the background of a student being medical/non-medical. The students would choose the major at the end of two years without any restriction on the choice of major subject. They would have the flexibility to change their mind at a later stage, if they wish. They would spend a full year (5th year of the BS-MS programme) pursuing research and would submit a thesis (not a report). What has been unique about IISERs in general and IISER Mohali in particular is a set of courses on history and philosophy of science.

The first convocation took place on 25 July 2012 with Shri Kapil Sibal, Hon’ble HRM as the Chief Guest. Prof. C. N. R. Rao was awarded an Honorary Doctorate degree. Dr. R. A. Mashelkar, Chairman BOG presided over the ceremony.

Subsequent years have seen subsequent convocations under different chairpersons with different Chief Guests. Prof. P. Ramarao was the Chief Guest for the second convocation on 25 May 2013; Dr. K. Kasturirangan, Member, Planning Commission, New Delhi was the Chief Guest on 23 May 2014; Dr. M. V. S. Valiathan, National Research Professor, Manipal University was the Chief Guest for the 4th Convocation on 29 May 2015; Prof. T. V. Ramakrishnan was the
Chief Guest for the 5th Convocation on 24 May 2016. Dr. Anil Kakodkar, former Chairman Atomic Energy Commission was the Chief Guest for the 6th Convocation on May 27, 2017.

The alumni of IISER Mohali have started bringing glory to their alma mater. Asif Equbal of 2008 batch received the ‘Molekylspektroskopiprisen 2017’ – The Danish Society for Molecular Spectroscopy’s prize for the best PhD thesis evaluated in the period 1st January 2015–1st March 2017. Srijit Mukherjee and Shwetha Srinivasan of 2011 batch have received the Chemistry Graduate Teaching Excellence Award from the University of Colorado and the Massachusetts Institute of Technology, USA, respectively. Dr. Bodhisatta Nandy and Dr. Ritabrata Sengupta, PhD graduates from IISER Mohali have already become faculty members at IISER Berhampur. The former received the Young Scientist Medal from the Indian National Science Academy, New Delhi for the year 2017.

The Institute gets its name and fame from its research output. The money invested will get justified in retrospect from the quality of the output that ensues. The students and their mentors have been publishing research papers of quality in leading national and international journals. Some of them have filed patents too. There has been a significant increase in the number of publications and refereed journals.

It must be mentioned that many research papers from IISER Mohali are co-authored by the BS-MS students.

Some of the research papers at the forefront of science from IISER Mohali colleagues are:

- Physical realization of a quantum spin liquid based on a complex frustration mechanism. C. Balz, B. Lake, J. Reuther, H. Luetkens, R. Schönemann, T. Hermannsdörfer, Y. Singh,
In addition, colleagues at IISER Mohali have been sensitive to societal needs and have been working on the plight of migrant labor, particularly the ones involved in laying roads in the Himalayas.

Innovation is a part of life at IISER Mohali. Dr. Samrat Ghosh came up with a modified pipette that is safe to handle and a special burette filler, particularly for the physically disabled. Biplob Nandy, an undergraduate student participated in an international competition and came up with a Radioactivity Detection Drone. He filed several patents while at IISER Mohali. Dr. Samrat Ghosh and Dr. S. K. Pal came up with a simple test for acetone in bio-diesel.

No institute can grow independently. IISER Mohali has benefited immensely by interacting with neighboring institutes. Under the leadership of Prof. Arun K. Grover, Chandigarh Region Innovation and Knowledge Cluster (CRIKC) has been established and IISER Mohali is an active member of CRIKC. The Institute has signed an MoU with the Semi-Conductor Laboratory, Mohali and also with Azim Premji University, Bengaluru. It is important to have international linkages for the institute to emerge truly as an institute of global standards. IISER Mohali has an MoU with University of St. Andrews, Scotland, for exchange of undergraduate students. A number of BS-MS students go to Germany under the WISE program of DAAD and a good number come from Germany under the RISE scheme. There are 3 DST-MPI partner groups. There is an umbrella MoU between all IISERs and the Max Planck Society, Germany for exchange of faculty and students. There is an active Russian collaboration in mathematics. Several workshops and conferences are organized throughout the year. Two workshops were held under the Global Initiative of Academic Networks (GIAN) and the Santa Fe Winter School on Complex Systems was organized for the first time in India in IISER Mohali in December 2015.

Quality research publications in recognized international journals by students and faculty have naturally led to recognition at the national and international level. While some of the colleagues joining IISER Mohali were already recognized by the peers, several of them have received prestigious prizes after joining IISER Mohali. The list of such awards and awardees can be found in Table 1 and Table 2.
Table 1. Awards and Honours

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<tr>
<th>Award Type</th>
<th>Recipients</th>
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<tr>
<td>FTWAS: Sudesh Kaur Khanduja (2016)</td>
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<tr>
<td>J. C. Bose National Fellow: Anand K. Bachhawat, Kapil Paranjape, Somdatta Sinha, Sudeshna Sinha</td>
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<td>SA STRA~N R Rao Award for Chemistry and Materials Science (2016), Sastra University, Thanjavur, Tamilnadu: N. Sathyamurthy</td>
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<td>Sir C. V. Raman Medal, INSA Teacher Award 2015: T. R. Rao</td>
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<td>Sir C. V. Raman Medal, 2016: N. Sathyamurthy</td>
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<td>INSA Teacher Award 2015: T. R. Rao</td>
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<td>V. V. Narlikar Memorial Lecture Award from INSA: Sudesh Kaur Khanduja (2015)</td>
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<td>P. C. Mahalanobis Medal from INSA: I. B. S. Passi (2011)</td>
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<td>Indira Gandhi Prize for Popularization of Science from INSA: Rajesh Kochhar</td>
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<td>Khosla Medal from IIT Roorkee: I. B. S. Passi</td>
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<tr>
<td>National Women Bioscientist Award (Senior category) 2013 (DBT): Somdatta Sinha</td>
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Table 2. Young faculty recognized

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<tr>
<th>Award Type</th>
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<tr>
<td>SERB Women Excellence Award, 2017: Mahak Sharma</td>
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<td>Swarnajayanti Fellowship, 2017: Goutam Sheet</td>
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<td>NASI-SCOPUS Young Scientist Award in Earth and Environmental Sciences 2016: Vinayak Sinha</td>
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<td>INSA Young Scientist Medal (2015): Santanu Pal</td>
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<tr>
<td>NASI Young Scientist Platinum Jubilee Award (2015): Santanu Pal</td>
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<td>National Bioscience Award for Career Development (2014): Kausik Chattopadhyay</td>
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<td>Young Associate, IASc: Sanjay Singh, Samrat Mukhopadhyay, Mahak Sharma</td>
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<td>Ramanujan Fellows (DST): K. P. Singh, Yogesh Singh, A. Venkatesan, Sanjeev Kumar</td>
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<td>Ramalingaswami Fellow (DBT): Ram Yadav</td>
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<td>DBT-Wellcome Trust Intermediate Fellowship: Lolitika Mandal, Rajesh Ramachandran, Kavita Babu, Mahak Sharma, S. Rakshit</td>
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<td>DBT-Wellcome Trust Senior Fellowship: Lolitika Mandal</td>
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<td>Innovative Young Biotechnologist Award (DBT): Kavita Babu, Ram Yadav</td>
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<td>Professor S. Subramanian 60th Birthday Lecture Award 2012 by the Nuclear Magnetic Resonance Society of India: Kavita Dorai</td>
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There is a continuing effort to reach out to the students and teachers in neighboring schools and colleges to improve the quality of science education under the outreach program of IISER Mohali. Several summer interns are trained year after year. Several busloads of students come from nearby schools and colleges throughout the year to visit IISER Mohali. Workshops are held at regular intervals to train teachers in keeping up with changing times. The INSPIRE camp was held in January 2016 and Prof. V. Ramakrishnan, Nobel Laureate in Chemistry for the year 2009 was the star performer, inspiring several hundred students. Summer programs are held for children from the North East under the program Ishan Vikas of MHRD. The DST Child Scientist program brings in a large number of school children to interact with the faculty colleagues at IISER Mohali. Teachers’ workshops are held under the Rashtriya Avishkar Abhiyan (RAA).

To ensure that institutes such as IISER Mohali thrive in their pursuit of excellence, it is important to ensure their autonomy and to provide adequate financial support with minimal hindrance. Purchase procedures need to be simplified; scientific auditing should be done by technical experts. The fear of vigilance and audit should not come in the way of functioning of scientists, for them to emerge as global leaders. It is important to have global citizens in the faculty of the institute and there should be a large number of foreign students in the campus to attain truly global standards.

Acknowledgement

It is a pleasure to thank Prof. P. Ramarao, the first Chairman, BoG (2007–10), Dr. R. A. Mashelkar, the second Chairman, BoG (2010–12), Prof. K. K. Talwar, the third Chairman, BoG (2012–15) and Dr. Madhuchanda Kar, the fourth Chairman, BoG (2017–) for their able guidance and unstinted support. I am grateful to Suguna, my wife for her partnership in building IISER Mohali.
About the Author

N. Sathyamurthy, Honorary Professor, JNCASR, Bengaluru was the Founder Director, IISER Mohali.

He received his PhD degree from Oklahoma State University, USA and post-doctoral training at the University of Toronto, Canada.

He was a Faculty member at IIT Kanpur for more than three decades. He has authored/co-authored more than 200 research papers in the area of theoretical molecular reaction dynamics and electronic structure of molecules and clusters in different environments.

