



DIRECTOR'S REPORT

**THE 6th CONVOCATION
SATURDAY, MAY 29, 2004**

INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI

INTRODUCTION

His Excellency Shri Bhairon Singh Shekhawat, the Vice-President of India, Shri A.K. Saikia, Chairman, Board of Governors, members of the Board of Governors, members of the Senate, faculty, staff, graduating students, parents and guardians, ladies and gentlemen – it is my duty to now present before you a report of the activities and achievements of IIT Guwahati during the past one year. I would however like to begin by expressing honour and gratitude at the presence of Your Excellency the Vice-President of India Shri Bhairon Singh Shekhawat as the Chief Guest and to deliver the convocation address.

IIT Guwahati is nearing completion of ten years of its existence and five convocations have been held so far. Today in this sixth convocation, the following batches of students will be awarded their degrees :

- the sixth batch of B.Tech. and fifth batch of M.Tech. students in Computer Science & Engineering, Electronics & Communication Engineering and Mechanical Engineering;
- the third batch of B.Tech. and M.Tech. students in Civil Engineering;
- the third batch of B.Des. students in Design;
- the third batch of M.Sc. students in Physics, Chemistry and Mathematics; and
- 6 research scholars will be awarded Ph.D. degrees.

I extend my hearty congratulations to all the degree recipients.

ACADEMIC ACTIVITIES

IIT Guwahati at present has the following eleven academic departments:

Biotechnology (BT)
Chemical Engineering (CL)
Chemistry (CH)
Civil Engineering (CE)
Computer Science and Engineering (CS)
Design (DD)
Electronics and Communication Engineering (EC)
Humanities and Social Sciences (HSS)
Mathematics (MA)
Mechanical Engineering (ME)
Physics (PH)

New Centres

The Institute has established the following Centres recently. These Centres are in areas that are inter-disciplinary in nature and either the areas are cutting-edge or of relevance to the development of this region. The Centres will do R&D and the faculty will be drawn from the Departments of the Institute. They will have PhD programmes and may start M.Tech programmes as well.

1. Centre for Energy
2. Centre for the Environment
3. Centre for Nanotechnology

New Service Centres

The following service centres have been established this year. Besides them, other central services are provided by the Central Library, the Computer Centre (currently under the Department of CSE), and the Workshop (currently under the Department of Mechanical Engineering).

1. Central Instruments Facility
2. Centre for Education Technology
3. Centre for Mass Media Communication

The total number of students on the rolls during the academic year 2003-2004 at the undergraduate, postgraduate and Ph.D. levels were :

Undergraduate programme

B.Tech. / B.Des.

4th year (2000 batch): 129 (CS-40, EC-33, ME-21, CE-17, DD-18)

3rd year (2001 batch): 127 (CS-33, EC-39, ME-24, CE-14, DD-17)

2nd year (2002 batch): 207 (CS-42, EC-42, ME-46, CE-27, CL-18, BT-18, DD-14)

1st year (2003 batch): 215 (CS-35, EC-40, ME-43, CE-34, CL-23, BT-22, DD-18)

From Earlier Batches: 03

M.Sc.

2nd year (2002 batch) : 25 (PH-08, CH-09, MA-08)

1st year (2003 batch) : 32 (PH-12, CH-08, MA-12)

From Earlier batches : 04

Postgraduate programme

M.Tech.

2nd year (2002 batch) : 85 (CS-25, EC-21, ME-23, CE-16)

1st year (2003 batch) : 117 (CS-23, EC-33, ME-31, CE-30)

From Earlier Batches : 04

Ph.D. : 126 (CS-9, EC-14, ME-15, CE-15, DD-04, PH-14, CH-22, MA-8, HSS-15, BT-05, CL-05)

*Total no. of undergraduate and postgraduate students : **1074***

The number of successful candidates who are to receive their B.Tech., B.Des., M.Sc., M.Tech. and Ph.D. degrees today are given below :

B.Tech.

Computer Science and Engineering	36
Electronics and Communication Engineering	32
Mechanical Engineering	22
Civil Engineering	17
Design	16
Total	123

M.Sc.

Physics	07
Chemistry	10
Mathematics and Computing	06
Total	23

M.Tech.

