भारत सरकार
अंतरिक्ष विभाग

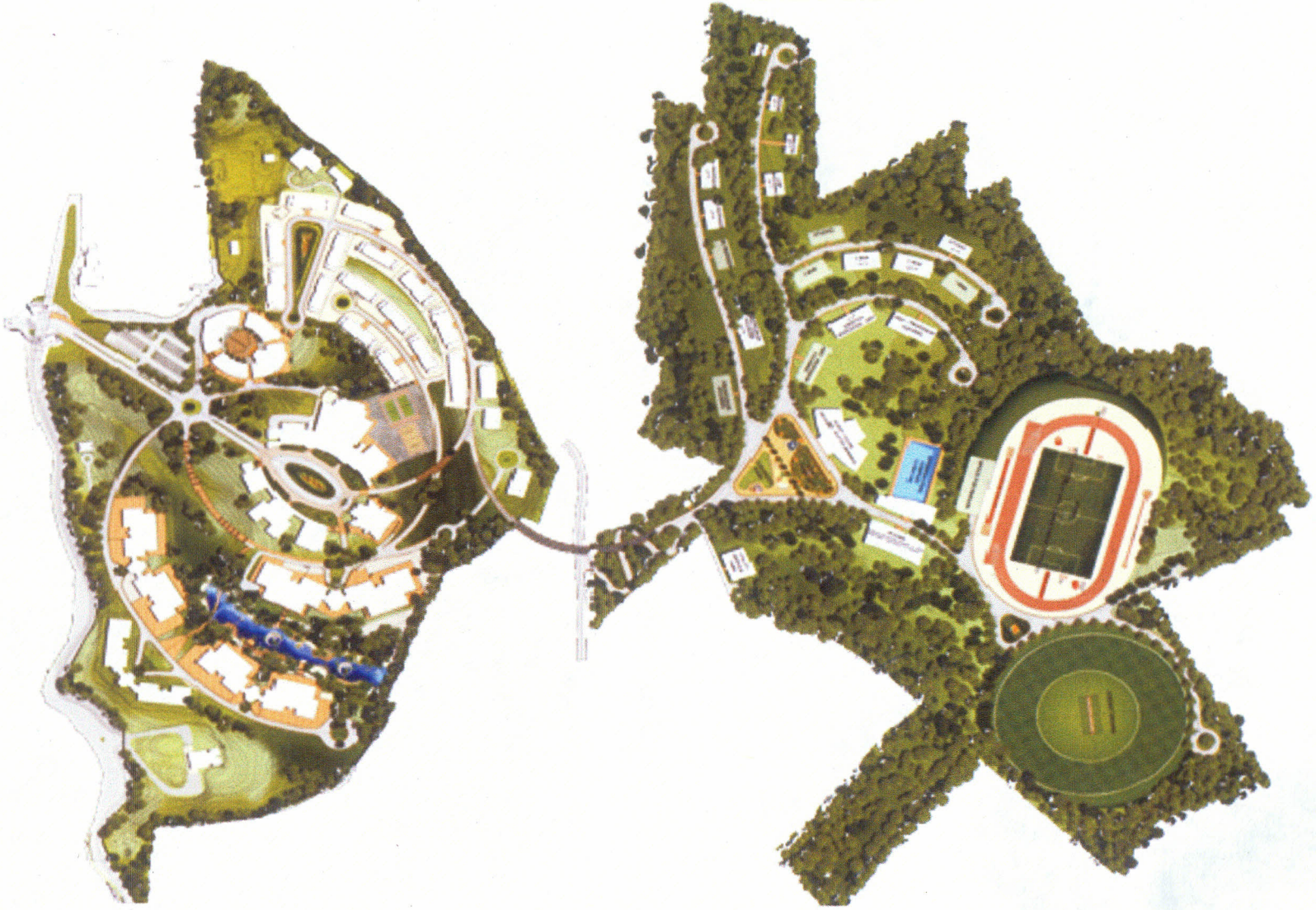
Government of India
Department of Space

INDIAN INSTITUTE OF SPACE SCIENCE AND TECHNOLOGY

Declared as deemed to be University under section 3 of UGC Act, 1956

ANNUAL REPORT 2010 - 2011

Master plan of IIST Campus



भारत सरकार
अंतरिक्ष विभाग

Government of India
Department of Space

सत्यमेव जयते

INDIAN INSTITUTE OF SPACE SCIENCE AND TECHNOLOGY

Declared as deemed to be University under section 3 of UGC Act, 1956

ANNUAL REPORT 2010 - 2011

Contents

Vision and Mission

Vision:

To be a world class educational and research institution contributing significantly to the space endeavours.

Mission:

Create a unique learning environment enriched by the challenges of the space programme.

Nurture the spirit of innovation and creativity.

Establish Centres of Excellence in niche areas.

Provide ethical and value based education.

Promote activities to address societal needs.

Network with national and international institutions of repute.

Foreword

It was with great pleasure and anticipation that I assumed the position as Director, IIST on 27th December 2010. The new campus at Valiamala had already started functioning. The challenges ahead were many, encompassing a broad spectrum of issues.

The Indian Institute of Space Science and Technology continues to serve as the platform for unique and diverse research in niche areas of space science and technology. Simultaneous to the construction of new buildings, the pylons of academics and research had to be strengthened as well. Keeping this objective in mind, we have been trying hard to tap the resources and channelize them to academia - in teaching, learning, R & D and extension activities at IIST. We have been greatly involved with the most challenging facets of academia while continuing to kindle our concern for sustained engagement with on-going R & D projects.

It has always been our endeavour to build a unique and path-breaking institution with a view to encapsulate education with creativity, innovation and research, notwithstanding the human resource requirements of the Indian Space Research Organisation and other related National Institutes . Collaboration with national and international organisations of repute is already ingrained in the infrastructure build-up of IIST.

At IIST, we strive to move engineering away from experience - based hand book, to one that is centrally based on the first principles of Science. Our goal is to construct a shared, distributed, reflective practice where experiences are collected, vetted, clustered, commented on and tested out under various contexts. We believe in creating a 'learning about learning' environment – a boot strapping operation in which faculty, along with students are learning among and between themselves.

This annual report, which takes stock of the events and efforts of 2010-11, while looking ahead to the challenges of 2012, underscores the broad range of projects undertaken by IIST. Here, we have the whole support system of creativity, innovation and research to bolster the active teaching-learning processes. Our emphasis is to find out the most effective pedagogical method of knowledge transfer. The substance and goal are to disseminate and share information in every possible way. This, we believe, facilitates the participation of every individual and group in the mediation of information in the corridors of cognition and knowledge management.

Board of Management

Chairman

Secretary, Department of Space, Government of India

Members

Secretary, Department of Atomic Energy, Government of India

Secretary, Department of Higher Education, Government of India

Chief Secretary, Government of Kerala

Prof. Roddam Narasimha, Member, Space Commission

Director, Indian Institute of Technology, Mumbai

Director, Indian Institute of Technology, Madras

Director, Indian Institute of Science, Bangalore

Director, Vikram Sarabhai Space Centre, Thiruvananthapuram

Director, Space Applications Centre, Ahmedabad

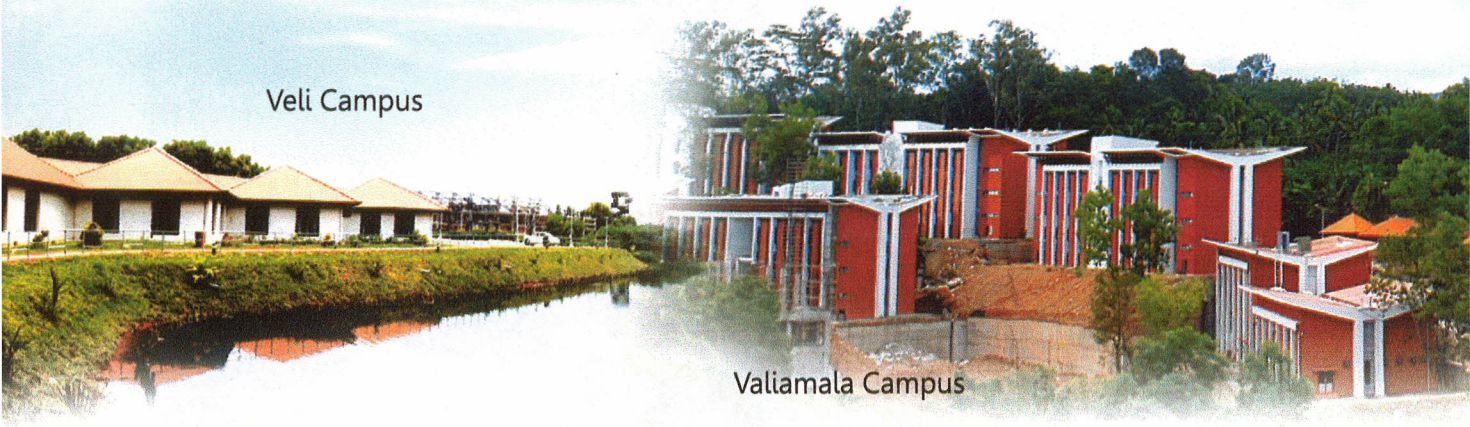
Additional Secretary, Department of Space, Government of India, Bangalore

Scientific Secretary, ISRO Head Quarters, Antariksh Bhavan, Bangalore

Nominee of UGC Chairman

Director, IIST- Member Secretary

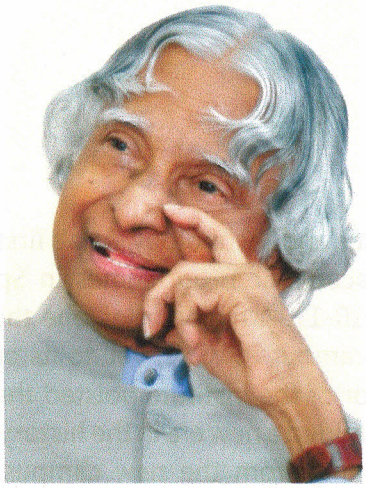
Indian Institute of Space Science and Technology, Asia's first Space University and only the third in the world to offer academic programmes in Space Science and Technology entered its fourth year in 2010-11. A major milestone this year was the shifting of the Institute from its alternative campus at VSSC, Veli to its permanent abode at Valiamala. When Dr. B N Suresh, Director of the Institute hoisted the National flag on 15th August 2010 in the new campus, it heralded a new era in the history of IIST. From the very next day, the Institute started functioning from the new campus. The full range of academic activities are now being conducted from the new campus and all the students and research scholars are comfortably accommodated in the hostels.



IIST witnessed a change at the helm towards the latter part of the reporting year as Dr B N Suresh laid down office on 12th November 2010 after an eventful tenure as the Institute's Founder Director. Dr K S Dasgupta, former Director, Development and Educational Communication Unit (DECU) and Deputy Director, Satellite Application Centre (SAC) took over as IIST's new Director on 27th December 2010.

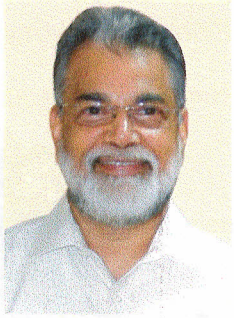
Key Functionaries

Our Chancellor



Dr. A. P. J. Abdul Kalam

Chairman, Board of Management



Dr. K. Radhakrishnan
Chairman, ISRO/Secretary, DOS

Director

Dr. K. S. Dasgupta

N Vasudevan. IFS.
Registrar

Dr. V. Adimurthy
Dean (R & D)

Dr. R Krishnan
Dean (Academics)

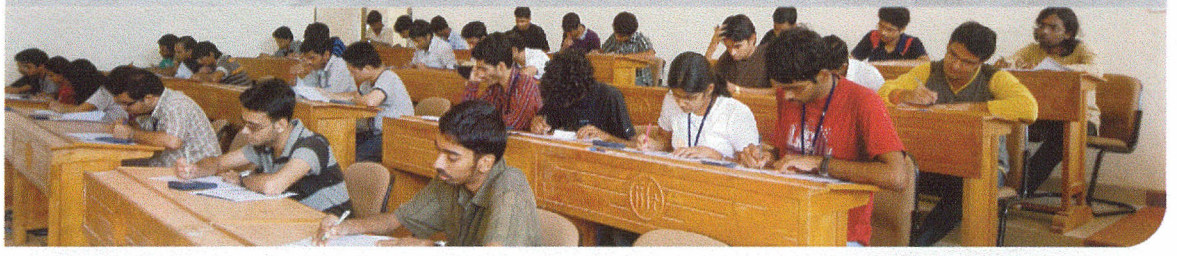
Dr. Thomas Kurian
Dean (Student Activities)

Features of the New Campus

IIST now has a campus of its own. Though not fully established, the campus has the infrastructure and facilities necessary to support the ongoing academic and research programmes.

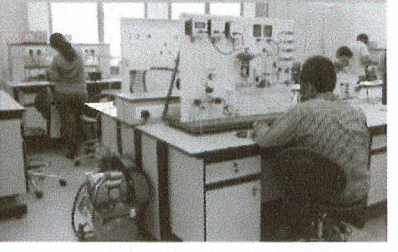
Lecture Halls

The institute has spacious and well equipped lecture halls.