He received the S. S. Bhatnagar Prize in Chemical Sciences and was a J. C. Bose National Fellow. A Fellow of the Indian Academy of Sciences, Bengaluru, Dr. Sathyamurthy is the Chief Editor of Resonance – Journal of Science Education and President, Chemical Research Society of India.
Figure 1. Foundation Stone laying ceremony. Dr. Manmohan Singh at the podium; seated from left to right are: Smt. Rajinder Kaur Bhattal, Deputy Chief Minister of Punjab; Capt. Amarinder Singh, Chief Minister of Punjab; General Sunith Francis Rodrigues, Governor of Punjab; Shri Arjun Singh, Minister for Human Resource Development, Government of India; Shri Pawan Kumar Bansal, Member of Parliament, Chandigarh; Shri Ashwini Kumar, Rajya Sabha MP, Punjab.

Figure 2. Dr. T. Ramasami, Secretary, Department of Science and Technology, New Delhi inaugurating the computing facility at IISER Mohali.
Figure 3. Sameep Chandel receiving the first C. N. R. Rao Foundation Prize for the best performance in the first semester from the Director on 26 January 2008. Dr. C. G. Mahajan, Dean Students and Dr. R. Kapoor, Dean Academics look on.

Figure 4. The front view of Academic Block I.
Figure 5. The Informatics Centre.

Figure 6. The first convocation of IISER Mohali. Seated from left to right are: Prof. C. N. R. Rao, Shri Kapil Sibal, Dr. R. A. Mashelkar and Dr. N. Sathyamurthy. Standing from left to right are: Dr. K. N. Ganesh, Dr. K. K. Bhutani, Prof. R. C. Slobti, Dr. Rakesh Tuli, Dr. P. Bapaiah, Dr. Anu Sabhlok, Prof. Sudeshna Sinha, Prof. Jasjeet Singh Bagla, Prof. R. Kapoor, Prof. C. G. Mahajan, Dr. Arvind, Dr. Chanchal Kumar, Dr. Sanjay Mandal, Prof. Kapil Paranjape, Dr. N. G. Prasad and Prof. A. K. Bachhawat.
IISER Bhopal
Bhopal Bypass Road
Bhauri, Bhopal
Madhya Pradesh
The journey begins

I received a letter sometime towards the end of May 2008 from Dr. D. D. Bhawalkar, the first Chairperson of Board of Governors (BoG), IISER Bhopal that I had been appointed the Director of this new Institute. I was elated, but at the same time nervous. However, after talking to Prof. S. G. Dhande, the then Director of IIT Kanpur, I could overcome my initial nervousness. I still remember his one sentence “Go join there and paperwork for relieving can be done later.” I believe that very few administrators would have this kind of positive mindset. I am sure, this kind of thinking made IIT Kanpur different from other IITs.

With some apprehensions and a specific dream, I reached Indore on the evening of June 11 2008, via IISER Mohali (thanks to Prof. Sathyamurthy, the then Director of IISER Mohali for taking care of my airfare) to meet our Chairperson. I gave my joining letter to Dr. Bhawalkar the next day and we both travelled to Bhopal. We met state Government officials and discussed about the transit campus and land for the permanent campus. The weather then was harsh and the on-ground conditions harsher. I had come to Bhopal with just two bags and my laptop and honestly, I had absolutely no idea where to stay and what next was to be done. The academic session was scheduled to commence from August that year and hence it demanded expeditious action on all fronts. The Government of Madhya Pradesh was kind enough to provide us with a transit campus, the ITI (Gas Rahat) Building in Govindpura Industrial area of Bhopal. We were allotted two floors of a section of this building (being occupied then by the Bhoj Open University which moved out shortly) and IISER Bhopal was thus started.

The teething troubles and a humble beginning

Since there was no guesthouse or any pre-fixed accommodation for me, I moved into the Maulana Azad National Institute of Technology (MANIT) guest house and continued to stay there for many weeks. At that time, I had nothing ready; no land being allotted for the permanent campus, no classrooms, no laboratories, no hostels, no canteens, no staff or faculty members. I realized that it was a daunting task and the road ahead would be challenging. There was only one Air India flight to Delhi which took off early morning and returned late evening to Bhopal. I used to visit Vallabh Bhawan to get the Institute up and running as there were no funds allocated by then. Sometimes, I had to mobilize my personal funds to overcome the inertia of the others. Additionally, I was also holding the post of Founding Director (additional charge) School of Planning and Architecture, Bhopal which too demanded a lot of my time and energy.
I had my office, which was basically a log cabin of approximately 10 feet by 10 feet dimensions. It lacked proper furniture and was without an internet connection! This, however, did not dampen my spirit. I knew that these were temporary and passing phases; my job was to build an institution.

I must mention that our first Chairperson, BoG, Dr. D. D. Bhawalkar was a man with a vision. His positive attitude, immaculate scholarship, rational and practical approach towards problem-solving is something I appreciate. IISER Bhopal has been fortunate to have had Prof. Madhav Gadgil as its next Chairperson, BoG and Shri Vipin Sondhi holds the post at present. I have been extremely lucky to receive the advice and guidance of these three great visionaries and our relationships were/are always based on trust and transparency.

The early days

Soon thereafter, I was joined by Prof. S. K. Dogra (former faculty, Department of Chemistry, IIT Kanpur) as the Dean, Academic Affairs. Prof. Dogra was of immense help in structuring the course contents which were supposed to be offered to the first year BS-MS students. Mr. Subrata Sarkar from NIPER Mohali joined us as the first Registrar of IISER Bhopal. He was instrumental in shaping the initial rules and regulations, hiring accommodation for faculty and staff members, and also designating some houses as students’ hostels. Eventually, a batch of 18 students started their journey in August 2008 and subsequently in 2013 they happened to be the first set of alumni of IISER Bhopal.

The good old days at ITI

Here I must mention that Mr. Prabhat Raut, a plumber and carpenter by profession, relocated from Kanpur, successfully converted two small buildings inside the ITI campus as students’ hostels. The only mess was a hall at the far end of the campus having a tin shed where all students and some community members had their food. Since that was the only dining room available and that too with a limited number of seats, students used to stagger their food sessions. Tea and samosas were available at the Monohar Dhaba, a small tea stall which actually belonged to a small industry sharing the boundary wall with our campus. This was a place of casual chitchat where people shared stories and experiences but everyone longed to have a canteen of our own. I personally knew that at times, the situation became demoralizing for many of my colleagues. Therefore, I used to chat with them, sometimes in the capacity of a Director and sometimes as a friend, instilling the confidence that soon we would move to greener pastures. Believe me, there were only two restrooms; one for the ladies inside our building and the gents toilet was open to the public and shared by IISER Bhopal and ITI members. However, the spirit was like that of a well-knit family. My colleagues never complained of the lack of basic facilities, as they knew my limitations. However, to be honest, deep inside me I really felt very bad for them, but somehow we managed. I was never perturbed that my colleagues were not
having a ‘comfortable life’ at the office, but the fact that their research was suffering and that the students deserved a better mode of education was gnawing my mind increasingly.

Taking care of the health issues of the students was also a major concern as most of the students were getting exposed to the outside world for the first time. The support I received from Dr. Anil Batra and his clinic is deeply acknowledged as he was always available for us, anytime.

Life was not only about academics. Even in transit, students regularly organized cultural programmes and the community members all pooled to have a fete inside our transit campus which added vibrancy and damped the monotony.

There was only one lecture hall and most of the classes were taken by visiting faculty members from IIT Kanpur, IIT Bombay, TIFR Mumbai and some educational institutions in Bhopal. Professors Dipendra Prasad, Manindra Agrawal, V. Chandrasekhar, Sandeep Verma, Brajesh Pandey and others, from IIT Kanpur and other premier educational Institutions, helped us immensely and unconditionally in conceptualizing and implementing our academic courses, as Board or Senate Members, and members of selection committees.

Towards greener pastures

An area of ~200 acres was allocated on 3 October 2008 for the permanent campus of IISER Bhopal in Bhauri, on the outskirts of the city. After registration, the land was required to be elevated and made compatible for civil construction as the allotted land had a rocky terrain.

On 8 October 2008, the then Union Minister for Human Resource Development, Shri Arjun Singh laid the foundation stone for the permanent campus. The boundary wall for the campus was soon constructed by CPWD and the ball started rolling. Time flew fast; recruitments happened on all fronts, the rooms of the ITI Building were revamped, our transit campus did not have a deserted look any more. Some of the faculty members joined in late 2008/early 2009 and were immediately assigned teaching and some additional administrative responsibilities. The teaching and research laboratories were made functional with the state-of-the-art facilities and our small campus began to take a definitive shape. Mr. S. K. Bose, ex-librarian from IIT Kanpur joined us and began to set up our library. He was always bubbling with energy and had scholastic interactions within the community members and thus he added vibrancy. Our Finance and Accounts section was streamlined by Mr. J. M. Pareek who joined us as the Finance Officer. The local support that I received in the formative stages of our Institute should not go unacknowledged. The invaluable assistance of many government officials like Mr. Manish Rastogi, District Magistrate and Collector, who helped us in procuring the land for our permanent campus, and of the then Secretary of MHRD, Mr. R. P. Agrawal, Additional Secretary Mr. Ashok Thakur, and later Secretary Ms. Vibhapuri Das, and also of Mr. Sewaram, Principal Secretary of Technical Education will always remain alive in my memory. Mr. J. P. Singh, Registrar, IISER Mohali, was
of great help, especially when we were struggling to frame the initial rules and regulations. The ITI building was rather old and had a lot of issues related to electricity. We had to commission a new transformer as our power requirement to run so many instruments was on the higher side, and to execute this I received all the support from the Madhya Pradesh State Electricity Board.

