



भारतीय अंतरिक्ष विज्ञान एवं प्रौद्योगिकी संस्थान  
का

**द्वितीय दीक्षांत समारोह**

**जून 3, 2013**

तिरुवनंतपुरम

*Second Convocation*  
of

Indian Institute of Space Science and Technology

**June 3, 2013**

Tiruvananthapuram

*Convocation Address*

by

**Dr. R. Chidambaram**

Principal Scientific Adviser to the Government of India



Dr. A.P.J. Abdul Kalam, Hon'ble Chancellor of IIST, Dr. K. Radhakrishnan, Chairman ISRO, Dr. K.S. Dasgupta, Director, IIST, Members of the Faculty, Members of the ISRO family, Ladies and Gentlemen and my young friends who are graduating today:



It is a great pleasure to be with you on this happy occasion and I am grateful to Dr. Radhakrishnan for inviting me. It is also a privilege to share the stage with my close friend Dr. Kalam, with whom I have spent many years in collaboration in the nineties. We didn't have much contact before that, though I did visit his laboratory in VSSC in 1970. That was before the Pokhran 1 test of May 1974. Once when I mentioned to Dr. Vikram Sarabhai, then also Chairman of the Atomic Energy Commission, that I need high-speed detonators, he told me that a young man was working on detonators in VSSC and he asked me to come with him on his next visit to VSSC. That young scientist was Dr. Kalam, but it turned out that his design was for millisecond detonators suitable for his requirements, while I needed sub-microsecond detonators for initiating the implosion of the Pokhran1 device. Of course, I found later that the capability to design this existed with the scientists at the Terminal Ballistics Research Laboratory (DRDO) in Chandigarh.





IIST is a relatively young Institute, inaugurated in September 2007 and becoming a Deemed-to-be-University in 2008, but already much sought after. I am very happy to learn from Dr. Radhakrishnan that, for the 150 or so seats available for the undergraduate B.Tech degrees in Avionics, Aerospace Engineering and Physical Science, there are almost 90,000 applications. So the IIST has the choice to select the most brilliant among them, and those of you graduate today will be an asset to the various institutions of the Department of Space/ISRO.

I am also particularly happy because the Department of Atomic Energy, in which I have spent my entire professional career, and the Department of Space were at one time umbilically-connected. Dr. HomiBhabha, the founder of the atomic energy programme, also started the space programme through his friend Dr. Vikram Sarabhai. Some of the earliest leaders of the space programme came from the BARC Training School, which was started in 1957; today all the leaders of the atomic energy programme—Director of BARC, Chairman of the Atomic Energy Commission, etc.— are former graduates of this School. So some of you young people will reach the top echelons of the space programme after some decades. The advantage of the 'Select and Train' concept in these programmes of the Department of Atomic Energy and now of the





manufacturing skills. And the Department of Space is creating an ecosystem which has this mix.

We, as a nation, are proud of our achievements in the space programme. This goes beyond the communication platform provided by the satellites. In agriculture, a National Centre for Crop Forecasting is being established under Ministry of Agriculture. There is the Indian National Centre for Ocean Information Services. High-resolution satellite data is being used for assessment of irrigation potential. The other important applications include groundwater prospecting, data for facilitating watershed development and wasteland monitoring. These are all applications which have major societal impact. The famous Nobel Prize-winning biologist Peter Medawar said many decades back in his book 'Advice to a Young Scientist': "Always work on important problems" – Important to Science or Important to Society. This is excellent advice for all you young people. In the space programmes you will all find many important problems of both the types. The Chandrayan Mission to the Moon and the proposed Mars Mission have strong science components.

Science is getting more and more internationalized today. According to the National Science Foundation of U.S.A., almost



one-quarter of research articles in 2010 featured authors from more than one country, up from 10% in 1990. The Large Hadron Collider(LHC) of the Centre for European Nuclear Research (CERN), which found the signatures of the elusive Higgs Boson recently, is an international effort. The Indian Department of Atomic Energy contributed 40 million U.S. dollars worth of equipment to the LHC – including more than a thousand superconducting sextupole, decapole and octupole corrector magnets. We are participating in the construction of two detectors and analysis of the data from them. For the CMS Detector which found the first signatures of the Higgs Boson, a consortium of Indian Universities under the leadership of TIFR is a partner. Similarly technology is getting internationalized. We are a full member of the ITER (International Thermonuclear Experimental Reactor) project coming up in Cadrache, France. ISRO launches some of its satellites from French Guyana through Ariane-5. ISRO has launched till date 35 satellites from 19 countries using its PSLVs(Polar Satellite Launch Vehicles). In its 100th Mission during September 2012, ISRO launched a French Earth Observation Satellite and a Japanese Scientific Satellite. ISRO and the French Space Agency CNES have worked together on the design of the satellite MEGHA-TROPIQUES for studying the





water cycle and energy exchanges in the tropics; this Satellite was launched by PSLV in October 2011.

Technology foresight analysis indicates what are the Critical Technologies for India, and with further analysis, the detailed profile for each of these critical technologies can be worked out. Technology Foresight has a strong component of Technology Forecasting but this has to be convoluted with an assessment, based at a national level, of the social, economic, environmental and cultural issues involved in the introduction of the technology. On the basis of technology foresight analysis, the critical technologies for India are strategic technologies (nuclear, space and defence-related); advanced manufacturing and advanced materials; strong knowledge-based technologies like nanotechnology, biotechnology and information technology; technologies related to MSMEs; and rural development – related technologies. Space technologies have applications ranging from advanced communications to those that benefit rural India.