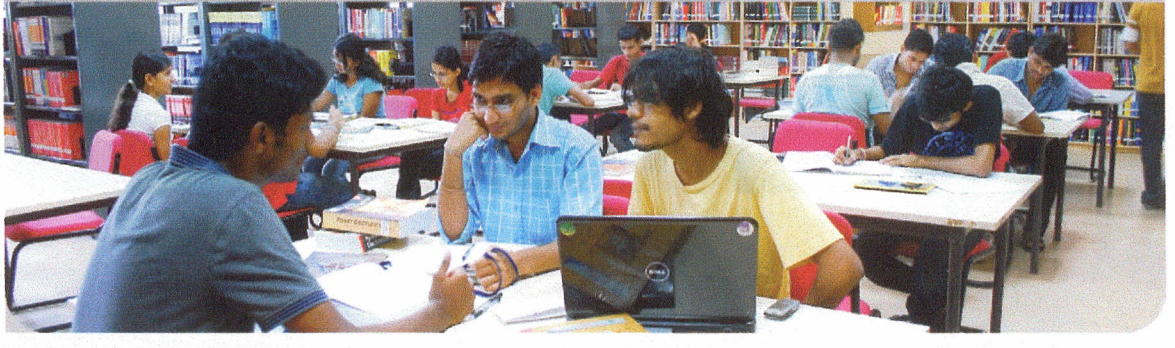
Laboratories

All the departments in IIST can boast of modern laboratories with sophisticated equipments.



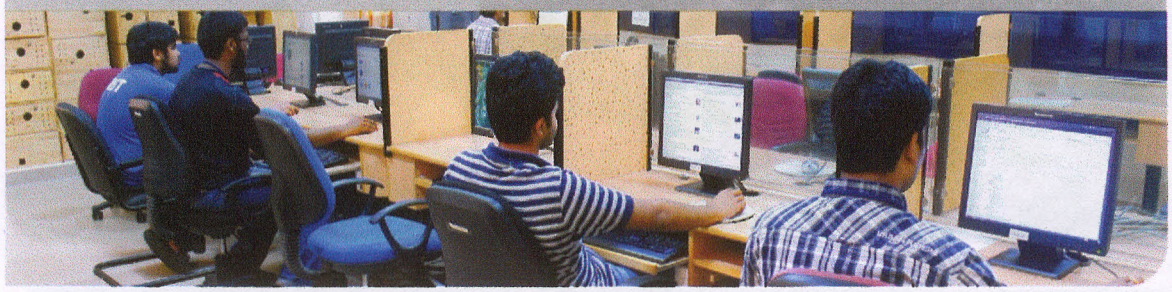
Library

The library has a collection of more than 7000 books and 3200 e-journals. Online Public Access Catalogue [OPAC] is made fully operational. It is also connected to the UGC INFONET Journal Consortium of INFLIBNET. A binding facility is recently added.



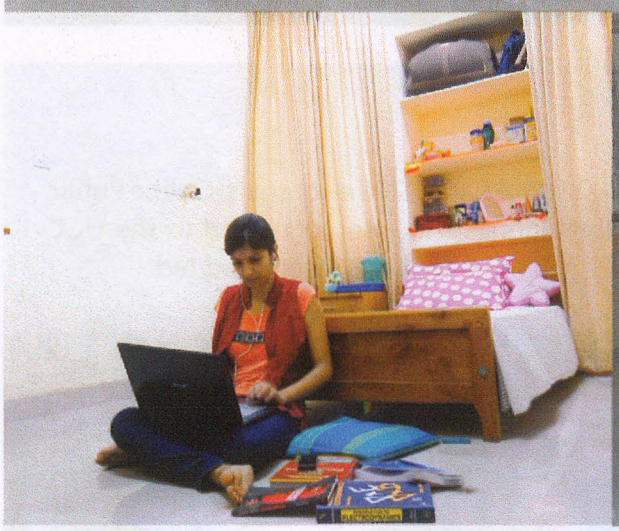
ICT Facility

The Institute has a Central Computing facility. Wi-Fi network is available throughout the campus. An internet room also provides students with facility for browsing, downloading and printing.



Hostels

Being a residential Institute, the students are housed in 8 well furnished hostels in the campus. The hostels are named after constellations viz, Chitra, Ardra, Dhanishta,Arundhati, Phalguni, Ashwini, Dhruva, Rohini

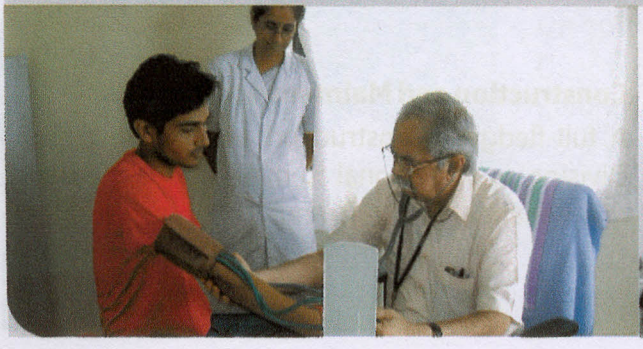


Mess Halls

IIST has two mess halls namely Adhiti and Akshaya provided with well equipped kitchens and serviced by excellent catering staff. Utmost care is taken to provide healthy and wholesome food to the students.

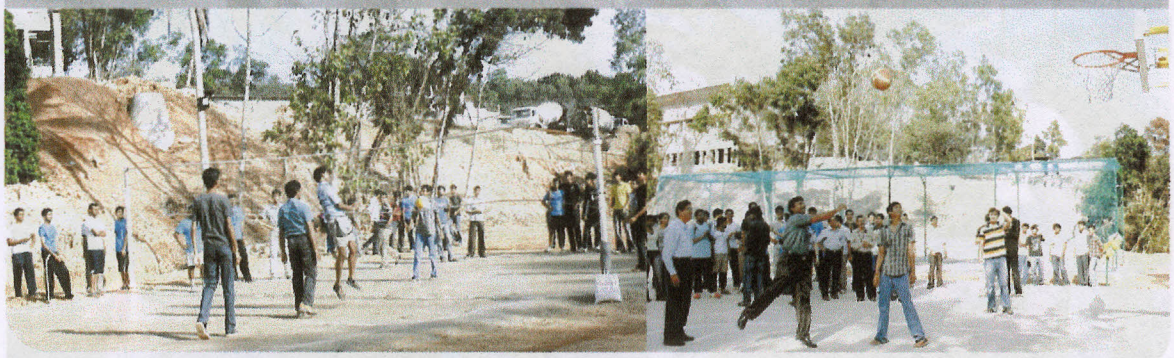
Medical Facility

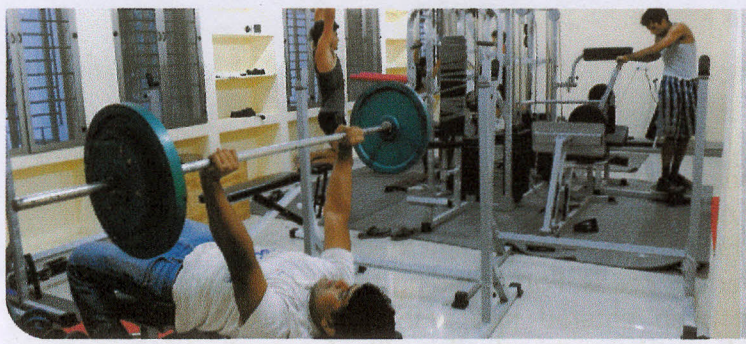
A well experienced medical team with a Chief Medical Consultant, three Medical Officers and paramedical staff offer their services to students and staff on all days. A clinic has been established in the campus with sufficient medicines and equipment to take care of the day to day medical needs. For attending to cases requiring greater attention, an agreement has been entered into with a prominent hospital in Thiruvananthapuram city. Students also enjoy the benefit of a medical insurance coverage worth ₹ 100,000 per annum.



Sports facility

There are two playgrounds, one within the campus and the other shared with a nearby school, which are utilised by the students for their sports activities. The play area in the campus houses the basketball court, a badminton court, a cricket practice pitch and two volley ball courts. Facilities for indoor games like Table Tennis, Carroms and Chess are available in the hostel recreation rooms.





Gymnasium

A well equipped gymnasium with three Instructors ensures the physical well being of the students.

Construction and Maintenance Division

A full-fledged 'Construction and Maintenance Division' is operational to meet the day to day maintenance of the buildings.

Cafeteria

A private-run cafeteria serves variety snacks and food till very late in the night.

Security

A private security agency has been engaged to take care of the campus security.

Transport facility

All faculty members are provided conveyance facility from the city to the Institute.

Banking facility

A branch of Union Bank with its ATM counter is functioning in the campus.

On going constructions works

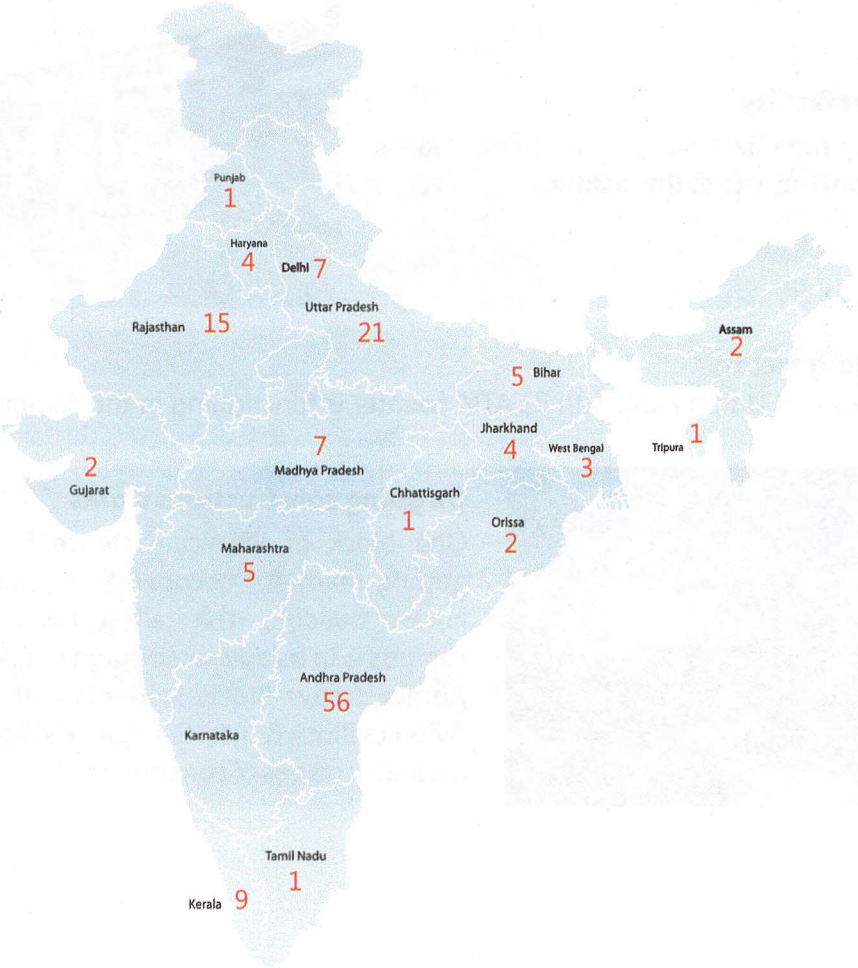
One block of Physical Science building is getting ready for occupancy. The six storeyed library building, the tallest building in the campus is in its advanced stage of construction. Administrative Block, Students Activity Centre, Avionics Block & Inter Disciplinary Block are also in various stages of construction.

Admissions 2010-11

B Tech Programme

In a major deviation from the past, admissions to the B Tech programmes of IIST for the academic session 2010-11 were done through an All India Admission Test called "ISAT-2010". This was conducted in 26 cities across India on 16th April 2010. 80106 candidates appeared in the Test. Academic session for the new batch of 146 students commenced on 30th August 2010.

Category	Aerospace Engineering	Avionics	Physical Science	Total
GEN	26	38	27	91
OBC	13	13	1	27
SC	9	9	6	24
ST	3	1	0	4
TOTAL	51	61	34	146



M Tech Programme

In addition to the existing postgraduate programme on "Soft Computing and Machine Learning", a new M Tech programme on "Chemical Systems" was introduced with 10 candidates selected from different ISRO Centres.

Ph D Programme

Doctoral programmes are offered in Aerospace Engineering , Avionics and Chemistry , Earth and Space Sciences, Humanities, Mathematics and Physics. 40 Research Scholars are enrolled for PhD programmes in these areas.

Academics

The academic activities of the institute is centered around the following departments:

- Aerospace Engineering
- Avionics
- Chemistry
- Earth and Space Science
- Humanities
- Mathematics
- Physics

Core Faculty

The faculty strength of the Institute rose to eighty during the year. Several well qualified and experienced faculty members, many of them from premier institutions in the country and abroad, joined the IIST family.

