Incubation Centre @ IISc – Scope for Student participation

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Outline

- Technology Transfer challenges
- Infrastructure & Technology development @ IISc
- Entrepreneurship activity @ IISc
- Incubation Centre @ IISc
- Policy framework for NVI
- Services & Facilities offered at Incubation Centre
- International Scenario
- Role of Alumni Cell
## Technology Transfer Challenges: Contrasting Cultures

<table>
<thead>
<tr>
<th>University</th>
<th>Industry/Corporate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social responsibilities</td>
<td>Shareholders responsibilities</td>
</tr>
<tr>
<td>Basic research</td>
<td>Applied research</td>
</tr>
<tr>
<td>Create new knowledge</td>
<td>Develop new products</td>
</tr>
<tr>
<td>Pure scientific driven research</td>
<td>Specific objectives, product focused</td>
</tr>
<tr>
<td>Publications &amp; collaborations</td>
<td>Ownership &amp; secrecy</td>
</tr>
<tr>
<td>Sharing of material</td>
<td>Control of material</td>
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</tbody>
</table>
**Current Scenario**

- Increasing awareness among academic community to transfer their innovation to industries for mutual benefit.

- **However this is not happening at the expected pace due to following reasons:**
  - Academics don’t have proper exposure to the industry requirements and as such do not extend their basic research activity for industrial applications.
  - Industrial application requires multidisciplinary Research, group activity and proper networking satisfying the application requirements and timeframe.
  - As individual scientists can neither form the groups themselves nor can effectively interact with industries, the success in this direction is limited.
Technology Commercialization

The Basic Problem

Industry

?  

Inventors

R&D Centers

Academy
IISc – A 100 year old premier Institute

- Original Objective – Human Resource Development
- Research leading to Publications and IP

How to Encash the IP?

- Consultancy to Strategic Sectors (Space, Aerospace, Defence and Atomic Energy)
- Consultancy to Industries
- Clusters & Centers of Excellence (in close association with industry)
- Entrepreneurship, Incubation & encashment of IP
Centre for Scientific & Industrial Consultancy (CSIC)

Consultancy to Strategic Sectors:

- Space, Aerospace, Defence and Atomic Energy
- Industries
The Society for Innovation and Development (SID) was founded in the year 1991, in close collaboration with the Indian Institute of Science (IISc) Bangalore. IISc is premier research institute which has contributed in a significant way towards the scientific and technological growth of the country as well as producing outstanding intellectuals to manage Industries, Business houses, and Institutions.
The mission of SID is to enable development and diffusion of IISc's innovations in science and technology by creating a purposeful and effective channel to help industries and business establishments to compete and prosper in the face of global competition, turbulent market conditions and fast moving technologies.
How SID Works
(Autonomous and proactive)

- Industry Friendly
- Faculty Friendly
- Flexible operational modes
- Better Communication

at the same time take care of IISc’s interests (focusing on Innovation)
Various Mechanisms

- Industry funded projects- Collaborative & Contract mode
- Umbrella programmes
- Industry R&D Centres in academic campus
- Clusters - Industry Oriented Programs
  - Cutting Edge Technologies
- Entrepreneurship & Incubation Centres
- Networking
  - National programmes (CAR, IMTMA, B-Smart)
  - International programmes (Indo-US Forum, European Commission)
SID since 1994

- Number of Projects Initiated: **303**
- Number of Projects completed successfully: **142**
- Number of Companies involved in Interaction: **161**
# Projects