Despite our limited infrastructure, we were bold enough to organize the 2009 admissions to IISERs with our Institution being the coordinating IISER and Prof. Dogra being the Joint Admissions Committee (JAC) Chairman. Again, we proved that it is not the infrastructure that matters; rather it is the will, determination and unified spirit that helps us at the end of the day. Additionally, we successfully conducted the KVPY interviews (which we still do every year) and started our Outreach Programme (a programme that is close to my heart) from 2010 in our transit campus. It was never easy, taking responsibilities of so many school-going children, and that too, with limited resources called for tremendous involvement from my colleagues, a target which they achieved almost to perfection. The outreach programme has been a huge success in attracting schoolchildren towards basic science and every year we have been organizing this with greater vigour. To top this up, we also host the Ishaan Vikas Programme (a flagship programme of MHRD to promote high-quality academia to the schoolchildren of the North-Eastern states of India) every year. The participants stay in our campus hostels, attend stimulating lectures from eminent academicians and have hands-on experience in our laboratories.

There were storage cabinets, refrigerators, incubators, shakers fully functional yet kept on corridors. The basement of the ITI building was partitioned and converted into faculty offices, classrooms and teaching laboratories. All offices and laboratories were shared and there were no separate sitting places for the PhD students with the reading room of the library used for this purpose. During the monsoons, a majority of the rooms including the laboratories, had water leaking from the rooftops. Sometimes we had to shift instruments and office furniture to places which were not affected. Each day was a challenge with new(er) problems popping up. There was only one room which was just decent enough to be termed as Seminar Room and it was actually used for multiple purposes by everyone, including the students. I knew that the transit campus would soon be insufficient to accommodate an Institution of this magnitude; my primary goal was to shift to our permanent campus at the earliest as I could sense that the entropy inside the ITI building was tending to a maximum!

**The permanent campus was now a reality**

To facilitate a quicker transition to the new campus, we established our Institute Works Department (IWD) and the construction work of our permanent campus commenced on 29 July 2009. We planned to do it using our in-house team and not through any external agency. Mr. T. V. Prabhakaran, retired Architect from the Department of Atomic Energy, Kalpakkam, was appointed as Advisor, Infrastructure and Mr. Rajiv Kumar was the first Superintendent Engineer. We started hiring people on deputation and on project mode from CPWD.
IISER Bhopal

The construction for the permanent campus was done in phases to meet various challenges regarding road conditions and the condition of the soil, which was not conducive to digging and subsequent heavy civil constructions. M/S Ramki Infrastructure, KPC, and then IVRCL were assigned the contracts in three different phases. Unfortunately, things did not work out well. It was later decided to divide the construction work between different contracting agencies and this model worked very successfully, thereby accelerating the pace of construction. The first two buildings that were constructed were the Central Instrumental Facility (housing the common research equipment) and the Lecture Hall Complex (taking care of the teaching facilities). Mr. Madan Pal, the present Superintendent Engineer and Mr. K. V. Satya Murty, the present Registrar made seminal contributions in enabling us to move to our permanent campus in August 2012, a remarkable feat I believe. The architectural services extended by Mr. Ujan Ghosh of M/s Upalghosh Associates synergised the orientation of the buildings and services for achieving academic, research and administrative objectives in a smooth way.

IISER Bhopal as it stands today

By virtue of the National Institutes of Technology, Science Education and Research Act, 2012, implemented on 7 June 2012, IISER Bhopal could grant degrees to the graduating students. At present, we grant the degrees to our students enrolled in the BS-MS (Dual Degree), Integrated PhD and PhD programmes. We offer the five-year BS-MS (Dual Degree) and PhD programmes in Biological Sciences, Chemistry, Earth and Environmental Sciences, Mathematics and Physics. Additionally, the Departments of Chemistry, Mathematics and Physics also offer the Integrated PhD programme. IISER Bhopal was from the very beginning, committed to tread innovative paths in teaching and pedagogy and to combine research and learning in engineering disciplines and basic sciences. In order to inculcate a humanistic approach and ethical and social awareness among students, seeking to challenge strict disciplinary boundaries and creatively work at the interfaces of different disciplines, we started the Department of Humanities and Social Sciences. Additionally, Departments of Engineering Sciences, representing areas like Computer Science, Electrical Engineering and Chemical Engineering were envisioned and established, a unique and exclusive feature of IISER Bhopal. We had our first Convocation in 2013 where the first batch of students (both BS-MS and PhD) received their degrees. Since then it has been a regular affair, with prominent educationists like Prof. C. N. R. Rao, Prof. Goverdhan Mehta, Dr. V. K. Saraswat, Prof. Ajay Sood and Dr. Anil Kakodkar receiving the Honoris Causa Doctorate degree of IISER Bhopal.

With only 18 students on the rolls in 2008, we have come a long way. We have 1113 students now staying in 7 hostels. The entire community is housed within the serene campus equipped with the state-of-the-art teaching and research laboratories, lecture theatres, and with ample opportunities for extra-curricular and creative pursuits for students and other community members. The in-house Community Centre, Crèche (Aadharshila), Institute Club and Visitors’ Hostel are surely meeting global standards. Awards, accolades, research grants and publications came
thick and fast and today IISER Bhopal is repetitively featuring in the Nature Index Reports due to the academic excellence. Serving the society is also one of our goals and through missions like Unnat Bharat Abhiyaan, IISER Bhopal has adopted three nearby villages. Prayas, a voluntary organization started by our students, offers some basic education and clothes to the children of the labourers.

We have established Centers of Excellence like CREST (Center for Research on Environment and Sustainable Technologies) and CREATES (Centre for Research in Advance Technology for Education in Science) through which multi-disciplinary research and technology-enabled modular proactive teaching are envisioned. I must state that the help, cooperation, support and most importantly the trust the community members have shown in me makes me humble.

It would be improper to mention any specific name(s) of faculty and/or staff members, but the members who joined me in my journey till late 2009 deserve a special mention in enabling us to achieve whatever we have in this short tenure. Support from all my fellow Directors of IISERs and other friends from IIT Kanpur was always there. We could create a sustainable system and the credit goes to the Registrar, Shri K. V. Satya Murty. Our Superintendent Engineer, Shri Madan Pal and his team were responsible for achieving the goal of completing the campus construction using an in-house team. It gives me immense pleasure to state that we moved into our permanent campus in totality in July 2016.

I feel that this is indeed a remarkable achievement given the adverse conditions we had to face on all fronts, but yes, we did it. Finally, the immense contributions of my wife, Mrs. Anjali Singh should not go unacknowledged; she helped me in giving finesse to our Institute, especially for the crèche through which the entire community is vastly benefitted.

And finally...

Today, as I look at these tall buildings, a fully functional campus, a vibrant young crowd of students and an academic ambience within IISER Bhopal, I do get some satisfaction. Yes, I must admit a part of my dream of 2008 has been realized. However, being a scientist, I can never be complacent with whatever I (or IISER Bhopal) have achieved.
About the Author

Vinod Singh is a Professor of Chemistry at IIT Kanpur. As a Founding Director of IISER Bhopal during 2008–2018, he set up the whole campus from scratch. He also served as the Mentor Director of IISER Berhampur.

His research work in the area asymmetric synthesis has been recognized with honors such as Swarnajayanti Fellowship, S.S. Bhatnagar Prize, Padma Shri, among others. He has been elected as a Fellow of Indian National Science Academy, Indian Academy of Sciences, National Academy of Sciences, and The World Academy of Sciences. He is an Editor of Tetrahedron Letters and a Member, Editorial Advisory Board of Organic Letters and Journal of Organic Chemistry.
Figure 1. The first meeting of the Board of Governors of IISER Bhopal on 10 July 2008.

Figure 2. The first batch of students at the 2008 Teachers’ Day function (5 September 2008).
**Figure 3.** The first Independence Day celebration at ITI Building (5 August 2008).

**Figure 4.** The first Republic Day Celebration at ITI Building (26 January 2009).
Figure 5. The FETE organized by the IISER Bhopal community.

Figure 6. Foundation stone laying ceremony by late Shri Arjun Singh, the then Honourable Mister, HRD.
Figure 7. Outreach Programme at 2010 and 2016, indeed we have evolved with time!

Figure 8. IISER Bhopal completed one year, the first foundation day programme (8 October 2009).

Figure 9. It has been a memorable journey; our entrance then (2008) and now (2017).
IISER Thiruvananthapuram

Part I

E D Jemmis

The Beginnings

The genesis of the IISERs is described earlier in this anthology. IISERs at Bhopal and Thiruvananthapuram started in 2008. The background work for IISER Thiruvananthapuram (IISER-TVM) began in 2007 with the promise, from the Govt. of Kerala, of land for the campus in Vithura in the Western Ghats and space for the temporary campus at the College of Engineering Trivandrum. Several scientists from Kerala and outside strived hard to make it happen. It started as a Society registered on 20 Feb 2008, under Travancore-Cochin Literary Scientific and Charitable Societies Registration Act, 1955. Prof. M. R. S. Rao, then President of JNCASR, was appointed the first Chairman of the Board of Governors (BoG) of IISER-TVM (March 2008–February 2011). Prof. V. M. Katoc was the next Chairman. The letter of appointment as the Director, IISER-TVM came to me on 28 May 2008 from the Chairman of the BoG, on behalf of the Ministry of Human Resource Development (MHRD), Government of India. The Director of Indian Institute of Science (IISc) Bangalore, Prof. P. Balaram, reluctantly granted me the permission to go on deputation for two years initially with the provision that this could be extended on request, one year at a time for three years more. I joined as the Director on 9 June 2008.

