Vol. 11 No. 2 November, 2005 ISSN - 0972-2548

# FITT FORUM

*A Newsletter of Foundation For Innovation and Technology Transfer,* **Indian Institute of Technology, Delhi**

## From the Desk of the Managing Director

*Since April 2005, the month the last edition of the newsletter FITT Forum was published, a number of significant events happened in the Institute. On behalf of FITT Team let me first congratulate* ***Prof. Surendra Prasad*** *, Deputy Director ( Faculty) of IIT Delhi , who has been appointed the new Director of IIT Delhi.*

*The National Technology Day at IIT Delhi was celebrated in a big way on May 11, 2005. IIT Delhi along with FITT participated in " Education India & Beyond " at Pragati Maidan from Sept. 8-10, 2005. FITT participated in CII Technology Summit from September 18-20, 2005, showcasing of our technologies at IIT Delhi.*

*The Technology Business Incubation Unit (TBIU) programme in the Institute got a boost, with large number of companies showing interest in participating in the programme. During the last six months two companies viz Mechartes Research Pvt. Ltd & OnYoMo are our new entrants to the TBIU.*

*Let me speak a few words on Research &Development aspects of the country. Leading industry associations are realizing that R&D thrust is key to India's competitive strength. India's annual R&D spending hovers around US$3 billion, a mere 0.8% of GDP. For instance, the total investment in 100-odd MNC research labs in India has been close to $1 billion over the last five years,. This gets dwarfed in comparison with US' annual R&D spending of US$265 billion. Countries such as India are small players in the on-going battle over patents. The US is aggressive in pursuing its policy of imposing a patent regime on its terms.*

*One heartening feature at the Institute front is that faculty & Scientists are working overtime to bring their innovations which can be utilized by Industry and benefit the society at large.*

*Super computing facility at IIT Delhi is enhancing and accelerating Indian contributions to computational genomics, proteomics and drug design. A major reason as to why Indian research has languished within the laboratories is due to the lack of focus on cutting-edge research – bioinformatics, nanotechnology, biomedical engineering, oceanography, genomics, aerodynamics, etc. The way forward is to partner with corporate entities . In this respect we have taken a step forward by further strengthening our partnership with Dabur Research Foundation and HCL Technologies to work on high-end projects in the area of drug discovery and development including genomics and proteomics projects.*
*It is hoped that with the committed support of faculty IIT Delhi will be at the forefront of applied research, aiming to serve the nation & the global torch bearer of technology.*

*Prof. K.D.P. Nigam*
*Managing Director*

## Law to Reward Scientists Involved in R&D

The Government plans to introduce a new legislation in the Budget session of Parliament that will ensure that scientists and researchers are not deprived of profits from new inventions.

At a research and development conference organised by FICCI, **Mr Kapil Sibal**, Minister of State for Science and Technology, said, "We want to bring a synergy between academia, research centres and industry. Scientists and researchers working on intellectual property too must get a share of profits."

There are no specific guidelines on intellectual property rights (IPRs) for projects funded by the Government. "Issues related to who owns the IPRs, what are the rules governing them, would the Government have marching rights in case of an emergency and so on, remain unaddressed. Therefore, the Government has initiated a dialogue," said **Dr R. A. Mashelkar**, Director-General of Council of Scientific and Industrial Research (CSIR).

Discussions with various research centres and universities have already been concluded. The Department of Science and Technology will hold internal discussions to finalise the law.

## *Highlights of the Issue*

## Kritikal Solutions Pvt. Ltd.: Succes Story of a TBIU at IITD

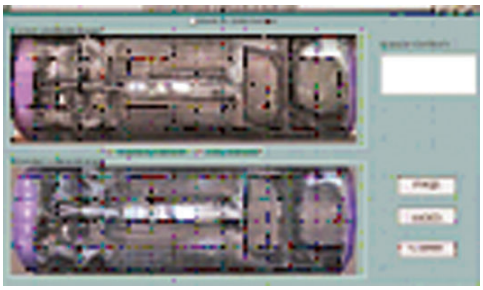
**History**

KritiKal Solutions Pvt. Ltd is the first successful student faculty led startup company to have emerged from the Technology Business Incubator at IIT Delhi. Founded in August 2002 by five eminent faculty members and seven graduating students from the Department of Computer Sciences & Engineering, IIT Delhi, the company is fast emerging as a leading technology design house in the areas of Computer Imaging and Embedded Systems. Over the last three years, KritiKal has matured to become an organization with 26 full time members and established the support team of HR, marketing and finance.

**Latest development**

We have recently shifted our office from TBIU, IIT Delhi to Sector 16 in Noida. The new office area is 2000 Sq Feet and equipped with all necessary amenities.

Recently we have spun off a product company, as KritiKal's subsidiary, named 'KritiKal Secure Scan Pvt. Ltd' (KSS), with the help of a private equity investor. The subsidiary has been formed to commercialize an in-house vision security product.




*Some of the System and Products developed by KritiKal*

**About us**

We do contract product design work in the domain of Embedded Systems and Computer Vision and Image processing for clients and provide them full solutions. Our mandate is to work on high-end part of work chain in these areas and in this process generate high quality

*...Contd. on page 8*

## TECH INCUBATORS

***Hing-end research in IITs and IISc is churning out entrepreneurial success stories***

In the finely landscaped institute campus of the Indian Institute of Technology, Delhi (IITD), sits the technology business incubation unit amidst its departments, centres, laboratories and workshop. With a mandate to promote partnership with new technology entrepreneurs, it has incubated and spun-off 7-8 technology-based firms as commercial enterprises. A similar number of hi-tech incubatees are developing their core R&D skills to join the mainstream. Their advances range from developing high-end IP phones, internet-based technologies in telecom and financial services, GIS-based tools, Bluetooth-enabled energy meters, Wi-Fi/WiMAX-based products and applications, etc.

At another centre in IIT Mumbai, Society for Innovation and Entrepreneurship (SINE) is facilitating the conversion of research activity into entrepreneurial ventures. Success stories from the incubator include Herald Logic which develops products in enterprise information, rule-based engine; Voyager2 Infotech, which built a creative ideas portal and was bought out by Purple Yogi; Myzus Technologies, which develops products and services in the areas of wireless gateways and connectivity bridges.

In Bangalore too, Indian Institute of Science's (IISc) venture with TCS—APDAP (Advanced Product Design and Prototyping) — serves over 150 top notch names in the Indian and global industry. From building an innovative MiG-cum-Mirage helmet for the IAF pilots to a low-cost refrigeration product for serving motels, APDAP leverages both its strong IISc faculty backing and technical skill-sets of TCS.

Dozens of similar examples can be found in the other IITs at Kharagpur and Kanpur as well. They confirm the impression given by recent headlines that the country's leading technology institutes are adopting the concept of business incubation. Says **Ashok Jhunjhunwala**, IIT Madras, "the concept of having an incubation centre attached to a technological university is quite well-known and successful in the industrially-advanced countries. So far, the drive by various IITs to create intellectual property (IP) remained on paper. Now, there is some interest to take it to market."

On the gains to researchers and academicians, he adds, "we academicians learn a lot. It changes the way we teach and do research work. Also, to do some work which is widely used and causes wealth generation is highly rewarding". Mr Jhunjhunwala, who has been involved in developing corDECT wireless in the local loop (WLL) technology, says, "the academia-researcher collaboration at IIT Madras has started 14 companies and come up with a host of technologies."

Says **HM Chawla**, a member of the IIT-Delhi faculty who has been instrumental in setting up Sanmotech, "Indian companies have long been criticised for their low level of investment in R&D. This has prevented them from becoming serious players in global markets. Most companies spend a fraction of their sales, less than 1%, on R&D."

*...Contd. on page 8*

# TECHNOLOGY BUSINESS INCUBATION UNITS AT IIT DELHI

## Mechartes Researchers Pvt. Ltd.

Mechartes Researchers Pvt. Ltd. has been brought into existence with the idea of cultivating and assisting the need for R & D works in the Basic Engineering segment of both the Indian and the Global Industries. We believe that the commercial industry must make quantitative progressions with due understanding of the need for research, to survive competition.

The company was incorporated in June 2005 by IIT Alumni and Professors and has a unit in the TBIU Block of the IIT Delhi.

We would like to build fresh relations between the Industry and the Institutes of Technology by using commercial result oriented approach for time based research projects. The knowledge of technology now available with the universities will not be discarded by the industries as redundant.

We are at present focusing on the Automobile Ancillary Industry and have been successful in our first few ventures.

The research projects taken up by the Mechartes Researchers Pvt. Ltd. can be divided in to these broad categories:

1. Research to fundamentally develop new products/processes.
2. Research on basic engineering involved in the functioning of the product to establish the mathematical relationships.
3. Research to theoretically validate design changes.

The results and information of all the research projects by Mechartes are documented into customized user friendly software which themselves provide an accessible foundation for further research in the field.

The company can cater to complete design needs of an automobile and other sectors, for example, create fundamental designs, redesigning and modify designs to optimize certain output of parameters.

We also have a proficiency in conventional software analysis which provides high quality results to complex analysis problems. The basic tools used by Mechartes for the analysis projects are:

1. Finite Element Analysis (FEA): Software like, - ANSYS, NASTRAN, DYTRAN , ABAQUS, I-DEAS, PAMCRASH
2. Computational Fluid Dynamics (CFD): Software like Flotran , FLU ENT, PAM-FLOW.
3. Customized Analysis Software Developed In-house/ Open Source/ Procured
4. Basic Mathematics
5. CAD Modeling.

For further information, please contact:

*Mechartes Researchers Pvt. Ltd.,*
*TBIU, Block – I Extension,*
*IIT Delhi, Hauz Khas,*
*New Delhi – 110 016.*

## OnYoMo

OnYoMo is an information service that delivers consumer information over internet and mobile devices. The company was started by alumni of IITs and it commenced its operations in August 2005. It is founded on the rationale that as consumers' disposable income goes up, their need for a better lifestyle comprising household products, entertainment services etc. goes up too. However, with the rise in incomes also comes a need for a solution to help consumers sift through heaps of information to locate the product or service that meets their needs. OnYoMo is an effort in this direction – it makes finding all such products and services an easy task. The underlying technologies use sophisticated algorithms to find precise matches to user searches and the platform design ensures that the results are delivered in the shortest possible duration. Extension of the service over mobile devices ensures that the service is accessible to a much larger audience. Finally, analyzing user patterns enables OnYoMo to assist marketers in devising their marketing strategies and designing their product strategies.

For more information, please contact:
*OnYoMo, TBIU, Block-1 Extension, Suite 7*
*IIT Delhi, Hauz Khas, New Delhi – 110 016,*
*Email: info@onyomo.com*

## VirtualWire Technologies

VirtualWire Technologies is wireless and communications technology start-up with significant capabilities in Signal Processing, DSP, Embedded Systems & Software, IP Core Development, RF Design, etc.

VW is offering R&D services, based on a strong research orientation coupled with the above mentioned capabilities, and has partnered with equipment manufacturers in India and UK, for design and development of innovative products.

VW has also developed its own range of VoIP products. It is planning to soon start manufacturing and marketing of its high-end business IP Phone. It is also developing a low cost IP phone, currently targeting a price range of 1-1.5 K INR.

