



CONVOCATION ADDRESS

BY

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AT

**THE 5TH CONVOCATION OF
INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
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**Address of Dr. K. Kasturirangan at the
Fifth Convocation of
Indian Institute of Technology Guwahati
on 30 May 2003**

Your Excellency, Lt. Gen. (Retd.) S. K. Sinha, Governor of Assam and the Chairman of the Board of Governors, distinguished members of the Board, Prof. Gautam Barua, the Director, Esteemed members of the Senate, Faculty and staff, Distinguished guests and invitees and my dear young graduates,

I deem it a great pleasure and honour to deliver this Fifth Convocation Address of IIT Guwahati. It adds to my pleasure to be here in the North East region, which is distinguished for its great natural beauty and cultural diversity. Whenever I think of the region, I am overwhelmed with memories of the richness and range of its natural and cultural heritage as reflected in its snow clad mountains, lush green hills and forests, profuse display of orchids, holy shrines, verdant tea gardens, sanctuaries of wild life, classical dance forms, martial arts and above all the quality and warmth of people. It is fitting that this Institute of erudition is located in this region, at the very hub of the great Ahom culture of the Brahmaputra valley, signaling the intermingling of tradition with modernity, nature's rhythm with human spirit and the calm of the eternal with the dynamic tunes of progress.

As a recent addition to the illustrious family of IITs, this institute shoulders a great responsibility, for the region and indeed the entire nation, for growing excellence in the field of higher technical education and research. I am glad to see that a strong foundation towards this has already been laid at this institution, through the dedicated efforts of the faculty, staff, students and administration. On this august occasion today, I would like to pay my tributes to two outstanding men who shaped this institution to the present level of accomplishment since its very inception - His Excellency Lt. Gen. (Retd.) S. K. Sinha who had been the Chairman of the Board of Governors and a pillar of strength for the development of the institute and Prof. D. N. Buragohain, who ably steered this institute as its Director from its very beginning to the completion of his tenure recently. It is also a

fitting occasion to recall with gratitude the pioneering contributions of Prof. R. C. Malhotra, during the formative stages of this institution. It gives me great pleasure to welcome the dynamic new Director Prof. Gautam Barua and wish him all success for the challenging times ahead.

My dear young graduates,

Today marks an important day in your lives and a significant step in your life's journey. Entering the portals of this institution facing great competition, you pursued your studies with great dedication. You met all demands for hard labour, maintained high standards and qualified yourselves for this graduation. It is a moment of pride for you, your teachers, parents, friends and indeed, all the rest of us. But you all know that life's laboratory is full of uncertainties, challenges, opportunities as well as excitements – and soon you will realize that what you experienced at this institution is only a beginning of the learning process, and this has to go on further with the same vigour and determination, and indeed extended to several new dimensions, so that you can gain success and serve the society at large. I am sure that each one of you has different dreams, but surely you should never give up your dreams and aspirations, for it is those aspirations that will drive you to higher levels of achievement and make your life purposeful. From the depth of my heart, I wish each one of you success in your future endeavours.

Technology is the vital theme that drives the activities of this Institute. Modern history of the world has made us aware of the central role that science and technology play in shaping our lives in diverse ways. We have already seen its impact in enhancing food security, providing means to cure and control diseases, improving human connectivity by modern means of transportation and communications and equipping us with tools to deal with natural disasters. Technology has been a key resource for accelerating economic growth and in strengthening security. Rapid trends of globalization that we witness today are in a way a product of technological progress. As a consequence, increasingly global policies have been influencing different facets of national policies. Markets are sought to be accessed on a global scale and barriers to the flow of capital across continents are thinning down. Thus, Technology has become a powerful tool in shaping the destiny of nations and peoples across the globe.

While technology has provided tremendous power to accomplish and accelerate development, it has also caused grave concerns of possible misuse in a way that can

threaten the future of mankind and integrity of the earth's environment. Technology is a great force, but by itself it is for neither good nor bad. It is a tool in the hands of humanity, demanding wisdom for using it. It is expressed beautifully in a Buddhist proverb— "To every man is given the key to the gates of heaven; the same key opens the gates of hell".

The progress of science and technology has shown that there are unlimited possibilities for furthering our knowledge and that this comes from maintaining the freedom of thought and an honest enquiry into things we doubt. Our duty to the future generations lies in maintaining this freedom and path to progress of knowledge.

One of the key challenges we face in current times is achieving competitiveness at a global level. Without attaining such a position in a globalised world, progress at a nation's level is likely to be marginalized. For India, the problem is even more compounded, when the above challenge is superimposed on the task of meeting basic needs of over a billion population in a sustainable manner, preserving the quality of our environment. India's dreams to become a developed country within a decade have to necessarily rely on effective use of the instrument of technology. It is here that the IITs have a great role to play. This role is two fold, namely, the creation of high caliber human resources on the one hand and the promotion of technological leadership through research in frontier areas on the other hand. Both these roles are very important if we reckon with the fact that advanced nations of contemporary world are not always willing to share technologies which have a strategic role in our socio-economic development. Therefore, there is a need for developing self-reliant capabilities in technologies, which strengthen our independence to accelerate our development. As the new millennium opens more opportunities for knowledge-based industries, contributions from the IITs will be of paramount importance.