India, if it is to become a knowledge-driven economy, should also have the courage to be the first introducer of new advanced technologies. The so-called Proven Technologies, unless subject to continuous evolutionary improvements, are after a synonym for Obsolete Technologies.



Let me conclude by saying that you young people are entering an organization, which has had a glorious past and, I am sure, will have an even more glorious future. And India, as it grows rapidly, will throw you challenging opportunities, some of which you have to create yourself.

Thank you!







**Indian Institute of Space Science and Technology**

(Declared as Deemed to be University under section 3 of the UGC Act, 1956)

**Valiamala, Thiruvananthapuram**





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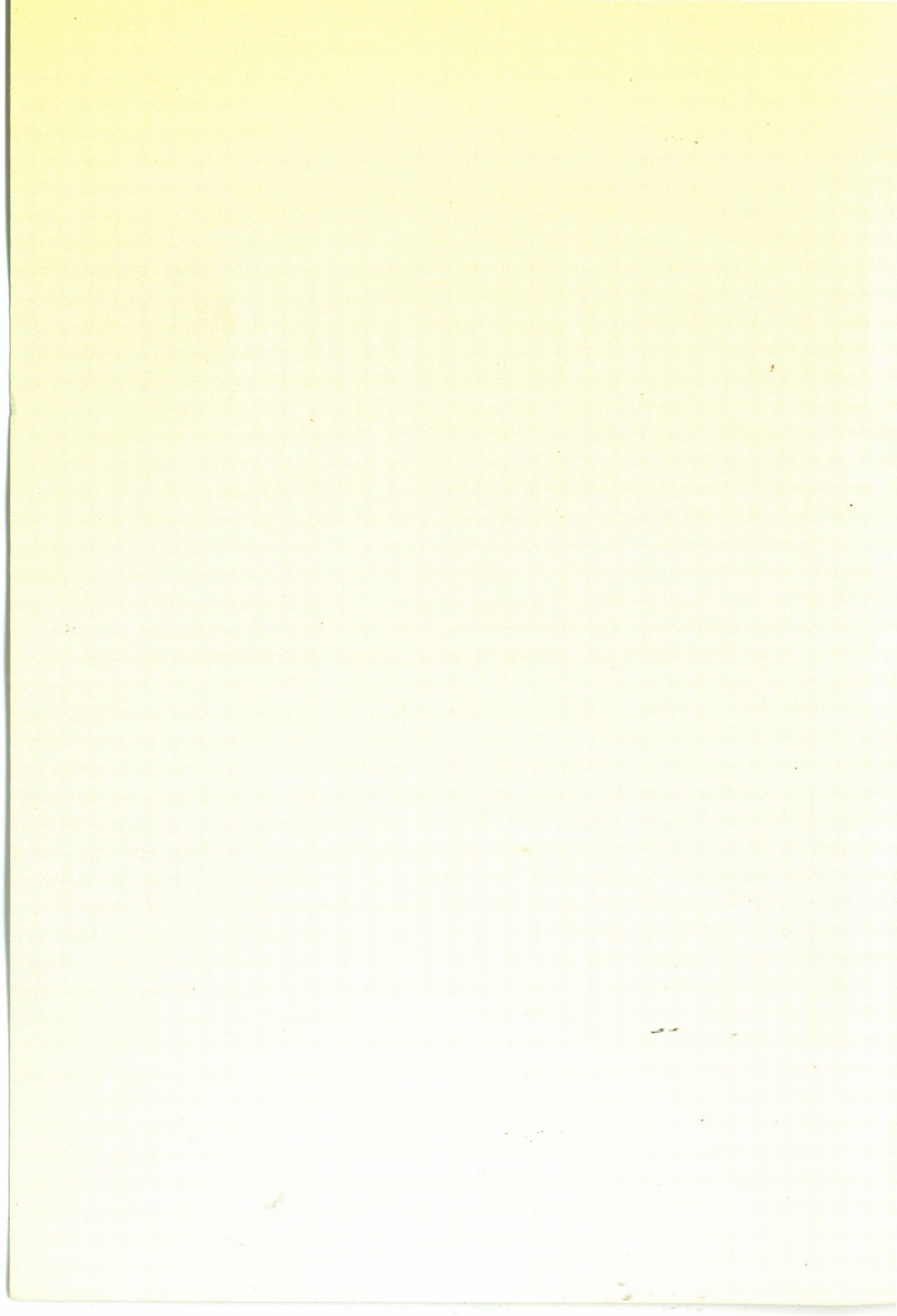
*Convocation Address*  
by

**Dr. A. P. J. Abdul Kalam**

Honourable Chancellor, IIST





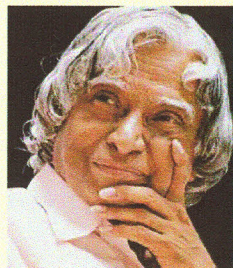




## EXCELLENCE IN THE NATIONAL MISSIONS

*"Be a lamp, a life boat and a ladder.  
Help someone's soul heal.  
Walk out of your house like a shepherd"*

-.....Jalaluddin Rumi  
13<sup>th</sup> Century Persian Sufi Poet



I am delighted to participate in the 2nd Annual Convocation of IIST Trivandrum. My greetings to the Director, Professors, Lecturers, Staff and students, special invitees and distinguished guests. I congratulate all the students on their accomplishment of acquiring knowledge and resulting into award of degrees. My greetings to the great teachers who have worked very hard in shaping the young minds. I also greet all the parents who have inspired their children towards studies and provided them the resources and environment for their growth.