For more information, please contact:
*VirtualWire Tchnologies,*
*TBIU, Block-1 Extension, IIT Delhi, Hauz Khas,*
*New Delhi – 110 016*
*Contact Info: info@virtualwire.co.in*
*Website: www.virtualwire.co.in*
*Ph.: +91 11 26581524*

## *5 Fs of FITT*

***1. Friendliness*** ***2. Flexibility***
***3. Freedom*** ***4. Focus***
***5. Facilitation***

# TECHNOLOGY BUSINESS INCUBATION UNITS AT IIT DELHI

## Elfsys Embedded Solutions Pvt. Ltd.

Elfsys Embedded Solutions was founded in July 2004 by faculty and alumni of the Electrical Engineering Department of IIT Delhi. Elfsys has been focusing on developing technologies in the field of security using its expertise in the domain of wireless and embedded systems. Elfsys main concentration over the last one year has been on the development of a generic sensor network framework that provides very high reliability over wireless links. Sensor Networks, as the name suggests is a wireless network of sensors. The network consists of nodes that contain basic processing power, a wireless unit and a sensor.

The special features of these networks are its robustness & resilience and ease of deployment. They are practically maintenance free and provide the reliability of wires over a wireless medium. These networks are a perfect replacement for wired networks, without the mess of wires. Leveraging on the vast and varied experience of the core team, Elfsys was able to develop a simple test bed of sensor networks within two months of its inception. Keeping the broad expertise in the field of Wireless Sensor Network Technology Elfsys has put its main thrust in solving most of the problems of security.

Sensor network is a generic technology that can be put to many uses based on the sensor being used. Although Elfsys concentrated on this technology solely from the security point of view but during the course of development we have come to the conclusion that security is just one of the many problems this technology can solve. This view has actually been corroborated by market inputs as well. Some of the applications that can be targeted using these networks include, Home Security, Home automation, disaster management, industrial monitoring, supply chain management, automated meter reading etc.

For further information, please contact:
*Elfsys Embedded Solutions Pvt Ltd.,*
*TBIU, Block – I Extension, IIT Delhi, Hauz Khas,*
*New Delhi – 110 016. Phone: 011-26581524 Extn – 1*
*Email-info@elfsys.net, Website: http://www.elfsys.net*

## Sanmotech Labs Pvt. Ltd.

Sanmotech laboratories are engaged in the development of new generation of multi-tasking sunscreen activities for protection from ultraviolet radiation and prevention of photoageing and sunburns. The new activities are based on the research work carried out by **Prof. H. M. Chawla**, Department of Chemistry and his co-workers at IIT Delhi.

The active molecules are based on macrocyclic metacyclophane molecular framework. During the course of past one year, Sanmotech Labs have narrowed down the search for sun protectants and one active ingredient has been identified and synthesized in the laboratory. It has been completely characterized by UV, IR, NMR and FAB-Mass spectroscopic methods and preliminary efficacy data on the compound has been collected. New formulations are being developed for dermal applications.

Sanmotech Labs are exploring the use of the sun protectant for coating spectacles, glasses and buildings. Sanmotech Labs are collecting data on other molecules submitted to FDA (USA) for sun protection by competing companies for comparison and market evaluation while simultaneously negotiating with commercial organizations for synergy and launch in the world markets since the Sanmotech active seems to be superior to all existing organic sun protectants in many respects.

For further information please contact:
*Prof. H.M. Chawla, Department of Chemistry, IIT Delhi*
*Hauz Khas, New Delhi-110016*
*E-mail: hmchawla@chemistry.iitd.ernet.in*

## GridSolv

GridSolv has been admitted as startup company into the FITT-sponsored Technology Business Incubator Unit (TBIU) at IIT Delhi on 1st *February, 2005.* The company's vision is to develop advance software solutions that leverage Web/Grid Computing Technologies and Open-Source Software. It focuses on building reference architectures, frameworks and reusable compute and data services with an emphasis on delivering the end product through composition and refinement. It results in lower cost, higher quality and lower delivery times.

"FITT sponsorship of GridSolv will contribute immensely to our growth", said Vikul Khosla, CEO of GridSolv, "our association with IIT Delhi, faculty, students, and leading-edge research as well as having access to the large pool of computational resources at IIT Delhi provides a strong foundation to grow the company."

**Services Offered**

*A) Product Life Cycle Collaboration*
--For early stage software startups looking to build Grid enabled platform products or business applications that leverage a Grid enabled infrastructure.

*B) Enterprise Solutions*
--For Enterprises that wish to deliver business functionality through composition of Compute and Data Services on top of a grid enabled infrastructure leveraging commodity hardware.

**Industry Focus**

--Enterprise Analytics
--Seismic Data Processing
--Bioinformatics
--HPC in Automotive, Aerospace
--Scientific Applications
--Telecom converged Applications

**Technology**

| *Open Source* | *GridSolv* |
|---|---|
| Globus WSRF | Horizontal SOA Frameworks |
| LAMP Stack | Vertical SOA Frameworks |
| Data Grid | Core infracstructure Services |
| Other Grid Middleware | Untility Services |

*For more information please contact*
*Mr. Vikul Khosla, CEO*
*TBIU Block 1, Suite 5, IIT Delhi, New Delhi, India - 110016*
*E-mail: vkhosla@gridsolv.com Website: www.gridsolv.com*

## AIIMS, IITD Join Hands to Nip Disease in the Bud

Imagine a surgical tool so microscopic that it works at the cell level, diagnosing and delivering drugs at the most basic stage. Science fiction? Not really, it could soon be reality, if a collaborative research venture between the All India Institute of Medical Science (AIIMS), and the Indian Institute of Technology, Delhi (IITD), bears fruit. The collaboration is to be in the field of nanotechnology, with the basic thrust being on the health care delivery system. In his introductory speech at the launch of the initiative, **Dr. Venugopal**, Director, AIIMS, said: "Nanotechnology has the potential to provide us nano-instruments to examine cells and tissues in unprecedented detail…so, if this information is available to the scientists they can work out direct nano-intervention techniques which can nip the diseases in their buds." While the final blue print for the collaboration is still being worked out, some core areas like cardiology, cardio-thoracic surgery, cancer and orthopaedic implants are already being earmarked, said AIIMS spokesperson, **Dr. Aarti Vij.**

*( Source: Times of India, September 4, 2005)*

## IIT Cashes in on Tech Transfers

The Indian Institute of Technology, Delhi, recently handed over a vehicle authentication system to public sector units BHEL and ECIL. At a 5 per cent royalty from both firms, the transfer is expected to leave the institute richer by Rs 30 lakh annually.

This is just a small part of the kind of resources the industry-academia interface at IIT-Delhi, under the stewardship of the **Foundation for Innovation and Technology Transfer,** has been generating in the post-liberalisation era.

In the last four years, IIT-Delhi has made about 15 different technology transfers to various industries. Compare that with the 19 transfers in the eight years before that, and the figures speak for themselves.

In fact, over the past couple of years, the institute faculty itself has been generating Rs 30 crore of the total budgetary allocation of Rs 100 crore through technology transfers, consultancies and sponsored projects.

Says **Professor K. D. P. Nigam**, Managing Director of FITT, ''Although globalisation happened in the early 90s, it took the industry almost a decade to realise its full impact. The largescale incursion of imported items, that are of better quality, and cheaper, hit the process industries hardest. Then came the international pressure to promote eco-friendly industries and it was sheer compulsion that made the industry turn to us for solutions.''

Apart from these, FITT and the institute's Industrial Research Unit together receive some 500 queries annually from the firms on various issues.

Some of the other technologies that have been transferred out of IIT include a microwave-integrated circuit kit —— a first in the country —— developed by the Centre for Applied Electronics, rustguard technology developed by the Centre for Polymer Science and a bobbling testing technology for wool developed by the Department of Textile Engineering.

The patent scene too has never looked so good. In the last four years, IIT-Delhi has been granted 35 patents, second only to its counterpart in Kharagpur.

**The Road Ahead**

Negotiations are on with Indian and foreign firms over technology for producing 100 pc pure optical grade lactic acid, developed by the Department of Biotechnology. "It is estimated to be worth about Rs 60-70 lakh," says IIT's **Prof K.D.P Nigam**. Also, heat-transfer technology developed in the Department of Chemical Engineering is awaiting a deal.

*(Source: Indian Express: Express Newsline May 15,2005)*

## IIT Delhi Dresses Up Cycle Track

The CYCLE track at Pankha Road is being redesigned as a model track by MCD. Experts from IIT and Denmark are supervising the new look which will cost Rs.1.8 crore. The track was constructed on the recommendation of the Traffic Police for the convenience of labour population frequenting the nearby Mayapuri industrial area on cyclists. However, the track is hardly used by the cyclists, who prefer to ride to the main road. MCD Commissioner **Rakesh Mehta** said that the present road engineering is motor-driven. "Cycle tracks are not being used because they are not designed to suit the requirements of the cyclists," he said.

Danish experts along with **IIT's Transport Research and Inquiry Prevention Programme (TRIPP)** conducted an audit of the 3-kilometer stretch in February 2004. " The experts concluded that the track was not being used by cyclists because it was ill designed. It was found that it was physically impossible to cycle through the stretch because it had garbage bins, street poles, slums, motor repair shops and trash dumped all around," said **Geetam Tiwari of TRIPP**. Also the Pankha Road track is poorly designed- it starts just after a busy intersection and ends just before another busy intersection.

" The cyclist would not feel safe suddenly merging into heavy traffic. The track provides poor safety: There is an open drain along one side and the lighting is poor: The track comes across as a secluded lane that cyclists tend to avoid," she said. Experts objected to the track doubling up as a service lane.

"Also, the track has an incoherent logic- it is constructed only on one side of the road. Tracks should be on either sides of the cross section so it can be used by cyclists heading in different directions," she said.

TRIPP has provided the MCD with an alternative design for the Pankha Road cycle track, which has cycle lanes on both sides. The new design also has provision for parking of rickshaws, curbstones around trees, fencing, landscaping, proper signages and road markings.

*( Source: Hindustan Times, July 16, 2005 )*

# Tech Renaissance

*Researchers are working overtime to productise R&D and bring it out of the laboratories*

Notwithstanding decades of slow decisions, frightening documentation and divergent timeframes, which have confined world-class research to the laboratories, Indian research and universities are in the midst of a technological renaissance. Researchers are overcoming obstacles to productise their R&D into meaningful products and solutions. Following the footsteps of their counterparts in US and Europe, Council of Scientific and Industrial Research (CSIR) centres, Indian Institutes of Technology (IITs), Indian Institute of Science (IISc), among others, are following a two-pronged strategy: focus on cutting-edge research which is relevant to society, and partnering with corporate entities to transfer their research from the confines of laboratories to the market.