Computer Science and Engineering	03
Electronics and Communication Engineering	06
Mechanical Engineering	05
Civil Engineering	01
Total	15

Ph.D.

Mechanical Engineering	01
Civil Engineering	01
Physics	01
Chemistry	02
HSS	01
Total	06

GRAND TOTAL **167**

The number of M.Tech students is relatively less as the M.Tech programmes' duration have been increased to two years and most M.Tech students will graduate in July.

New Academic Programmes

The Department of Civil Engineering has started a new M.Tech. programme in "Water Resources: Utilization and Environmental Management" from July 2003.

The Department of Chemical Engineering is starting its first M.Tech. programme in "Petroleum Refinery Engineering" from July 2004.

Revision of Course Structures

The syllabi of all undergraduate programmes have been thoroughly revised this year keeping in mind the changing academic and technical scenario. A revised course structures for the B.Tech. and B.Des. programmes were implemented in the 2003-2004 session.

Quality Improvement Programme (QIP)

IIT Guwahati has become a major centre for the Quality Improvement Programme, a scheme of the Ministry of Human Resource Development (MHRD). Several activities were undertaken during the year under QIP. Ten CD Cell projects were started and a number of short term courses were sponsored and many teachers from other Institutes have been offered admission into the PhD and M. Tech programmes.

Under the Early Faculty Induction Programme (EFIP), thirteen scholars were selected as probable future engineering faculty by the EFIP, IIT Guwahati cell.

RESEARCH AND DEVELOPMENT

The growth in R&D activities of IIT Guwahati has been maintained. In the year 2003-2004, we have been able to generate about Rs. 4.87 crore, an increase of 210 % over the last year's receipts. A total of sixty-seven projects were running in the year under report out of which eight have already been completed.

Under the National Programme for Technology Enhanced Learning – (a joint project of all the Indian Institutes of Technology and Indian Institute of Science, Bangalore sponsored by MHRD) IIT Guwahati is developing course material – both video based (5) and web based (16) – for courses in the Undergraduate engineering programmes of the country.

A number of projects sponsored by various Government agencies like Ministry of Human Resource Development, Dept. of Science and Technology, CSIR, Dept. of Atomic Energy, Dept. of Space, Ministry of Social Justice and Empowerment, are being carried out in the Institute.

Under the Improvement of S&T Infrastructure (FIST) Program 2003, the Institute received a grant of Rs. 1.25 crore for the Department of Chemistry. The total value of these ongoing projects is approximately Rs. 8.25 crore.

A Technical Backup Unit (TBU) under the programme of the Khadi & Village Industry Commission (KVIC), was setup during 2002-2003 at IIT Guwahati. This is a multi department project and is developing technologies for the rural sector. The Institute is involved in projects in energy, bamboo and cane furniture, and loin loom development .

The project "Resource Centre for Indian Language Technology Solutions" in the Department of Computer Science and Engineering has developed four e-dictionaries, viz., English-Assamese (49,627 words), Assamese-English (9,015 words), English-Manipuri (36,778 words) and Manipuri-English (7,228 words). The Centre has also developed two corpora, viz., Assamese Corpora and the Manipuri Corpora.

Consultancy Projects

In addition to the sponsored R&D projects, the Institute also offered consultancy services to many government, public and private sector agencies during the period under report. The total value of the ongoing consultancy projects is approximately Rs. 46.41 lakhs, and during the year under report Rs.42.97 lakhs was received on this head. A total of 67 consultancies were carried out during the year.

The clients include Govt. of Meghalaya, National Construction Corporation Limited, Bharat Sanchar Nigam Ltd., Indian Oil Corporation Ltd., Hindustan Paper Corporation Ltd., Numaligarh Refinery Ltd., Govt. of Arunachal Pradesh, Govt. of Assam (Departments of PWD, Police Finance, Tourism, Education), Assam Petrochemicals Ltd., North Eastern Indira Gandhi Regional Institute of Health & Medical Sciences (NEIGRIHMS), Indian Air Force, North Eastern Council, M/s Larsen & Toubro Limited, CPWD, RITES, Kendriya Vidyalaya Sangathan, NF Railways, Gammon India Ltd., General Insurance Corporation Mumbai, National Informatics Centre.