I am happy that the Institute has state-of-the-art academic and research environment in multiple Engineering and Technology domains. The micro precision manufacturing facility centre is contributing to the researchers and students the importance of precision products leading to developing of Nano-Technology and micro machining. Hence, I would like to share my thoughts on the topic "Excellence in the national missions"





## What worked yesterday, will not work today

Dear friends, I was studying a book, "Empires of the Mind" by Denis Waitley. This book gives what type of the new world which we are facing now? What was yesterday and what is today. I have modified certain points of the author to suit the occasion today. I have also added a third line which relates to action of leadership. The book specially says, "What worked yesterday, won't work today."

### Role of leadership in a Knowledge Society:

1. Yesterday - natural resources defined power  
Today - knowledge is power  
**Institutions should empower itself with knowledge**
2. Yesterday - Hierarchy was the model  
Today - synergy is the mandate  
**Institutions will be enabler for intersection of multiple faculties towards mission goals**
3. Yesterday - leaders commanded and controlled  
Today - leaders empower and coach  
**Institutions will enrich itself through exposure to the needs of sustainable development**
4. Yesterday - shareholders came first  
Today - customers come first  
**Institutions should inculcate sensitivity to the needs of all the stakeholders**



5. Yesterday - employees took order  
Today - teams make decision  
**Institutions will promote team spirit**
6. Yesterday - seniority signified status  
Today - creativity drives status  
**Institutions will be judged by innovation and promote creativity**
7. Yesterday - production determined availability  
Today - Competitiveness is the key  
**Institutions will constantly evolve more competitive with knowledge, management and technology**
8. Yesterday - value was extra  
Today - value is everything  
**Institutions will have the priority to inculcate value addition at every level**
9. Yesterday - everyone was a competitor  
Today - everyone is a customer  
**Institutions will value feedback and action based on that**
10. Yesterday - profits were earned through expediency  
Today - Work with integrity and succeed with integrity.  
**Institutions have to imbibe the concept of work with integrity and succeed with integrity and act as promoters of such a culture in their students**

When I see the creative young minds in the IIST environment, I am thinking what drives the culture of excellence – that is innovation and creativity.





Friends, now let me share an experience, during my engineering education, how I learnt system design, system integration, and system management in MIT, Chennai (1954-57).

### **Learning integrated system design**

I was assigned a project to design a low-level attack aircraft together with five other colleagues. I was given the responsibility of system design and system integration by integrating other team members. Also, I was responsible for aerodynamic and structural design of the project. The other five of my team took up the design of propulsion, control, guidance, avionics and instrumentation of the aircraft. My design teacher Prof. Srinivasan, the then Director of MIT, was our guide. He reviewed the project and declared my work to be gloomy and disappointing. He didn't lend an ear to my difficulties in bringing together data base from multiple designers. I asked for a month's time to complete the task, since I had to get the inputs from five of my colleagues without which I cannot complete the system design. Prof. Srinivasan told me "Look, young man, today is Friday afternoon. I give you three days time. By Monday morning, if I don't get the configuration design, your scholarship will be stopped." I had a jolt in my life, as scholarship was my lifeline, without which I cannot continue with my studies. There was no other way out but to finish the task. My team felt the



need for working together round the clock. We didn't sleep that night, working on the drawing board skipping our dinner. On Saturday, I took just an hour's break. On Sunday morning, I was near completion, when I felt someone's presence in my laboratory. It was Prof. Srinivasan studying my progress. After looking at my work, he patted and hugged me affectionately. He had words of appreciation: "I knew I was putting you under stress and asking you to meet a difficult deadline. You have done great job in system design".

Through this review mechanism, Prof Srinivasan injected the necessity of understanding the value of time by each team member and brought out engineering education has to lead system design, system integration and system management. I realized that if something is at stake, the human minds get ignited and the working capacity gets enhanced manifold. That's what exactly happened. This is one of the techniques of building talent. The message is that young in the organization, whatever is their specialization, be trained to systems approach and projects, which will prepare them for new products, innovation and undertaking higher organizational responsibilities.

Now, let me share with you how a street boy became a Nobel laureate.





### **It does not matter who you are**

Mario Capecchi had a difficult and challenging childhood. For nearly four years, Capecchi lived with his mother in a chalet in the Italian Alps. When World War II broke out, his mother, along with other Bohemians, was sent to Dachau as a political prisoner. Anticipating her arrest by the Gestapo, she had sold all her possessions and given the money to friends to help raise her son in their farm. In the farm, he had to grow wheat, harvest and take it to miller to be ground. Then, the money which his mother left for him ran out and at the age of four and half years, he started living sometimes in the streets, sometimes joining gangs of other homeless children, sometimes living in orphanages and most of the time hungry. He spent the last year in the city of Reggio Emilia, hospitalized for malnutrition where his mother found him on his ninth birthday after a year of searching. Within weeks, the Capecchi and his mother sailed to America to join his uncle and aunt.

He started his 3rd grade schooling afresh over there and started his education, interested in sports, studied political science. But he didn't find it interesting and changed into science, became a mathematics graduate in 1961 with a double major in Physics and Chemistry. Although he really liked Physics, its elegance and



simplicity, he switched to molecular biology in graduate school, on the advice of James D Watson, who advised him that he should not be bothered about small things, since such pursuits are likely to produce only small answers.