No wonder, research work, so far focused on electronics, computing and software engineering, is now strong on life sciences. Consider this. Institute of Genomics and Integrative Biology (IGIB), a constituent laboratory of the CSIR, has a four teraflop (a teraflop is a measure of computer speed and equates to a trillion floating-point operations per second) supercomputer to advance its life sciences computational biology research. It is using XC3000 HPC cluster with 288 nodes based on dual-Xeon 3.6 GHz ProLiant servers running Linux. The supercomputer vaults IGIB into the ranks of global research institutions such as Pacific Northwest National Laboratory, Pittsburgh Supercomputing Center, Sandia National Laboratory and Los Alamos National Laboratory that have implemented ultra-scaleable, multi-teraflop supercomputing systems. IGIB's scientific exploration ranges from genes to proteins and from biotechnology to pharmaceuticals and personalised medicine. The supercomputer will be used to meet these increasingly complex needs of life sciences research that have advanced beyond genomics, says Samir Brahmachari, Director, IGIB.

Tata Institute of Fundamental Research (TIFR), Pune, has a one teraflop installation with 78 nodes in clusters based on the 64-bit Itanium 2 processor running Linux. It is utilised to conduct research in computation and mathematics. George Paul, executive VP - marketing, HCL Infosystems says, "Indian research and scientific institutes are adopting IT infrastructure and computing solutions on open architecture to do some high-end research work".

Centre for Cellular and Molecular Biology (CCMB), Hyderabad, has established the country's first facility for advanced microscopy and image analysis to help during examination of normal and disease cells at very high resolution and monitor molecular interactions in living cells. The new facility consists of laser scanning fluorescent microscopes with a high-speed and 3D stereo-imaging systems. It would help in collecting, collating and disseminating information regarding advances in microscopy and imaging systems, besides providing a forum to serve as a beta-testing centre in India for new microscopes and imaging systems.

Similarly, a supercomputing facility at IIT Delhi is enhancing and accelerating Indian contributions to computational genomics, proteomics and drug design. The facility currently hosts a 70 processor (Ultra Sparc III 900 MHz) cluster over a Gigabit switch — the aggregate compute power of the facility is over 100 Gflops.

Says an IIT Delhi faculty member, "A major reason as to why Indian research has languished within the laboratories is due to the lack of focus on cutting-edge research — bioinformatics, nanotechnology, biomedical engineering, oceanography, genomics, aerodynamics, etc". A key reason as to why there are hardly any takers for BioSuite, a collaborative effort between 18 research institutes and three industries. "Though it was designed to serve as a multipurpose tool for carrying out diverse bio-analysis ranging from gene analysis to comparative genomics, it is outdated and similar other packages are available in the market," he adds.

The way forward, according to researchers, is to partner with corporate entities to make research meaningful. A case in point is that of IIT Delhi's partnerships with Dabur Research Foundation and HCL Technologies to work on high-end projects in the area of drug discovery and development including genomics and protemics projects.

Sudipta K Sen, MD and CEO, SAS Institute (India) says, "the life sciences industry has seen dramatic changes. Blockbuster drugs are becoming increasingly hard to find, approved drugs have been pulled from the market for safety concerns and costs are soaring."

In such a scenario, partnerships are win-win for both: corporates reduce their R&D burden and research institutes get valuable assistance to productise their research into products and services.

*(Source: Reproduced from Financial Express, 7 November, 2005)*

## IITs Abroad: As Good as it Gets Back Home?

This is one branding everyone would love to have. No wonder countries such as Mauritius, Singapore and UAE are wanting a piece of the IIT Brand. But can it be replicated abroad? Will Nehru's vision for IITs- institute par excellence imparting top-range technical education-envelop other countries too? IIT dons say yes, it can, provided the exacting standards here are matched there too.

IIT-Kharagpur Director **Prof. S. K. Dube** cautions, "If the institutions are opened in haste in good numbers, it'll create problems-mainly for the new institutions and partly for the existing IITs in terms of migration of faculty. Also, the quality of education may suffer. If done gradually, it's a feasible idea. Quality should be strictly maintained at the same or at a better level to keep IITs' reputation intact.

There are three factors that make this Brand. Firstly, the students who are brand ambassadors in their own right, says Dube.**Prof. S. S. Sirohi**, former IIT Delhi director and V-C, Bhopal University, says, "They come from different backgrounds and are provided the best opportunity at IITs to integrate well. Where else will you get engineers turned-journalists, or even musicians? Secondly, the superb faculty at IITs. Thirdly, the research here is one of its main assets, attracting quality scholars and earning valuable revenue." Check out the innovations done here- continuous renal replacement machine at one-fifth the cost of imported machines, low-cost motorized artificial hand, LPG stove for the visually handicapped, improved antimicrobial sutures…" And IITs abroad should meet these conditions," emphasizes Sirohi.

To maintain this Brand, says **Dr. S. K. Guha**, IIT Kharagpur, the entire system will have to be operated on a different scale. "The narrow sarkari pattern of induction of faculty, and so-called 'democracy' in each step will need to be relooked so that new dimensions of international programmes are brought in. If proper precautions are not taken, there could be a sidelining of the training effort in India." Faculty too should be looked into. Sirohi asks, "When IITs here are facing faculty shortage, how can we spare them for IITs abroad? Also, can the commitment shown by students here- they get in after a rigorous exam and two years' coaching- be replicated abroad? What's desirable is faculty exchange programmes and joint research with institutions abroad." Disparity in faculty salary structures in IITs abroad and at home would also need to be looked into, says Dube.

Further, it needn't be the whole institution, but could be a campus like the one IIT Bombay is opening in Singapore, says **Prof. D. P. Kothari**, the then director-in-charge, IIT-Delhi. **Dr. Deepak Dogra**, president, IIT-Delhi Alumni Association, Gurgaon asks, "Will the rigorous Joint Entrance Exam for IIT selection be conducted abroad?" If the conditions are met, by all means start IITs abroad, say the dons. " Any scheme if implemented with planning and care will not lead to problems. Take BITS, Pilani-it already has a BITS campus in Dubai," says Kothari. And though Mauritius is a small country with educational facilities which don't meet international standards,"this beautiful island could be a good choice in attracting students from other countries to an IIT there. However, places like Singapore are better equipped for an IIT," says Dube.

And yes, the world is large enough and good students deserve quality education. Just make sure, says these experts, that the final product abroad is as good as the one back home.

*( Source: Times of India, May 1, 2005 )*

## IITians Showcase Innovations at Design Show

If you visited IIT Delhi campus this past week, you might have noticed futuristic tractor-like contraptions, zipping around at top speed. They are prototypes on display at the Design Show 2005, — a celebration of the 11th year of the Master of Design programme at IIT, Delhi.

There is, for instance, a three-wheeler designed for paraplegics, a product of 23-year-old Vishwas Morghare's collaboration with the Indian Spinal Injury Centre. "I interviewed more than 25 paraplegics for feedback on the inconveniences they face while moving in a vehicle. Most of these working professionals said their biggest difficulty was in having to be lifted in and out of a car. Plus there's never any space inside for a wheelchair, not even in the metro or a bus or a taxi." His solution? A 65 cc engine attached to collapsible rails, on which the paraplegic can manoeuvre himself into the vehicle.

The next time your mobile phone battery runs low, don't fret. Just attach the magnetic base of your wind powered phone charger to the top of your car, or clip it on to your helmet visor while you cruise along the highway. "An average colour screen mobile phone consumes about 5.7 volts of power. If you are moving above 25 kmph, the little blades will rotate and behave like a dynamo, generating enough power to charge your phone," says design student Amit Sabherwal, who plans to patent the product made out of waste computer hardware at a manufacturing cost of Rs.150.

Tucked away in a corner of the Industrial Design Studio is a table arranged with cream-coloured miniatures. "Perfume bottles designed for celebrities," Sabherwal tells us. So while Big B's bottle looks rather like the Oscar statuette, Sushmita Sen gets a flamboyantly curved structure.

From space saving furniture to a Road Runner which looks like a pogo stick, this was a good opportunity to see great ideas being translated into reality.

*( Source: Express Newsline, June 23, 2005 )*

## IITs Rated as World's Third Best

The Indian Institutes of Technology (IITs) have been ranked the third best technology universities in the world for 2005, according to the prestigious Times Higher Education Supplement (THES).

The publication, which is highly respected and read in the world of academia, said: "Our peer review of the world's top technology universities shows that in 2004, the high praise for the Indian Institutes of Technology was no fluke.

"Up to third position in 2005 from fourth place last year, the IITs are a source of Indian national pride as well as innovation and wealth".

Among science universities, the IITs have been ranked 36th in the world.The THES table shows that the technologists among our peer review panel regard Imperial College London as the UK's hottest university, ahead of Cambridge University and fifth in the world.

The ranking is dominated by the US it appears 26 times in the top 101 institutions in the list.

"Our definition of technology covers the main engineering disciplines including information and communications technology.

"Viewed alongside the tables for science subjects, our rankings suggest it is possible for a university to be strong in science but not technology, and vice versa", THES said.

*(Source: Times of India, 10 October, 2005)*

## IIT Delhi All Set to Patent Insulin Tablets

If IIT Delhi has its way, then it would take just a few pills a day for diabetics to make insulin injections a thing of the past. IITs oral insulin delivery system is one of the 25 products which have been forwarded to the concerned authorities for a patent. The 'Oral Insulin Delivery System' uses PH sensitive polymeric hydrogel based microparticles which are put inside a gelatin capsule. A patient would require 2 or 3 capsules per day and each capsule would cost Rs.50. Diabetes mellitus is characterized by destruction of insulin secreting beta cells of the pancreas and inability to maintain blood glucose level.

The brain behind the project are IIT's **Prof. Harpal Singh** of Centre of Biomedical Engineering, IIT student **Amit Tyagi** and **Dr. S. S. Lahiri** of DRDO. Dr. Singh said," Insulin injection cannot duplicate the psychological pattern of insulin release. Besides, these injections are very painful and chances of an infection at administration site are high".

"Insulin is protein in nature as it undergoes inactivation by acids in gastro intestinal tract in stomach. The capsule will overcome these difficulties because after being swallowed, while the gelatin, capsule is dissolved by the stomach which is of acidic medium, the insulin laden micro particles will go to intestines where the medium is basic. From here they are released in the bloodstream which is basic in nature and not harmful for the protein. The entire process will take three to four hours," added Singh. This has been successfully tested on rats and there is a strong potential for human trials.

Statistics reveal that IIT Delhi which applies for 20 to 25 patents every year is second to IIT Kharagpur which applied for 40 to 50 patents. In the last four years, IIT Delhi has patented 40 products. This is followed by other institutes in Mumbai, Chennai, Roorkee and Guwahati. The categories in which patents are usually applied for include electronics and communication, biochemical and biotechnology, rural development, polymer, plastics and rubber, chemical engineering and others.

*(Source: The Hindustan Times, October 23, 2005 )*

**...Success Story of a TBIU** *(Contd. from page 2)*

intellectual property. KritiKal Solutions (Pvt.) Ltd wants to maintain its positioning as a hi-tech design house and aims to attract talent from top technology institutes in the country.
Simultaneously, whenever the design house comes up with innovative products while working on new and high-end technology, we plan to commercialize these products by either product spin-offs or IP licensing. Recent formation of KSS is first in the series of such product spin-offs.

We have identified following five focus areas to achieve high growth rate. These areas include Machine Vision, Traffic Solutions, Automotive Embedded, Security & Surveillance and Computation Intensive Embedded Systems.

We are looking for venture capital funding to scale up and achieve desired growth rate as per our business plan.