<table>
<thead>
<tr>
<th>IT</th>
<th>BT</th>
<th>Materials &amp; Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Honeywell</td>
<td>Shantha Biotech</td>
<td>General Motors</td>
</tr>
<tr>
<td>Intel</td>
<td>Indian Immunologoes</td>
<td>Tata Motors Ltd</td>
</tr>
<tr>
<td>Microsoft</td>
<td>Biological E cole</td>
<td>Honeywell</td>
</tr>
<tr>
<td>Nokia</td>
<td>Mitokor</td>
<td>Daimler Chrysler</td>
</tr>
<tr>
<td>Samsung</td>
<td>GPS Usha</td>
<td>Boeing</td>
</tr>
<tr>
<td>CISCO</td>
<td>Dabur Research Foundation</td>
<td>Pratt &amp; Whitney</td>
</tr>
<tr>
<td>Motorola</td>
<td>FMC India</td>
<td>IMI Cornelius</td>
</tr>
<tr>
<td>Texas Instruments</td>
<td>Sir Dorabji Tata Centre</td>
<td>ADA</td>
</tr>
<tr>
<td>Ericsson</td>
<td>Sourav Chemicals</td>
<td>NPOL</td>
</tr>
<tr>
<td>Nortel</td>
<td>Unichem Laboratories</td>
<td>ISRO</td>
</tr>
<tr>
<td>HP Labs India</td>
<td>Cadila Pharmaceuticals</td>
<td>DRDO</td>
</tr>
<tr>
<td>Mahindra &amp; Mahindra</td>
<td>Hindustan Lever Limited</td>
<td>Research Centre</td>
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<td>Imarat</td>
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</tbody>
</table>
Industry R&D Centres in academic campuses
R&D Centres

- Cadila Pharmaceuticals Limited
- Unichem Laboratories
- FMC Rallis India Limited
- Sir Dorabji Tata Centre for Tropical Diseases
- ViZiPhar Biosciences
- Cookson India Ltd
- Cranes Software International Ltd
- Satyam Computers Services Ltd
- Tata Motors Limited
- IMI R&D Centre India Pvt Ltd

**Advantages:** Space provided to have better interaction with faculty, improve R&D interaction by identifying more projects, monitor on day to day basis, carryout clinical tests/develop systems for industry requirements.
Clusters
Transport Sector

Micro & Nano Technologies

Pharmaceuticals - Drugs & Vaccines

Energy & Environment

Knowledge Sciences
Cluster on Transport Technologies
Collaborative Research Lab (CRL)
(General Motors)

- This is one of the three CRLs of GM outside US.
- Focus – R&D on Light weight materials for automotive industry
- Exchange of visits between faculty & scientists from industry
- Faculty get exposed to industry requirement
- Projects with focus on multidisciplinary research
- Knowledge gained in this process helped the faculty to interact with more industries
## Faculty from IISc.

<table>
<thead>
<tr>
<th>Faculty Involved</th>
<th>Faculty Involved</th>
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</thead>
<tbody>
<tr>
<td><strong>Mechanical Engineering</strong></td>
<td>12</td>
</tr>
<tr>
<td><strong>Metallurgy</strong></td>
<td>7</td>
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<tr>
<td><strong>Aerospace Engineering</strong></td>
<td>2</td>
</tr>
<tr>
<td><strong>Centre for Electronic Design Technology</strong></td>
<td>15</td>
</tr>
<tr>
<td><strong>Computer Science and Automation</strong></td>
<td>9</td>
</tr>
<tr>
<td><strong>Electrical and Communication Engineering</strong></td>
<td>6</td>
</tr>
<tr>
<td><strong>Centre for Product Design and Manufacturing</strong></td>
<td>8</td>
</tr>
<tr>
<td><strong>Electrical Engineering</strong></td>
<td>10</td>
</tr>
<tr>
<td><strong>Solid State and Structural Chemistry</strong></td>
<td>1</td>
</tr>
<tr>
<td><strong>APDAP</strong></td>
<td>5</td>
</tr>
<tr>
<td><strong>SuTRA</strong></td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>76</td>
</tr>
<tr>
<td><strong>GM Fellows</strong></td>
<td>6</td>
</tr>
<tr>
<td><strong>Project Assistants</strong></td>
<td>13</td>
</tr>
</tbody>
</table>
Industries:

General Motors
Boeing Company
Pratt & Whitney
TVS Company
TELCO Limited
Mahindra & Mahindra Limited
Bharath Earth Movers Limited
Daimler Chrysler Research Centre
Honeywell
Aeronautical Development Agency
Combat Vehicles Research and Development Establishment
Hindusthan Aeronautics Limited
Alcoa
AirBus
Rolls-Royce plc Ltd
Cluster on Micro & Nano Technologies
Key Requirement