Research Activities in the Institute

Research forms a significant part of the goals envisaged for this premier Institute. The main aim is to seamlessly integrate research and development with academics and encourage faculty members and students to carry on research in their respective areas of interest. The institute has developed the infrastructure to foster an excellent research atmosphere and it provides opportunity to share the sophisticated research facilities of ISRO centres and national labs. In order to give an impetus to this activity, IIST has created a Research Board with eminent members from ISRO Centres and other premier educational and research Institutes in the country. IIST funds the research projects of IIST faculty while encouraging active collaborations with other ISRO Centres, units and laboratories of national importance. Peer Review Committees constituted by the Board will critically and systematically appraise the research programmes, projects etc so that the researchers are challenged to excel.

Research Labs at the Institute

All the departments have now established functional research labs, the focus being on conducting basic and applied research. State-of-the-art facilities are being housed in these labs, including a wide array of modern equipments essential for exploring the horizons of research frontiers.

Laboratories under different departments

Department of Aerospace Engineering

Aerodynamics Lab is equipped for Wind tunnel studies related to aircraft models, aerofoils and air flow related activities.

Faculty Supervisor: Dr. Rajesh G

CADD Lab facilitates students to evolve concepts, ideas and convert them into complete products. The process of modelling and analysis takes place in a digitally integrated environment.

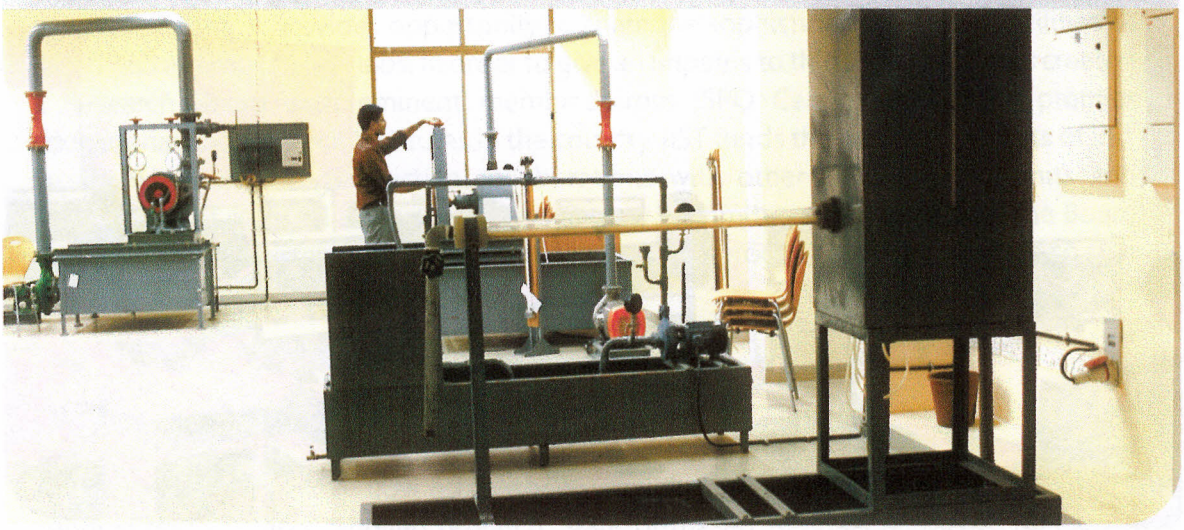
Faculty Supervisor: Shri Sam Noble

Flight Mechanics Lab gives exposure to students on fundamentals of flight through flight simulators. It also has unmanned instrumental aircrafts and rigs to study the dynamics of aerospace vehicles.

Faculty Supervisor: Sri Pankaj Priyadarshi

Fluid Mechanics Lab conducts major experiments with calibration of flow meters including venture meter Reynolds experiments.

Faculty Supervisor: Dr Abdusamad alias Salih

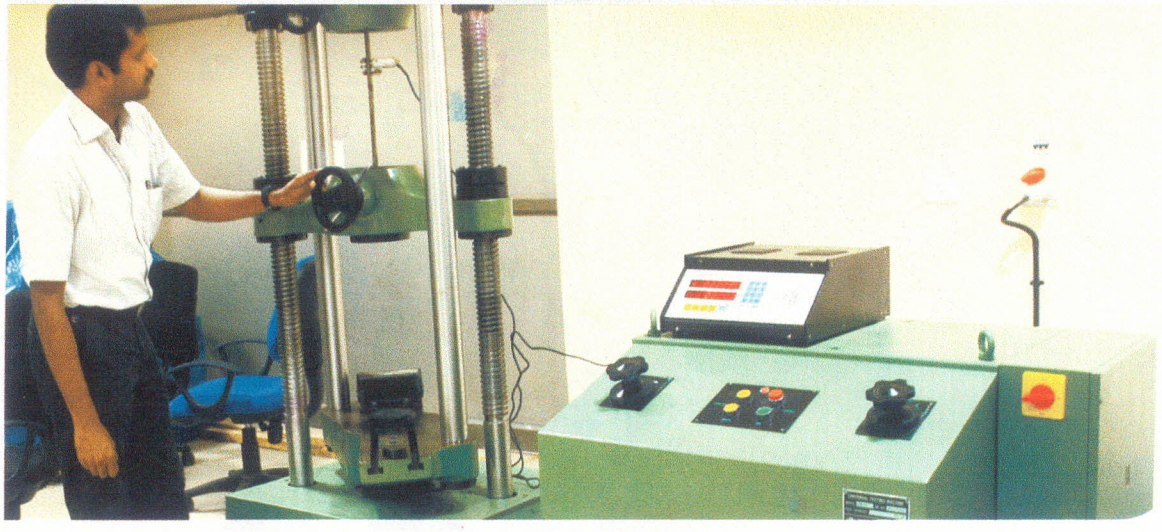


Manufacturing Lab contains conventional machines, Computerised Numerical Control Machines (CNC), Flexible manufacturing System (FMS), Robots, Electrical discharge machines (EDM), CNC grinding machine, Assembly and disassembly sections.

Faculty Supervisors: Shri K Jayakumar and Shri Sooraj V S

Strength of Materials Lab is equipped with facilities for testing of engineering materials and for the conduct of regular experiments for undergraduate students. The major equipments in the lab include Universal Testing Machine of 20T capacity, Rockwell, Brinell and Vickers Hardness Testing Machines, Torsion Testing Machine, Impact Testing Machine, Rotary Bending Fatigue Testing machine and Creep and Rupture Testing Machine

Faculty Supervisor: Ms Roshina Babu



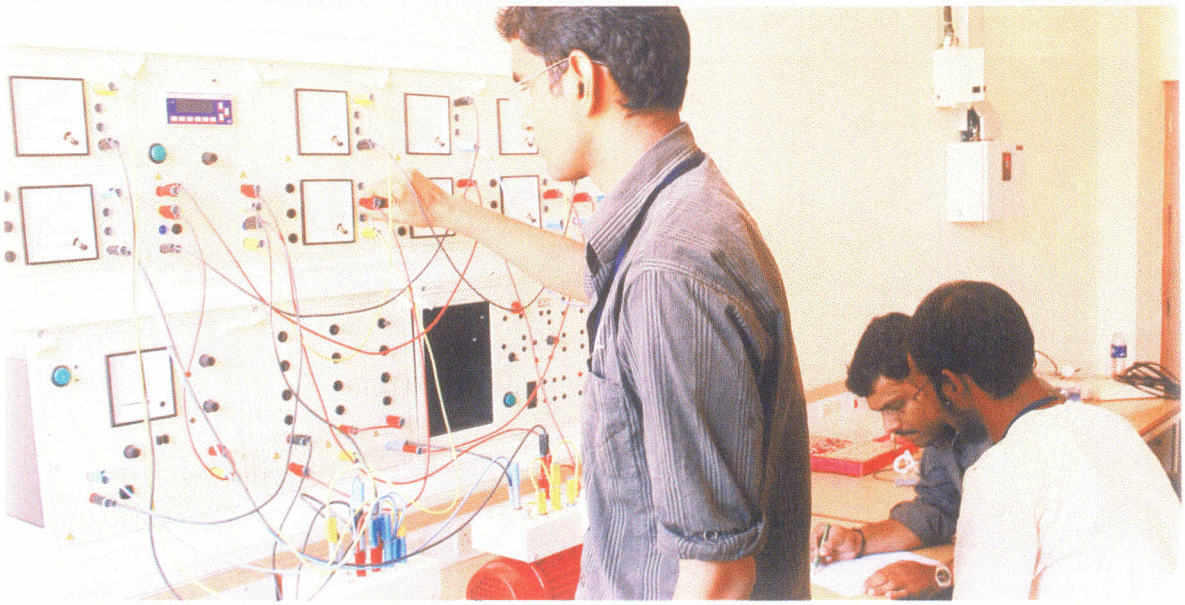
Department of Avionics

Analog Electronics Lab deals with the implementation of analog electronics circuits using bread board, verifying in CRO and measurement using multimeter for various signals generated from signal generators.

Faculty Supervisor: Smt Vani Devi

Basic Electrical Lab provides exposure of students to various electrical machines and carrying out tests to assess performance of such machines.

Faculty Supervisor: Dr Selvaganesan



Basic Electronics Lab deals with implementation of basic electronics circuits using bread board and verifying in CRO.

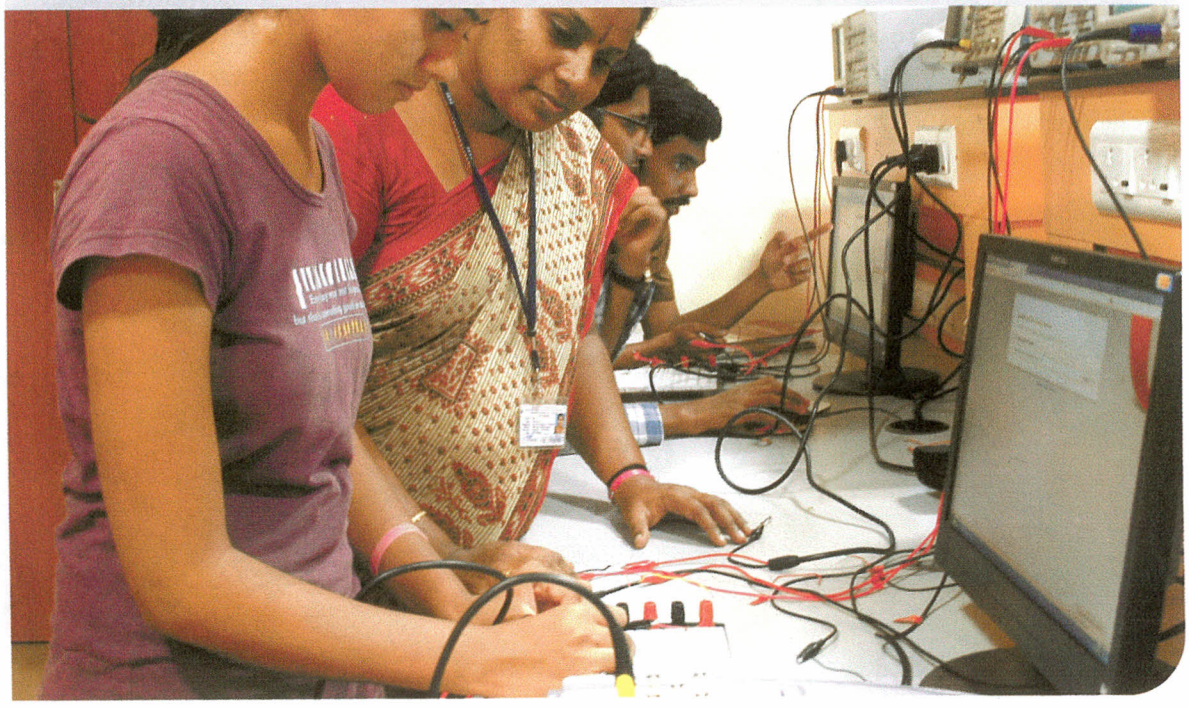
Faculty Supervisor: Smt Sreeprabha P K

Control and Guidance Lab deals with the design of controllers in real time system using matlab and simulink, real time models such as inverted pendulum, twinrottor MIMO systems, electro mechanical actuator systems

Faculty Supervisor: Dr. N Selvaganesan

Digital Communication Lab conducts testing of various digital modulation and demodulation techniques and assessing the performance.

Faculty Supervisor: Smt Vani Devi



Digital Electronics Lab does implementation of Digital Electronics circuits using digital trainer kit and verifying the functionality of various logic circuits.

Faculty Supervisor: Smt Vani Devi

Digital Signal Processing Lab deals with Design of digital filters for various signal processing and image processing applications and implementation hardware.

Faculty Supervisor: Dr J Sheeba Rani

E-Cad Lab does simulation of analog and digital elctronic circuits using Pspice A/D and capture CIS, creating model library, basics of layout design, PCB label, etc.