The State Bank of India took up a scheme called "Project Uptech" to upgrade the skills and technology of artisans to raise product quality and competitiveness. IIT Guwahati has participated in it with technical expertise for improvement of the brass metal cottage industry of village Hajo near Guwahati. Tools and implements that were developed for the artisans some modern hand tools were identified. One group of artisans have been trained and other groups will be covered in the next phase. The experts feel that with the introduction of the new tools and processes the productivity will rise by at least three-fold.

Courses and Workshops

The Institute organized the following short-term courses during 2003-2004:

1. GIS and Remote Sensing Application in Water Resources (CE/QIP)
2. Signal Processing and its Application (CE/QIP)
3. Computational Methods for Differential Equations (CE/QIP)
4. FEM in Manufacturing (CE/QIP)
5. Fundamentals of Design and Detailing of Earthquake Resistant Buildings Sponsored by NPEEE. (CE)
6. Earthquake resistant design of reinforced concrete buildings sponsored by NPEEE. (CE)
7. State-of-practices in Earthquake Engineering sponsored by UNDP-MHA. (CE)
8. "Project Management" for NEEPCO Shillong. (ME)
9. Application of Finite Element Method in Manufacturing. (ME/QIP)
10. Training of engineers from NE states. (CE)
11. Training Programme on JEs/AEs of Assam, Meghalaya involved in the Pradhan Mantri Gram Sadak Yojana (PMGSY). (CE)
12. Web Enabled Application Development using Oracle. (CSE)

The 69th Annual Meeting of the Indian Academy of Sciences, Bangalore, was hosted by the Institute during 21-23 November 2003. The meeting provided an opportunity to the academic community of the North East (and also the public) to interact with some of the leading scientists of the country. Around 250 persons from different universities and institutes of the country participated in the meeting.

The Institute hosted the second Winter Academy, jointly organized by the Institute of Fluid Mechanics, Friedrich Alexander University, Erlangen-Nuremberg, and the Indian Institutes of Technology, Guwahati, Kanpur and Kharagpur during December 8-17, 2003. 49 students from the IITs, 05 from FAU Erlangen and one from the Technical University Munich, and 15 experts from India and Germany participated in the Academy.

The first National Symposium on Rotor Dynamics (NSRD-2003) was organized by the Institute during Dec. 15-17, 2003. The event had 35 paper presentations with participation from IITs, other leading Universities of the country, major public sector units, and foreign delegates. The major topics covered were Plant Maintenance, Instrumentation, Diagnostics and several experiments and case studies on Advanced Analyses of Industrial Machinery.

A four-day National Workshop on 'Science and Technology for Regional Development: Case for North-East India', was held in the Institute during 3-6 February 2004, organised jointly with Tezpur University and the Centre for Mathematical Modelling and Computer Simulation, Bangalore.

More than 320 speakers and delegates attended the Workshop. 33 invited papers were presented and there was also a poster session with over 35 papers. Prof. Arun Nigavekar, Chairman of UGC delivered the key-note address. The Workshop adopted an action plan Vision:NE 2020 to be achieved through a coordinated effort of all NE states.

A two-day awareness workshop on *The Facilities of Inter University Consortium for Department of Atomic Energy Facilities at Indore* was organized jointly by IIT Guwahati and the Inter University Consortium For Department of Atomic Energy Facilities (IUC-DAEF) at IIT Guwahati during on 20th and 21st February, 2004. The workshop aimed at generating awareness among the potential users from universities and other academic institutions of the North-east Region about various in-house advanced research facilities available at IUC-DAEF, Indore.

A two-day consultation programme on the new Educational Satellite (EDUSAT) of India was organized jointly by IIT Guwahati, Development and Educational Communication Unit (DECU), Ahmedabad and North Eastern Space Application Centre (NESAC), Shillong on 27 & 28 March, 2004.

Visitors

More than forty scientists and researchers visited various Departments of the Institute during the year. About ten were from abroad while the rest were from other Institutions in the country.

INSTITUTE PROGRAMMES

Memoranda of Understanding

- a) An MoU was signed between IIT Guwahati and North Eastern Industrial and Technical Consultancy Organisation Ltd. (NEITCO) to work together for fulfillment of the objectives of providing technical & consultancy support to clients in various fields.
- b) An MoU was signed between IIT Guwahati (RCILT) and IIT Kanpur for Non-Exclusive Transfer of Anglabharti Technology from IIT Kanpur.