**Contact**
*Madhup Bansal, Business Development Manager*
*A – 28, Sector 16, Noida, Ph: +91 120 5310 387, 98184 13123*
*Fax: +91 120 2516 701, Website: www.kritikalsolutions.com*

**...TECH INCUBATORS** *(Contd. from page 2)*

He adds: "Today, however, the scenario looks different, perhaps not vastly, but certainly noticeably. A few sectors like IT, telecom, pharmaceuticals, automobiles and biotechnology, are leading the charge in the R&D field. Mr Chawla's start-up has developed an indigenous technology for sunscreen creams based on natural products with anti-ageing properties. It is in advanced stage of discussions with overseas firms for fine-tuning its R&D work for commercial applicability.

On the rapid surge in India's R&D investment and scientific output, Microsoft Research India MD P Anandan says, "the drive to develop core R&D skills was, in large part, prompted by the threats and opportunities presented by globalisation.

Statistics, albeit incomplete, show a rapid surge in the percentage of patents issued to and science journal articles published by scientists in India. Indian companies are quickly becoming the second-largest producers of application services in the world, developing, supplying, and managing database and other types of software for clients around the world.

Says **Vishal Chandra**, CEO of Virtual Wire Technologies, a wireless and communications technology start-up, "India's greatest overall advantage is its huge supply of scientists and engineers, particularly at a time when students in the west are turning away from science and engineering. While technology business incubation appears to be a very relevant concept, insufficient grants and near absence of venture funding is crippling." Virtual Wire has developed its own range of VoIP products. It is planning to soon start manufacturing and marketing its high-end business IP phones.

Through preferential policies, Indian tech institutes and universities are improving the quality of their science and ensuring the exploitation of future innovations.

*(Source: The Financial Express,eFE, 24 October, 2006)*

# FOCUS ON A DISTINGUISHED FACULTY OF IIT DELHI

In this issue of FITT-FORUM, we are covering the Research & Development achievements of Prof. A.K. Gosain, one of the distinguished faculties of IIT Delhi.

## Prof. A. K. Gosain

**Prof. A. K. Gosain**, is a distinguished and renowned Professor in the field of Water Resources Engineering and GIS Technologies. After completing his under-graduation in Civil Engineering from Punjab Engineering College, Chandigarh, he has done his M. Tech. and Ph. D. in Water Resources Engineering from the Department of Civil Engineering, IIT Delhi. He joined the Civil Engineering Department, IIT Delhi as a lecturer in 1979. He was selected to the position of Assistant Professor in 1986 and was elevated to the position of full Professor in 1997.

Prof. Gosain has been associated with the research and development work in the area of hydrological modeling, water management, climate change impact assessment, Geographic Information System, and many allied areas. Some of the recent works of Prof. Gosain include contribution made to the NATCOM – national project undertaken by the Ministry of Environment and Forests for making the National Communication to the United Nations Framework Convention on Climate Change (UNFCCC). Prof. Gosain and his team undertook the segment on Vulnerability Assessment & Adaptation for Water Sector and quantified the possible impact of the climate change on the water resources by performing distributed hydrological modeling of the river basins of the country.

He has also been spearheading the research on formulation of appropriate technologies for water resource planning and management, first through a UNDP funded project with the Department of Science and Technology, and recently through a Department for International Development (DFID) funded collaborative project "Low Flows" with the University of Newcastle, UK. Through these initiatives, Prof. Gosain is demonstrating the use of latest technologies of hydrological modeling and GIS for providing scientific backup and sustainable approach to the watershed interventions.

All along Prof. Gosain has been actively participating in collaborative research and development. He was a member of the core team of Indo-UK collaborative research project on Newer Techniques in Highflow Range Forecasting during 1980-84. He was the coordinator of IIT Delhi MoU with ESRI India from 1996-2002. He is also the coordinator of a MoU with SWAT hydrological model group at the Agricultural Research Service, Blackland, Texas, USA from 1996 to date.

Prof. Gosain has served on many prestigious assignments. He was a consultant to the World Bank funded project to help the Ministry of Water Resources to formulate the Hydrology Project Phase II, in 2004. He was consultant to Andhra Pradesh Government, as a member of the review committee on the World Bank supported project on "Hazard Mitigation Studies", in 1999. He was consultant to IIMI, Sri Lanka, on MIS development activity in Gandak Project for their INDIA-IIMI project in 1993. He was full time Senior Consultant to Water and Power Consultancy Services (India), from 1989 to 1990, on the USAID funded program to establishing the Water And Land Management Institutes (WALMIs) in eleven States of India. He helped the training institutes in building their microcomputer facilities and to initiate the use of microcomputers in the area of irrigation water management. He introduced the concepts of Management Information Systems (MIS) in water management during this tenure.

Prof. Gosain has also served on many important committees of national importance. He was a member of a sub-group of the Task Force on Interlinking of Rivers formulated by the Central Government under the Chairmanship of Mr Suresh Prabhu, Member of Parliament, in 2003. He has served on the National Standing Committee on Watershed Conservation and Development Programme, Council for Advancement of People's Action and Rural Technology (CAPART) in 1998 and has again been appointed to serve a second term in 2004. He is a member on the council of National Institute of Hydrology, Roorkee. He is also a member of the Monitoring Committee for ISO/TC 113 Works, a sub-committee of International Organization for standardization, since 1999. He has chaired many committees for specific tasks for many national organizations.

Prof. Gosain has to his credit a very large number of sponsored research and consultancy projects. Most of his research projects are oriented towards field level applied research problems. He is one of the few faculty members who have undertaken international consultancy projects. He executed a project to develop a mathematical model for the hydrologic simulation of Trasimeno Lake in Italy. He is a firm believer of using the technology for the benefit of the society. It is with this intention that he took the challenge of establishing one of the first TBIU units under FITT in 2001, by the name INRM. Since then, along with his extended team, Prof. Gosain has been providing cutting edge solutions in the area of natural resources management and GIS to national and state organizations as well as private industry.

Prof. Gosain has to his credit 22 papers published in refereed national and international journals and 53 papers in national and international conferences. One of his papers got the Mausam gold medal award for best paper. Ten students have completed their Ph. D. under his supervision. He has supervised 35 M.Tech theses and a large number of B.Tech projects. Twice his B.Tech students won SURA project award. He has delivered a large number of invited lectures in India and abroad. He has also visited a large number of foreign universities and delivered lectures. Invited lectures in Harvard, USA in 1999 and in Karlsuhe university, Germany in 1996 are the prominent one.

He has introduced the GIS as an elective course in the undergraduate and postgraduate curriculum of the IIT Delhi. The courses are very popular with the students of various programmes across the Institute. He has also been instrumental in establishing the computational facilities in the Department such as the Simulation Laboratory of the water resources section and the Computational Laboratory- a central computational facility in the department.

He may be contacted on the following address:
*Prof. A. K.Gosain, Civil Engineering Department*
*IIT Delhi, Hauz Khas, New Delhi-110 016,*
*E-mail: gosain@civil.iitd.ernet.in*

## National Technology Day Celebration


*(L to R: Prof. B.C. Nakra; Prof. K.D.P. Nigam, MD, FITT; Prof. D.P. Kothari, then Director-in-charge, IIT Delhi; Prof. Surendra Prasad, Deputy Director (Faculty), IIT Delhi; Prof. Arun Sharma; Prof. V.K. Srivastava, then Dean (IRD))*

The National Technology Day was celebrated at IIT Delhi on Tuesday, the 11th May 2005 with a well attended seminar meeting in the Senate Room of the Institute. The function was organized under the aegis of FITT. Prof D. P. Kothari, former Director-incharge, IIT Delhi presided over the function.

Four distinguished speakers amongst IIT Delhi faculty members made presentations in the areas of Developments in Vibrations and Noise Engineering, Accessing Legacy Documents on the Web, Geo-Technical Earthquake Engineering, From Kinetics to Molecular Machines: Unraveling Biological Membrane Fusion. IIT Delhi faculty members who made the presentations were **Prof. B. C. Nakra** of the Mechanical Engineering Department; **Prof. Santanu Chaudhury** of the Electrical Engineering Department, **Dr. G.V. Ramana** of the Civil Engineering Department and **Dr. Aditya Mittal** of the Department of Biochemical Engineering and Biotechnology.

## FITT-Corporate Membership

An information support service unit had been set up in FITT since its inception in 1992 in order to keep abreast the industry with the technological developments, research activities and faculty and expertise of IIT Delhi and also to help IITD faculty to access details on industries as well as technology development information worldwide. In this endeavour a project has been developed at FITT known as **Corporate Membership Scheme** of FITT. FITT invites the industry/industry associations/R&D organizations and financial institutions to become corporate members of FITT at a nominal fees.

A Corporate Member client can participate in Technology Transfer and joint R&D programmes of the Institute on a priority basis, with FITT providing the interface.

To become a corporate member of FITT, please send the corporate membership form duly filled with a nominal fee, which can be available on request from FITT office or can be downloaded from the FITT website (http://www.fitt-iitd.org). For the details contact:

*Partha Bhattacharya, Executive Consultant (Info. & Doc.)*
*FITT, IIT Delhi, Hauz Khas, New Delhi-110016*
*E-mail: parthab@fitt.iitd.ernet.in, Phone- 91-011-26581013*

## List of IPR Applications Approved/Filed/Processed by IITD-IPR-SC during April 2005-October, 2005

| *Sl. No.* | *Title of the Invention* | *Principal Inventor/ Deptt./Centre* |
|---|---|---|
| 1. | A New Surface Accumulation Layer Transistor (SALTran) Concept for Current Gain Enhancement in Bipolar Transistor | Pror. M. Jagadesh Kumar, DEE |
| 2. | A system for achieving Broadband, lossless flat-gain Raman amplification by using an asymmetrical twin-core fiber' | Prof. K. Thyagrajan Physics |
| 3. | Synthesis of Mercury Cadmium Telluride Nanoparticles by Solvothermal Technique | Prof. Viresh Dutta, CES |
| 4. | Innovative Heat Exchanger | Prof. K.D.P. Nigam, D.Ch.E |
| 5. | A System and Method for Routing of Data in Sensor Networks | M/s. Elfsys Systems |
| 6. | A Thermography based method for detecting defects in materials | Dr. Suneet Tuli CARE |
| 7. | Crypto System Identification using Neural Networks | Prof. B. Chandra, Mathematics. |
| 8. | A Chaos based system for public key encryption | Dr. Ranjan Bose DEE |
| 9. | A New Asymmetrical Double-Gate Poly Si TFT with Modified Channel Conduction Mechanism for Highly Reduced Off-state Leakage Current | Prof. M. Jagadesh Kumar, DEE |
| 10. | Synthesis of Mercury Cadmium Telluride Nanoparticles by Solvothermal Technique | Prof. Viresh Dutta CES |
| 11. | High Breakdown Voltage Lateral Schottky Collector Bipolar Transistor | Prof.M.Jagadesh Kumar, DEE |
| 12. | Development of Contact Microbial Killer Quaternary Amine Acrylate Based Hydrogels for Water Disinfection | Prof. Harpal Singh CBME |
| 13. | Suspended stripline based hybrid dielectric waveguide | Prof. S. K. Koul, CARE |

It is to be noted that all IPR related activities in IIT Delhi is co-ordinated by FITT.