His objective was to do gene targeting. The experiments started in 1980 and by 1984, Capecchi had clear success. Three years later, he applied the technology to mice. In 1989, he developed the first mice with targeted mutations. The technology created by Doctor Capecchi allows researchers to create specific gene mutations anywhere they choose in the genetic code of a mouse. By manipulating gene sequences in this way, researchers are able to mimic human disease conditions on animal subjects. What the research of Mario Capecchi means for human health is nothing short of amazing, his work with mice could lead to cures for Alzheimer's disease or even Cancer. The innovations in genetics that Mario Capecchi achieved, won him the Nobel Prize in 2007. Nobel laureate Capecchi life indeed reveals: -

*"When you wish upon a star,  
Makes no difference who you are  
Anything your heart desires  
Will come to you"*

Now let me share with you my thoughts on the "21st century University Vision".





## **Vision for 21st century Institute of National Importance**

I have, in the last ten years, met more than 3 Million university students and faculty from more than 150 universities in India and 50 universities in abroad. Based on this spirit, I wish to formulate a 'Vision for 21st century Institute of National Importance':

- The universities and national institutions have to prepare citizens of the future with a global outlook and be capable of serving his/her nation or nation of his/her choice.
- Science and technology and public policy are interrelated for mutual benefit and ushering in human kind's development. This link has to be solidly built in the university education.
- Good teachers can be in any part of the world. The institution has to bring in this resource through innovative content generation in virtual classrooms.
- Technological connectivities among universities and institutions have to be pursued on a war footing using cost effective virtual classrooms.
- Cost effective continuing education possibilities are essential for citizens to be in tune with time.
- Can university education lead to sustainable development of the nation?



- With the world population increasing and resources dwindling, a mindset has to be developed for conserving and sharing the resources and look for new research for abundant resources. This calls for a “noble spirit” as well as a “research spirit.”

In summary, the 21st century national level institutions' education is about developing enlightened citizenship for a knowledge society for peace and prosperity of nations and the world. 21st century Institutions have to be the incubator of world knowledge powerhouse. Based on my interaction with Indian and foreign institutions, I have detected certain dynamics. Wherever there is research intensity, it has enhanced quality teaching and also the institutions have got a great name in the world of teaching. Universities or Institutions from developed world with their vast experience of a century have realized the significance of research as a foundation for the university or institution. This is one dimension. The other dimension is that the student community with research focus will most aggressively ask questions. The third dimension is that the sharp gradient and accelerated development processes can give a platform for research for sustainable development. There is a large student community in the developing countries and there is an urge for higher education.





Hence, we should see how we can empower them through university to university collaboration, student – faculty interaction, lab to lab collaboration, reaching out the world class quality teaching and research through a virtual reality environment with the excellent content generated.

### **Conclusion:**

Friends, finally I would like to ask you, what would you like to be remembered for? You have to evolve yourself and shape your life. You should write it on a page. That page may be a very important page in the book of human history. And you will be remembered for creating that one page in the history of the nation – whether that page is the page of invention, the page of innovation or the page of discovery or the page of creating societal change or a page of removing the poverty or the page of finding new technologies in energy or astronomy. I will be happy if you could write this page and mail it to me ([apj@abdulkalam.com](mailto:apj@abdulkalam.com)).

1. Will you be the part of evolution of next generation of scientific payloads as a follow on to Chandra X-Ray Observatory, The Hubble Space Telescope (HST) or Spitzer Space Telescope?
2. Will you be the one to contribute to the mission of bringing the low cost access to launch vehicle a reality? It means



orbital cost per kg has to come down from the existing US\$ 20,000 to US \$2000. This mission may need the contribution of thousands of young scientists and engineers.

3. Will you be the technological leader in realizing supersonic combustion, in scram jet engines?
4. Will you be the designer in realizing mid-air collection, separation of oxygen liquefaction and realizing the liquid oxygen reactor for the reusable launch vehicle?
5. Will you be the part of the pioneering work in system engineering and realizing the solar power satellite a reality, which will be a solution for energy crisis of planet earth?
6. Will you be the technological leader for providing the high efficient wireless transmission of electrical energy from the solar power satellite into the terrestrial grid?
7. Will you be the technological leader establishing the helium thermo nuclear energy complex for power generation on Moon?
8. Will you be the one to walk on the Mars, as scientists, technologists for establishing human habitat?
9. Will you dream to become the great rocket pioneer like as





Konstantin Tsiolkovsky, Robert Hutching Goddard, Hermann Oberth, and the space pioneer Vikram Sarabhai of the 21st Century?

With these words, I once again congratulate all the graduating students and my best wishes to faculty members and professors of IIST for success in their mission of creating enlightened citizens towards building the knowledge society.