It was clear from MHRD that the classes for the first batch of BS-MS students had to begin in August, and that the students for IISER-TVM would be selected by the older IISERs. The task ahead appeared daunting. It was necessary to have an able administrator. Mr. T. N. Sahadevan, a Senior Administrator of National Centre for Biological Sciences (NCBS), was requested to come for a year and he agreed. Prof. K. VijayaRaghavan, then Director of NCBS, sanctioned to loan the services of Sahadevan for six months. Sahadevan, Alice (my wife) and I reached Trivandrum on 12 June 2008. The CSIR-NIIST Director Prof. T. K. Chandrashekar provided us guest house facilities for two weeks. With the authorization of Dr. K. A. Abraham, Principal Secretary, Ministry of Education of the Kerala Govt., we received the key of the temporary building (top floor of the Department of Computer Science of the College of Engineering Trivandrum (CET) from Prof. J. Letha, Principal of CET. The State Government also made Prof. Kuncheria Isaac, who was the Director of Technical Education to act as a Liaison Officer between the State Govt. and the Institute.

The next five years went by as if it was one long day.
After two weeks, we shifted from CSIR-NIIST guest house to Rajiv Gandhi Centre for Biotechnology (RGCB), nearer to CET, where the Director Prof. Radhakrishna Pillai provided an office and Guest House accommodation. IISER-TVM continued to receive support and encouragement from RGCB in many ways, the first of which was a joint account opened with the Director of RGCB for operating the IISER accounts in the first few weeks. The first meeting of the BoG took place on 29 July 2008, with Prof. M. R. S. Rao, President, JNCASR, Bangalore, Mr. P. J. Thomas, Chief Secretary, Govt. of Kerala, Prof. M. V. George, NIIST, Thiruvananthapuram, Dr. J. Gowrishankar, Director, CDFD, Hyderabad, Prof. K. N. Ganesh, Director, IISER Pune, Mr. S. K. Ray, Joint Secretary and Financial Adviser, MHRD, New Delhi, Prof. M. S. Gopinathan, Special Invitee, Mr. T. M. Sahadevan, Acting Registrar and Secretary and myself. The Board approved our initiatives to start classes and other short and long-term plans.

The one floor in the department of computer science building given to us temporarily had to be converted to classrooms, labs and offices in a few weeks’ time. Sahadevan was experienced in starting institutions, having done so for TIFR-Bangalore campus and NCBS. He could assemble a team of able, efficient and reliable advisors from and around Trivandrum. IISER had Mr. P. A. Prabhakaran, retired Chief Engineer of ISRO, Mr. S. B. Jayaram, retired Senior Purchase Officer of ISRO, Mr. Viswanathan Nair, retired Finance Officer from RGCB and Mr. Kurup from CSIR-NIIST to help us. They, in turn, could locate a few more people to form a small a team which transformed the rooms given to us above the computer science department of CET into lecture rooms, offices, etc. Essential classroom and office furniture were procured on time. The old and unused chemistry and physics laboratories of CET were given to us. These were renovated in a short time to start the laboratories. The Institute also constituted a Finance Committee and a Building and Works Committee as per the guidelines of the MHRD.

Prof. M. S. Gopinathan, an accomplished theoretical chemist, who had superannuated from IIT Madras and settled in Trivandrum readily agreed to help in organizing the academic program. Dr. George Thomas from CSIR-NIIST came forward to teach and help in locating temporary teachers. Prof. S. V. Sunderpandian (IIITMK), S. Akila (ISRO), K. Savitri (NIIST), Unnikrishnan Nair (Kerala), O. Thomas (Govt. Woman’s College), Ommen V. Ommen (Kerala), G. Pradeep Kumar (RGCB), Ayan Datta (Univ. Texas), T. K. Shajahan (IISc), and Nandakumar (CUSAT), agreed to our requests and came forward to teach the first semester courses. Prof. K. P. Mohanakumar (IICB, Kolkata) agreed to spend a semester at IISER-TVM. The course patterns of the first two years of IISERs at Kolkata, Pune and Mohali, in addition to many other sources, were obtained and IISER-TVM formulated its own syllabus. I had frequent conversations with Professors Ganesh (IISER Pune) and Sathyamurthy (IISER Mohali), and Prof. Vinod Singh (IISER Bhopal), who was also starting the first year classes at the same time in IISER Bhopal.

A hostel for boys was located on the campus of the Mar Ivanios College. The three girl students were accommodated in a temporary Guest House that was rented near CET. The first
batch of students started coming along with their parents on 14 August 2008. The Engineering group hurriedly erected a flag mast and the National Flag was hoisted on the Independence Day. The classes started on 17 August 2008 and the laboratory courses soon thereafter. Despite many hurdles, classes at IISER-TVM always started at 8.00 AM.

Lack of Space and Permanent Campus

The lack of space in the temporary campus and the absence of large quality space around the CET gave the idea that even though the permanent campus was far away we might quickly construct some buildings and shift as early as possible. Considerable time and energy was spent on this idea, but the MHRD secretary was of the strong opinion that with a (small) area of 200 acres one should not begin without a master plan. Thus the idea of temporary constructions was reluctantly abandoned. There were additional reasons as well for this decision. The undulating, hilly terrain of the campus in the Western Ghats was breathtakingly beautiful, but power had to be brought through underground high tension lines drawn from 29 kms away, by Kerala Electricity Board. Our own water resource management with all the purification and reuse processes had to be arranged, along with a check dam. Elephants trespassed breaking the fence and the walls that were built quickly. Though these intrusions were very infrequent, IISER-TVM had to have an electric fence with the help of the Kerala State Forest Development Corporation before moving in. Since these were time-consuming processes, we looked for parallel processing.

The CET agreed to our constructing additional floor on top of the Department of Computer Science building. This was done in about three months and IISER-TVM had an additional 10000 sq.ft. in 2009. We were permitted to do so again on top of the Civil Engineering buildings in 2011 and 2012. Our Engineering team did those difficult jobs quickly, taking only three months for each, that too, without disturbing our as well as CET’s ongoing academic activities. IISER-TVM had to rent several small buildings in the vicinity for hostels, and classrooms as the intake of students increased year after year. The ISRO administration also came to our help and allowed us to hire their training hostels for our students for a couple of years 2011–12 to 2012–2013.

Due processes were started in parallel, to select an architectural team for preparing the Master Plan, a project management team and a contractor for the main campus construction. With the approval of the Board of Governors, three committees were appointed for these purposes. The committee to select the architect was chaired by Prof. Sengupta of the Department of Architecture of IIT Kharagpur. Prof. Subba Rao, Retired Professor of Civil Engineering and Head of the Works Committee at IISc headed the committee to select the project management group. Dr. E. Sreedharan of Delhi Metro agreed to our request to chair a committee to select a suitable contractor for the first phase of construction. Dr. Sreedharan helped the IISER with his advice and involvement in many difficult phases later on and also gave a public seminar during one of his visits.
The task of construction in the Vithura campus was daunting since starting from a virgin land at a remote location with extremely difficult topology everything had to be built up, not just buildings but every service as well including power, water and sewage systems. Even before the construction agency was in place, the Institute had taken up the work of building the first roads into the rather inaccessible terrain through a separate contractor and also had built a site office. The campus land per se had no direct road access. After some effort, the state government procured a strip of land connecting the Institute property to the adjacent road and transferred it on long-term lease. This was bitter-sweet in that while the Institute got connected, a house and private land belonging to a local resident had to be taken over. In the social milieu existing in Kerala, it was imperative that the Institute maintains a good rapport with the local community if it is to grow and flourish. This was a particular challenge unique to a socially forward state that could potentially either strengthen or weaken the institution. So the issue of land take over had to be handled with utmost care and this was successfully done with minor rankles.

Academic Programs

The academic program started with the five-year BS-MS dual degree. Though the first batch was small, there was much excitement in the air to do everything quickly. The students and the faculty sat together for two days and designed our emblem. While IISER-TVM was as generous as possible towards the CET, they reciprocated in several ways, the most important of which was the special treatment that the CET students gave us by not disturbing our academic programs even when there were many disturbances in the campus. The seminar halls and auditoria of CET were made available on a continuing basis for several years.

The Varsha semester in August 2009 saw the second BS-MS batch with a larger number of students. IISER-TVM had to hire a large number of small buildings as hostels as large buildings were not available in the area. Academic standards and discipline were always in focus right from the inception of the Institute. The start of the second year of classes already had seen the departure of one student from the first batch, who did not do well academically and withdrew on his own. The first few cases of academic dishonesty like copying in exams were dealt with firmly to set the tone for the years to come. The syllabus and the curriculum developed by the young faculty members, not tempered by years of teaching experience, were challenging and reflected the state of the art in pedagogy in their respective subjects. For the students, the hours were long and the classes were intense but like all bright young girls and boys, they took up the challenge and most of them thrived in this environment. IISER-TVM also started the PhD program in the year 2009 with a small intake. The Int. PhD program began in the year 2012. While there were severe restrictions with respect to space, IISER-TVM did not reduce its efforts in keeping up the quality of the programs. A video classroom facility was quickly built so that courses from IISER Pune and IISER Mohali could be shared by our students.
Faculty

The 25 years spent at the formative period of the University of Hyderabad allowed me to observe the formation, growth, development, accomplishments and standing in the field of several schools from the beginning. A fact that struck me was that in general there was no correlation between the number of faculty and the accomplishments in teaching and research of a school. In fact, a closer observation had revealed that the Schools that expanded in a hurry did not do as well as the Schools that expanded slowly. Another observation from the same period was that Schools, where faculty members chose to select their own students as faculty, in general, did not do well in the long run. At IISER-TVM the rate of selection of faculty members has been low, but at the end of five years, there was a team of about 40 regular faculty members. They were drawn from all over the world, based on their accomplishment and promise. The young faculty members had, by 2013, among themselves 6 Ramanujan Fellows, 3 INSA Young Scientists, 2 Ramalingaswamy Fellows, 2 Wellcome Trust Intermediate Fellows, 2 IASc Young Associates, 2 Max Planck partners, 1 Atomic Energy Young Scientist, 1 UKERI Exchange program, and 1 Indo-EU-Energy Initiative. I understand that several of them have gone on to win many laurels since 2013. At any given time there were about 15 visiting faculty members, who helped in teaching and other academic duties. In addition, several courses were shared with IISER Pune and IISER Mohali over the web. The untiring efforts of the regular and temporary members in teaching and all other aspects of running the Institute brought short and long-term recognition to IISER-TVM. They went beyond the call of duty in getting the Institute growing in the best possible ways. These early experiences are sure to keep them going well in their future endeavors.