For further details please contact:
*Mr. Mohit Mahajan, Executive Consultant (IPR & TT)*
*FITT, IIT Delhi, New delhi-110016 Phone: 91-011-26597116*
*E-mail: mahajanipr@yahoo.co.in*

## Presentation by MD, FITT

**Prof. K.D.P Nigam,** Managing Director, FITT attended a meeting at Indian Institute of Foreign Trade (IIFT), New Delhi on '*Union Budget, Knowledge Management and E-learning'* on April 01, 2005.

On September 13, 2005, he made a presentation on *'Technology Transfer'* in a 2-day Workshop organised by M/s. Mark Evans at Mumbai.

## HRD Programme for Defence Personnel

Two short term courses on ***System Administration*** were organized by Computer Service Centre ( CSC) of IIT Delhi, under the aegis of FITT, for the technical personnel of DIPAC, an establishment under Ministry of Defence , Government of India.

The first programme, was held for 10 days from July 19, 2005 to July 29, 2005. The Title of the Programme was "***Training Programme on Unix Administration.***"

The Second Programme which was held for 5 days from September 26, 2005 to October 01, 2005. The title of the programme was "***Linux Network Servers Administration***." The sessions covered were Networking & TCP/IP Basics; Linux Network configuration: commands & GUI; Apache Web server administration; DNS essentials and configurations; DNS secure configuration-Firewalled dual-DNS; E-mail service overview, sendmail configuration; Mail service management features, procmail,spam control, log and header analysis; Ldap & email services; Securing networked systems, tools and practices & Practical Assignment.

The co-ordinators for the Programme were **Prof. B. P. Pal** & **Ms. Akhila Sinha**.

## Workshop on "EMBEDDED SYSTEMS: ADVANCES & APPLICATIONS" ( October 21-23, 2005)

A three day intensive workshop on "EMBEDDED SYSTEMS: ADVANCES & APPLICATIONS" was organized at IIT Delhi, under the aegis of FITT from October 21-23, 2005.

*Participants at the Workshop*

The goal of this workshop was to convene interested engineers and teachers, researchers from a wide cross section of academia, industry, and R&D establishments to understand the recent trends and advances in developing and deploying embedded systems over a wide range of applications. The following topics were covered in this workshops viz., recent trends in Processor Architecture for embedded Systems; Trends in Embedded Operating Systems; Networking in Embedded Systems; Soft Computing Techniques for Embedded System Control; Distributed sensing; Pervasive Computing Applications; Embedded multimedia and Biomedical appliances.

## Education India and Beyond

IIT Delhi participated in an exhibition and conference on **"Education India and Beyond"** held at Pragati Maidan during September 8-10, 2005. This was an International exhibition on education in which universities from India and abroad participated and displayed their curricula, research directions and admission procedures. The focus country was Holland from where 12 universities participated. The IIT Delhi stall was jointly prepared by ETSC, IRD and FITT and the objective was to share the IIT vision and academic culture with the visitors. There was an impressive display of posters depicting the IIT vision, academic departments and achievements in research and consultancy. A special film containing IIT history and achievements, highlights of the Eklavya technology channel and an interview with the deans of undergraduate and postgraduate studies at IIT Delhi was constantly run in the stall to give visitors a close look into the ethos of IIT, Delhi.


*Students visiting the stall of FITT-IIT Delhi*

There was also a conference on " India as a Global Player in Education: Opportunities & Challenges" in which faculty of IIT Delhi presented two papers. The first paper titled , "IITs as provider of Scientific & Technical Education in Global Context" was presented by Prof. Anshul Kumar, Dean, UG, and the second paper titled, " The Educational Technology Initiatives of IITs: A Global Perspective" was presented by **Prof. Kushal Sen** and **Prof. Arun Kanda** of the ETSC. Both the papers evinced an enthusiastic response from the audience and there was a lively discussion.

## Certificate Course on Embedded Systems and Applications

Based on the curriculum and courseware developed on Embedded Systems as an internal project, the Fourth **Certificate Course on Embedded Systems and Applications** was ended successfully on May 15, 2005. Based on the feedback received in the last four course from participants and industry, next (Fifth) course will be announced soon. There will be around fifty participants to be enrolled in the course and the candidates' eligibility criteria will be-aggregate 60% marks or above in a Graduate degree (4 year BE/B.Tech. or M.Sc) in Electronics/ Electrical Engineering/Computer Science & Engineering/ Electronics Engineering & Telecommunication/Instrumentation or Master of Computer Applications (MCA). It is essential to have proficiency in C/ C++ and Java, exposure to Computer Architecture, Operating System,

Computer Networks.The course will have 10 modules with the following broad contents:

**Core Modules**

--Introduction to Embedded Systems

--Designing Embedded Computing Platform

--Operating System for Embedded Systems

--Embedded System Architecture

--Programming Embedded Systems

--Network Based Embedded Applications

--Embedded System Development

**Application Modules**

--Embedded Control Applications

--Applications in Telecom

.

--Multimedia Applications

•

.

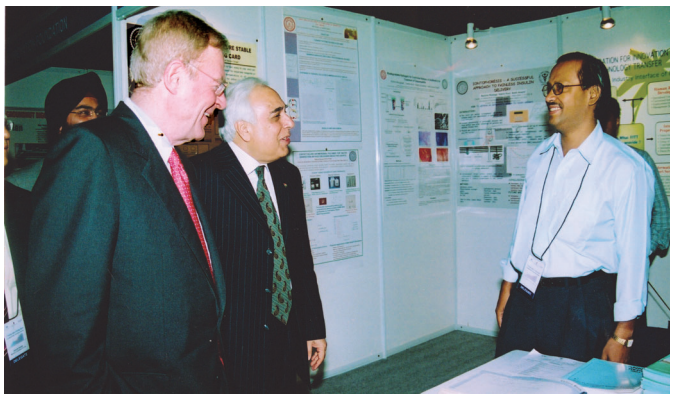
.

The announcement and other details about the course will be put on our website in due course. So please keep in touch with our website www.fitt-iitd.org .or contact

*Shri K. K. Roy, Manager (Tech/Admin.), Foundation for Innovation and Technology Tranasfer (FITT), Indian Institute of Technology Delhi, Hauz Khas, New Delhi-110016,*
*E-mail: kirityroy@hotmail.com*

## Eleventh Technology Summit & Technology Platform (CII)

The Confederation of Indian Industries (CII) organized the Eleventh Technology Summit & Technology Platform at Hotel Taj palace, New Delhi during September 21 & 22 , 2005.



*Mr. Kapil Sibbal, Hon'ble Minister of Science & Technology, Govt. of India (2nd from left) at the FITT-IIT Delhi stall*

FITT participated in Exhibition during this Summit & had displayed the posters of IIT Delhi technologies developed in house in the areas such as Biotechnology, Health Research, Medical Devices, Wireless applications & Alternative energy. Mr. Kapil Sibbal, the Minister of Science & Technology, G.O.I., who had inaugurated the exhibition visited the stall of FITT.

## Pneumatic Conveying Technology (24-25 November, 2005)

A two-day workshop on Pneumatic Conveying Technology is going to held in IIT Delhi from November 24, 2005 to November 25, 2005. This two-day course on the subject would be of specific interest to both designers and users of pipeline transportation of bulk materials. The sessions cover various aspects of system design, component selection and the conveying capability of a large number of different materials. It is a practical course, with emphasis on design, operation, control and maintenance of systems, and features a number of case studies.

The co-ordinator for the programme is **Dr. V. K. Agarwal**, from ITMMEC, IIT Delhi.

For more information, please visit the website: http://www.fitt-iitd.org/new/pneumatic_technology.htm

Or contact:
*Dr. V. K. Agarwal, ITMMEC, Indian Institute of Technology Delhi*
*Hauz Khas, New Delhi – 110016, Tel: 011-26591278*
*Fax: 011-26596222, Mob: 9810204943*
*E-mail: vagarwal@itmmec.iitd.ac.in*

## International Conference on Productivity and Quality Research -ICPQR 2005 (December 12-15, 2005)

The 11th International Conference on Productivity and Quality Research (ICPQR 2005) is going to be held during December 12-15, 2005, organized by Indian Institute of Technology Delhi in association with International Society for Productivity and Quality Research Miami, USA. ISPQR (International Society for Productivity and Quality Research) is a premier international society dedicated to the creation and dissemination of cutting edge and relevant knowledge in productivity and quality research.

The theme of the conference is '***Emerging Issues In Productivity and Quality'***. The conference includes: Productivity and quality concepts and measurement issues; Managerial issues; Impact of emerging technologies on productivity and quality; Strategic and organizational perspectives; Sector and industry-specific issues; Productivity and quality challenges and Socio-cultural issues.

**Registration**

The last date for registration is as following:

---Early registration: August 31, 2005, Extended up to Sept. 20,2005
---Pre-registration: November 15, 2005
---Spot registration: Starts from December 12, 2005

For more information please visit the website :
http://www.iitd.ernet.in/icpqr/index.html

You may also send queries to: icpqr2005@rediffmail.com

# FORTHCOMING SEMINARS/CONFERENCES/EVENTS IN IIT DELHI

## CHEMCON 2005 (December 14-17, 2005)

The 58th Annual Session of the Indian Institute of Chemical Engineers will be held at IIT Delhi, New Delhi from 14 to 17 December 2005. The Conference theme is ***'Sustainable Technologies for Efficient Energy Utilization in Process Industries'***. This is organized by INDIAN INSTITUTE OF CHEMICAL ENGINEERS (Northern Regional Centre) in association with International partners.

It is expected that the **CHEMCON 2005** will have the benefit of active support and participation of many developed countries as the joint organizers of the congress. All sessions will be guided by prominent professionals in the specific fields of their specialization. Besides, there will be plenary lectures by delegates from various countries. Poster sessions will be arranged during the congress. The challenges for Chemical Engineers require harnessing knowledge and expertise in several related fields and call for periodic upgrading of their professional skill.

Technical sessions will focus on the theme of the congress and the topics being covered with interaction through plenary sessions, invited lectures, presented papers and poster sessions are: Hydrocarbons and Other Fossil Fuels; Hydrogen Energy and Fuel Cells; Fertilizers; Electrochemical and Electro thermal Technologies; Polymer Engineering and Technologies; Biotechnology; Pharmaceutical Industry; Green Technologies; Membrane Separation; Novel Separation Processes; Instrumentation and Process Control ; Materials of Construction and Protective Coatings; Process Safety Management; Environmental Engineering; Nano-Technology; Particle Technology; Catalysis and Reaction Engineering; Interfacial Engineering; Transport Phenomena; Modeling and Simulation of Processes ; Computational Fluid Dynamics; Emerging Changes in Chemical Engineering Education; Energy and Environmental Policy Issues and Global Treaties.

For more information please visit the website: http://www.iitd.ernet.in

## International Workshop on " Advances in Asbestos-free friction composite – 1" (IWAAFC-I)- India (5-6 January, 2006)

An International workshop on "Advances in Asbestos-free friction composite – 1 (IWAAFC-I)" is going to be organized at Industrial Tribology Machine Dynamics and Maintenance Engineering Center (ITMMEC), I.I.T. Delhi on 5th and 6th January 2006. The objective of the programme is to create awareness in the community of scientists in academics & industries about the recent developments in the area of most advanced class of friction materials. The co-ordinator of the programme is **Dr. Jayashree Bijwe** of ITMMEC.