*May God bless you*

### **Eight point Oath for Graduating Students**

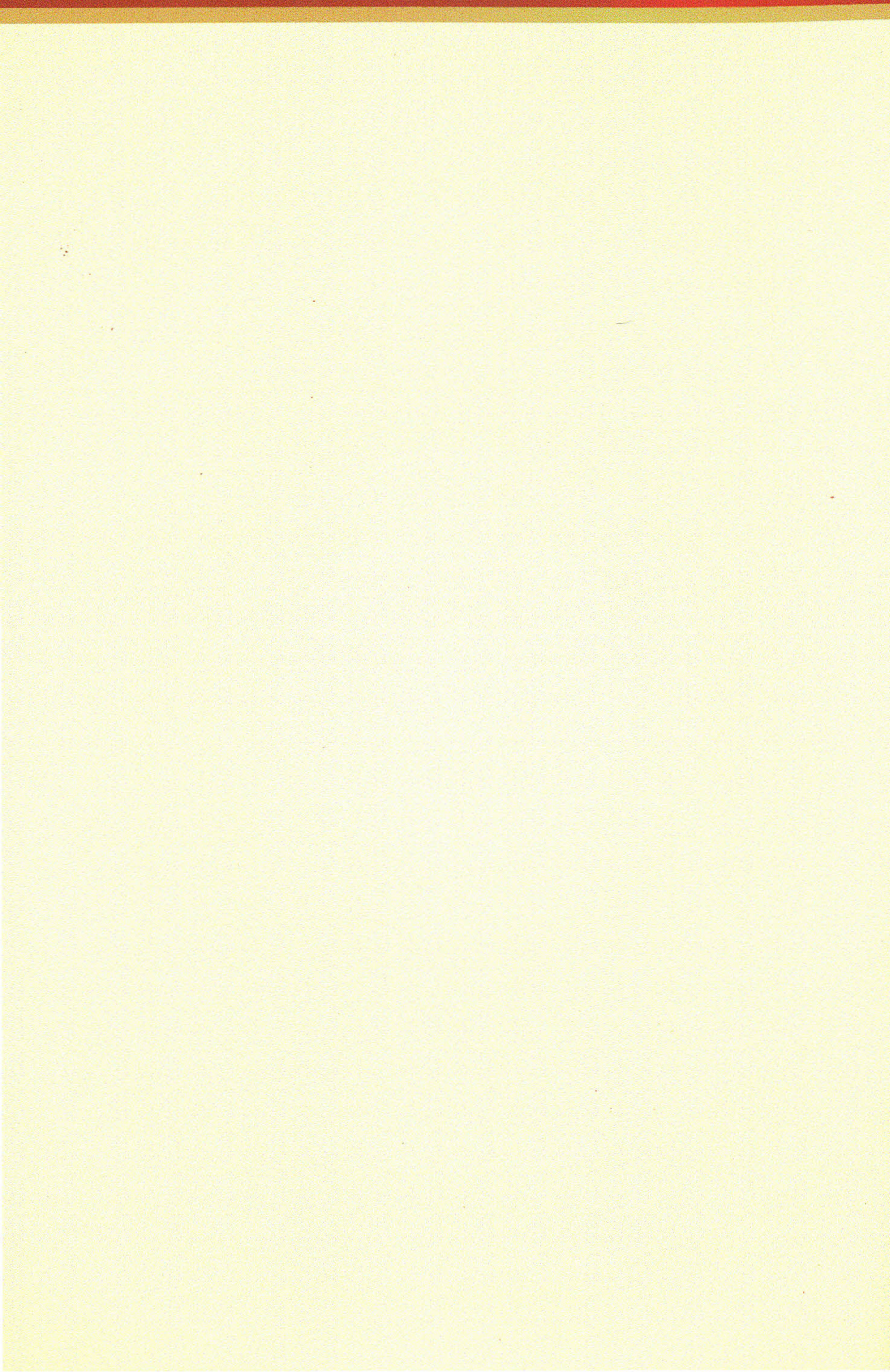
1. Engineering and Technology is a life time mission. I will work, work and work and succeed.
2. Wherever I am, a thought will always come to my mind. That is what process or product I can innovate, invent or discover.
3. I will always remember that "Let not my winged days, be spent in vain".
4. I realize I have to set a great technological goal that will lead me to think high, work and persevere to realize the goal.
5. My greatest friends will be great scientific/technological minds, good teachers and good books.