Administrative Staff

The success of a teaching and research institute depends crucially on its administrative and support staff. We were fortunate to have Mr. Sahadevan as our first Registrar. After the first six months, it was very clear that IISER-TVM wanted him to continue. His parent institution NCBS allowed him to continue for another six months. His ability to network helped in the crucial beginning stages, assembling a competent team. Mr. Sahadevan could not extend his services beyond one year. The administrative processes were still ad hoc because of the many things to be done with a few people to manage them all. The status as a registered society with a Memorandum of Association (MoA) provided for some guidelines, with the additional suggestion that any matter that was not specially dealt within the MoA, the Institute might use the procedures followed by IISc, Bangalore. IISER-TVM was happy therefore to welcome Mr. B. K. Subburaman, who retired as the Registrar of Indian Institute of Science as the next administrator. Mr. Subburaman brought with him years of experience of academic administration and put several processes in place for academic and administrative matters. He helped the faculty in issues about courses, grading, remedial courses, course requirements for Int. PhD students and PhD students, minimum credits and addressing student grievances in academic and non-academic
ED Jemmis

matters. Mr. Subburaman spent about two years and went back to Bangalore after a regular registrar was appointed following the rules. Mr. Bharat Jyothi, an Indian Forest Service Officer from Bihar, joined as the Registrar taking a three-year Deputation. Mr. Bharat Jyothi brought with him professional administrative skills and quickly changed our administrative system from improvised co-option to regular and customized systems within the MoA. A new set of purchase rules were formulated. A delegation of Administrative and Financial Powers to the Academic and Non-Academic authorities were made very carefully. It was also during this period that we changed from an Academic Advisory Committee to an Academic Senate, which was in line with the yet to be passed Act of Parliament. Mr Bharat Jyothi also led the Institute in many difficult situations with respect to finding space in the temporary campus, in liaison with the forest department, in dealing with a failing contractor, always being the link between the Institute, and the BoG, Finance Committee and Building and Works Committee. The quality of the human resource that constituted the administrative staff was of the highest order. We had a retired Finance Officer of DoAE, Shri P. N. Mohanan, following the departure of Shri Viswanathan Nair. All the administrative staff went far beyond the call of duty and rose to many difficult occasions. Their names are not given individually lest any omission will be more unpardonable. Their contribution to the growth of IISER-TVM is invaluable.

Students

Our students form the heart of the Institute. The first batch that started with minimal facilities in the first semester rose to the occasion to overcome any disadvantage. With time the Institute obtained the best facilities in the temporary location as well. 70% of the students of the first batch selected scientific research as a career and are about to complete or have completed PhD in science from institutions around the world. The student body over the years has performed well academically and in all other areas too. They participated in Lindau and Jerusalem meetings of Nobel Laureates, won awards in competitions in areas of research, culture and sports from across the country. IISER-TVM came first in YETI – IIT Guwahati- An Ecology Research Meet. The students came in top positions in CSIR JRF, and summer projects in India and abroad. Several of them had outstanding research publications working from temporary laboratories, which were well-equipped. They came out with flying colors in the Inter-IISER sports meet with an overall Second Prize. The Cultural Club and the Science Club began early on and gave birth to many separate interest-groups forming their own units in photography, dance, etc. In the midst of all that, academic excellence was given maximum importance.

Outreach Programs

Our students and faculty along with Infosys volunteers taught the students of the local Government school, with the result, in 2012, one of those students got admission in an IISER. IISER-TVM cooperated with the Foundation for Capacity Building in Science (FCBS) and held several workshops for college and higher secondary school students. IISER-TVM conducted
several INSPIRE Scholars programs. Our faculty members gave inspirational lectures on the
excitement of doing research at various colleges in the state and throughout the country. Our
Open Day was a resounding success. By the beginning of the fifth year of the Institute, the
results of these efforts were visible.

IISER-TVM developed healthy collaborations with RGCB and the National Institute of
Interdisciplinary Science and Technology (NIIST) in many areas: Use of common facilities,
Common courses, Sharing courses, other academic activities, Collaborative Research in Cancer
Biology, Nano-Biotechnology and Organic Synthesis. IISER-TVM conducted national seminars
and workshops, took an active part in the Kerala Science Congress of 2011, 2012, and 2013 and
became a leading part of the central and state institutions in the southern part of India.

Mission and Vision

Though there was no proclaimed mission statement of IISER Thiruvananthapuram per se, the
mission and vision of the institution were fast evolving. The general idea was to let it take shape
by the involvement of the outstanding young faculty. IISER-TVM had a working Mission and
Vision: To be a leading research and teaching institute in basic sciences, where excellence and
dynamism form a way of life, through the collective vision of a group of young faculty. The sug-
gestions for expansion to achieve this came from the faculty and several centres of exploration
were visualized for future as presented to the combined meeting of the academic advisory com-
mittee and the Senate in 2013.

The research facilities in the temporary campus, though cramped in space, was outstanding.
Several remarkable research results came from these laboratories. Though the research was carried
out for its own sake, the faculty did not have any hesitation to apply these ideas in energy research,
the betterment of ecology and environment, development of sensors, financial modeling, disease
control, stem-cell therapy, and so on. IISER-TVM had faculty members working as a part of the
LIGO project, which eventually detected the gravitational waves and won a Nobel Prize.

The fifth-year – 2012–2013

The letter of the last extension of a deputation to the undersigned from the Registrar of IISc
in June 2012 was clear in its finality. Although IISER-TVM was making great strides at the
Academic front, progress was rather slow in the construction front. The first phase of construction
of the campus at Vithura envisaged Academic Buildings for Physics, Chemistry, Biology, Animal
House, Instrumentation Facility, Hostels for 500 students, Engineering Service Facility, Indoor
stadium, accommodation for 65 faculty and staff and common facilities like roads, 3 bridges,
5 culverts, Check Dam for water supply, drainage treatment plant, 110 KVA HT substation,
drawing power lines for 29 kms by the Kerala State Electricity Board (KSEB). There were over
25 buildings coming up at the same time. But the pace of construction was very slow. Attempts
were made to accelerate it in many ways. Looking back, we can see many reasons for this tardy progress, none within the control of the Institute. Last minute efforts were on to complete at least a few buildings and shift some of the students to the campus to reduce the space crunch at CET.

In its fifth year, IISER-TVM had approximately 40 outstanding faculty members, who had started publishing vigorously in outstanding journals. There was a remarkable group of Visiting Faculty, many with global experience. A reputation of having one of the toughest academic programs was built strenuously. Our students had done very well. IISER-TVM had outstanding national and international visitors coming all the way to Thiruvananthapuram to interact with the teachers and students. This included Professors Anthony James Leggett, Roald Hoffmann, Ada Yonath (all three Nobel Laureates), Roger Penrose, and a large number of outstanding Indian Academics. I went back at the end of five years to IISc, Bengaluru, handing over charge to the seniormost professor. By then there was a functioning administrative structure with the Deans, Associate Deans, and the Registrar’s office. The task ahead was huge and my successors had done enormous work to get the construction of the first phase completed and to undertake new ones.

Acknowledgement

In addition to all the references made above, I would specifically thank the Secretaries, Financial Advisors and other members of MHRD, who helped us continuously. They had given IISER-TVM the confidence that, in our endeavours to bring up a world-class institution, they would always be there with us. In fact, whenever IISER-TVM needed something badly from MHRD, it was readily forthcoming. MHRD deserves full credit for what IISERs are today. All branches of the Govt. of Kerala helped IISER-TVM in myriad ways to get the Institution going. All educational, research and technology institutions in and around Thiruvananthapuram and the public, in general, helped the Institute in numerous ways. I thank them, and my wife Alice who worked as a volunteer for IISERTVM for five years.
About the Author

Eluvathingal Jemmis studied at IIT Kanpur, Princeton and Cornell, and joined as lecturer in the newly established University of Hyderabad in 1980. In 2005 Jemmis accepted an invitation from IISc Bangalore. After three years he shifted on a five-year deputation, generously granted by IISc, to establish IISER Thiruvananthapuram. Back in June 2013, he continues teaching and research in structure, bonding and reactivity of molecules, clusters and solids (http://ipc.iisc.ac.in/~edj). His work on boron, relating condensed polyhedral boranes to beta-boron via mno rule is in chemistry textbooks. Jemmis is a Fellow of the three national science academies, and received many honors, including NSTS Scholarship of NCERT, Shanti Swarup Bhatnagar Prize, and the Padma Shri.
Figure 1. Library and laboratories in the temporary campus. Most of the sophisticated instruments needed for research were made available here.
Figure 2. Vithura Campus: Contour Map, Master plan, Approach Road, Rivulet which is bridged, winding Roads and compound wall.
Figure 3. Vithura campus construction at various stages and the foundation stone laying ceremony.
Figure 4. Our students did well. (1) V year BS-MS students (M. Gopikrishnan) with Prof. William Philips Nobel Laureate in Physics in year 1997 at Lindau meeting in Germany, June 2012. (2) Ms. Reshmi Thomas, a PhD student of the School of Chemistry, receiving the Malhotra Weikfield Foundation – Bangalore Nano Young Scientist Award 2012. (3) II year BS-MS students (Brinda, Linta and Vishnu) with Prof. Kobayashi, Nobel Laurate in Physics in year 2008 at Jerusalem in August 2012. (4) IISER-TVM Football team-2013.
In the beginning of 2014, IISER Thiruvananthapuram was already making a promising progress with respect to its primary mission of providing world-class undergraduate and graduate level education in the basic sciences, set in an environment of active scientific research. Many of the faculty members had set up their research laboratories in the transit campus and the first set of undergraduate and PhD students had just graduated with most of them pursuing a career in scientific research as envisioned when the IISERs were established. Publications were on the upswing in terms of numbers as well as impact and quality, and several of these publications were co-authored by BS-MS students.