For more information, please visit the website: http://www.fitt-iitd.org or http://www.iitd.ernet.in Or contact

*Dr. (Ms) Jayashree Bijwe - Coordinator*
*Associate Professor, Industrial Tribology Machine Dynamics & Maintenance Engineering Center (ITMMEC)*
*Indian Institute of Technology, Delhi, Hauz Khas,*
*New Delhi - 110016, India, Tele-fax- + 91 11 2659 1280/6222 (Mobile:- + 919818444679),*
*Email- jbijwe@gmail.com, jbijwe@itmmec.iitd.ac.in*

## International Conference on Mesoscale Processes in Atmosphere, Ocean and Environmental Systems IMPA 2006 (February 14-17, 2006)

An International Conference on Mesoscale Processes in Atmosphere, Ocean and Environmental Systems (IMPA 2006) is going to be held at Indian Institute of Technology (IIT) Delhi, India during February 14-17, 2006.

The aim of the conference is to review the current knowledge of the complex interactions between physical and chemical processes within the earth-atmosphere system, and to identify remedies and strategies for sustainable development plans in both industrialized and developing countries. The objective of the conference is to bring together the scientists/engineers from industry, research organizations, government and academia who are involved in monitoring, measurements, simulation and management of the various problems related to weather and pollution. *A special session is proposed to be organized on natural hazards such as cyclones and tsunami waves.*

The Conference is organized by Centre for Atmospheric Sciences, Indian Institute of Technology Delhi and the topics include: Monsoon Variability and Predictability, Regional Climate Change, Advanced Observational Systems and Data assimilation, Natural hazards and Coastal Zone Management, Air Quality Modeling and Impact Assessment, Urban Pollution, Coastal/Estuarine Processes, High Performance Computing in Environmental Modeling, Weather-climate environment and sustainable development.

For more information please visit the website: http://www.iitd.ernet.in/ or contact

*Organizing Secretary*
*Professor Mailthili Sharan, Head,Centre for Atmospheric Sciences*
*Indian Institute of Technology, Hauz Khas, New Delhi - 110 016*
*Tel(O): 91-11-26591301,26596029, Res. 91-11-26591946,26515480*
*Fax: 11-26591386,26582037, E-mail: impa2006@cas.iitd.ernet.in*

## International Conference on Nano Science & Technology (ICONSAT 2006) (March 16-18, 2006)

As part of the National Initiative on Nanoscience and Technology of the Department of Science and Technology, Govt. of India, an International Conference on Nano Science and Technology (ICONSAT 2006) is being organized at the India Habitat Centre, New Delhi from March 16-18, 2006. There will be about 6 plenary talks, 30 invited speakers and about 300 poster presentations. The key technical areas of the conference include: Novel Synthesis Routes, New Applications and Nanodevices, Functionailty and Properties at Nanocale, Nanobiology and Computational Nanoscience.

For more information, please visit the website www.iconsat2006.com or contact on the following:

*Professor B. R. Mehta,*
*Department of Physics, Indian Institute of Technology,*
*New Delhi 110016, India., Tel. : +91-11-2659-1333*
*Fax : +91-11-2658-1114, E-mail: iconsat06@physics.iitd.ernet.in*

## Institution-Industry Partnership

SENIOR FACULTY members and administrators from academic institutions, technical and management institutions attended the NASSCOM-HR Summit in Chennai on July19 and 20. Except the Vice-Chancellor of Anna University and the Director of a Management School, all the speakers were from industry. They talked about various HR functions, the present and future requirement of manpower for IT industry, etc.

It is projected that by 2008, India will need two million IT professionals against the present one million working in IT and ITES organisations. Today 0.35 million Engineering graduates are coming out of Indian universities annually, but only about 40 per cent of them are employable, that is to say, the industry will not be able to meet even 50 per cent of its manpower requirement in three years from now if the quality of output from the universities does not improve drastically and fast. This scenario, which is frightening, must have prompted NASSCOM to offer complementary participation to academia.

Plenty of jobs are available for young engineers with certain basic skills and personal characteristics in the entire gamut of industry, thanks to sustained industrial growth during the last three years. The job market in India was never so exciting for job seekers as of now. Educational institutions are also upbeat because many of their students are placed well. But they cannot be happy; in fact they are quite worried about 60 per cent of their graduates, who could not be employed in spite of highly favourable job market indicators.

Reasons for poor quality of graduates leaving the portals of institutions are not hard to find. Academia and industry are aware that acute shortage of qualified and trained faculty in about all the institutions in the country is responsible for such a gross waste of human resource.

Institutions are in need of trained faculty and regular input regarding the latest developments in IT profession. Industry should have a holistic policy to hold hands with institutions and work together for producing knowledgeable and competent graduates who could be absorbed fully for productive employment.

**Threat looming ahead**

The Indian IT industry is concentrating on high volume low value business. They are chasing available manpower with lucrative offers. Talented and enthusiastic fresh engineers of all disciplines are made to slog on mundane jobs which do not help them to move up the value chain. They do not complain because the pay packet is heavy. Companies are happy because their share value is galloping. It is a win-win situation for both.

Are the company executives unaware of the dangers ahead if such a business strategy is pursued for long? Certainly not. They are pursuing the policy vigorously for immediate short-term gains. They perhaps plan to change the track when the perceived threat is about to become real. Such a game plan is too risky to be comfortable for two reasons: (1) Other nations could be working hard and fast to beat us earlier than expected and (2) In the absence of properly laid out road map for quick change of business strategy, we would be caught napping when the need arises.

A few tips on Industry-Institute partnership:

1. Industry should invest for creating facilities in selected institutions for research and training.
2. In-house expertise of industry should be made available to empower academia for advanced research.
3. Industry should provide sustained motivational inputs for the faculty to pursue high quality research.

All these steps would make the educational institutions/universities as true partners in developing technology, processes and products which are essential for the Indian IT industry to lift the business a few notches high in the value chain.

*(Source: Reproduced from The Hindu, August 14, 2005)*

## Impoverished in Innovation

(India and its institutions have the ability to provide world-class undergraduate education, and train highly skilled managers and designers. However, they cannot claim to have the ability to organise cutting-edge research; in innovation and invention we still lag behind, says P. V. Indiresan., former Director IIT Madras)

Recently, in Boston, US, different country representatives discussed the prospects of world-class research universities in their countries. We, in India, are doing fairly well but cannot speak with the same confidence as the Chinese and the South Koreans did, and share the apprehensions that the Japanese have of burgeoning competition from East Asian countries.

Undoubtedly, our higher education system can count several successes. Several of our undergraduate institutions have earned worldwide recognition. Recently, the US Congress went so far as to pass a special resolution commending the services rendered by IIT graduates to the United States. Most Fortune 500 companies have India-educated managers at top levels, even as heads. Many of those firms have established research divisions in India. Several Indian firms have developed complex products that compete with those from abroad. In the past three decades, three undergraduates trained in India have won Nobel Prizes. Sadly, all three did their research abroad, not in India.

Therefore, we can say that we have the ability to provide world-class undergraduate education, and that we have begun to train world-class managers and designers. However, we cannot claim to have the ability to organise world-class research; in innovation and invention we still lag behind.

The National University of Mexico claims that it has made the front-page in the prestigious journal *Nature* more often than any other university in developing countries. China claims astronomical incomes from technology parks. China increased its Ph.D. output in engineering from only four in 1983 to 6,242 in 2003. In India, the number of Ph.D.s awarded in engineering increased only to 739 from 139 over

the same period. Although mere numbers do not tell the whole story, China still has twice as many highly-cited research publications than India has.

All top universities from both Latin American and from East Asian countries have huge enrolments, in excess of 100,000 students. IITs and the IISc are puny in comparison. It is not clear how far size is an advantage (or disadvantage). Great American universities are quite large. At the same time Caltech is quite small with an enrolment of barely 2000 students (half that of several IITs). Yet, Caltech has produced 31 Nobel Laureates. Equally prestigious Stanford has produced only 16 Nobel Prize winners though its enrolment is ten times larger. Stanford has nearly half its students among African-Americans and Hispanics. Apparently, support for disadvantaged students need not necessarily impede world-class research.

"Stratification" was a major issue that cropped up in the discussions in Boston. Should a country have stratified universities with a few institutions enjoying special privileges? Or should the stratification be intra-university with separate campuses for different level of students? When it came under political pressure to lower admission standards for students of native extraction, the University of Sao Paulo in Brazil started an entirely new campus for their benefit. (As a matter of interest, the University managed its own solution; it was not ordered about by the government the way the Indian government does.) In some other countries, different courses are offered with lower levels of academic demands for less able students. Can we have a similar solution in India too? When I was Director of IIT Madras, I introduced a B.Tech. (Arts) degree for the benefit of those students who could not cope with our mathematically-oriented programmes. The move was rudely shot down both by the government and by one of my own fellow directors. I was forced to drop the idea.

Not every IIT student has to be trained in advanced engineering design; not every MIT graduate becomes a researcher. There is scope in higher education for study at varying levels of complexity. Our education system is flawed in the sense we have a one-size fits all policy.

University of California has addressed this issue in a systematic manner by operating three types of Higher Education. At the top, the University of California (with further sub-stratification of the Berkeley campus which enjoys greater prestige than others) is a research university. At the second level are the state colleges concentrating on undergraduate education. Two-year programmes of community colleges provide vocational skills to make up the third tier. In India, we are "democratic".

In the eyes of the law, an engineering degree from a fly-by-night engineering college is the same as a degree from an IIT. Within the same institution, for a given course, all students study the same topics and write the same examinations. IITs are only a little better in the sense they offer a number of electives, but the mathematical skills required are about the same. India will do well to learn from other countries and institute intra-university stratification to match different levels of academic competence.

Talent alone is not enough. About science education in Brazil, Nobel Laureate Feynman has caustically remarked: "Everything was entirely memorised, yet nothing had been translated into meaningful words. I couldn't see how anyone could be educated by this self-propagating system in which people pass exams, and teach others to pass exams but nobody knows anything."

That criticism applies with much force to Indian education too. We will not perform world-class research or train our students to think innovatively until we release our students from the bondage of examinations.

As in India, in other countries too, private institutions train an overwhelming majority of students. Yet, the most prestigious ones are those run by the state. The US is an exception. Although there are several outstanding state universities, most prestigious universities are private. However, they all take care to support brilliant students from poor families with fees (and student assistance) fixed on a case-by-case basis. In India, in the matters of fees too, we have a virtual one-fee-fits-all policy. At the most, the law permits a two-tier system with one set of fees for "merit" students and another for students admitted under the management quota. Private universities in the US exercise absolute autonomy in the way they admit and the way they charge variable fees.

China now allows universities to pay teachers according to the exigencies of the market, the way American universities do. In India, a Reader's or a Professor's salary is the same everywhere irrespective of discipline and status of the institution.

Apart from the three basic freedoms of a university (freedoms to decide who will teach, what to teach and whom to teach), universities need a fourth freedom — to reward differently teachers from different disciplines.