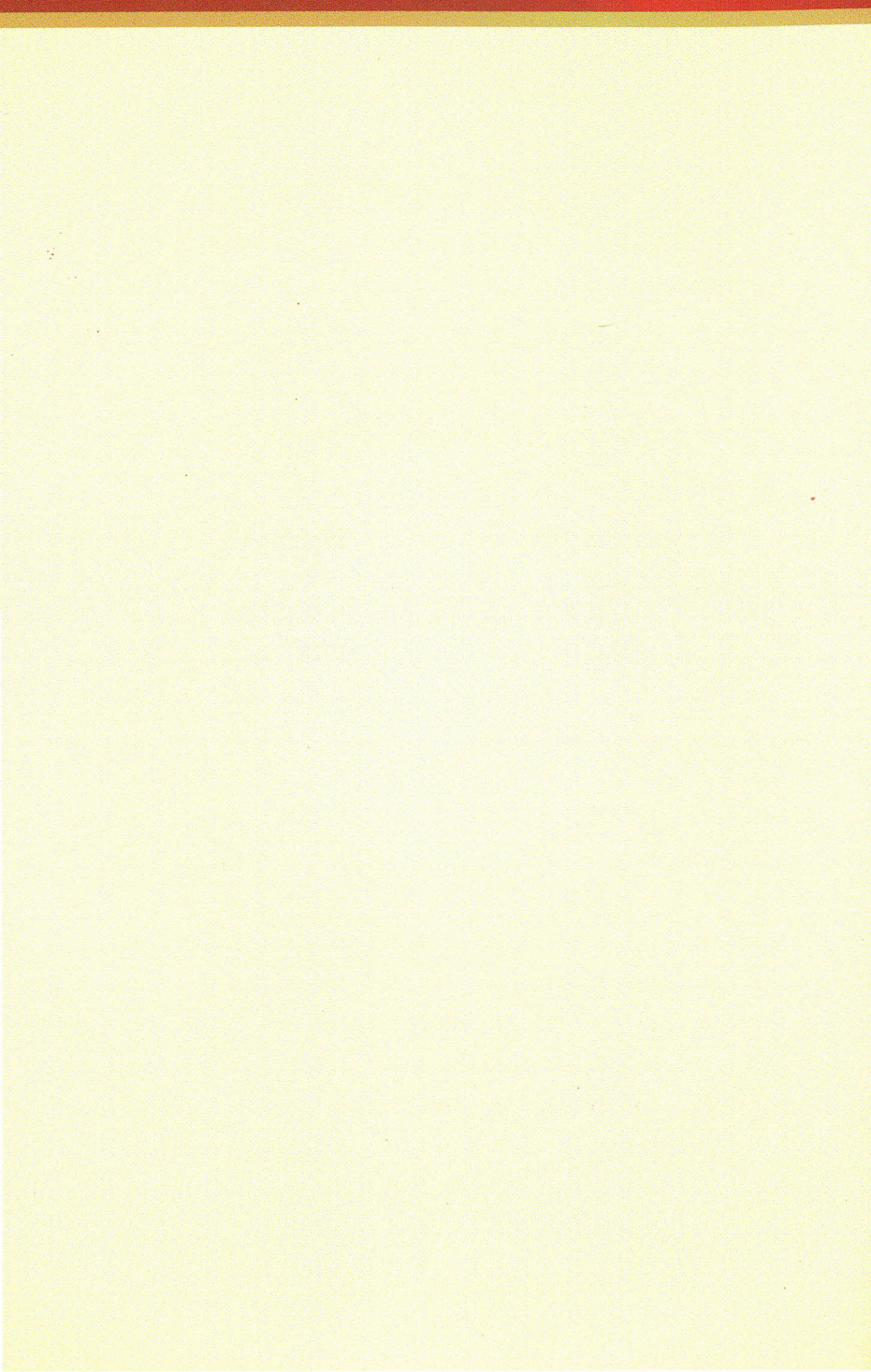
6. I firmly believe that no problem can defeat me; I will become the captain of the problem, defeat the problem and succeed.
7. I will work and work for removing the problems faced by planet earth in the areas of water, energy, habitat, waste management and environment through the application of science and technology.
8. My National Flag flies in my heart and I will bring glory to my nation.















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*Director's Report*  
by

**Dr. K. S. Dasgupta**

Director, IIST





## DIRECTOR'S REPORT

Most Respected and Our Beloved Chancellor, Dr A.P.J. Abdul Kalam, Honorable Chief Guest, Dr Rajagopala Chidambaram, Principal Scientific Advisor, Government of India, Respected Chairman, Board of Management, IIST, Dr K. Radhakrishnan, Dr B.N. Suresh, our former Director, Dr. S. Ramakrishnan, Director, VSSC, Members of the General Body, Members of Board of Management, Members of IIST Council, Centre Directors of ISRO/DOS, Degree recipients, Distinguished Guests, Colleagues, Ladies and Gentlemen, Good Morning.



It is indeed my great privilege to present a brief report highlighting the activities, aspirations, achievements and future plans of the Indian Institute of Space Science and Technology (IIST) during this solemn occasion of the Second Convocation. Before that I deem it my honour to say a few words of introduction for our Chief Guest Dr. R Chidambaram.

Dr Chidambaram is currently holding one of the most prestigious and important positions in the country, that of the Principal Scientific Advisor to the Government of India. Dr Chidambaram played a key role in the 1974 nuclear tests conducted at Pokhran





and also led the Department of Atomic Energy (DAE) team in the Pokhran-II tests of May 1998. Dr Chidambaram became a member of the Atomic Energy Commission (AEC), following this he joined as the Director of Bhabha Atomic Research Center (BARC), Bombay and subsequently became the Chairman of AEC in 1993.

Dr. Chidambaram completed his B.Sc. (Hons) and M.Sc in Physics from the University of Madras, and obtained his PhD in Nuclear Physics from the Indian Institute of Science, Bangalore. He was also awarded the D.Sc. in Metallurgy and in Material Sciences by several universities. Dr. Chidambaram is the recipient of a number of awards and honors. **In recognition of his significant contribution in the country's nuclear programme, the Govt. of India honoured him with the Padma Shri (1975) and Padma Vibhushan (1999).**

Before, I get started with the important task of presenting our institute's activities; I wish to pose the following question. We all know that universities are expected to provide "education"; but what is this "education"? Swami Vivekananda, whose 150th year birth anniversary is being celebrated throughout the country, provided the following answer. **"Education is the manifestation of the perfection already in Man"**. Another stalwart, Gurudev



Rabindranath Tagore, who got the Noble Prize exactly one hundred years back, also has the following to say. **“The highest education is that which does not merely give us information but makes our life in harmony with all existence.”**

For the benefit of our Chief Guest and other dignitaries, let me give a brief genesis of this institute. IIST was formally inaugurated on 14 September 2007 and is the first of its kind in the country, to offer high quality education at the undergraduate, post-graduate, doctoral and post-doctoral levels on areas with special focus toward Space sciences, Space-related technology and their applications. In a little less than a year of its establishment, IIST received the recognition from UGC as a 'Deemed to be University' under Section 3 of UGC Act, 1956. IIST functioned from an alternate campus at VSSC, Thumba from 14 September 2007 to 14 August 2010 and then moved to its own campus at Valiamala, Thiruvananthapuram on 15th August 2010. The present campus at Valiamala of around 100 acres blends beautifully with scenic hills on the foot hills of the Sahyadri range. The campus offers a serene and peaceful backdrop essential for working unperturbed and efficiently.