Faculty Supervisor: Dr J Sheeba Rani

Instrumentation and Measurement Lab deals with different types of sensors, testing and calibration

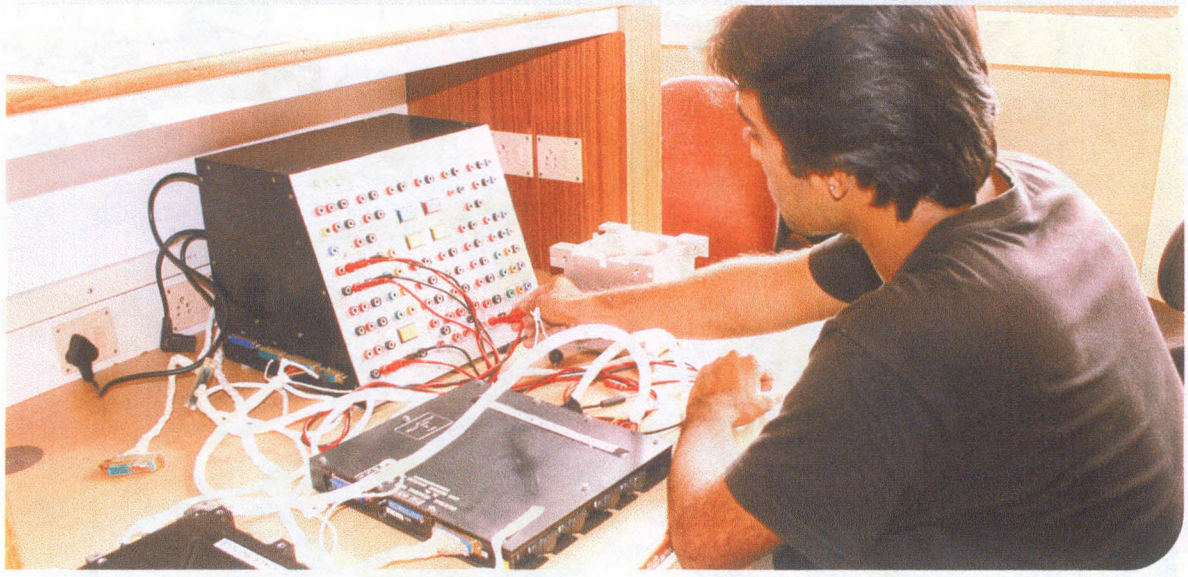
Faculty Supervisor: Dr. N Selvaganesan

Microprocessor and Microcontroller Lab provides exposure to usage of microprocessor and development of software for embedded system and applications.

Faculty Supervisor: Dr J Sheeba Rani

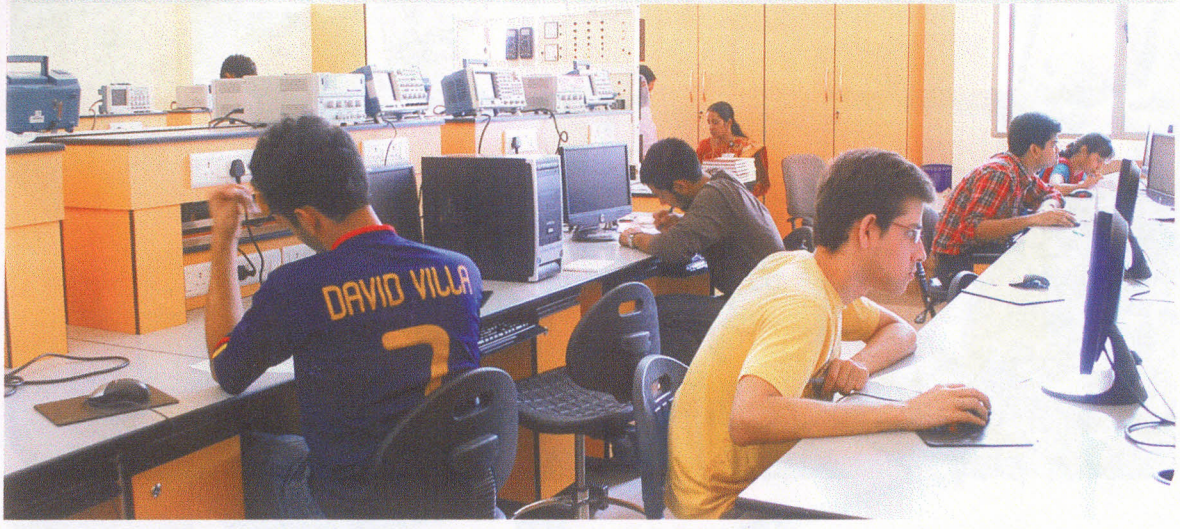
Navigation System and Sensors Lab has dynamically turned GYRO, accelero meter, testing and design.

Faculty Supervisor: Dr. V. Krishnan



Power Electronics Lab deals with simulation of power circuits using orcad and matlab, DC-DC converter experiments, Motor control trainer and solar array simulator experiments.

Faculty Supervisor: Smt Sreeprabha P K

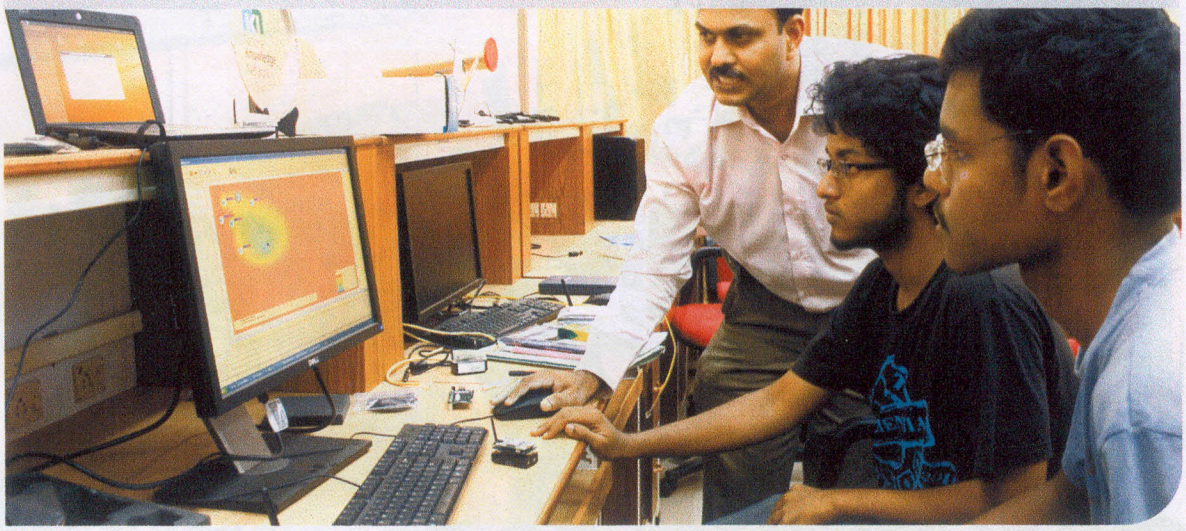


RF and Microwave Lab provides exposure to various RF and Microwave passive and active components and their usage for developing filters, amplifiers, oscillators etc and measurements of various parameters related to their performance.

Faculty Supervisor: Smt Vani Devi

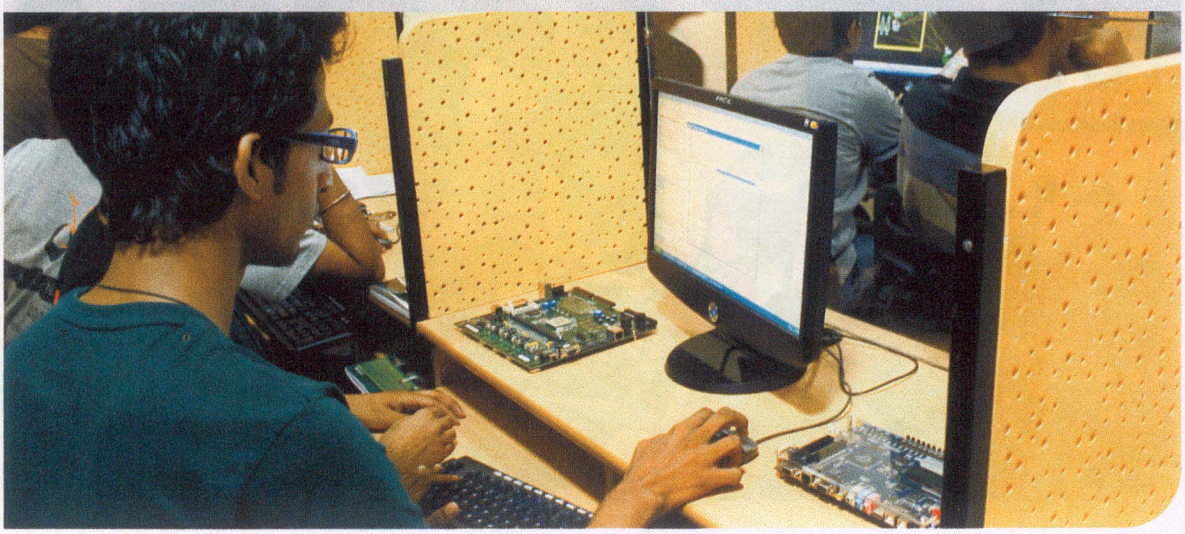
Sensor Networks Lab is for configuring various networking schemes for sensors and communication between them for efficient transfer of data.

Faculty Supervisor: Dr Manoj B S



VLSI Lab has state-of-the-art software tool for front end and back end design. The software tool comprises cadence, synopsis and mentor graphics, Digital ICs modeling, analysing digital and analog circuits/ devices, Altera sponsored FPGA kits and Xilinx high end FPGA kits for R & D applications. Undergraduate level projects are also done in this lab.

Faculty Supervisor: Dr J Sheeba Rani



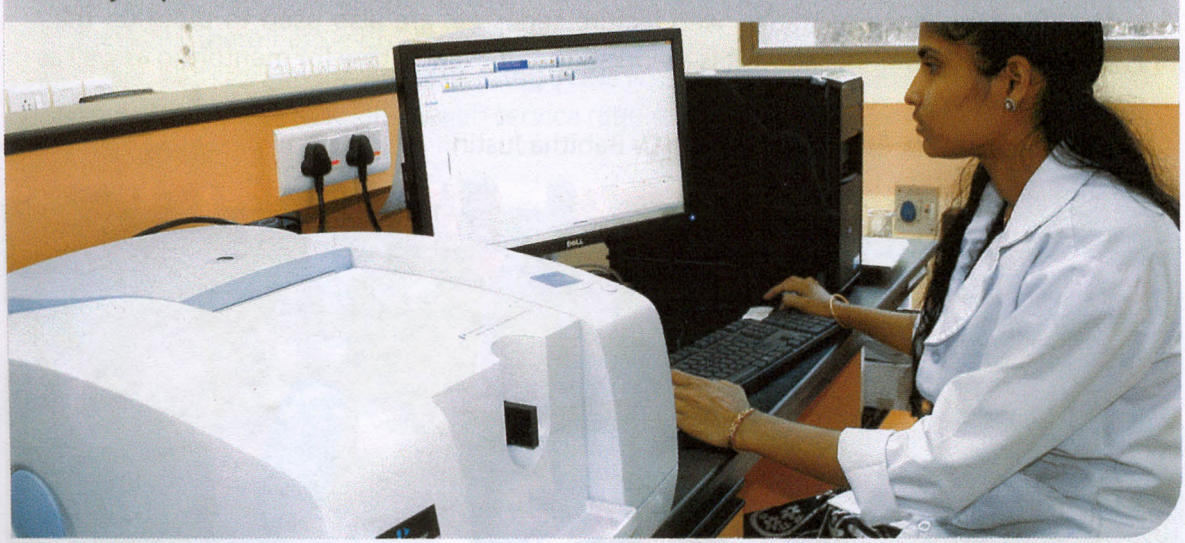
Department of Chemistry

General Chemistry Lab is to give exposure for first year B.Tech students to general chemistry experiments with the help of advanced equipments like Spectro photometer, Polarimeter, pH meter, Auto titrator etc. It also helps the students to practice their theoretical knowledge in Chemistry in the areas of Electrochemistry, Kinetics of Reactions, Organic Synthesis, Spectroscopy etc.

Faculty Supervisor: Dr Nirmala Rachel James

Material Characterization Lab is a sophisticated characterization laboratory with IR Spectro photometer, UV Spectrophotometer, TGA, DSC, Glove box, Ultra sonicator, Electrochemical Work Station etc. Many more characterization equipments like AFM, HPLC, DMA, GPC will be installed soon.

Faculty Supervisor: Dr K Prabhakaran



Chemical Engineering Lab is mainly meant for B.Tech and M.Tech students for doing their basic chemical engineering experiments with respect to the chemical engineering theory papers. It has been developed with the facilities like different reactors setup, heat exchanger, packed bed distillation column, fluidized bed, P, PI, PID controller etc. for undergraduate and post graduate teaching and research. The lab has the equipments covering the various parts of chemical industries like fluid mechanics, heat transfer, mass transfer, reaction engineering and process control to facilitate the basic understanding of application of chemical engineering.

Faculty Supervisor: Dr. N Gomathi

Department of Earth and Space Sciences

Atmospheric Science Lab houses instruments for meteorological, solar radiation, air pollution and cloud microphysics studies. It provides hands-on experience to under graduate students on instrumentation, miniaturization and data analysis and is also equipped for advanced research.