The Boston Meeting came to no conclusion about private endowments. A former President of Harvard, the richest university in the US, has written graphically about troubles raising the money to meet Harvard's never-ending needs, and about the risk of improper commercial pressures. Top-notch American universities have managed to maintain a balance between academic integrity and commercialisation of education. Admittedly, it helps to have a few Nobel laureates on the faculty.

Admitting students from very rich families is a contentious issue that was not discussed in Boston. American universities do have a window for children from rich families who pay high fees. India is estimated to spend over Rs 10,000 crore a year in educating the children of rich parents abroad.

It is worth enquiring why a student whom MIT and Oxford are willing to admit should be denied admission to an IIT even after agreeing to pay international level fees. If a Scheduled Caste student with 18 per cent marks can be admitted, why not a rich student with 30 per cent marks, even if he does not make the merit list?

Apart from the considerable drainage of foreign exchange, is there not a social cost in making such youth (who are likely to take over leadership of inherited institutions) study abroad than at home? Dr. Arun Shourie brought this facet of this controversial issue to my attention by pointing out that it is better to educate our future leaders rather than suffer the consequences.

*...Contd. on page 19*

# FITT PROGRAMMES

## HRD Programmes

Since April 2005 and till now, 11 customised HRD programmes were held under the aegis of FITT. A list of some HRD programmes completed during the past few months, ongoing and forthcoming courses is given below:

| *S.No* | *Title* | *Sponsors/Participation* | *Date & Venue* | *Co-ordinator & Deptt.* |
|---|---|---|---|---|
| | **HRD Programmes (Concluded & Ongoing)** | | | |
| 1. | Embedded Systems & Applications for CSC, Noida | Computer Sciences Corporation India Pvt. Ltd. Noida | June 3-4, 2005, CSC, Noida | Prof. S. Chaudhury & Dr. I. N. Kar, EED |
| 2. | Value Addition Training at IIT Delhi for TMEs from ARI | Applied Reseach Institute (ARI), New Delhi | July 1 - Aug. 8, 2005, IITD | Prof. Sunil Pandey, Central Workshop |
| 3. | NATCOM Consultative Meeting on Impacts of Climate Change on Water Resources | Winrock International India, New Delhi | July 7, 2005, IITD | Prof. A. K. Gosain, Civil |
| 4. | SYSTEMC Training Course | Interra Systems India Pvt. Ltd. Noida | July 8, 2005, Interra, Noida | Dr. P. R. Panda, CSE |
| 5. | Training Programme on Unix Systems/ Network Services Administration | DiPAC (Defence Services) | July 19-29, 2005 & Sept. 26 to Oct. 1, 2005, IITD | Ms. Akhila Sinha, CSC |
| 6. | Joint Workshop on Telecommunication: Visions of the Future | Lucent Technologies, Mumbai | August 8, 2005, IITD | Prof. Surendra Prasad |
| 7. | The Role of Indormation Technology in Weather Forecasting | Silicon Graphics Systems India, Gurgaon | Sept. 9, 2005, IITD | Prof. S. K. Dash, CAS |
| 8. | TPM (Total Productive Maintenance for - ARI) | ARI, New Delhi | October 7- December 3, 2005, IITD | Prof. R. Sagar, ME |
| 9. | Workshop on Embedded Systems Advances & Applications | Participation based | October 21-23, 2005, IITD | Dr. I. N. Kar, EED<br>Dr. Lipika Dey, Maths |
| 10. | Geoenvironment and landfills Design of MSW & HW Land fills Geotechnical Aspects | Participation based | November 28- December 2, 2005, IITD | Prof. Manoj Dutta, Civil<br>Dr. G. V. Ramana, Civil |
| 11. | Pneumatic Conveying Technology | Participation based | November 24-25, 2005, IITD | Dr. V. K. Agarwal, ITMMEC |
| | **Forthcoming Programmes** | | | |
| 12. | International Workshop on Advances in Asbestors-free Friction Composites-I | Participation based | January 5-6, 2006 | Dr. Jayashree Bijwe, ITMMEC |

## Technology Development Projects at FITT

**List of some major Technology Development Projects at FITT during the last few months**

| *S. No.* | *Title* | *PI* | *Deptt.* | *Client* |
|---|---|---|---|---|
| 1. | Design & Development of Interface for electrically addressed spatial light modulator | Prof Subrat Kar | Elect Engg. | IRDE (DRDO), Dehradun |
| 2. | Development of Technology to get Dynamic Compressive Properties of Tissues | Dr Anoop Chawla | Mech Engg. | General Motors India Ltd., Bangalore |
| 3. | Mathematical Model Studies of expected flood level of river Yamuna after construction of Jewar Tappal Marginal Bund | Prof A K Gosain | Civil Engg. | Irrigation Deptt., U.P. Govt. |
| 4. | Strategic Alliance Between Supercomputing Facility for Bioinformatics & Computational Biology and M/s. HCL Technologies Ltd. for technical consultancy and manpower training. | Prof B Jayaram | Chemistry | HCL Technologies Ltd., Noida |
| 5. | Development of Antenna Trainer Kit | Prof S K Koul | CARE | The Scientific Instrument Co.Ltd. (SICO), Ghaziabad |

## Intellectual-Property Rights and Wrongs

Last year in the month of October, the General Assembly of the World Intellectual Property Organization (WIPO) decided to consider what a development-oriented intellectual property regime might look like. The move was little noticed, but, in some ways, it was as important as the World Trade Organization's decision that the current round of trade negotiations be devoted to development. Both decisions acknowledge that the current rules of the international economic game reflect the interests of the advanced industrial countries – especially of their big corporations – more than the interests of the developing world.

Without intellectual property protection, incentives to engage in certain types of creative endeavors would be weakened. But there are high costs associated with intellectual property. Ideas are the most important input into research, and if intellectual property slows down the ability to use others' ideas, then scientific and technological progress will suffer.

In fact, many of the most important ideas – for example, the mathematics that underlies the modern computer or the theories behind atomic energy or lasers – are not protected by intellectual property.

Academics spend considerable energy freely disseminating their research findings. I am pleased when someone uses my ideas on asymmetric information – though I do appreciate them giving me some credit.

The growth of the "open source" movement on the Internet shows that not just the most basic ideas, but even products of enormous immediate commercial value can be produced without intellectual property protection.

By contrast, an intellectual property regime rewards innovators by creating a temporary monopoly power, allowing them to charge far higher prices than they could if there were competition. In the process, ideas are disseminated and used less than they would be otherwise.

The economic rationale for intellectual property is that faster innovation offsets the enormous costs of such inefficiencies. But it has become increasingly clear that excessively strong or badly formulated intellectual property rights may actually impede innovation – and not just by increasing the price of research.

Monopolists may have much less incentive to innovate than they would if they had to compete. Modern research has shown that the great economist Joseph Schumpeter was wrong in thinking that competition in innovation leads to a succession of firms. In fact, a monopolist, once established, may be hard to dislodge, as Microsoft has so amply demonstrated.

Indeed, once established, a monopoly can use its market power to squelch competitors, as Microsoft so amply demonstrated in the case of the Netscape Web browser. Such abuses of market power discourage innovation.

Moreover, so-called "patent thickets" – the fear that some advance will tread on pre-existing patents, of which the innovator may not even be aware – may also discourage innovation. After the pioneering work of the Wright brothers and the Curtis brothers, overlapping patent claims thwarted the development of the airplane, until the United States government finally forced a patent pool as World War I loomed. Today, many in the computer industry worry that such a patent thicket may impede software development.

The creation of any product requires many ideas, and sorting out their relative contribution to the outcome – let alone which ones are really new – can be nearly impossible.

Consider a drug based on traditional knowledge, say, of an herb well known for its medicinal properties. How important is the contribution of the American firm that isolates the active ingredient? Pharmaceutical companies argue that they should be entitled to a full patent, paying nothing to the developing country from which the traditional knowledge was taken, even though the country preserves the biodiversity without which the drug would never have come to market. Not surprisingly, developing countries see things differently.

Society has always recognized that other values may trump intellectual property. The need to prevent excessive monopoly power has led anti-trust authorities to require compulsory licensing (as the US government did with the telephone company AT&T). When America faced an anthrax threat in the wake of the September 11, 2001, terrorist attacks, officials issued a compulsory license for Cipro, the best-known antidote.

Unfortunately, the trade negotiators who framed the intellectual-property agreement of the Uruguay trade round of the early 1990's (TRIP's) were either unaware of all of this, or more likely, uninterested. I served on the Clinton administration's Council of Economic Advisors at the time, and it was clear that there was more interest in pleasing the pharmaceutical and entertainment industries than in ensuring an intellectual-property regime that was good for science, let alone for developing countries.

I suspect that most of those who signed the agreement did not fully understand what they were doing. If they had, would they have willingly condemned thousands of AIDS sufferers to death because they might no longer be able to get affordable generic drugs? Had the question been posed in this way to parliaments around the world, I believe that TRIP's would have been soundly rejected.

Intellectual property is important, but the appropriate intellectual-property regime for a developing country is different from that for an advanced industrial country. The TRIP's scheme failed to recognize this. In fact, intellectual property should never have been included in a trade agreement in the first place, at least partly because its regulation is demonstrably beyond the competency of trade negotiators.

Besides, an international organization already exists to protect intellectual property. Hopefully, in WIPO's reconsideration of intellectual property regimes, the voices of the developing world will be heard more clearly than it was in the WTO negotiations; hopefully, WIPO will succeed in outlining what a pro-developing intellectual property regime implies; and hopefully, WTO will listen: the aim of trade liberalization is to boost development, not hinder it.

*(Source: Reproduced from Economic Times, 16 August, 2005)*

## Patents (Amendment) Act 2005 — Setback for Innovators and R&D

*India wants its economy to grow at a rapid pace; it needs a Second Green Revolution; its industries have to become competitive in the world market, and energy conservation is a desperate need. Innovation is the key to achieving success on all these fronts. For this to happen, however, the Government must take urgent steps to re-draft the Patents (Amendment) Act 2005 to ensure that the interests of innovators and the generic industry are protected. Only then will R&D efforts gain the desired momentum, points out Uttam Gupta.*

THERE is lot of unease among innovators over key provisions of the Patents (Amendment) Act 2005. These require close examination, especially against the backdrop of their having had to wait for a decade for the product patent regime to come into force after the TRIPS (Trade-Related Intellectual Property Rights) agreement came into force on January 1, 1995.

At the outset, let us look at the fate of those innovators who had put their applications for product patents in the Mail-Box (mostly for agrochemicals and pharmaceuticals) created under the first amendment to the Indian Patent Act in 1999, effective from January 1, 1995. With product patent law in place under the amended Act of 2005, the Patent Office has opened the Mail-Box and taken up scrutiny of applications filed before January 1, 2005. However, it has decided not to process those applications on which the word "WTO" is not marked.

The Patent Office has taken the view that at the time of their filing, the product patent law was not in place (Section 5(1) of the Act prohibited grant of product patent on agrochemicals, pharmaceuticals, biotechnology, etc.). The argument is fallacious.

The prohibition was applicable only for the period when the product patent law was not in force. Now, when, the law is in place, following the third amendment to the Patents Act (2005), there is no basis for disallowing certain applications on an artificial pretext.