Undergraduate programme in the branches of Aerospace Engineering, Avionics and Physical Sciences which are relevant to space studies has been the prime focus of IIST. Admission to the UG programme is purely merit-based. For the first three years intake was based on IIT-JEE and during the next three years (from 2010 to 2012), IIST conducted its own entrance test ISAT. For the year 2013, admissions will be based on the common entrance test JEE conducted by MHRD and normalized Board marks. The present intake of students for Aerospace Engineering, Avionics and Physical Science is 60, 60 and 36, respectively. The curriculum and syllabus have been carefully formulated to strengthen the fundamentals, experience the practical realities, and enhance the knowledge and understanding in the areas of interest. This has been done under the expert supervision of various Boards of Studies constituting eminent academicians from premier institutes of the country. Reviews and improvements to the curriculum are done regularly.

Let me take this opportunity to enlighten our Chief Guest and other dignitaries about the novel educational model which our institute is presently adopting. IIST provides assistantship to the tune of Rs.49,000/- per semester to undergraduate student to cover the cost of statutory tuition fees, statutory amenity fee,



establishment, hostel and dining. This stipend also covers medical expenses and allows for a book grant of Rs.3,000/- per semester. More importantly, upon successful completion of their B.Tech degree, the students are directly recruited as Scientists / Engineers into the various centres / units of ISRO /DOS, subject to meeting a certain minimum academic standard as per ISRO/DOS recruitment norms. This unique opportunity of employment in the nation's space research organization is an added motivation for bright young talents. One of the yardsticks followed is to seamlessly integrate science and engineering and hence IIST seeks to provide equal importance (footing) and opportunity to both.

The growing visibility of our institute has been steadily increasing over the years. IIST has been actively involved in collaborative programmes with national and international organizations / universities. The institute has an MOU with Universities Space Research Association (USRA), USA, and with California Institute of Technology (Caltech), USA. Five students of 2007 B.Tech batch did their project at USRA institutes/universities. The topper of B.Tech (Aerospace Engineering) programme will have the option to undergo a fully sponsored rigorous nine-month graduate course at Caltech from this year.





It is indeed my pride to inform you about the nano-satellite designed by the UG students. The students have conceived a 3-axis stabilized nano-satellite of mass around 5 kgs. The conceptual design of the satellite has been completed and the payload and components have been identified, based on the functional requirements and availability. The nano-satellite is proposed to be launched in a polar sun synchronous orbit in the near future.

To encourage the undergraduate students to excel in Academics, IIST has constituted various gold medals which will be given away in today's ceremony. The Chairman, Board of Management's Gold Medal will be awarded to the student with the best academic performance from across the three branches and Institute Gold Medals will be given to the toppers of the three individual branches. To cultivate the need for an overall development of the student, importance is given to extra-curricular activities at IIST and the student excelling in Academics as well as extra-curricular activities is rewarded with the Director's Gold Medal for the Best All-Rounder again from across the three branches.

Apart from the undergraduate programme, IIST has been offering two post-graduate courses since 2010 in Soft Computing & Machine Learning and Chemical Systems. Four new courses were added in the last academic year namely (i) Aerospace Propulsion,



(ii) Radio Frequency and Microwave Engineering, (iii) Digital Signal Processing, and (iv) Optical Engineering. From the next academic session, the institute is planning to aptly expand the postgraduate programme by offering M.S. in Astronomy and Astrophysics, and nine new M.Tech courses in Geoinformatics, Earth System Sciences, Solid State Technology, Control Systems, VLSI and Microsystems, Aerodynamics and Flight Mechanics, and Structures and Design, Machine Learning and Computing, Material Science and Technology.

The admission to the M.S. and M.Tech programme is against open advertisement with an additional option for intake of Scientists / Engineers from ISRO/DOS. The selection criteria is based on national level tests like GATE and written tests / interviews. At present the strength of the M.Tech programme is 42 and is expected to increase by atleast 100 more with the new PG courses proposed.

Research forms a significant part of the vision of IIST. The institute has an excellent research atmosphere with 73 PhD scholars and 2 Post Doctoral Fellows (PDF). The institute presently offers a limited number of high-valued ISRO-IIST fellowships amounting to Rs 35,000 per month as well as a large number of regular IIST fellowships (Rs 16,000/Rs 18,000 per month) for PhD scholars.





IIST also offers an attractive fellowship for PDFs amounting to Rs. 40,000 per month for a period of one year with a possible extension for another year depending on satisfactory research output. Two DST-INSPIRE Fellows have also joined IIST about a year back. In these initial years, we have built a strong research tradition, which is easily seen in the impressive statistics that the IIST can boast of in terms of various research indicators. We have continuously improved on our credentials in research as evidenced by way of publications. Our target of significantly increasing the intake of quality candidates into our PhD. programme is on the right course.

At IIST, we strongly believe that the quality of an academic institution largely rests on its faculty. Our faculty members are among the finest in the country and are recognized nationally and even internationally for their quality of research and teaching. Many of our faculty members serve on the Editorial Boards of reputed journals, undertake peer-review for journal papers, and are on the Boards of many institutions and organizations.

Recruiting and retaining these bright faculty members in our institute is one of our most important missions, since therein lies the future of the institute. In this connection our Board of Management has played a very positive and constructive role in





approving policies, which facilitate the faculty members to deliver their best in both teaching and research. For the benefit of prospective faculty members based abroad, the institute has provision to interview them over video conferencing. The institute provides sufficient relocation allowance to the faculty members amounting to up to Rs 1 Lakh for within India and Rs. 3 Lakhs for faculty members relocating from overseas. The faculty members have large number of peer-reviewed international publications to their credit. They have also presented significant number of papers in national and international conferences. Besides this, they have also published a few books and several book chapters.