However calamitous to the progress of the institute, the efforts to create the necessary infrastructure at the permanent campus that could nurture and enable the plans and aspirations of the faculties and students was faltering ominously at the same time. The land given for the permanent campus rises more than 150 meters from the entry at the south side to the northernmost point. While the site and location promised one of the most beautiful campuses in the country, if not the world, constructing a campus in this difficult terrain was no easy task and it was bound to be a time and money consuming exercise. The constraints of the transit campus were already starting to create strains on the system while the first set of buildings that were expected to be ready in the permanent campus much before 2014 were nowhere near being commissioned and usable.

The contractor who had taken up the work of building the first major phase of the permanent campus had failed miserably to continue the targeted milestones and the work had come to a grinding halt. Extraordinary measures taken in the preceding six months to revive the work had resulted in only marginal response from the contractor and the attempts to mobilize and make use of the facilities and finish at least a threadbare minimum of facilities required to make the campus operational were not resulting near the expectations.

The Institute transitioned from the leadership of its first director to a new director in early 2014 and a decision was taken to rescind the contract. Almost upon joining of the new Director, MHRD wanted a revised detailed project report (DPR) projecting a realistic cost estimate and timeframe for completing the campus construction. A thorough revision of the DPR was undertaken and submitted for clearance by the expenditure finance committee (EFC) of the Union Government. In due course of time, thanks to the unstinting support of all concerned at MHRD,
including the then Secretary, Shri Ashok Thakur, Additional Secretary, Smt. Amita Sharma, and others, the revised DPR was approved and almost all the funds for which approval was sought were granted, securing the finances of the institute at least during the project mode when the infrastructure was being established.

During the first five years of its existence, when the Institute was still small, the focus was almost entirely on the primary missions of the institute, namely research and teaching. While good researchers and teaching faculty were already working, it was felt that some of the ad hoc administrative measures had to be replaced by a reliable support system with permanent staff that could serve the primary stakeholders, namely the students and the faculty, in the long term.

It was time to build robust systems for works, purchases, hostels and general administration that functioned independent of individuals. It was also time to move away from the small institution mode where everyone was privy to more or less every activity happening in the institute. The first step in this direction was the appointment of a Registrar with enough experience to handle the multi-directional operational concerns. Several other permanent personnel were hired to staff the various offices and functions of the institute and structural changes were introduced to streamline the support machinery for enabling the teaching and research activities.

Following the notification of the first statutes of the Institute, Heads of Schools, Deans and Associate Deans were appointed to enable a structured decision-making process with inputs from all levels and all stakeholders of the Institute. An annual budget was formulated from the financial year 2015–16 and the yearly budgeting exercise was initiated to make best possible use of the grant-in-aid received by the institute and for the smooth functioning of the schools and for ensuring proper utilization of the available funds. A research manual was put together so that the researchers were clear on the nature and extent of the support that the institute could provide in furthering the research and teaching goals. For the Director, the emphasis was on viewing each issue on its merits and solving it amicably within the established rules and regulations without letting it spill over outside or reflect on other aspects of the functioning of the institute. The long-term health of the organization also had to be kept in mind, along with the development of the infrastructure and research and teaching capabilities.

It was decided to take up the priority works in-house. Dedicated hardwork by all concerned – especially the project team – made it possible to restart the works within six months after settling all immediate concerns with the earlier contractor. In fact, more than fifty separate works were identified and tendered out before the end of the year 2014, bringing some life back into the campus construction. As 2014 drew to a close, the construction activities on the priority blocks and essential services gained steam and the work started to move. The in-house engineering team was doing a great job but they were also getting stretched too thin, coordinating so many individual pieces of work that had to come together seamlessly for the construction to move forward as per schedule. It was felt that overloading them with the remaining work would be counterproductive.
and hence assistance from the CPWD was sought in restarting the non-priority works. A MoU was signed with CPWD in this regard and a project division ably staffed by an experienced chief engineer was set up by CPWD allowing the institute to initiate almost all the remaining works in the campus in parallel.

The smoking embers of the failed contract with CCCL attracted attention at all levels and in late 2014, the Chief Technical Examiner’s organization reporting to the Central Vigilance Commission decided to take up the IISER-TVM campus construction works for intensive examination. After going through all the records and events that happened since the start of the campus construction activities, the CVC raised several concerns and comments in their preliminary report. The institute answered all the queries point by point and rebutted all the concerns, which resulted in eventually, either dropping of the majority of the raised audit paragraphs or found to be not worth pursuing. This was a testament to the integrity and commitment of all involved and the leadership who stuck to the straight and narrow path of honest efforts even in the face of serious setbacks and difficulties.

Plans that were made and research equipment that was procured in anticipation of the timely completion of the permanent campus were now either kept on hold or idling for lack of infrastructure. Based on a detailed cost-benefit analysis, it was decided to continue with the expansion of the transit campus facilities not just to accommodate the increasing number of students but also to try and facilitate as many of the stalled activities as possible within the confines of a temporary place.

The college of engineering was gracious enough to continue accommodating the growing needs of IISER-TVM even though the institute had overstayed in the college. To augment the facilities of the institute hosted inside the college, several buildings in the immediate vicinity had to be taken on rent to house research labs, classrooms, offices and the ever-growing need for student accommodation.

Late in 2014 and in early 2015, another aspect of the growing institute came into focus and it had to be addressed. This has to do with the personal aspirations of the young faculty and staff for career progression and growth. True to the spirit of the Four Tier Flexible Structure (FTFS) structure of MHRD, assistant professors who had been at the Institute for around five years were given the chance to prove that they could compete with the available talent elsewhere vying for an appointment at the associate professor level. Several such reappointments were made ensuring career progression for those already associated with the institute and also bringing in new and competent people from elsewhere in a manner that best served the growth and interests of IISER-TVM. In a faculty proactive process, the nature of employment of faculty members who were appointed as Assistant Professors (PB3 Rs. 30000 +AGP 8000/9000) on contract for a period of five years was changed to regular employment from the date of successful completion of the probation period so as to be in compliance with FTFS. An increase in the staff strength
with appointments to newly created posts happening concurrently, administrative and technical staff who were employed already with the institute were having opportunities for advancing their career. In parallel, steps were initiated for instituting an acceptable career path and succession planning for the non-academic staff of the institute, once again with an emphasis on establishing a system that did not depend on particular individuals for its proper and efficient functioning.

The constitutional obligations of the institute towards the weaker sections of the society was another important issue that was addressed in 2015. The law of the land was clear and unambiguous even if, in academic circles, there has always been an ongoing discussion on how to align these obligations to the pursuit of excellence in research and teaching that is the main mission of institutions of national importance like IISER-TVM. As far as the student body was concerned, IISER-TVM, from its inception remained faithful to the constitutional obligations and provided exceptional assistance both in academic form and monetary form to students from these sections of the society. Special drives for recruiting talented faculty from these sections were undertaken in 2015, and several new assistant professors with excellent training and promising research records were recruited.

Academic pursuits are seldom successful in isolation. IISER-TVM also started to reach out to institutions at a similar level from across the globe by signing MoUs with them that facilitated the exchange of personnel and taking up of joint research projects. The Honorable President of India, Shri Pranab Mukherji, who is also the Visitor of the Institute provided significant impetus to these efforts by facilitating such academic exchanges during his trips abroad. MoUs were signed with institutions like SINTEF Materials and Chemistry, Norway, IFE Norway, the University of Turku in Finland, Abo Akademi in Finland, University of Lund and Stockholm University. Within the aegis of these MoUs, several activities including exchange visits, joint workshops etc., are being taken up and several more collaborations with institutions elsewhere are in the offing. In these efforts, the invaluable contribution from Ms. Omita Paul, Secretary to the President and Shri Suresh Yadav, OSD associated with the Rashtrapati Bhavan has to be placed on record as a token of our appreciation. A joint PhD programme is being offered between IISER-TVM and the University of Parma, Italy from 2017.

By late 2015, the herculean efforts to restart the stalled campus construction works and complete the priority structures and services were starting to bear fruit. The CPWD was also getting into the act with several of the contracts for completion of the non-priority buildings being awarded in this period. With an end in sight with respect to the priority construction, it was decided to put a specific target by scheduling a formal inauguration of these structures. The Honorable Minister for Human Resource Development at that time, Smt. Smriti Irani consented to inaugurate the buildings and the date was set for 16 January 2016. The Chemical Sciences Block, two hostels and a large dining hall were thrown open for the use of the Institute at a large and well attended public function held in the permanent campus of the Institute on that day. The then Chief Minister of Kerala, Shri Oomen Chandy presided over the function. A local news
V Ramakrishnan

report said, indeed “now our IISER can also take flight.” This success was due to the cumulative efforts of a large number of people. Among them the contributions of Dr. V. M. Katoch, Chairman, Board of Governors of the Institute from 2011 onwards almost up until the date of inauguration of the permanent campus, guiding the institution through difficult periods are to be placed on record, with gratitude.

The project mode of the Institute is expected to last till 2018 and it is a comfortable period in which internal funds for supporting research and teaching are relatively easy to come by along with the substantial outlay already given for the infrastructure development.