The Patent Office's refusal to grant Mail-Box status to applications not marked "WTO" will severely penalise the applicants simply because the receiving officer in the Patent Office did not write "WTO" on their applications.

Even for Mail-Box applications, the amended Act allows patent rights to commence from the date of patent grant only. This results in a substantial reduction in the protection period. Thus, for an application filed in 1995, assuming three years for patent grant, this would only be seven years.

Of the 20-year term of a patent, the applicant loses 10 years because the date of putting the application in the Mail-Box is taken as the filing date. A filing date prior to the date on which the product patent law came into force has no meaning. And, yet, by doing so, all the Mail-Box applicants have been penalized.

It is understood that only 10 per cent of the total applications filed has been processed for grant of patent. At this pace, grant of patents for the majority of applications will be inordinately delayed. The more the delay, the less the protection period.

The amended Act allows generic manufacturers who were producing and marketing products of a Mail-Box patentee before January 1, 2005 to continue doing so on payment of a "reasonable" royalty (term "reasonable" is not defined). This means that even after patent grant, the rights of the patentee are seriously compromised.

The amended Act (2005) allows pre-grant opposition of a patent application. The person opposing the application need not even be a stakeholder. Further, he is a party to the opposition proceedings. This means that he can go ahead and prevent the grant of even a genuinely valid patent.

The Act provides for increasing the time limit for filing a pre-grant opposition request to six months from date of publication. Besides, grounds for such opposition have been increased from two to eleven. These changes will inordinately delay the grant of patent and may lead to frivolous opposition.

Ironically, the applicant cannot appeal against the decision of the Controller of Patents if the latter allows the pre-grant opposition application. Thus, the former would have forfeited his right to get a patent even before the application is subjected to detailed examination!!

Following the Second Amendment to the Patents Act (1970), parallel imports of products patented in India were allowed, subject to the condition that the foreign exporter was authorised by the patentee to sell and distribute. Under the amended Act (2005), the foreign exporter need only be 'duly authorised under the law'. This change is tantamount to allowing sale of generic products without the consent of the patent-holder and defeats the very purpose of granting a patent. It will result in a flood of imports from countries where the product does not enjoy patent protection.

The Patents (Amendment) Act, 2002 had introduced the Bolar provision to allow for using and selling the patented product during the term of the patent, for obtaining regulatory approvals. The amended Act 2005 has revised this to include the act of importing as well. The provision has been selectively transposed from the US law.

In the US, under the Bolar provision (applicable only to pharmaceuticals), even as enabling measures are provided to ensure the entry of generics just at the time of expiration of the patent term, it also gives relief to the patent-holder by allowing a suitable increase in the patent term to compensate for the time lost in getting regulatory approval. That strikes a balance between the interest of the generics and those of the patentees.

However, under the amended Act (2005), due to the selective transposition of Bolar, even as the generics can gain entry immediately on expiration of the patent term, the patent-holders of, say, crop protection products (CPP) are at a considerable disadvantage because of the inevitable delay in getting regulatory approvals.

For getting market approval of CPP, the applicant is required to generate data from studies spread over several years to demonstrate the safety and efficacy of the product mandated by the Registration Committee under the Insecticides Act (1968). For pharmaceuticals, such studies are generally not required in India, if the product is approved by the US FDA (Food and Drug Administration). The Patent (Amendment) Ordinance, 2004 allowed for the possibility of patenting incremental innovations — new use or new property of a known substance, etc. Under the amended Act (2005), this flexibility has been substantially curtailed.

As per Section 3(d), new form of an existing substance may be patentable if it results in enhancement of known efficacy of that substance. However, the term "efficacy" used is vague and may result in considerable bias/subjectivity in assessment by the Patent Office. It seems the Government has sought to restrict the patentability of an innovation only to a New Chemical Entity (NCE). The discovery of an NCE is a hugely expensive affair (about $1 billion for drugs and $300 million for CPP). This is beyond the reach of even big companies, not to mention small entities and research institutions/ universities.

India's real potential lies in incremental innovations. By discouraging these, the amended Act will actually cause a serious setback to the R&D efforts of thousands of Indian scientists. It will accelerate brain-drain as scientists look for territories outside India to get the reward for their innovations.

The amended Act provides for the issue of compulsory licences (CL) under various circumstances which include a situation where the government perceives that the patent-holder is unable to ensure the supply of a product at an "affordable" price. `Affordable price' is a relative term, which could be interpreted variously whereby even a reasonable price could be termed as unaffordable.

From the above, one cannot escape the conclusion that, at every stage, there is an underlying attempt to infringe on the rights of the innovators. This is manifest in:

- restricting the patentability of innovations to NCE;
- restricting Indian nationals from getting patents outside India;
- diluting substantially the patent rights of Mail-Box applications;
- denying patents to non-WTO applications filed before January 1, 2005;
- affording multiple opportunities for opposing patents — pre-grant, post-grant and revocation;
- allowing parallel imports of patented product without authorisation of the patent-holder;
- enabling entry of generics just at the time of patent expiry; yet ignoring the inevitable delay of the innovator in launching the product;
- setting extremely liberal provisions for compulsory licencees to produce and sell patented products any time during the protection period.

The above changes may have been prompted by the fear that prices will rise. This is baseless as about 98 per cent of drugs and almost all CPPs currently in use are off-patent. Even for patented products, there are substitutes available and competition will rein in the price.

There exists no valid reason for tightening the noose on the innovator!

India wants its economy to grow at a rapid pace of 8 per cent per annum; it needs a Second Green Revolution; its industries have to become competitive in the world market; energy conservation is a desperately need; its researchers have to look for solutions to problems unique to India's tropical conditions; and, above all, any development has to be environment-friendly.

Innovation is the key to achieving success on all these fronts. We have a huge pool of scientific manpower that can make this happen. In this backdrop, there is an urgent need to take a re-look at the Patents (Amendment) Act 2005 to ensure that R&D efforts in India get the desired momentum and protection. The Government may consider revisiting the Patent (Amendment) Ordinance 2004, which made an attempt to balance the interests of the innovator and the generic industry, unlike the amended Act 2005, which seems to be concerned solely with protecting the latter.

*(Source: Reproduced from The Hindu Business Line, September 23, 2005)*

---

**...Impoverished in Innovation** *(Contd. from Page 15)*

Can any Indian university attract international level funding and yet enjoy both academic and financial freedom at the level Harvard and Caltech do? Should we have separate institutions to cater to disadvantaged students the way Sao Paulo has organised? Should a world-class university be compact like Caltech or should it expand like Stanford to attract substantial numbers of minority students too? Will Indian universities ever have the freedom to fix salaries of faculty on a case-by-case basis and fix student fees (and scholarships too) in the same manner?

Which is better: government funded and politically controlled institutions, or privately funded and commercially pressured ones? Should there be one Flagship University as is the case in most countries or should we have a large number vigorously in competition with one another as in the US? Should we have a window for rich students the same way we have for backward caste students but with academic skills not inferior to the latter? Or, even, should we have a research university at all?

*(Source: The Hindu Business Line, July 11,2005)*

## *FITT MISSION*

*To be an effective interface with the industry to foster, promote and sustain commercialisation of Science & Technology in the Institute for mutual benefits.*

## Convocation of IITD 2005

*(L to R: Prof. M.G.K. Menon, Chairman, Board of Governers, IIT Delhi; Dr. Kiran Mazumdar (Chief Guest) CMD, Biocon; Mr. E. Sreedharan, MD, DMRC and Prof. D.P. Kothari then Director-Incharge, IIT Delhi)*

The 36th Convocation of IIT Delhi, was held on August 13, 2005. **Dr. Kiran Mazumdar Shaw** was the chief guest of the function. A total of 1326 degrees were awarded at the ceremony, of these 65 percent were post graduate degrees & 129 Ph. D. degrees. **Mr. E. Sreedharan** , DMRC director was awarded Doctor of Science degree (Honoris Causa ). Distinguished alumni award was received by **Mr. K. Venkataramanan,** ( President-operations, L& T Ltd, Mumbai ) **Dr. Krishnan Sabnani** ( Senior Vice President Networking-Bells Lab, U.S.A.) & **Dr. Raghuram G. Rajan** ( Economic Counsellor & Director of Research , IMF, U.S.A.).

## IIT Honour for Sreedharan

The DMRC Managing Director E. Sreedharan was awarded by IIT Delhi, at its convocation. Sreedharan received Honoris Causa – Doctor of Science Degree – from the Institute at a sparkling ceremony.

Mr. Elattuvalapil Sreedharan was born on 12th June, 1932 in Palghat District of Kerala. After early education in his native place, he joined Victoria College, Palghat and later graduated from Government Engineering College, Kakinada in 1953. He had a small stinct as lecturer in Civil Engineering in Kerala Polytechnic, Calicut.

He has many firsts to his credit during his career in Indian Railway Services and received many prestigious awards. He headed the country's biggest railway project namely Konkan Railway as its Chairman and Managing Director. After completion of the Konkan Railway project, the government made him in-charge of the prestigious Delhi Metro Project which he is now heading as its Managing Director.

## Awards

**Prof. B. P. Pal** of Physics Department and Head of Computer Services Center has been selected as one of the 5 new ***"Distinguished Lecturers for 2005-06"*** of IEEE/LEOS (The Institute of Electrical and Electronics Engineers /Laser and Electro-Optic Society) of USA. The Distinguished Lecturer Awards program is designed to honour excellent speakers who have made technical, industrial or entrepreneurial contributions of high quality to the field of lasers and electro-optics, and to enhance the technical programs of LEOS chapters.

**Prof. D. P. Kothari** has been selected for the ***Khosla National Award*** by Indian Institute of Technology Roorkee, for his life time achievement in the field of Engineering. The award carries Rs.51,000 and it includes a Citation and a Gold Medal. The award was conferred at 5th Convocation of IIT Roorkee on September 21, 2005.

## Attention!

For any information regarding latest courses, seminars, conferences, symposia or workshops at IIT Delhi and FITT, please keep in touch with the websites: **http://www.fitt-iitd.org** and **http://www.iitd.ernet.in**

## FITT Team

Chairman, Governing Council
**Prof. Surendra Prasad**

Managing Director
**Prof . K. D. P. Nigam**

Executive Consultants
**Shri K.K. Roy**
**Shri Partha Bhattacharya**
**Shri Mohit Mahajan**

Support Staff
**Mrs. Seema Lamba**
**Shri Raj Kumar Mehta**
**Shri Akhilesh Gupta**
**Shri Viswaroop Bhattacharya**
**Shri Jagdev Singh**
**Shri Uttam Aswal**
**Shri Mahender K. Rajoriya**

Project Staff
**Mr. Pawan Kumar Jha**

**Foundation For Innovation and Technology Transfer (A Regd. Society)**
**Indian Institute of Technology, Delhi,** Hauz Khas, New Delhi-110016,
**Ph:** 26857762, 26581013, 26597164, 26597167, 26597153, **Fax** : 91-11-26851169,
**Website** : http://www.fitt-iitd.org,
**Editor** : Shri Partha Bhattacharya, **email** : parthab@fitt.iitd.ernet.in, **Printed By :** Presdezyns for FITT