Understanding the importance of attracting talented faculty members, and endeavouring to nurture their research aspirations, the institute provides direct research funding to faculty members based on proposals which are peer-reviewed by experts in the field. In addition, IIST also provides funding for fast-track research projects which amounts to Rs. 10 Lakhs to encourage newly joined faculty members to initiate their research plans. The institute also covers the publication charges for the faculty members and research students and PDFs. The institute encourages the faculty members to organize/participate in international and national conferences, workshops, symposia and schools.





Over the last five years, IIST has expanded its teaching and research interests to a wide range of areas of national importance and current relevance, related to space science, space technology and other areas. The major research facilities in areas like Nanoscience & Technology, Virtual Reality, and Advanced Propulsion & Laser Diagnostics have started and promise to provide a thrust to advanced research in these emerging interdisciplinary fields. These major research facilities are to emerge as Centers of Excellence in the near future.

An institute, we believe, is only as good as its people. Our greatest asset is the presence of 94 highly qualified faculty members, emeritus professors, visiting professors, 39 non-academic staff members including library, hostel, canteen management and other supporting service staff members apart from an outstanding body of 565 UG students, 42 PG students, 73 PhD students, 2 DST-INSPIRE Fellows, 2 PDFs and an excellent infrastructure. These form the backbone of all our activities and excellence.

The story is far from complete without an update on the infrastructure development of IIST. The institute policy is to remain continuously engaged in the modernization of the academic infrastructure. Adequate funds are made available to the Departments for up-gradation of laboratories and creation of new



facilities. This has significantly helped in the improvement of quality of teaching and research.

The library in the institute boasts of an excellent collection of books and electronic journals. Online access to the library portal is available 24x7. The institute is an active member of INFLIBNET consortium and presently eight INFLIBNET e-resources are currently being subscribed in the library. The major e-resources are ACM Digital Library, AIAA, AIP, APS, Annual Reviews, ASME, Cambridge Online, IEL Online (IEEE), JSTOR, Optic Infobase, Oxford Journals, Royal Society of Chemistry, and Science Direct. While the institute has purchased books for the library worth Rs.1.51 crores in the last four years, e-journals have accounted for an expenditure of Rs.2.57 crores since inception. The annual cost of e-journal subscription in the library is presently Rs.1.38 crores.

The campus has a high performance computing facility with adequate number of work stations and campus wide inter/intranet. The following are the highlights:

(i) Computing Facility: High Performance cluster server having 3 Terra flop speed (32 HP Blade servers having 64 Dual Quad Processor). 1.20 TB SAN Storage with NAS Header. Tape Library with Backup software.





(ii) Internet and campus network connectivity extends all its ICT resources to students and faculty through this Campus Network.

At present the institute's campus has a well equipped Medical Centre to provide medical aid. M/s. Ananthapuri Hospitals and Research Institute situated in Thiruvananthapuram city has been recognized by the institute for specialized OPD consultation and it has provision to admit our students as inpatients. The institute provides Comprehensive medical coverage through a special scheme which is free of cost (extent of coverage).

The civil construction work in the campus related to infrastructure development is in the advanced stage of completion. The campus is expected to be fully operational by end of this year.

The Dean (Student Activities) of IIST heads the Student Activity Board (SAB), consisting of the Registrar, the Heads of the Departments, Chairpersons of the Cultural, Technical and Sports Council of IIST and student representatives from all batches and branches. The students of this institute organize a unique inter-collegiate cultural festival named "Dhanak" as well as an inter-collegiate technological festival named "Conscientia" every year. These provide a platform for the students to showcase their talents and creativity both in the cultural as well as in the technological





domains. The institute celebrates “Sports Day” wherein students and faculty members of the institute compete in several sporting events and win medals and prizes. Various sports tournaments and cultural competitions are organized regularly for the recreation of the faculty and staff members. The institute also conducts yoga classes for the benefit of staff and students.

We would like to acknowledge the unstinted support and encouragement received in abundance from the Department of Space, Government of India. I personally acknowledge the support and encouragement I have received from our beloved Chancellor, Dr APJ Abdul Kalam, our Chairman, Board of Management Dr K. Radhakrishnan, and Members of General Body, Members of our Board of Management, and from all my colleagues, and extend my appreciation to the students for their exemplary behavior and their contributions towards enriching the campus life.

I once again thank respected Chief Guest Dr R Chidambaram, our beloved Chancellor Dr APJ Abdul Kalam, our Chairman, Board of Management, Dr K. Radhakrishnan, and all the distinguished guests for being with us today.

Dear students, keep in touch with your alma mater, support it in whatever way you can, and be the ambassadors of IIST. I am sure





that you would work for a better world where science and technology are used in socially responsible ways, and in harmony with nature. It would be worthwhile to keep in mind Steve Jobs words of wisdom.

**“Your work is going to fill a large part of your life, and the only way to be truly satisfied is to do what you believe is great work. The only way to do great work is to love what you do. If you haven't found it yet, keep looking. Don't settle.”**

Let me conclude my report, by quoting Swami Vivekananda, extolling the youth of India with the following exhilarating words,  
**“Arise, Awake and Stop not till the goal is reached”.**

Thank you all!  
Jai Hind!











**Indian Institute of Space Science and Technology**

(Declared as Deemed to be University under section 3 of the UGC Act, 1956)

**Valiamala, Thiruvananthapuram**