**FLEXIBLE** Fabrication Facility

This is the key for

- Exploring ideas
- Phenomenological studies
- Unit process developments
- Hands on training for manpower

Differs from other fabs in defect density (much higher)
Nanotechnology: A Multidisciplinary Effort

Nanotechnology thrives on tight integration of:

- Material Science
- Process Technology
- Nanoelectronics
- Chemistry and Biology
- Mechanical Engineering
Departments Involved

Labs involved: 15

Faculty involved: 55
Research Funding at IISc in Nano Domain

- Rs. 50 crores (~US$ 13 million) funded by Ministry of Communication and Information Technology (MCIT)
- Rs. 50 crores (~US$ 13 million) Institute contribution in building and additional equipment infrastructure
- Rs. 5 crore (~US$ 1.3 million) funded by National Program on Smart Materials (NPSM) phase-I
- Rs. 10 crore (~US$ 2.6 million) funded by Department of Science and Technology (DST) under Nano Science and Technology Initiative (NSTI)
- Approximately Rs. 50 crore (~US$ ~13 million) expected from NPSM phase-II

Total Research Funding till date ~ US$ 30 million with an additional 13 million expected by next year (NPSM-II)
Interaction with Academic Institutions:

- Stanford University, USA
- University of California, Berkeley, USA
- Cornell University, USA
- University of Washington, Seattle, USA
- University of Maryland, USA
- University of Arkansas, USA
- Mc-Gill University, Canada
- EPFL, Switzerland
- Delft University, Netherlands
- IMEC, Belgium
- National University of Singapore, Singapore
- Tokyo Institute of Technology
Interaction with Industries:

- Applied Materials, USA
- Boeing, USA
- Cookson Electronics, New Jersey, USA
- General Motors, USA
- Honeywell Technologies, USA
- Alcoa Technical Centre, USA
- Texas Instruments, USA
- Motorola, USA
- IMI Vision, UK
Faculty/staff of the Institute are permitted by the Council Of IISc to undertake entrepreneurship related activity:

- Setting up of commercial ventures, companies or similar entities with equity participation.

- Without prejudice to and as an additional dimension to their traditional roles as faculty/staff.

- TOTLE (The Office of Technology Licensing & Entrepreneurship) has been set up in SID to handle all action associated with entrepreneurship activities-required approvals, equity negotiation, legal documents etc.
<table>
<thead>
<tr>
<th>Faculty Members</th>
<th>Company</th>
</tr>
</thead>
</table>
| Prof. Vijay Chandru  
Prof. Swami Manohar  
Prof. Ramesh Hariharan  
Dr. V. Vinay           | Picopeta Pvt Ltd                             |
| Prof. H S Jamadagni  
Prof. T V Sreenivas  
Prof. K V S Hari  
Prof. V Chandrasekar | Esqube Communication Solutions Pvt. Ltd      |
| Prof. Vijay Chandru,  
Prof. Ramesh Hariharan  
Prof. Swami Manohar  
Prof. Srinivasan Seshadri  
Prof. V. Vinay          | Strand Genomics Pvt Ltd                      |
| Prof. B Gurumoorthy   | 3D Solid Compression Private Limited          |
Strand Life Sciences

formerly Strand Genomics, is a premier *in silico* technologies innovation company. Strand leverages its core strengths in Data Mining, Predictive Modeling, Computational Chemistry, Software Engineering and Research Biology to develop Technologies and offer various Products for research biology, chemistry and drug discovery. Strand also offers custom Solutions based on its technologies.
Products:

- avadis
- Sarchitect
- Target focused Library
- truPK & truTox
- Sarani
- Chiktrakka
- Sphatika
- Acuris
ESQUBE Communication Solutions Pvt Ltd

The Founders: Founders of ESQUBE are faculty at the Indian Institute of Science, Bangalore and carry over eight decades of experience and fundamental knowledge in the field of DSP and Telecommunication. ESQUBE plays a dominant role in the creation of IP in the domain of Sensors, Signals and Systems.