Faculty Supervisor: Dr M V Ramana

Remote Sensing Lab is equipped with GPS, Spectro Radiometer and Mirro Stereoscope for remote sensing and photogrammetry experiments and also advanced digital image processing, GIS and photogrammetry software such as ARC GIS, IGIS, LPS, ENVI, ERDAS IMAGINE. This provides a platform for students to work in image processing, mapping and navigation related research activities related to earth observation and land use

Faculty Supervisor: Dr L Gnanappazham

Department of Humanities

Language Lab is provided with state-of-the-art facilities like audiovisual aids and language teaching-learning software such as Clarity and Orell to bolster the Communication Skills course that gives special emphasis to the listening, reading, writing and speaking skills of the students. Students are given opportunities to make presentations (individual as well as group), debates, extempores, role-plays etc. Movies, video clippings, documentaries, web lecture series etc are also used to build up their competency in communication. It is a workshop-cum-laboratory for mentoring as well as self improvement.

Faculty Supervisors: Smt Gigy Alex and Dr Babitha Justin

Programming Lab has 60 desktop computers for conducting matlab programming and C programming. The systems are IBM Lenovo and are connected in a wired network.

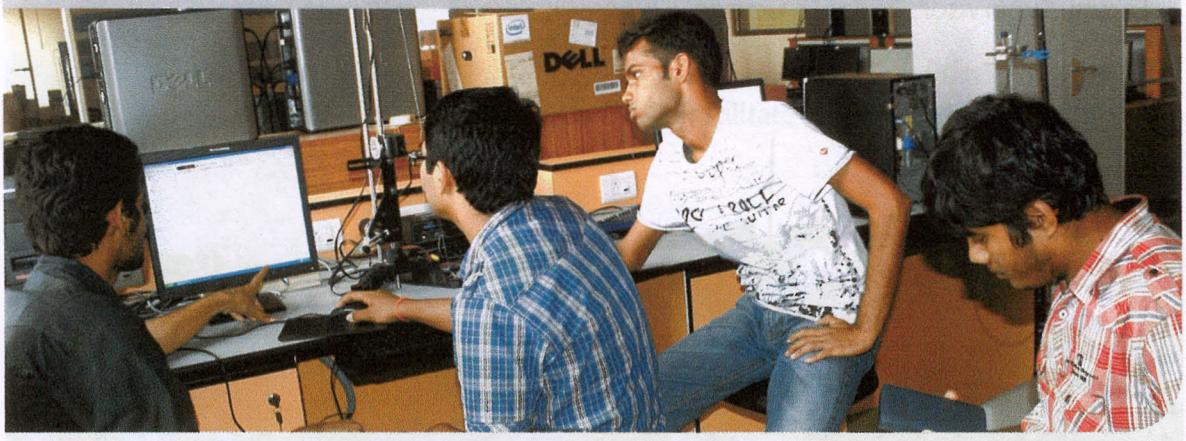
Faculty Supervisor: Dr. Raju K George

High Performance Computing Facility at IIST has HPC Lab and HPC cluster. HPC Lab has 10 high end workstations having 72 GB Ram and 1 TB memory, 4 GB N vidia graphics memory. M Tech soft computing lab is being conducted here. These machines can also be used to connect the IIST HPC cluster for computationally intensive tasks.

Complementing the HPC lab is HPC cluster that contains a Red Hat Enterprise Linux based control node and 32 dual-processor quad-core compute nodes thus making a total of 256 computer cores that provide a total computing power of 3 TFlops. The control node has four Intel Xeon processors with 2.93GHz processor, 8GB Cache, and four cores. The compute nodes have dual processors with 3GHz, 8GB Cache, and quad cores. The HPC rack forms the backbone of the internal computing resources. It provides high performance computing facility that can be accessible from Linux and Windows OSs for degree/post graduate/research students to undertake high level computational projects. In addition, there are eight high performance utility servers, PBS schedulers, Gigabit switches, and storage servers co-located in the HPC cluster rack. These high performance utility servers are used for IIST's web service requirements such as the registration servers for ISAT 2012.

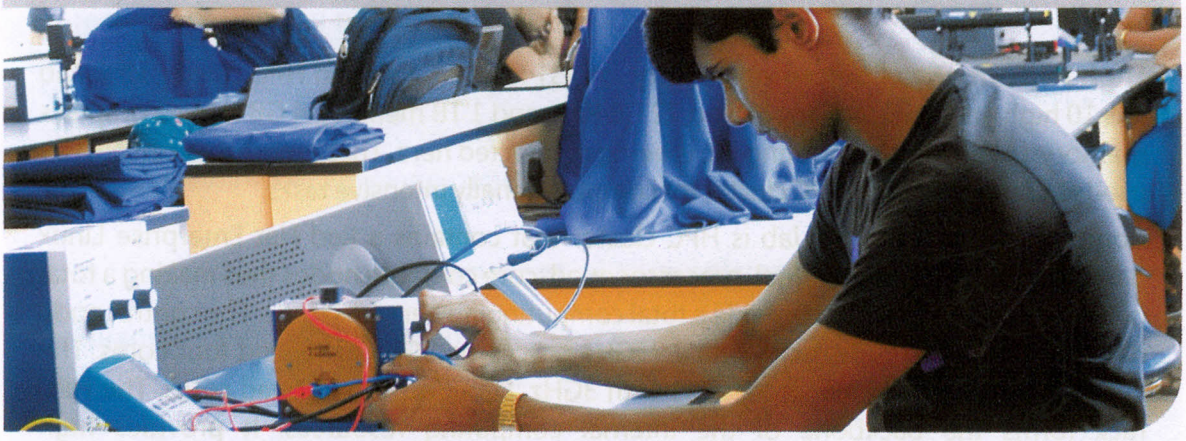
General Physics Lab gives an introduction to the basic experiments in mechanics, electricity and magnetism.

Faculty Supervisors: Dr Murugesh and Ms Sasikala



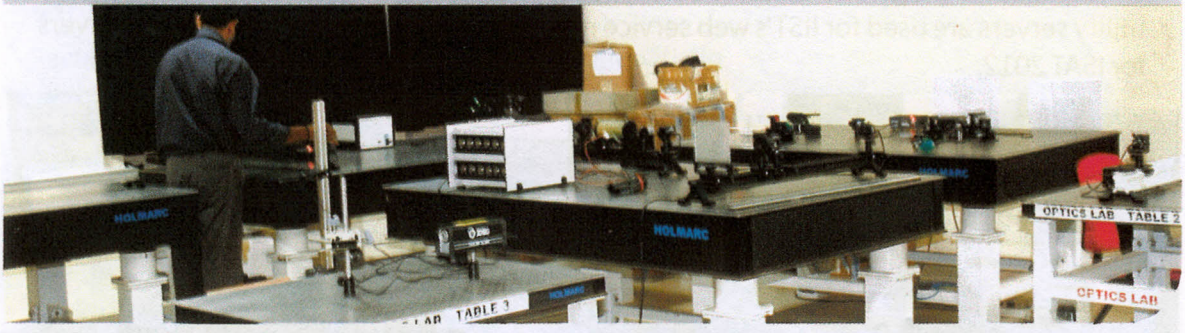
Modern Physics Lab caters to advanced experiments in the field of modern physics like spectrsocopy, Zeeman effect, ESR, etc.

Faculty Supervisor: Dr Umesh R Khadhane



Optics Lab deals with diffraction, interference, polarization experiments, Faraday optic rotation, liquid lens, Fourier imaging, holography, photoelasticity etc.

Faculty Supervisor: Dr Pramod Gopinath



Atomic and Molecular Physics lab is used for research purpose in the design and development of mass spectroscopy and recoil ion mass spectrometry laboratory and study of novel molecular ions.

Faculty Supervisor: Dr Umesh R Khadhane

Publications of the faculty

Department of Aerospace Engineering

1. **Anup, S**. *'Influence of viscoelasticity of protein on the toughness of bone'*, Journal of the Mechanical Behavior of Biomedical Materials, Volume 3, Issue 3, Pages 260- 267, April 2010.

2. **Chakravarthy.P**., U. Chakkingal and P. Venugopal *" Use of Ring Compression Test and Plastic Poisson's Ratio in Extruding Sintered Powder Metallurgical Preforms"*, Powder Metallurgy, DOI 10.1179/1743290110Y.0000000011, 2011.

3. **Salih. A** and Ghosh Moulic, S., *"Numerical Simulation of Buoyancy-driven Bubble Motion Using Level Set Method"*. International Journal for Computational Methods in Engineering Science and Mechanics, 11, issue 4, 211-229, 2010.

4. **Sooraj V. S**., Jose Mathew, *"An experimental investigation on the machining characteristics of microscale end milling"*, International Journal of Advanced Manufacturing Technology, accepted for publication Published online: 24th March 2011.

Department of Avionics

5. T. B. Reddy, **B. S. Manoj**, and Ramesh Rao, *"An Autonomous Access Point for Cognitive Wireless Networks,"* in Cognitive Radio Mobile Ad Hoc Networks, Edited by F.R. Yu (ed.), Springer Science Media,. [DOI: 10.1007/978-1-4419-6172-3 15], 2011.

6. **Deepak Mishra**, Prem K. Kalra, *"An energy function approach for finding roots of characteristic equation"* accepted for the publication in ICTACT Journal on Soft Computing - Special Issue on "Fuzzy in Industrial and Process Automation", 2011.

Department of Chemistry

7. Palaty S; Mary K J; **Honey J**; Devi P V, *" Effect of dopants and preparation conditions on the conductivity of polyaniline"* Progress in Rubber, Plastics and Recycling Technology, p.141-154, Volume: 26, Issue No: No.3, 2010.

8. K G Princy, Rani Joseph, **Honey John** and K T Mathew, *"Complex permitivity and conductivity of poly(p-phenylenediazomethine) and its blends at microwave frequencies"* Bull. Mater. Sci., Vol. 33, No. 3, , pp. 265–272, June 2010

9. Bibin John, C. P. R. Nair, **K. N.Ninan**, *"Effect of nanoclay on the mechanical, dynamic mechanical and thermal properties of cyanate ester syntactic foams"*, Materials Science and Engineering A, 527 5435 – 5443, 2010.

10. Bibin John, Dona Mathew, B. Deependran, George Joseph, C. P. R. Nair & **K N Ninan**, *"Medium density ablative composites: Processing, characterization and thermal response under moderate atmospheric re-entry heating conditions"*, Journal of Materials Science, 46, 15 5017 – 5028, 2011.

11. **Kuruvilla Joseph**, M.Kannan, S.S. Bhagawan, *"Effect of sequence of nanoclay addition in TPU/PP blends: Thermomechanical properties"*, Journal of Materials Science, Volume 45:1078-1085, 2010.

12. Sherly Annie Paul, Charlie Oommen, **Kuruvilla Joseph**, *"The role of interface modification on thermal degradation and crystallization behavior of composites from commingled polypropylene fibre and banana fibre"*, Polymer composites, Vol. 31,(6) 1113-1123, 2010.

13. Tom lal Jose, Aju Joseph, Mikael Skrivarfs and **Kuruvilla Joseph**, *" Thermal and Crystallisation behaviour of cotton-polypropylene commingled composite systems"*, Polymer Composites Vol. 31(8) 1487-1494, 2010.

14. **Kuruvilla Joseph,** Sherly Annie Paul, G. Mathew and L A Pothen, *"Influence of polarity parameters on the mechanical properties of PP-BF composites"*, Composite Part A: Applied Sci. and Manufacturing, Vol. 40(10) 1380-1387, 2010.

15. Jayanarayanan, Sabu Thomas and **Kuruvilla Joseph**, *"Morphology and Mechanical Properties of Normal Blends and In-Situ Microfibrillar Composites from Low-Density Polyethylene and Poly(ethylene terephthalate)"*, Polymer-Plastics Technology and Engineering, Volume 49: 442 – 448, 2010.

16. Jayanarayanan, Sabu Thomas and **Kuruvilla Joseph**, *"Dynamic mechanical properties of oil palm microfibril-reinforced natural rubber composites"*, Journal of Applied Polymer Science, published online, 2010.

17. Sherly Annie Paul, Sabu Thomas and **Kuruvilla Joseph**, *"Mechanical Performnce of Short Banana/Sisal Hybrid Fiber Reinforced Polyester Composites"*, Journal of Reinforced Plastics and Composites, Vol. 29, No. 1, 12-29, 2010.

18. Tomlal Jose E., Rani Mathew, Thomas P.C. **Kuruvilla Joseph**, *"Impact, Tear, and Dielectric Properties of Cotton/Polypropylene Commingled Composites"*, Journal of Reinforced Plastics and Composites, Vol. 29(12) 1861-1874, 2010.

19. Shaji Joseph, Sreekumar P.A., Jose M. Kenny, Debora Puglia, **Kuruvilla Joseph**, *"Oil palm microcomposites: Processing and mechanical behavior, Polymer "*, Engineering and Science, Vol. 10, 1853-1869, 2010.