After the adoption of policies relating to deregulation and liberalization by India more than a decade ago, it is noteworthy that the Indian Industrial Sector began to grow at a faster pace. The overall average growth rate during the eight and ninth plan periods put together (mostly covering decade of nineties) is seven percent. However, we witnessed a slow down in recent years, which has been a matter of concern. Improvements in productivity, cost competitiveness and capabilities for new product developments are still major issues for our industry and there are big challenges to be met to realize success in these areas. This situation needs effective response through innovations. Technology has to be leveraged to achieve international standards of quality and minimizing time and

cost to market. The recent slow down in industrial growth needs to be addressed through measures for boosting internal demand as well as exports. A targeted approach is essential to enhance our national per capita manufacturing value addition as this value is still a fraction as compared that of countries like China.

Hand in hand with our efforts for growth of the industrial sector, we should endeavour to increase our influence and participation in policymaking process at the international level. Greater awareness is being built in recent years on this aspect. One example is our initiatives for Intellectual Property Rights, which is an important tool to promote and protect innovations and which has assumed great importance in the context of industrial and trade activities in the globalised era. World wide, there has been a thrust for harmonization of Intellectual Property Rights and related regulations. As India needs to take full advantage of its intellectual potential and to translate this potential into economic value, creation of IPRs on scales unprecedented is a national priority.

In recent times, much debate has also been taking place globally on the nature of technical knowledge. It is widely recognized now that knowledge related to technology is not merely governed by positivistic principles, which are fundamental to physical sciences, but it embodies a component of 'social construction' as well. In his illuminating work "Beyond Engineering: How society shapes Technology" Robert Pool captures this and I quote:

"Modern technology is created not so much by individuals as by organizations, and the characteristics of those organizations- their histories, their leaders, their structures, their cultures, their financial well being, their relationships with other organizations- will shape the sorts of the technology their engineers produce."

Hence organizational systems are crucial for our success. They have a great bearing on catalysing innovations and putting them to use on a large scale. As young engineers, you need to discover and manifest the power of teamwork and organizations.

'Team work' indeed is the secret of success in our space program, with which I have the privilege of long association. India is globally recognized today as a significant space faring nation. This is the result of teamwork in facing several challenges squarely and maintaining focus on our goals. The constraints on the flow of technologies,

components and equipment at the international level made us rely on our own innovative skills to design and develop systems, which are state of the art. Each set back or failure is taken as a learning experience. Because we have to rely on our own capabilities, we could create systems, which are of world class. A complex multidisciplinary system such as a launch vehicle like GSLV or a satellite system needs enormous teamwork and the right organizational culture to succeed.

There is another area in space in which we established leadership. This is in the field of applications of space for development. Crop forecasts in advance of harvests, monitoring land degradation, locating ground water, mapping forests, plans for urban areas, predictions of weather, tracking of cyclones are but a few examples of applications of our remote sensing satellites. Similarly, our telecommunications and broadcasting satellites have been put to use in a large array of social and commercial applications. Having developed such state of the art systems, we are ambitiously working to build dedicated satellite systems for educational and health related applications that are critical for our future development.

In the North East Region itself, we initiated a number of activities involving local institutions and the North Eastern Council (NEC). A dedicated centre called North East Space Applications Centre has been established by Department of Space in 1999, with facilities for application of Remote Sensing and Geographic Information System tools for generation of information relevant to different aspects of natural resources management. The Centre has also plans to operate a satellite communications network in the region for undertaking developmental communications including training and education activities. Prominent among the applications so far pursued are mapping flooded areas and development of digital databases to assist in damage assessments and mitigation measures. Already such digital databases are developed for eight districts in Assam and work is in progress for more districts. Another major area is Landslide Hazard zonation, which involves currently study of Shillong-Silchar-Aizwal highway region. Satellite remote sensing is also widely applied in several other areas such as development of forest working plans, study of river channel changes, identification of sites for horticulture development and development of comprehensive Natural Resource Information System for the region. Hand in hand with Remote Sensing, satellite based communications are also applied to meet specific needs. Guwahati Medical College has a satellite telemedicine network which

connects it to All India Institute of Medical Sciences at New Delhi and in due course, this will be connected to other district hospitals. Another example is the initiation of developmental communications program covering 12 districts of the region initially, with plans for extending to all districts in the region. I am glad to see that even in the field of space sciences, some high caliber studies are being undertaken in universities at Guwahati, Dibrugarh and Nagaland. Obviously, there are several needs of the region, where high technology could play an important role. Premier institutions like IIT Guwahati could play a central role in undertaking research in technologies that accelerate development and also in networking with several other institutions in order to promote effective applications of those technologies. I am sure that you can bring to bear your core innovative capabilities to develop ideas for meeting priority needs in areas such as services and industrial developments, disaster management, roads, power and communications infrastructure, environment friendly technologies and so on.

My dear young graduates,

You are among a privileged few to receive education at this institute of great repute. The education you received here will serve as a strong foundation to build your future and make contributions at the national or international level. It is also your bounden duty to remember your alma mater and also this region in which you have grown. Contribute your mite for their future development. Always remember that we bequeath a great heritage, as India is a land which adorns an ancient culture that blossoms up great values for life and a deep concern for human development. It is also a land teeming with challenges in every field of human activity. The rich heritage of thought and experience, handed down to us by countless noble souls and great personalities have deep implication to the process of shaping our lives. It is my hope that you will integrate, with all that you learnt in academic career, the core values of life which will give you the capacity to face the rigors of real life.

I wish you all the very best and pray that you are endowed with the necessary strength, courage and wisdom to face the challenges before you and create your destiny, bringing welfare to yourselves and your fellow beings.