Vision: To be a world-class Design Powerhouse in Communication, Networking and Signal Processing.

Mission: To provide innovative Products and R&D solutions to the Communication, Networking and Multimedia Industries.

Commitment: ESQUBE would realize its vision through commitment to profitability, innovation and joyful experience.
Products:

- **VQUBE:** offers real time multi party VoIP, data collaboration technology on unmanaged internet for PC to PC communication anywhere in the world.

- **Dynamic Toolbar:** A novel technology from Esqube that would allow the toolbar plugin in the browser to dynamically change its content based on the webpage that is being viewed.

- **TARANG:** is a new audio codec solution developed at Esqube. The algorithm is unpublished and to be patented.

- **Click to CallEven:** with the proliferation of web-based services, most website visitors prefer talking directly to an agent/advertiser.
The Simputer\textsuperscript{TM} : Invention

- Simple Inexpensive Multilingual People's Computer
- Invented by scientists and industry collaborators Indian Institute of Science in 1998
- Invention owned by Simputer Trust
- "The most significant innovation in computer technology in 2001 was not Apple's gleaming titanium PowerBook G4 or Microsoft's Windows XP. It was the Simputer, a Net-linked, radically simple portable computer, intended to bring the computer revolution to the third world." - \textit{New York Times November 2001}
- Radical Simplicity for Universal Access - A device designed to bridge the digital divide by surmounting barriers of literacy, cost, multiple languages and steep technology learning / adoption curve
Picopeta Simputers Pvt Ltd

Provides hardware, design and software solutions based on the powerful, yet affordable Simputer platform. The Simputer is a powerful full-featured handheld computer, and is globally marketed by Picopeta under the brand name Amida Simputer. Amida Simputers are manufactured at Bharat Electronics Ltd, and they are sold as a BEL-PicoPeta product in India and abroad.

Picopeta is currently focussing on the following business domains for the initial deployment of Simputer solutions:

- Education
- Banking
- E-governance
- Sales Force Automation
- Healthcare
- Agriculture & Rural co-operatives

The latest from Picopeta are two developments that are sure to excite developers, business and users worldwide:

- Simputers for spot billing
- Announcement of the Amida brand name
- Alliance with BEL
**Simputer based projects:**

- **E-GRAM SURAJ:** *Mobile village MIS*

- **HEALTH DATA COLLECTION:** *WHO/NTI Mobile TB data collection system*

- **SPOT BILLING:** *Simputers being used in Gulbarga, Karnataka for electricity spot billing*

- **E-GOVERNANCE:** *Simputers used by village accountants as part of land records procurement project*

- **SCHOOL EDUCATION:** *Project for rural children in Chattisgarh, India*
3D Solid Compression

3DSoC is an interactive 3D modelling company borne out of Indian Institute of Science, Bangalore and Stanford University, Palo Alto and is based in Bangalore, India.

Developed a new patented data format for 3D model representation - "VIS" format, which is typically 100 times smaller than some of the CAD formats and is smaller than even the JPEG or GIF images. In addition to the geometric data, it is possible to specify textures, sound, animation and interactive behaviours in a VIS model. VIS models are internet ready in that these models can be viewed in a standard browser.

Technology allows us to deliver the next generation e-catalogues and e-manuals. We help companies to create, organize, distribute and maintain technical data necessary to perform service operations on their equipment. The companies who would need such a solution are those that are:

- **Supporting complex mechanical equipment, because 3D is an efficient way to communicate complexity.**
- **Geographically dispersed, because we use the internet to distribute the information.**
- **Multilingual, because models and animation are language-independent.**

*A picture is worth a thousand words and a VIS model is worth a thousand pictures.*
Products:

- VISTRANS
  Using VISTrans, you can import all your existing 3D models into VIS framework. VISTrans currently supports translations from STL, VRML, Lightwave, Wavefront OBJ, Maya and 3DStudio into VIS models.

  The translated VIS files are 10 to 100 times smaller than the original files without any loss of visual or geometric accuracy in the model. VISTrans can also be run in batch mode, and the files are translated to VIS format in a few seconds.