20. Sarita A and **Kuruvilla Joseph**, *"Design, Development and Testing of Rubber Nanocomposites"*, Key Engineering Materials, Vol. 425, 61-93, 2010.

21. Sherly Annie Paul, **Kuruvilla Joseph**, G. Mathew and L A Pothen, *"Preparation of polypropylene fibre/banana fibre composites by novel commingling method"*, Polymer composites, Vol. 31 (5) 816-824, 2010.

22. Gejo George and **Kuruvilla Joseph**, *"Recent advances in green composites"*, Key Engineering Materials", 425:107-166, 2010.

23. **Kuruvilla Joseph**, *"Morphology and Mechanical Properties of Normal Blends and In-Situ Microfibrillar Composites from Low-Density Polyethylene and Poly(ethylene terephthalate)"*, Polymer-Plastics Technology and Engineering, Volume 49: 442 – 448, 2010.

Department of Earth and Space Sciences

24. M Govindan Kutty and **A Chandrasekar**, *"Impact of assimilation of ATOVS temperature and humidity and SSM/I total precipitable water on the simulation of a monsoon depression"*, Natural Hazards, DOI: 10.1007/s011069-011-9857-x.2, 2011.

25. M Govindan Kutty and **A Chandrasekar**, *"Effect of 3DVAR Assimilation of MODIS Temperature and Humidity Profiles on the Dynamic and Thermodynamic Features of Three Monsoon Depressions over the Bay of Bengal"*, Meteorological and Atmospheric Physics, 107, 65-79. 2010.

26. Blair. D. Savage, **Anand Narayanan**, Nicholas Lehner, and Bart P. Wakker, *"A Multiphase Absorber Containing O VI and Broad H I Directly Tracing Million Kelvin Plasma at Low Redshift Toward HE 0153–4520"*, Astrophysical Journal, Volume 731, Issue 1, 2011.

27. **Anand Narayanan**, Blair D. Savage, Bart P. Wakker, Charles W. Danforth, Yangsen Yao, Brian A. Keeney, J. Michael Shull, Kenneth R. Sembach, Cynthia S. Froning, and James C. Green, *"Cosmic Origins Spectrograph Detection of Ne VIII Tracing Warm-Hot Gas Toward PKS 0405-123"*, Astrophysical Journal, Volume 730, Issue 1, 2011.

28. **Anand Narayanan**, Bart P. Wakker, Blair D. Savage, Brian A. Keeney, J. Michael Shull, John T. Stocke, and Kenneth R. Sembach, *"Cosmic Origins Spectrograph and FUSE Observations of 100,000 K Gas In A Nearby Galaxy Filament"*, Astrophysical Journal, Volume 721, Issue 2, 2010.

29. Blair D. Savage, **Anand Narayanan**, Bart P. Wakker, John T. Stocke, Brian A. Keeney, J. Michael Shull, Kenneth R. Sembach, Yangsen Yao, &James C. Green, *"O VI Absorbers Tracing Hot Gas Associated with a Pair of Galaxies at z = 0.167"*, Astrophysical Journal, Volume 719, Issue 2, 2010.

30. **M. V. Ramana**, V. Ramanathan, Y. Feng, S-C. Yoon, S-W. Kim, G. R. Carmichael, and J. J. Schauer: *"Warming influenced by the ratio of black carbon to sulphate and the black-carbon source"*, Nature Geoscience 3, 542 – 545, 2010.

31. **Mandal S** & Eichler, D., *"How Unusual is XRF 060218?"*, The Astrophysical Journal Letters, 713, Issue 1, L55, 2010.

32. Sarkar, R., **Mandal S**. et. al, *"Instruments of RT-2 experiment onboard CORONAS-PHOTON and their test and evaluation IV: background simulations using GEANT-4 toolkit"*, Experimental Astronomy, 29, Issue 1-2, 85, 2011.

33. **R. R. Nidamanuri** and B. Zbell, *"Normalized Spectral Similarity Score (NS3) as an Efficient Spectral Library Searching Method for Hyperspectral Image Classification"*, IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing, 4 (1), 226 – 240, 2011.

34. Sunil Nautiyal and **R. R. Nidamanuri**, *"Conserving biodiversity in protected area of biodiversity hotspot in India: A case study"*, International Journal of Ecology and Environmental Sciences, 36 (2-3), pp. 195 – 200, 2010.

35. R. Rallo, B. France, R. Liu, **S. Nair**, S. George, R. Damoiseaux, F. Giralt, A.E. Nel, K.A. Bradley, and Y. Cohen. *"Self-Organizing Map Analysis of Toxicity-Related Cell Signaling Pathways for Metal and Metal Oxide Nanoparticles"*. Environmental Science & Technology, 45(4): 1695-1702, 2011.

36. R. Liu, R. Rallo, S.George, Z. Ji, **S. Nair**, A. E. Nel, and Y. Cohen *"Classification nano-SAR modeling for the cytoxicity of a family of Metal Oxide Nanoparticles"*. SMALL., DOI: 10.1002/smll.201002366, 2011.

Department of Humanities

37. **Babitha Justin**. *"Tourism Propagated: A Study of Travel and Tourist Texts"*, has been peer reviewed and vetted for publication. Protocol: Journal of Translation, Creative and Critical Writings, Vol. V, No. I & II Spring and Winter, 2011.

38. **Babitha Justin**. *"Tedious Transits to Modernity: the Story of Some women Entrepreneurs in the Garo Hills, Meghalaya"*, Indian Journal of Social Sciences Paper under peer Review.

39. **Lekshmi V Nair**. *"Women SHGs in coastal Kerala: The lope side of social development?"*, International Journal of Sociology and Anthropology.; 3(2) February 2011.

40. **Lekshmi V Nair**, *"Longevity: A Study of Elderly Women in Kerala. Indian Journal Of Gerontology"*, Vol 25, No 3, 2011.

41. **Lekshmi V Nair**, *"Women in Work- Strife, Struggle and Success Kyan Wood(ed.)"* Sage Publications, in Sociological Bulletin.

42. **V. Ravi**, R.Shankar, and N.K.Tripathi, *"Evaluation of market scenarios in automobile reverse logistics: a system dynamics approach"*, International Journal of Logistics Systems and Management, (Accepted for publication), 2011.

43. **V. Ravi**, *"Selection of third-party reverse logistics providers for End-of-Life computers using TOPSIS-AHP based approach"*, International Journal of Logistics Systems and Management, (Accepted for publication), 2011.

44. **Shaijumon C S**, *"Reflections on the Impacts of Space Technology on Economic Development"*, Journal of Polity and Society, Dept. of Political Science, University of Kerala, India, pp 70-80, Vol.3, Issue 2, July –December 2010.

45. **Shaijumon C S**, M Michael Raj, *"Integration of Global Markets: A Tussle of Sovereignity vs. Subjugation: A Theoretical Approach"*, in M K Saralamm and Manju S Nair (eds) 'Development vs. Deprivation in the Era of Globalization', Sonali Publications, New Delhi, pp 143-160, Vol. 1, 2011.

Department of Mathematics

46. **K. Mukherjee** and S. Natesan, *"Richardson extrapolation technique for singularly perturbed parabolic convection- diffusion problems"*. Computing, 92(1), 1-32, (Springer Publisher) 2011.

47. **K. Mukherjee** and S. Natesan. *"Optimal error estimate of upwind scheme on Shishkintype meshes for singularly perturbed parabolic problems with discontinuous convection coefficients"*. BIT Numerical Mathematics, 51(2), 289-315, (Springer Publisher) 2011.

48. **K. Mukherjee** and S. Natesan. *"E-uniform error estimate of hybrid numerical scheme for singularly perturbed parabolic problems with interior layers"*. Numerical Algorithms, (DOI: 10.1007/s11075-011-9449-6), (Springer Publisher) 2011.

49. **N. Sabu**, *"Deriving one-dimensional model of thin rods using gamma convergence "*, Diff. Eqns Dyn. System, 18137, 317.325, 2010.

Department of Physics

50. **C. Sudheesh**, Nir Bar-Gill, Boris A Malomed and Gershon Kurizki, *"Two-dimensional solitons in periodically modulated double-well potentials"* J. Phys. B: At. Mol. Opt. Phys. 43, pp. 205304 (1-8), 2010.

Papers presented

Department of Chemistry

1. Cinthya kuriakose , Asha Krishnan, P.R Anil Kumar and **Nirmala Rachel James**, *"A novel cytocompatible hydrogel composed of gum Arabic and gelatin for spheroid cell culture"*, Proceedings of the ICMST 2010 Conference, Thiruvananthapuram, Kerala, India, pp. 2.44 -2.46, 29-31st October , 2010.

2. S. Kiran, **Nirmala Rachel James**, A . Jayakrishnan and Roy Joseph, *"Effect of polyols on the properties of radiopaque polyurethanes."*, Proceedings of the ICMST 2010 Conference, pp. 2.77 -2.79, 29-31st October , 2010.

3. Sarika P R1 Cinthya Kuriakose, **Nirmala Rachel James** and Anil Kumar P R, *"Polymer scaffolds based on natural polysaccharides for tissue engineering"*, Proceedings of the Kerala Science Congress , Thiruvananthapuram, Kerala, India, 29-31st January , 2011.

4. Anilkumar PR, Cinthya Kuriakose, Sarika PR and **Nirmala Rachel James**, *"Novel polysaccharide- Protein hydrogel exhibiting selective cell adhesion promoting properties for surface patterening and tissue engineering"*, Proceedings of the 4th Indo Asutralian conference on biomaterials, tissue engineering and drug delivery applications 2011, Anand, Gujrat, India, pp, 10-12th February , 2011.

Department of Earth & Space Sciences

5. Thanh, N.X., **Rajesh, V.J.** and Itaya, T. (2010) Igneous stage of chromian spinels from albite porphyroblast-bearing greenschists in Shyok suture zone, Ladakh Himalaya, India. Proceedings of Japan Geoscience Union Meeting 2010, Chiba, Japan 23-28th May, 2010

6. **Rajesh, V.J.**, Sajeev, K. and Arai, S. (2010) Probable Precambrian oceanic remnants in the Palghat-Cauvery Suture Zone, southern India. Proceedings of the 7th Annual General Meeting of Asia Oceania Geosciences Society, Hyderabad, India 5-9th July, 2010.

7. Seo, J., **Rajesh, V.J.**, Choi, S-G. and Oh, C.W. (2010) Petrology of the Singok Ultramafic Bodies in the Hongseong area, Gyeonggi Massif South Korea. Proceedings of the 20th General meeting of the International Mineralogical Association, Budapest, Hungary 21-27th August, 2010.

8. **Rajesh, V.J.** (2011) Alaskan-type ultramafic rocks in Palghat Cauvery Suture zone, southern India: Petrologic Tectonic and Economic significances. *"23rd Kerala Science Congress"* Centre for Earth Science Studies, Akkulam Trivandrum, 29-31st January, 2011.

9. **Rajesh, V.J.** (2011) Fe-Ti-P Gabbro in Achankovil Shear Zone, southern India: Implications for intraplate magmatism.*"23rd Kerala Science Congress"* Centre for Earth Science Studies, Akkulam Trivandrum, 29-31st January, 2011.

10. **Rajesh, V.J.** (2011) Petrogenesis and tectonic setting of Alaskan-type ultramafic rocks in Palghat Cauvery Suture Zone, southern India. A conference on *"Tectono thermal evolution of the South Indian Shield"*, organized by Dept. of Geology, University of Kerala as a part of the activities related to the UGC-SAP programme 9th March, 2011.

11. **Rajesh, V.J.** (2011) A probable terrestrial analogue of Martian sedimentary rocks in southern India. *"Brainstorming Session on Mars Science and Exploration"* organized by Physical Research Laboratory, Ahmedabad 24-25th March, 2011.

Department of Humanities

12. **Babitha Justin** *"History's Mysterious Turns : Portrayal of Ancient Women Characters in Ancient and Contemporary Texts"*. Third National English Conference, MANUU. Hyderabad.

13. **Gigy J Alex**. *"A Sociological approach to teach English Language using Technology and Mass Media Fifth"*, International and 41st Annual ELTAI Conference-Anna Adarsh College, Chennai

14. **Gigy J Alex**. *Shifting Paradigms of Culinary Art in Cooking with Stella and Mistress of Spices*, International Conference on "Contextualizing the Contemporary" held at IIT Madras

15. **Gigy J Alex**. *Empowering Women handling Multiple Roles*. National Conference for ISRO Women, NRSC Hyderabad.

16. **Lekshmi V Nair** *"Tools and Techniques of PRA"*. National Conference on Research Methodolgy, St Teresas College.

17. **Shaijumon C S**. *"Inflation Control and Sustainability of Indian Economy"*, Invited talk in

the Seminar on Pre Budget Situation of Indian Economy, Naipunya International, Kaloor, Cochin, February 27, 2011.

Conference proceedings

Department of Aerospace Engineering

1. Varun Sakalkar, **K Kurien Issac**, *"A wheeled mobile robot for uneven terrain"*, Proceedings of 7th National Seminar on Aerospace and Related Mechanisms, p.220-224, September 2010.