Technology Transfer

An agreement was signed on 26 March 2004 among IIT Guwahati, SMS Pharmaceutical Pvt. Ltd., Hyderabad, IICT Hyderabad, NRDC and DSIR on transfer of technology for Preparation of Metal Acetylautonates. This is a part of a five-crore project being financed by DSIR and SMS Pharmaceutical Pvt. Ltd., Hyderabad.

The Institute has developed technology for production of three Chemicals - Metal Acetylacetonates, Quaternaryammonium Tribromides (QATB) and Pyridinium Fluorochromate (PFC).

For the same chemicals, the Institute has agreed to transfer the technology to Premier Cryogenics Limited, a Guwahati based firm. The Institute has also provided space to the firm to set up a pilot plant.

Incubation Centre

The setting up of the first Incubation Centre in the Institute has been a landmark event. Three ex-students of the Institute have got together and set up a firm named M/s Yellow Fourier Technologies Pvt. Ltd. to work in Electronics and software related areas. The Institute has provided space and other facilities at concessional rates to allow the firm to incubate its ideas. Faculty and staff of the Institute will be providing inputs to them. It is hoped that this will be the first of many such ventures to come up in the Institute.

Student Exchange

Four M. Tech. students of IIT Guwahati are doing their M.Tech projects in Germany under the DAAD Sandwich Scholarship scheme of the German Government. The number of scholarships for IIT Guwahati has been increased to six this year. A group of German students is also coming to IIT Guwahati this year under this scheme.

Major Equipment Procured

Description of Items	Department /Centre	Value (Rs.lakhs)
Variable Pressure Digital Scanning Electron Microscope	Central Instruments Facility	120.00
Camcorder, Camera Controller	Design	43.97
DME Switcher, Edit Control Unit		
Programmable Logic Controller	Design	19.99
Fluoro Max-3 Compact Spectrofluorometer	Biotechnology	15.80
Heat Exchanger Service Unit	Chemical Engg.	28.48
Surface Tensiometer, Julabo Circulator etc.	Chemical Engg.	10.09
Stress Path Testing System	Civil Engg.	20.98
Dual Channel Pulse Multi-Analyzer System	Civil Engg.	18.98
Aminco Bowman Series 2 Luminiscence cum Fluorescence Spectrometer	Physics	10.46
Perkin Elmer Polarimeter	Chemistry	10.00
Rotavapour R200/V/Basic with Condenser	Chemistry	11.80
Perkin Elmer FT-IR Spectrophotometer Spectrum	Chemistry	13.77
Perkin Elma Lambda 25 UV/VIS Spectrophotometer	Chemistry	12.38

FACULTY AND STAFF

The number of faculty at the beginning of the year 2003-04 was 111 which increased to 124 at the end of the year. The number of non-faculty staff increased from 205 to 254 during the year. The number of women employees reduced from 51 to 48. The total number of faculty, officers and staff increased from 316 to 378 during the year.

Honours and Awards

Prof. M.K. Chaudhuri of the Dept. of Chemistry, was awarded *Chemito International Award (2002)* presented in 2003.

Dr. A. K. Ghosal of Chemical Engineering received the *Professor N. R. Kuloor Memorial Award* for the best paper published in the IChE Journal.

Dr. S. Talukdar, Dr. A. Dutta & A. Das (a former student) of Civil Engineering received the *Indian Road Congress Commendation Certificate Award* for their paper titled "Response of cable stayed bridges induced by moving vehicle", published in *Highway Research Bulletin*, Vol. No.67. The award was presented at the 64th Annual Session of IRC held at Ahmedabad in January, 2004.

PUBLICATIONS

The faculty of the Institute have been publishing various research papers in international and national journals as well as in conference proceedings. The publications during the past one year include :

Journal Papers : 95 International; and 28 National.

Conference Papers : 128 International; and 68 National.

Compared to the previous year there has been an increase of 86% in publications in international journals and 75% in national journals; 39% in international conference and 28% in national conference publications.

The faculty have presented papers in 96 international and 58 national conferences and published 1 book review, 2 book chapters and 2 creative writings during the year.