Sustaining the levels of research support would require attracting substantially more extramural research funding than what the Institute was getting in the initial stages. A concerted effort has been made to encourage the faculty to attract more research grant funding from both governmental and non-governmental agencies. In the years between 2014 and the present, the per capita extramural support including fellowships and other awards has almost doubled.

A further increase is still needed and going after such funding has been incentivized by channelling a part of the overhead received along with each grant as flexible support for both the principal investigator and the parent department. In the same vein, the Institute was also able to obtain support for five different programs under the aegis of the Global Initiative for Academic Network (GIAN) program facilitating the visits of eminent experts from around the world to the Institute for a week or a fortnight-long visits. IISER-TVM also got a FAST grant from MHRD for setting up a center of excellence in high-performance computing. Technology-Business incubators: IISER-TVM hosts a technology-based business incubator (TBI) funded by the Department of Science and Technology and Promotion of Academic and Industry Research (PAIR) was established so as to have a strong interaction with Industries. Academic Review committee has been constituted for the first time for each school and the review was held during April 2015. Committees were constituted for revision in Syllabus & Teaching for BS-MS, Int. PhD and PhD programmes in 2016 for the first time.

The opening of the central instrumentation facility (CIF) of the Institute in 2016 on the occasion of its fourth convocation marked a significant step forward. Two transmission electron microscopes, two scanning electron microscopes, powder and single crystal X-ray diffractometers, a 500 MHz and a 700 MHz NMR spectrometers, high resolution and MALDI mass spectrometers, X-ray photoelectron spectrometer, Physical Property Measurement System, SQUID magnetometer, etc., are housed here. Some of the equipment is already commissioned or is in the pipeline for equipping the CIF. Guided by a committee under the leadership of the Associate Dean (R&D) and with individual committees overseeing the use and maintenance of individual equipment, the CIF is taking shape as a significant national resource for advanced analytic and characterization tools. In addition to the central facility, each school is also building a collection
of common tools used within the school for research and teaching, in the form of departmental instrumentation facilities.

The start of Varsha semester 2016 was special for IISER-TVM because for the first time the corridors of the permanent campus buildings echoed the footsteps of the students. Instruction for around 300 students in the first and second year of the BS-MS program was started in the permanent campus and the students occupied the newly constructed hostels there. It gave immense pleasure to all concerned to note that despite the remote location of the campus, far from the attractions of the city, the students – particularly those who had already spent a year in the transit campus – found the permanent campus a more attractive place to be in. During the course of the academic year, several facilities including volleyball courts, football grounds and other structures came up for the use of the students in the permanent campus, apart from the state of the art classrooms and teaching laboratories which were already in place. The transit campus hosts from the college of engineering Thiruvananthapuram were also happy that rooms in their building were being returned to them.

With the addition of new students, the numbers were adding up such that a further expansion of the faculty was required to maintain a healthy student to faculty ratio. The exercise that included several rounds of vetting of potential candidates took the better part of a year to complete but by the end of the process, the Institute had gained eleven new faculty members in various disciplines. Several assistant professors of the Institute got re-appointed as associate professors.

Another milestone was crossed as the institute moved all its teaching activities and the bulk of its research activities to the permanent campus by the start of Varsha 2017 as more structures were completed and more facilities were added and many more are on the way to make it a complete and self-contained campus. The process of moving the substantial infrastructure and equipment that had been established in the transit campus was a formidable challenge. With teamwork from the faculty, staff and students, the process that required months of planning and work, this challenge was successfully overcome. The Institute is also gearing up to move research activities of the school of biology that partly continues in the college of engineering to the permanent campus. It is planned to wind up all operations from the transit campus by the end of 2018. At this point of transition, there is considerable anxiety and there are formidable challenges and uncertainties but in their midst, there is optimism and an enthusiasm for a new beginning. The smell of fresh paint in the buildings and the clear mountain air of the campus portends hope and excitement. Time will reveal to what heights the institute will grow once it emerges from this initial stage.
About the Author

V. Ramakrishnan, second director of IISER TVM, born in Tamilnadu obtained his PhD from University of Kerala, Trivandrum with specialization in molecular spectroscopy and has Post-Doctoral experience at the Tata Institute of Fundamental Research, Mumbai.

He has extensively worked on spectral investigations on molecules, which have great importance in dye industry and biological applications, optical phonons studies of semiconductor hetero structures and Raman intensity mapping to characterize crystal growth and processing in the fabrication of semiconductor devices.

He has visited several Institutions abroad and availed prestigious fellowships like Commonwealth Academic Fellowship, UK and JSPS invitation Fellowship (Long Term), Japan. Considering his scientific contributions, Institute of Physics, London, UK has elected him as Fellow of Institute of Physics.

He has single handedly built an active research group of international standards in Raman Spectroscopy and established the Department of Laser Studies at Madurai Kamaraj University, Madurai wherein he has spent nearly thirty years as a faculty.
Figure 1. (a) Academic and hostel zones; (b) Chem Dam during Monsoon.

Figure 2. (a) School of Chemistry; (b) Central Instrumentation Facility.

Figure 3. (a) School of Physics; (b) Animal House.
Figure 4. (a) Central Dining Hall; (b) SB 1 & 2 Hostels.

Figure 5. (a) DB1 Hostel; (b) SB 5 Hostel.

Figure 6. (a) Institute Medical Centre; (b) Primary School.
Figure 7. (a) Indoor Stadium; (b) C3 Residence.

Figure 8. (a) Physical Sciences Block & Connecting Walkway; (b) Phase 2 – Anamudi Hostel Block.

Figure 9. Physical Sciences Block and Connecting Walkway.
Figure 10. A view from the permanent campus site of IISER Thiruvananthapuram.
Epilogue

Back in time, it was mathematics and philosophy. Then came natural sciences, man gazing at the stars and beyond on the one hand and looking into smaller and smaller objects on the other hand, trying to fathom the height and depth of the universe, symbolically addressed in the story of the competition between Brahma and Vishnu, trying to find the tip and the root of Shiva.

Somewhere along the line, as more and more details became available, natural sciences got fragmented into physics, chemistry, botany, zoology, geology, etc. Time has come to integrate them and look at science as a whole, for the sake of science as well as the society.

When the idea of setting up dedicated science institutes was discussed in the early part of the new millennium, the focus was on the curriculum, emphasizing the need to have both mathematics and biology as compulsory subjects, (which was nearly impossible in most existing curricula of the time), to ensure that the scientists of tomorrow have an integrated approach to science. Multi-disciplinary science and system biology were the buzz words.

An initial estimate of ₹500 crores per institute seemed right. Later, this was budgeted as ₹100 crores for construction, ₹150 crores for equipment and ₹250 crores for running expenses for a period of five years in the DPR for each institute.

The DPR envisaged 200 acres of land to be acquired for each institute and a residential campus to be constructed. It was understood that the number of students admitted each year would increase gradually and by the end of five years, there would be 200 students entering the BS-MS program each year and an equivalent number of PhD scholars would be admitted. The policy was to have a 1:1 ratio of undergraduate and post-graduate students. The DPR acknowledged the need to have a large number of post-doctoral fellows to be appointed to have viable research groups in each IISER. MHRD had decided that the student: teacher ratio would be 10:1 for the IISERs along the lines of the IITs.

Interestingly, the Government provided for allotment of 500 acres of land for each new IIT and allowed them to build double the area of what was allowed for each IISER. Although only about 120 BTech students were expected to join each IIT each year in the initial years, the new IITs were provided a larger canvas to paint.

MHRD made sure that outstanding scientists were appointed as Directors of IISERs with an attractive salary (at that time) of ₹26,000 per month (equivalent to that of Director, IISc Bangalore). Although they did not have any experience in building an institute, they shared the vision of building IISERs! They did not know which aspect of the DPR was flexible and which
was not. The fact that the provision of 117,000 sq.m. for the buildings in the DPR was sacrosanct, from the government point of view was not known to some of the Directors and the Governing Bodies. It was only when some of the IISERs ran out of the initial allocation of ₹500 crores that they became aware of the Government’s way of doing things.

Unfortunately, acquisition of land took some time for all IISERs, except IISER Pune. That construction of buildings in the permanent campus would take time was not taken into consideration in the DPR.

Kolkata is a metro with a rich tradition of doing science, but for reasons best known to the policy makers, the actual campus for IISER Kolkata would come up 40 kms away from the international airport. It had to shift the transit campus two times and it took several years to build the permanent campus. Initially, Pune had limited air connectivity, but the situation improved dramatically. Construction of the campus took its time. Despite having NCL for support, IISER Pune had to struggle in a transit campus. Apparently, the Prime Minister was particular that IISER Mohali would be located close to the international airport that would come up later. Bhopal campus is located outside the city, but close to the airport. IISER Thiruvananthapuram is situated in idyllic settings, but 40 kms away from the airport and will remain isolated from the city for some years to come.

When the IITs were set up, the location of an institute was not an issue. Some of the IITs were difficult to reach by road, rail or air and yet, students flocked to them. Today, connectivity seems to be an issue. Students and parents seem to prefer easily accessible locations. This is ironic. When the globe has shrunk, communication has become almost instantaneous and air/road travel is no longer an issue, location and distance should not matter.

While setting up new residential campuses, enormous energy, time and money are spent on building a small self-sufficient township, for all practical purposes. This is necessary, because, there is very little infrastructural support available in terms of accommodation and local transport for the students, faculty and the staff in the vicinity of the new campuses. Invariably, no land is available within the city.

Today, when a faculty member is appointed, the spouse is invariably qualified. Whenever the spouse is equally qualified, appointment is not a problem in most of the institutes. Some institutes still do not wish to appoint husband and wife in the same department, because of possible conflict of interest on certain issues. When the spouse is not appointed in the same institute, he/she looks for alternative avenues for gainful employment. This is where the location of the campus in the vicinity of a city helps.