2. N. Ganesh, **K Kurien Issac**, *"Form finding of support net of a tensigrity based deployable antenna"*, Proceeings of 7th National Seminar on Aerospace and Related Mechanisms, p.318-324, September 2010.

3. **Pankaj Priyadarshi** and Sanjay Mittal, *"Multi-Objective Multi-Disciplinary Design Optimization of a Semi-Ballistic Reentry Module "*, Presented in 13th AIAA/ISSMO Multidisciplinary Analysis Optimization Conference, Fort-Worth, USA, AIAA-2010-9127.

4. Nitin Gupta, **Pankaj Priyadarshi**, *"A Multi-Chamber, Multi-gas Configuration for Robust and High Performance Non-Rigid Airship"*, 8th International Airship Convention, Bedford, England, 2010

5. **Pankaj Priyadarshi** and Sanjay Mittal, *"Multi-objective Multi-disciplinary Design Optimization of a Semi-Ballistic Reentry Module"*, 2010 AIAA ATIO/ISSMO Conference, September, 2010.

Department of Avionics

6. **N.Selvaganesan**, Rajeev Ranjan, Gaurav Bholotia and Sunil Kumar, *"Real-time T-S Fuzzy Identification for Twin Rotor MIMO System"*, PP 5-10. IEEE Conf. on SYMOPA 2010.

Department of Chemistry

7. Cinthya Kuriakose , Asha Krishnan, P.R Anil Kumar and **Nirmala Rachel James**, *"A novel cytocompatible hydrogel composed of gum Arabic and gelatin for spheroid cell culture"*, Proceedings of the ICMST 2010 Conference, Thiruvananthapuram, Kerala, India, pp. 2.44 -2.46, October 29-31, 2010.

8. S. Kiran, **Nirmala R James**, A . Jayakrishnan and Roy Joseph, *"Effect of polyols on the properties of radiopaque polyurethanes."*, Proceedings of the ICMST 2010 Conference, pp. 2.77 -2.79, October 29-31, 2010.

9. Sarika P R1 Cinthya Kuriakose, **Nirmala R James** and Anil Kumar P R, *"Polymer scaffolds based on natural polysaccharides for tissue engineering"*, Proceedings of the Kerala Science Congress , Thiruvananthapuram, Kerala, India, January 29-31, 2011.

10. Anilkumar P R, Cinthya Kuriakose, Sarika PR and **Nirmala Rachel James**, *"Novel*

polysaccharide- Protein hydrogel exhibiting selective cell adhesion promoting properties for surface patterning and tissue engineering", Proceedings of the 4th Indo Australian conference on Biomaterials, Tissue Engineering and Drug delivery applications 2011, Anand, Gujarat, India, pp, February 10-12, 2011.

Department of Earth and Space Sciences

11. **Poompavai.V**, *"Coastal Vulnerability Assessment to Sea Level Rise using Satellite data and Geographic Information System"*, Proceedings of National Seminar on Spatial Strategies for Sustainable Management, Department of Environmental Management – SSSM 2011, Bharathidasan University, Tiruchirappalli, February 14-16, 2011

12. **Poompavai.V** and Ramalingam M., *"Vulnerability Assessment to Cyclones: A Remote Sensing and GIS approach"*, Proceedings of the Second National Conference on Geospatial Technologies and Applications– GEOMATRIX '11, CSRE, IIT Bombay,26-27th February, 2011

13. **S. Vig**, R. Cesaroni, L. Testi, M. Beltran, C. Codella, *"Multiwavelength investigation of a massive toroidal candidate G24.78+0.08 A2?*, International Workshop on Interstellar Matter and Star Formation – A Multi-Wavelength Perspective, (eds.) D. K. Ojha, Astronomical Society of India Conference series, Vol. 1, p141, 2010.

14. **S. Vig**, L. Testi, M. Walmsley, R. Cesaroni, *"Infrared imaging and spectroscopy of the (proto)cluster IRAS 18511+0146?*, International Workshop on Interstellar Matter and Star Formation – A Multi-Wavelength Perspective, (eds.) D. K. Ojha, Astronomical Society of India Conference series, Vol. 1, p249, 2010.

15. Pawade,V.S. Ojha,D.K., Ninan,J.P., **Tej A**. et al, *"Post-outburst phase of LDN 1415 nebula (IRAS 04376+5413)"*, International Workshop on Interstellar Matter and Star Formation – A Multi-Wavelength Perspective, (eds.) D. K. Ojha, Astronomical Society of India Conference series, 2010, Vol. 1, p243, 2010

16. Kaurav,S.S., Ojha,D.K., Ninan,J.P., Bhatt,B.C., Sahu,D.K., Ghosh,S.K., **Tej A.**,*"Second outburst phase of McNeil's nebula (V1647 Orionis)"*, International Workshop on Interstellar Matter and Star Formation – A Multi-Wavelength Perspective, (eds.) D. K. Ojha, Astronomical Society of India Conference series, 2010, Vol. 1, p237, 2010

Department of Mathematics

17. **Natarajan E**, *"Spectral Element Method for Wave Propagation"* – Proceedings of International Conference on Recent advances in Mathematics & Appl. ICRAMA' 2010.

18. **Raju. K. George**. *"Trajectory controllability of nonlinear integro-differential system"*, Journal of Franklin Institute, 347 (7), pp.1065-1075, (with Chalizhajar D.N, Nandakumar A.K and Acharia F.S).(2010)

Awards and Recognitions

Dr. Rajesh V J was awarded the Young Scientist award for his paper, 'Petrogenesis and Techtonic Implications of Alaskan type Ultramafic Rock in Palchat Cauvery Suture Zones' in the "Kerala Science Congress, 2011".

Dr. Kuruvilla Joseph, HoD, Department of Chemistry was invited as an expert in the "Round Table Discussion on Nano Technology - Renewable Energy" organized by FAO-United Nations in collaboration with Federal Govt of Brazil as part of the "International Conference on Food and Agricultural Application of Nano Technology".

Ongoing Research Projects

TITLE		COLLABORATOR
Department of Aerospace Engineering		
1. Rocket Injector spray studies	:	Dr.V.Aravind
2. Development of a versatile parallel 3-D RANS solver for simulating compressible flows	:	Shri.Pankaj Priyadarshi
3. Design of Autonomous walking Humanoid Robot	:	Shri Sam K Zachariah
Department of Avionics		
4. Autonomous landing system with ground Penetrating Radar Pervasive computing for disaster response	:	Smt Chris Prema
Department of Chemistry		
5. Development and feasibility study of polymeric Scaffolds for Tissue Culture under Microgravity	:	Dr Nirmala Rachel James
6. Polymer-Nano composites for Electronic and Photonic Application	:	Dr Honey John
7. Development of carbon foams for High Temperature Thermal Protection Application	:	Dr Prabhakaran
Department of Earth & Space Sciences		
8. Evaluation of the potential of hyperspectral remote sensing for species level classification and biophysical characterization of mangroves of Bhitarkania National Park, Orissa	:	Dr L Gnanappazham
9. Impact of assimilating SAPHIR and GPS-ROS data from MEGHA TROPIQUES in high resolution mesoscale model for prediction of severe weather over India	:	Dr A Chandrasekhar
10. Star formation in young Galactic clusters associated with massive stars	:	Dr Anandamayee Tej
11. Understanding the genesis of Anorthosites in Earth and Moon: A Geological and Remote Sensing Approach	:	Dr M. V. Ramana

TITLE		COLLABORATOR
12. Near simultaneous measurements of Aerosols, Clouds and Turbulence as the Maximum Cloud Zone moves northward Coordinated airborne, ship-borne/ground-based and Space-borne Measurements	:	Dr M. V. Ramana
13. Surface Layer Adjustment to Radiative Forcing	:	Dr M. V. Ramana
14. Young massive OB stars in UV using observing Time on Ultra Violet Imaging Telescope (UVIT), ASTROSAT	:	Dr Saritha Vig
15. Infrared spectroscopy of young stellar objects (YSOs) using Infrared Spectroscopic Imaging Survey (IRSIS)-Small Satellite project of TIFR-IUCAA	:	Dr Saritha Vig
16. Develop focal plane spectroscopic instrument to be used at Ponmudi/Mt. Abu Telescope	:	Dr Saritha Vig
17. Search for missing baryons in present Universe using the Cosmic orgins Spectrograph (HST) in collaboration with Univ. of Wisconsin	:	Dr Anand Narayanan
18. Multi-scale object oriented classification of satellite image	:	Dr M Ramarao Nidamanuri
19. Multi-sensor retrieval of tropical biophysical parameters	:	Dr M Ramarao Nidamanuri
Department of Humanities		
20 Development of an english lanquage software for the students of IIST	:	Dr. Babitha Justin
21. Women in New Profession-A srudy of Women in the Tourism		
22. Industry in Kerala-ICSSR Major Project	:	Dr Lakshmi V Nair
23. Long term living in institutions-A study of elderly care in selected old age homes in Kerala-UGCmajor project	:	Dr Lakshmi V Nair
24. Living beyond 90 years-A study of elderly women in Kerala-UGC minor project	:	Dr Lakshmi V Nair
25. Local links and impacts: The influence of local institutions on regional development	:	Dr C S Shaijumon
Department of Mathematics		
26. Controllability of Fuzzy Systems	:	Dr Raju K George
27. Dynamics and Rheology of forced spheroid	:	Dr. C V Anil Kumar
Department of Physics		
28. Polymer-Nano composites for Electronic and Photonic Application	:	Dr Pramod Gopinath
29. Investigating excited state dynamics of isolated molecular ions, hybrid molecular ions and cluster ions	:	Dr Umesh R Khadhane

International Conference on Recent Trends in Material Science & Technology

The International Conference on Recent Trends in Material Science & Technology (ICMST), jointly organised by IIST and Material Research Society of India (MRSI), Trivandrum Chapter was held at Trivandrum during 28-31st October 2010. The Conference was inaugurated by Dr. D. Banerjee, former Chief Controller, DRDO and Professor, IISc, Bangalore in a function presided over by Dr. B.N. Suresh, Director, IIST. The conference proceeding was released by Prof. A. Jayakrishnan, Vice Chancellor, Kerala University. The Souvenir was released by Dr. B. C. Pai, Former Director, NIIST, CSIR, Thiruvananthapuram, Dr. R. Krishnan, Dean (Academics), IIST & Chairman, ICMST welcomed the gathering and Shri. N. Vasudevan IFS, Registrar introduced IIST to the delegates. The keynote address was delivered by Shri. M. Narayana Rao, Director, Mishra Dhatu Nigam Limited, Hyderabad. 'ICMST - At a glance' was presented by Prof. Kuruvilla Joseph, Convener, ICMS. Dr. M.R. Suresh, Chairman, MRSI, Trivandrum Chapter proposed a vote of thanks.

The presentation of papers and other activities were held at the Conference village (ATF Campus) in VSSC premises. After the Special plenary sessions by Dr. Dipankar Banerjee & Dr. G.W. Greenwood, Professor, University of Sheffield, UK, several plenary, invited and contributory papers were presented by various national and international experts on different topics. The technical sessions were conducted in 4 (parallel) oral sessions and 2 poster sessions. These technical sessions were focussed on themes such as: Nano materials, Biomaterials, Polymer Blends and Composites, Energy materials, Ceramics, Metals and Alloys, Optical and Electronic Materials, Nano Composites, Smart and Functional Materials and Aerospace Materials.

This seminar was attended by about 400 delegates from 20 countries from five continents. A total of 20 plenary lectures, 70 invited talks, 45 contributory lectures and 150 posters were presented in this international conference. Awards were given to the best posters in each theme. The Conference concluded with a valedictory function on 31st October 2010

Symposium on "Contemporary Trends in Optics and Optoelectronics"

XXXV Optical Society of India Symposium on "Contemporary Trends in Optics and Optoelectronics" was jointly organized by IIST and Optical Society of India from 17th-19th January, 2011.

It was inaugurated by Dr K Radhakrishnan, Chairman, ISRO and Secretary, Department of Space at VSSC campus, Veli , Thiruvananthapuram Dignitaries included Shri P.S. Veeraraghavan, Director, VSSC, Dr T.K. Alex, Director, ISAC, Bangalore, Prof E.D. Jemmis, Director, IISER, Thiruvananthapuram, Dr K. S. Dasgupta, Director, IIST, Prof L. N.Hazra, University of Kolkata and over three hundred delegates from various parts of India and abroad. Industrial participants from many industries related to Optics and Optoelectronics participated in the conference. Prof. James R. Fienup, Institute of Optics, University of Rochester, Wilmost, USA gave the keynote address. Dr K Radhakrishnan gave a brief overview of the progress that ISRO has made in the last five decades and how it has helped to improve the planning, infrastructure and disaster management programs in the country. Dr T.K. Alex underlined the importance of optics in remote sensing satellites and the fact that ISRO imagery has been in demand in India as well as abroad. He also expressed the possibility of offering ISRO imagery to develop a solution to avert tragedies like the recent one at Sabarimala Pilgrimage site.