CONSTRUCTION AND CAMPUS DEVELOPMENT

This year, the Kendriya Vidyalaya Sanghathan (KVS) agreed to set up a Kendriya Vidyalaya in the campus in the "civil" sector. The school will be run by the KVS and all expenses will be borne by them. The Institute has handed over a 10-acre plot in the campus for the school.

The school started functioning from temporary premises from August, 2003. With this, one of the major requirements of the campus community has been met. I wish to record the Institute's gratitude to the KVS for this step. As a consequence of this, the school run by the Institute was wound up. A pre-primary school cum creche named *Akshara*, was started to cater to the needs of the tiny tots.

Due to construction activities, it was difficult to plant trees on a wide scale on the campus. A substantial programme for planting of trees has been initiated this year. All the horticultural activities of the campus have been outsourced to two private parties. Similarly, civil maintenance work has also been outsourced while the process of outsourcing electrical maintenance and operations, and water pump operations, is underway.

The Institute offices have moved into the Administration Building after the completion of all the internal works and the procurement of furniture.

Two F-type units and 41 D-type units of residential quarters were completed and allotted for occupation this year. With this, the number of residential quarters are 314 (F-8, E-24, D-102, C- 37, B-119, A-24).

The 4th Boys Hostel with a capacity of 300 students was completed in December 2003 and was allotted for occupation. The Girls' Hostel with a capacity of 168 students was completed in July 2003.

The Academic Complex was to be completed by December 2003. Unfortunately, this has not happened and this has hampered some of the expansion plans of the Institute. It is hoped that the complex will be completed by December 2004. Central air-conditioning of the complex and other buildings is going on and will be completed at the same time.

The construction of the Library and Computer Centre building is in progress and is expected to be completed by December 2004.

A 4-lane railway over-bridge for the main entrance is currently under construction. It is expected that the entrance will be open for traffic with the completion of one side (2-lane) of the over-bridge, by December 2004.

Works that have been taken up this year are : an Indoor Sports Stadium and a sports complex with playing fields; a boys' hostel of capacity of 500 students; a 15 bedded hospital; a commercial complex; sewage treatment plant with a campus-wide sewage pipe network.

The water supply project has got delayed due to technical problems. The plan is to take raw water from the river Brahmaputra through a floating barge and to treat this water. Tenders are being issued shortly.

As the Chairman has already mentioned, we are starting a number of new construction projects this year. The aim is to issue work orders for the following works by August so that the coming dry season can be fully utilised: a 1200 seat auditorium, a lecture hall complex with 4 lecture halls of capacity 250 each, a number of residential buildings, a married students hostel with 100 flatlets, a swimming pool, a school (on behalf of KVS), and another hostel of capacity 500.

A gigabit Local Area Network for the Academic Complex and surrounding buildings is under implementation. The Institute has augmented its Internet bandwidth and BSNL has laid fibre optic cables into the campus. A small exchange of BSNL has also been installed. I wish to record the Institute's gratitude to BSNL for the help and co-operation they have extended.

STUDENTS' ACTIVITIES

The Institute has on-campus placement for its students. Leading companies of the country come and recruit students. This year, the on-campus recruitment has been a big success for the undergraduate students. About 87% of the undergraduate students and about 50% of the postgraduate students were offered jobs through the on-campus placement activities. From the information available from previous years, it is clear that ultimately all students get placement.

With the completion of additional hostel buildings, the student's strength correspondingly increased to 1075 during the year. Students are now accommodated on a single room occupancy basis distributed in five different hostels on the campus.

Some of the major events organized by the students include

Alcheringa	—	the annual cultural festival
Techniche	—	the annual technical festival
Manthan	—	intra hostel cultural competition
Spirit	—	the inter-college invitation sports competition, and
Technotsav	—	the invited technical lecture series

Today, these events serve as excellent platforms for learning, exchange of ideas and search for talent not only among the various institutions in the north east but also among other parts of the country. The measure of their significance and success is reflected in the increased support these events receive from various organizations that have actively come forward in supporting these initiatives taken by the students.