- VISPublisher
  powerful tool for creation of Interactive 3D Content. VIS models imported into VISPublisher can be enhanced by adding animation, text and audio content. Presentations can be easily created showing exploded view of all internal components, assembling and disassembling of the whole object, creating an interactive demonstration of the object, maintenance manuals and part catalogues.

- VISPlayer Pro
  Application that enables interactive viewing of the animated VIS models. It allows full graphical interaction (rotate, pan, zoom) and can be run standalone or from any standard web browser (e.g. IE, FireFox).
INCUBATION CENTRE
INCUBATION CENTRE

ENCOURAGE ENTREPRENEURSHIP IN MULTI-DISCIPLINARY AREAS.

- Bio Informatics
- Medical Imaging
- Advanced manufacturing design
- Materials Research (Design of new materials)
- Microelectromechanical systems
- ASIC design for microelectronics and MEMS
- Drug design

IISc with its Research infrastructure and Ph.D and M.Tech students is ideally suited for such Multi-disciplinary research.
Inaugurated by

Hon. Sri. Ratan N. Tata, Chairman & President of the Court, IISc,
Chairman, Tata Group of Industries, Mumbai

on 17th March 2006
<table>
<thead>
<tr>
<th>Sl No</th>
<th>Company Name</th>
<th>Incubatees</th>
<th>Nature of the proposal</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Morphing Machines Pvt. Ltd.</td>
<td>Prof. S K Nandy, SERC</td>
<td>Pervasive solutions for Application-algorithm-architecture aware SOC Solutions</td>
<td>Company has been registered and space allotted to them</td>
</tr>
<tr>
<td>2</td>
<td>Eterno Infotech Private Limited</td>
<td>Mr. Chadrashekhar Soholi &amp; Mr. Umesh Kulkarni</td>
<td>Eterno Technologies-Indian Languages on Mobile Phones</td>
<td>Company has been registered and space allotted to them</td>
</tr>
<tr>
<td>3</td>
<td>Pangaea</td>
<td>Prof. Y Narahari &amp; Mr. V K Visvanathan</td>
<td>Urban Evolution</td>
<td>The space is to be allotted to him</td>
</tr>
<tr>
<td>4</td>
<td>Simulation and Innovation: Fluid Dynamic Associates</td>
<td>Prof. N. Balakrishnan, and Dr. Nikhil Vijay Shende</td>
<td>Development &amp; marketing of CFD software HIFUN</td>
<td>Being Evaluated</td>
</tr>
</tbody>
</table>
Policy Framework
for
New Venture Incubator (NVI)
NVI Mission

- To accelerate new venture development in conjunction with technological innovation from within the Institute environment and the Institute’s extended community.
Principal Participants

- The Institute (Faculty, Students, Alumni, Administration)
- Funding Agencies
- Investment community
- Industry
- Entrepreneurs ("Incubatees")
Professor as a mentor
Student completing his degree – entrepreneur
Alumni - business development
Government - seed funding
Academic institutes – incubator
Venture capitalist – funding
NVI Framework

- Flexible incubation model designed to accommodate various funding agencies
- Contractual agreement between NVI and incubated ventures (“Incubatees”)
- Adaptive policy framework which may be customized through formal review process
- New venture focus and specific agenda may vary depending on objectives of funding agency [e.g. MIT]
Operational Framework

New Venture Application

Application Review

Admission to Incubator

Performance Review(s)

Graduation (On-time or Early)

Maximum Of 2 years

Preliminary portfolio Of 3-5 companies

Performed every 3 months

Performed every 3 months
NVI “Services” to New Ventures

- Incubation for up to 2 years
  - Seed Funding
    - Unsecured Debt Capital
    - Convertible to equity by mutual consent
  - Infrastructure assistance
    - Office space and general infrastructure facilities
  - Mentoring and Advisory Services
    - Access to a range of professionals and services
Facilities

Offer a structural and supportive environment.