In some instances in the past (NIPER Mohali, for example), the government had arranged to have an officer-on-special-duty take care of building the campus first, and the Director joined at
a later stage and took care of the academic part. But such a model is not suited for setting up an institute whose ideas are evolving. Ideally, there should be an administrator appointed along with the Director to take care of the administrative and financial matters while the Director takes care of the academic matters.

Established with the explicit purpose of attracting students to science, IISERs have fulfilled their initial aim. The first couple of batches of students admitted to IISERs were from the ‘extended’ list of candidates who had cleared the Joint Entrance Examination (JEE) of the IITs. Subsequent batches attracted students from the main list of eligible candidates clearing JEE (Advanced). In the last few years, only students with a rank of 10,000 and above in the common merit list of JEE (Advanced) were admitted to the IISERs. What this means is that students eligible for admission to IITs choose to join IISERs. It is also true that some of the students selected for admission to Medicine choose to join IISERs.

The curriculum for IISERs includes Physics, Chemistry, Mathematics and Biology in the first two years. There were lots of apprehensions in the minds of people that students of mathematics (non-medical) will find it difficult to cope with biology and students of biology (medical) will not cope with mathematics. Our experience at IISERs has shown that these are false notions inculcated in the minds of young minds.

Prof. C. N. R. Rao Foundation Prize, established in all IISERs, is received by students trained in mathematics as well as in biology. As a matter of fact, it was found recently (2017) that 11 students of IISER Mohali received the prize in the second semester of their first year. All of them had a semester performance index (SPI) of 10 against the maximum possible 10 showing clearly that they could study mathematics as easily as biology.

In the initial years, very few Kishore Vaigyanik Protsahan Yojana (KVPY) scholars joined the IISERs; majority of them preferred to join the IITs. But, the number of KVPY scholars joining IISERs has increased steadily over the years, showing clearly that students with aptitude in science are joining the IISERs. “I know from the social media that IISERs are the chosen destination of students wanting to pursue science in the country,” remarked the Hon’ble Minister for Human Resource Development, while chairing the first meeting of the Directors of IISERs in June 2014.

Introduction of INSPIRE scholarship by the Department of Science and Technology (DST), New Delhi was a game changer for science in the country, particularly for the IISERs. It assured scholarship for ALL students joining the IISERs in the initial years. This made sure that students of IISERs did not feel ‘left out’ of IITs. Many of them had not appeared for JEE (Advanced) and had chosen to join the IISERs. For reasons beyond the control of IISERs, DST has decided to restrict the number of INSPIRE scholarships for IISERs (to about 60% of the admitted students). And yet, the students continue to join the IISERs.
What has been unique about the IISERs is that the students do not have to choose their major (mathematics or physics or chemistry or biology or...) at the time of joining. They make a “considered” choice at the end of two years. Furthermore, their choice of major is not based on their performance in the first two years. They have the flexibility to change their mind from one major to another (as long as they are ready to take some ‘required’ courses). It must be pointed out here that students of IISER Pune do not have to choose a major at all. They can take whatever courses they want to, to meet the credit requirements.

‘Teaching by research for research’ has become the dictum in the IISERs. Many courses require the students to go beyond their prescribed textbooks. The students are assigned term papers for which they have to read the original research literature. They are expected to do summer internships in one of the IISERs or elsewhere. By the time they come to the final (5th) year, some of them would have done summer internships in one of the leading Indian institutes under the Summer Research Fellowship of the science academies. Some of them go outside India using S N Bose or Har Gobind Khorana Fellowships offered by the Government of India or schemes like WISE offered by DAAD, Germany. All students of IISERs spend one full year doing research and submitting a thesis (not a project report) before graduation. Some of them become coauthors in research publications in national and international journals. Some of them are coauthors to some landmark papers.

Most of the best BS-MS students of IISERs have done exceedingly well over the years, going for higher studies (PhD) in India and elsewhere. Many of them have joined some of the best academic institutions in the world like Oxford, Cambridge, Harvard, MIT, Max-Planck-Institutes in Germany, etc.

Some of the BS-MS graduates have completed their PhD degree programmes in India or abroad and some of the PhDs from the IISERs have become faculty members in other academic institutes in the country, including some of the new IISERs. The quality of the research output from IISERs has been remarkable. In terms of Nature Index, IISERs as a group stand along with IISc, IITs and CSIR labs, in less than a decade of their existence.

While the faculty members of IISERs excel (as is expected of them) in research, they should not forget the fact that IISERs are institutes of science education and research. Just as the IITs innovated in teaching in 1960s and 70s, the IISER faculty must continue to innovate in teaching and research and produce textbooks of science that would serve as benchmarks for the rest of the country to follow.

One of the critical factors that enabled the IISERs to emerge as leading scientific institutions in India was the academic freedom given to them. Some of the leaders of Indian science were appointed the Chairman, Board of Governors and all the Directors of IISERs were active researchers with an excellent academic background. They could recruit some of the best faculty in
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the world and establish some of the best practices in teaching and research. MHRD was fully supportive of the IISERs. However, a thorn in the flesh was the control by MHRD on the number of faculty to be hired. It provided for recruitment of up to 60 faculty members in the first three years. But, in subsequent years, it insisted on the student: teacher ratio of 10:1 before sanctioning additional posts. This came in the way of growth for some of the IISERs.

A number of highly qualified women scientists have been applying for faculty positions in the IISERs. It is not uncommon for both husband and wife being equally qualified. The IISERs rose to the occasion and have recruited a number of women faculty.

What was equally important in the development of IISERs was the adequate financial support received from MHRD. Established initially with an outlay of ₹500 crores, each IISER was supported further with a revised estimate of ₹800–900 crores in their first ten years. This became necessary mainly due to a decline in the value of the Rupee and an increase in the cost of construction. It is important to keep the momentum up and keep supporting the IISERs adequately and not leave them high and dry. I remember vividly, when Mr. Wrigley was asked why he kept advertising for his chewing gum while it was undisputedly No. 1, he said that the question was similar to that was asked of the driver of an engine why he kept fueling it when the train was at full speed. To keep the IISERs going in their pursuit of knowledge and excellence, it is critical to give them unstinted financial support for space, equipment and human resource. To compete with the best in the world, this is imperative.

As of now, the five IISERs produce about 1000 MS graduates per year and this number will go up to 1400 when the two new IISERs also go full steam. That is a reasonable number of quality BS-MS graduates to produce per year and for the country to absorb. This is an order of magnitude smaller than what the IITs produce every year. There is a tendency among the ministry officials to comment about the number of graduates coming from the IISER system. This is by design. Quality comes at a cost. Additional IISERs may be started, if needed, only after observing the performance and effective absorption of current students, and when adequate funds are available.

All the IISERs were set up initially as societies and later converted to institutes of national importance by an Act of Parliament, through an amendment to the NIT act, later renamed as the NITSER Act, 2014. The Memorandum of Association (MOA) prepared by MHRD for each IISER was a progressive document that facilitated the setting up of the IISERs, with enormous academic freedom and functional autonomy. The IISERs wanted to come under a separate IISER Act, to be enacted by the Parliament. But because of public pressure, reflected in the media coverage, the ministry was in a hurry to bring the IISERs under an amendment to the NIT Act. IITs, for reasons known to them, did not want the IISERs to come under an amendment to the IIT Act. Eventually, it took nearly three years for the government to get the NIT Act amended and the IISERs declared as institutes of national importance. Initially, there was a provision in the amendment to have a separate Council for the IISERs, chaired by the Minister, Human
Resource Development. Unfortunately, this provision was removed when the NIT Act became the NITSER Act and now, there is one Council for the NITs and the IISERs. Because of the fundamental difference in the purpose and functioning of the NITs and IISERs, it is difficult to have a common governance system for both sets of institutions. Therefore, operationally, it has been resolved that there would be a Standing Committee of the IISERs, chaired by the HRM. Eventually, there should be an IISER Act that takes care of the special needs of the IISERs.

The faculty of IISERs have started publishing in high profile journals. Because of the quality of the graduates from the IISERs and the research output, IISERs have built a brand name within a span of ten years. The main reason for this phenomenal success has been the functional autonomy of the IISERs and the quality of their faculty intake and the student intake.

A decadal overview of the IISERs was given in an Editorial in Current Science in July 2016. The Editorial refers to IISERs as Science Universities. Purists would argue that a university would provide universal education, not just in science. IISERs were set up with a purpose. But to be an integral part of the society, their students must be trained as good citizens of the country and the world. They need education in humanities and social sciences and in engineering sciences too. The flexible curriculum of the IISERs should allow them to evolve with time.

IISER Bhopal has started a programme in engineering sciences. This is a welcome initiative. Science and Technology cannot be separated. They feed on each other. Every new discovery in science eventually leads to new developments in technology and each technological development helps in pushing the frontiers of science. Together they help in pushing the country’s development index.

In today’s world, where innovation and entrepreneurship are key elements to development, IISER graduates should have adequate exposure to engineering sciences and should be trained to become job generators rather than job seekers, wherever possible.

In spite of all the positive indicators of the health of IISERs, they have been subjected to the same government financial rules, audit objections and vigilance observations. Simplified purchase procedures are needed for the IISERs and other academic institutions in the country to flourish. An audit trained in scientific enterprise would be able to understand and appreciate the special needs of Science and Technology institutions. Right now, the heads of academic institutions are burdened with the financial responsibility. Most of them are trained in science and technology, but not in financial management. It is high time the academic leadership is relieved of financial responsibility such that they can focus on the job at hand, that is, to take their institutions to greater heights, as it is done in leading academic institutions elsewhere.

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Knowledge spreads like seeds.