Sports Activities

A contingent of 76 students accompanied by the Chairman (Sports) and two Physical Training Instructors represented the institute at the Inter IIT Sports Meet organized at IIT Bombay during December 10-19, 2003. Shri Upender Mahato won the Silver Medal in weight lifting in 55kg category. The hockey and cricket teams gave a spirited challenge to their rivals with the cricket team reaching the semi-finals stage. The students also organized the annual inter institutional invitation sports meet 'Spirit', with participation from various colleges and universities of Guwahati. A series of friendly matches in Volleyball, Tennis and Table Tennis were organized for girl students with the local colleges of Guwahati. The inter batch sports competition and the inter Hostel sports tournaments in athletics, cricket, table tennis, basket ball, volleyball and carom helped to motivate the new batch of incoming students to the different sports activities.

In February 2004, the institute Hockey Team won the Runners-up Trophy in the Gurucharan Singh Sethi Memorial Inter institutional/Club Hockey Tournament, 2003-04 organized by Guwahati Sports Club. With the completion of a tennis court in the campus there is a renewed enthusiasm for tennis.

Cultural Activities

The cultural activities included participation of the students in various events organized in the campus. The Spic-Macay IIT-Guwahati Chapter organized musical performance by renowned artist Pandit Salil Choudhary in January 2003.

A team from the Institute participated in 'Nihilant' - the annual inter IIT/IIM quiz competition organized by IIM Lucknow.

The students' clubs, viz., the Photography Club, the Movie Club, the Drama Club, the Music Club and the Environment Club undertook several activities during the year.

Student Achievements

The B.Tech project "End-to-End QoS in MultiHop Wireless Ad Hoc Networks" by Abhijit Kumar and Nishit Tewari secured second position in "Intel India Students Research Contest 2003-2004" held during 3-4 May 2004 at Bangalore.

CONCLUDING REMARKS

The Institute can no longer be called new. It has reached this stage in a relatively short span of nine years due to the dedication and hard work of the persons involved in establishing the Institute. A major part has been played by the support staff which has tirelessly worked for the success of the Institute, often under trying circumstances. I can confidently assert that our staff is the most computer literate when compared with all the major educational Institutes of the country. I urge the staff to continue their good work as without their support, this Institute cannot move forward.

Expectations can sometimes run high but they cannot be always fulfilled due to various constraints. I urge the staff to understand this. For example, we will always have to be "short" of staff and we will always be demanding more and more work from you. This is as a consequence of the MOU we have signed with the Govt. restricting the number of staff to a fixed ratio of the number of faculty present.

This brings me to the next point. The number of faculty has increased from 111 to 124, an increase of mere 13. Our goal is to add 40-50 faculty every year for the next three years. This year we will be offering positions to at least 50 new faculty. Already 12 have been made offers. But there is a shortage country-wide, and the situation has been made worse by aggressive hiring by the other IITs due to retirements in those Institutes. We are not able to compete with them, possibly the major reason being the curse of geography. The problem is being further compounded by the flight of faculty to other IITs. Some faculty, who have been here for even 6 years or more are applying to other IITs for positions. The reasons for this are complex and I cannot analyse them at this time. I urge those among the faculty who are so inclined to show more enterprise and to aim higher. It is easy to settle down in a big Institute near home, assured of your daily bread, and to do your bit in teaching and research. It is not so easy to assume leadership roles at a young age and to take risks in building research groups and breaking new paths. We are able to offer you such opportunities. Take them and show your mettle.

We are living in an oasis of plenty amidst an environment that has seen increasing levels of unemployment over the years. Very few new industries are coming up and the people are restive. We must be sensitive to their aspirations and problems. While there is little we can do directly to solve their problems, awareness and sympathy will go a long way.

As for the student community, my only wish is that more of you consider a career in research and development. The boom in IT related jobs in the last few years has seen a large number of students opting for jobs in the corporate sector right after graduating, or doing an MS in the US and then joining the market. Those of you who are interested in technical jobs should realize that it is the better qualified that do better. With Indian industry going up the value chain, the need for employees with M.Techs and with PhDs is going to increase. I appeal to all the graduating students both at the B.Tech and the M.Tech level to consider the option of doing a PhD, maybe after a few years in industry. The placement of students this year has been a remarkable success. IIT Guwahati is proud of its placement record. This is a reflection of the quality of the students, and we hope, a reflection on the quality of our education. But there is no room for complacency. I appeal to all continuing students to not take anything for granted. There is no alternative to hard work.

I wish the graduating students all the best in their careers.

Jai Hind.

Gautam Barua
Director,
Indian Institute of Technology Guwahati.