- Software tools for identified areas
- Supply, power, water, phone, internet, canteen facility
- Secretarial, Accounting, legal
- Management assistance
- Seed funding
- Angel funding
- Interacting with VCs
- Test seed funding
- Access to financing
- Alumni support (techniques and financing)
- Exposures to critical business on technical support services
- Training (employees) on human management
<table>
<thead>
<tr>
<th>Name of the Investor</th>
<th>Place</th>
</tr>
</thead>
<tbody>
<tr>
<td>View Corporate Advisors Limited,</td>
<td>Mumbai</td>
</tr>
<tr>
<td>West Bridge Capital Partners,</td>
<td>California, Mumbai, Bangalore</td>
</tr>
<tr>
<td>Axcend India Pvt Ltd</td>
<td>Bangalore</td>
</tr>
<tr>
<td>Pulsar Ventures</td>
<td>Toronto, Canada</td>
</tr>
<tr>
<td>Kerala Venture Capital Fund (P) Ltd</td>
<td>Kochi, Kerala</td>
</tr>
<tr>
<td>Digital Partners</td>
<td>Seattle, USA</td>
</tr>
<tr>
<td>Sarnoff Innovative Technologies P. Ltd</td>
<td>Bangalore</td>
</tr>
<tr>
<td>Intel Technology India (P) Ltd</td>
<td>Bangalore</td>
</tr>
<tr>
<td>XIRS Ventures</td>
<td>Toronto, Canada</td>
</tr>
<tr>
<td>Silicon Valley Bank</td>
<td>Santa Clara, USA</td>
</tr>
<tr>
<td>Kleiner Perking</td>
<td>USA</td>
</tr>
<tr>
<td>Upstream Ventures</td>
<td>Singapore</td>
</tr>
<tr>
<td>CII – New Ventures India</td>
<td>Hyderabad</td>
</tr>
<tr>
<td>AGES</td>
<td>United Kingdom</td>
</tr>
</tbody>
</table>
### Major Venture Capitalists - Visitors

<table>
<thead>
<tr>
<th>Name of the Investor</th>
<th>Place</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zmod Innovations Pty Ltd</td>
<td>Victoria, Australia</td>
</tr>
<tr>
<td>Melbourne University (P) Ltd</td>
<td>Victoria, Australia</td>
</tr>
<tr>
<td>GBS Venture Partners Ltd</td>
<td>Victoria, Australia</td>
</tr>
<tr>
<td>Dandolo Partners</td>
<td>Victoria, Australia</td>
</tr>
<tr>
<td>Wyld Group Pty Ltd</td>
<td>Victoria, Australia</td>
</tr>
<tr>
<td>Walden International</td>
<td>California, USA</td>
</tr>
<tr>
<td>Telesoft Partners</td>
<td>California, USA</td>
</tr>
<tr>
<td>Charles River Ventures</td>
<td>Massachusetts, USA</td>
</tr>
<tr>
<td>Krypton Consulting Incorporated</td>
<td>California, USA</td>
</tr>
<tr>
<td>WBCP Advisors (P) Ltd</td>
<td>Mumbai</td>
</tr>
<tr>
<td>Emergent Ventures India (P) Ltd</td>
<td>Bangalore</td>
</tr>
<tr>
<td>Bessemer Ventures Partners</td>
<td>California, USA</td>
</tr>
<tr>
<td>Ion America</td>
<td>California, USA</td>
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</tbody>
</table>
The “Society for Innovation” is itself a remarkable example of innovation – in the best interests of IISc – and the country. I admire your success to date and look forward to your even greater success, as an example of “what can be done.”
All best wishes

Lita Nelsen
Director, Technology Licensing Office
Massachusetts Institute of Technology, Cambridge
27-01-2006
Strengths

- Electrical engineering & Management Faculty play a proactive role.
- Large presence of entrepreneurs in the surroundings
- Royalties on Innovations – Music synthesizer, DNA, Google
Role of Alumni Cell

Alumni experienced in starting & selling companies

- can become partners.
- can visit IISc & deliver lectures on entrepreneurship, management etc
- can advise in patenting process
- can create business for the products
- can connect the incubatees to Angel funding & venture funding

BEST SUITED FOR HAND-HOLDING EXERCISE
Thank You