Prof Bishnu Pal, IIT, Delhi was conferred with OSI Award 2010. Dr R Krishnan, Chairman, National Organising Committee welcomed the gathering. Shri N Vasudevan, Registrar, IIST gave a brief description about IIST and Dr C. L. Nagendra explained about the significance of the symposium. Dr K Radhakrishan released the Conference digest. Shiri P Veeraraghavan inaugurated the Industrial Exhibition and released the souvenir. The programme concluded with vote of thanks by Prof C S Narayanamurthy.

Panel Discussion on "Higher Technical Education in India: Issues and Prospects"

A Panel Discussion on "Higher Technical Education in India: Issues and Prospects" was organized on 4th November 2010. The keynote Address was delivered by Dr. R. Natarajan, Former Chairman, AICTE. The panelists included Dr. A Jayakrishnan, Vice Chancellor, University of Kerala, Thiruvananthapuram, Dr. Ajay Chakrabarty, Vice Chancellor, Birla Institute of Technology, Mesra, Dr. E D Jemmis, Director, Indian Institute of Science Education and Research, Thiruvananthapuram, Dr. A Subrahmanyam, Professor, IIT Madras and Dr B N Suresh, Director, IIST.

Dr. R. Natarajan's keynote address on "Are We Ready for an Aerospace Revolution in India?" explored the possibilities of using the best of existing knowledge and research methods for innovation, the fundamental aspect of knowledge. He also talked about the need for re-designing the engineering education in India. Dr. Jayakumar's views on the ironies in the Indian educational scenario were thought-provoking. While 50 million children in India have no access to schools, we are preoccupied with the debate on the advent of foreign universities. Dr Ajay Chakrabarty's views on building up of an institution of eminence were analytical. In his opinion, there were two types of universities – "research intensive universities", which provide complete autonomy for its faculty members and "research informed universities", focused on technology and endowed with high quality manpower. He felt that IIST belongs to the second category.

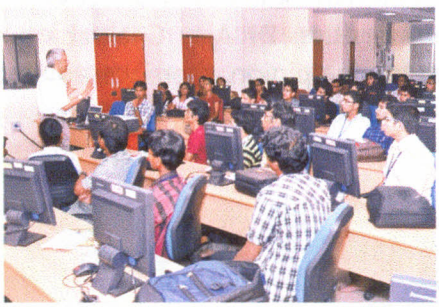
Dr. Chakrabarty suggested that IIST should focus on open-ended research, giving greater importance to academic freedom.

Dr. A Subrahmanyam gave some logical and coherent suggestions on ways to enhance the quality of higher education in the country. These included bringing class rooms closer to the students, installation of high band width connectivity in all class rooms, recruitment of high quality teachers with flair for research and encouraging the teachers to think out of the box.

Workshops

- A five-member team from **Universities Space Research Association (USRA)**, the largest Association of universities in the world visited IIST and conducted a workshop with IIST faculty members and students from 31st August 2010 to 2nd September 2010.

- The Department of Humanities organized a one-week **Neuro Linguistic Programme** from 25th to 29th October 2010 for the first semester students. The course was offered by Dr. Abraham Abraham, an authority on the subject.



This programme covered:

i. Better ways of human communication and language skills;

ii. Wholesome behavioural development in individual and groups;

iii. Pneumonics, or the memory development programme, which would train students in listening skills in class, note taking ability, etc.;

iv. Stress management skills so as to manage emotional and academic stress at the time of examination, etc.;

v. Better social skills along with communicative skills;

- As part of the Research Methodology course, a two day workshop on **"Introduction To Research Methods"** by Prof. N. Sundararajan, Eee/Ntu, was arranged for all Ph.D. scholars on 19th -20th March 2011.

- A five day **Telescope making workshop** was organized by Earth and Space Science Department from 1st to 6th February 2011 for the students of IIST. There were close to 50 participants. The students took turns to complete the arduous task of manual grinding of glass blanks to obtain the perfect focal length and spherical shape.

Collaborative Ventures

A team of three senior professors from **CALTECH, USA** visited the institute on 2nd August 2010, in connection with the ongoing collaborative programmes. Detailed discussions were held regarding collaborations at various levels and for establishing a 'Satish Dhawan Fellowship' at CALTECH.

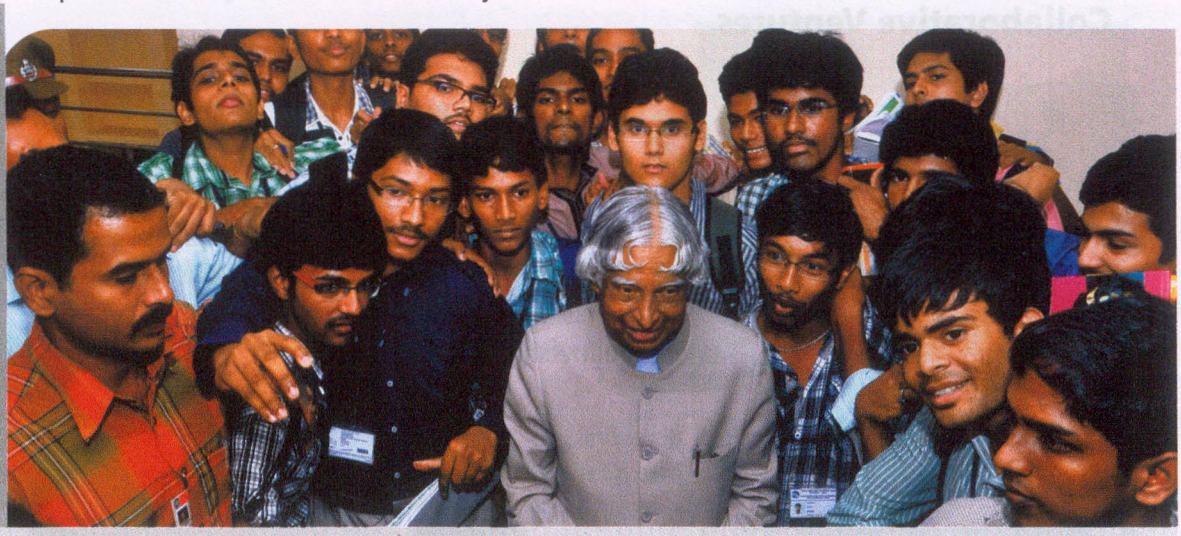
IIST signed an MoU with **Universities Space Research Association** (USRA), based in USA for collaboration in various areas.

Three final year students of IIST, Bhavesh Jaiswal, Vaibhav Mathur and Ankush Kumar worked as project interns at Lunar and Planetary Institute, Houston.

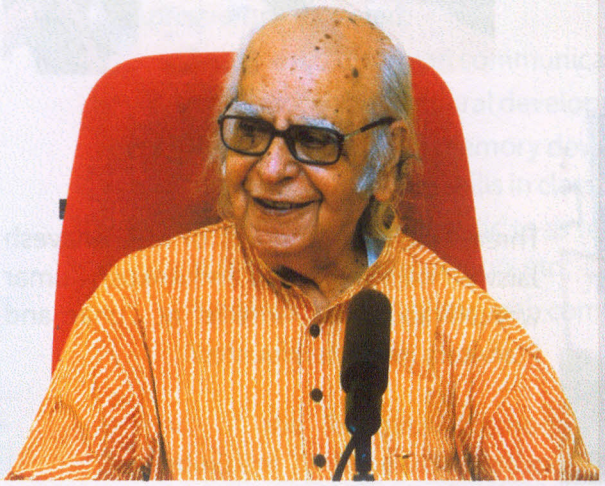
Apoorv Mehta and Pulkit Goyal did their final year project at the Aerospace Systems Laboratory, Department of Mechanical and Aerospace Engineering , University of Texas at Arlington.

Dignitaries at IIST

Many dignitaries visited IIST during the report period and shared their knowledge and experiences with students and faculty.



Dr A.P. J. Abdul Kalam, Former President of India and Chancellor of IIST visited the Institute and interacted with students and faculty on 14th October 2010.



Prof Yashpal, Former Chairman of UGC and the unforgettable anchor of "Turning Point", telecast on Doordarshan visited IIST on 21st October 2010 and interacted with the students.

Dr. R. R. Navalgund, Director, SAC, Ahmedabad delivered a special lecture on "Space: Touching Humanity" on 26th May 2010.

Dr. J. N. Goswami, Director, PRL, Ahmedabad gave a talk on "Chandrayan-I and Beyond" on 22nd September 2010.

Prof R. V. G. Menon, Former Director, ANERT, retired Professor CET and a popular figure in science programmes in media gave illuminating insights into the History of Science, on 10th October, 2010.

Sri P. Radhakrishnan, Former Deputy Director, LPSC gave an interesting talk on "Our Cosmic Quest "as part of Space Week Celebrations on 6th October 2010.

Seminars & Invited Lectures

- A seminar series was organized for the students from 12th-16th April 2010 where distinguished speakers like Dr V. M. Pandharipande, Director, CEME, Osmania University, Prof Ajay Ghatak, IIT Delhi, Dr. Shyam Chetty, Sci/Engr G, NAL, Bangalore, Prof Sreepad Karmalkar, IIT, Madras delivered talks on varied topics.
- A team of three Senior Professors (Prof. K. Mani Chandy, Prof. G. Ravichandran and Prof. Virendra Sarohia) from **CALTECH, USA** visited the institute on 2nd August 2010. They delivered two technical lectures on topics entitled "Nano/Micro Electro Mechanical System (NEMS/MEMS)" and "Engineering Smart Systems".
- Dr Vinod Kumar P. B from Rajagiri School of Engineering and Technology, Cochin talked on Introduction to Fractals and its applications
- Prof. Colin Sheppard delivered a talk on "Imaging into scattering media such as biological tissue using confocal microscopy".on 17th December 2010
- Ashish Mahabal, Staff Scientist, Department of Astronomy, Caltech visited IIST on 27th January 2011. He talked to the faculty and students about "Transient Science: The New Astronomy".
- Prof S Sritharan, Naval Postgraduate School,USA delivered a lecture on "Filtering and Control on Nonlinear Infinite Dimensional Systems that arise in Engineering and Physical Applications" on 1st March 2011
- Dr. Venugopal Reddy, Physican and Life Skills Coach USA delivered a lecture on "How to Boost our Self Confidence and Self Esteem" on 16th March 2011.
- Dr. Sunilkumar from L'Institut des Sciences Moléculaires d'Orsay (ISMO), Université Paris-Sud, France gave a seminar on "Photodissociation dynamics of small biological molecules".
- Prof. K. Muralidharan, Department of Statistics, M. S. University of Baroda on 16th March 2011 talked on "Stochastic Modelling Of Repairable Systems"
- Prof. AN Ramprakash, IUCAA, Pune talked about Astronomy Ahead: Technology Challenges & Opportunities on 16th March 2011.
- A talk by Professor. N. Sundararajan, School of Electrical & Electronic Engineering, Nanyang Technological University, Singapore was organized on Neural Networks - Theory and Applications on 18th March, 2011.

Study Tours

Visit to ISRO Centres

A tour was arranged to the ISRO Centres in Bangalore for the Final Year B.Tech (Physical Sciences) students who opted for the Remote Sensing stream. ISRO Satellite Centre, Regional Remote Sensing Centre and Laboratory for Electro-Optic Systems were the three places visited during the programme. At ISRO Satellite Centre, Sri. K. S. Prakash addressed the students with a video on the six major areas of ISAC, viz., Mechanical Systems Area, Digital and Communication Area, Integration and Checkout Area, Power Systems and Avionics Production Area, Controls and Missions Area and Reliability and Components Area. The clean room facilities for space craft integration was demonstrated to the students while the Resourcesat-2 and Youth Satellites were in the assembling stage.

Marayoor Visit

The third semester students, as part of their course on 'Introduction to Social Science and Ethics', undertook a tribal visit to Marayoor, an important pre-historic site in Idukki District of Kerala, from 19th-20th November 2010. Marayoor is the house of a forest-dwelling Scheduled Tribal community called Muthuvans. The students were exposed to the habitats and culture of the Muthuvans as they spent their time in the tribal area.

Trip to the Radio Astronomy Centre at Ooty

A study tour was organised by the Department of Earth & Space Sciences to the Astronomy Centre at Ooty from 19th-20th November 2010. Students were exposed to the working of the Ooty Radio Telescope designed and fabricated indigenously. They also participated in observations of Pulsars. This gave them an opportunity to see and use the techniques they studied in their theory courses.

Visit to Kuthiramalika and Kilimanoor Palace

As part of the Institute Elective on, "Visual Communications", offered by the Humanities Department, 16 students of Batch VII, accompanied by Prof. Kurien Issac, Dr. Lekshmi Nair and Dr. Babitha Justin, visited the historical museum of Kuthiramalika, the palace of the Poet King of Travancore, Shri. Swathi Thirunal Rama Varma, on 7th September 2010. The students took a tour of the splendors of Travancorean Art as well as witnessed the composite, yet simple tones of design in the architecture of the palace. This was also a trip in artistic history, as a few Ravi Varma portraits made in oil were also displayed in the Museum.

Innovative Intiatives

Demonstration of the week

A programme named "Demonstration of the Week" conceived by Dr. Umesh R. Kadhane and a group of eager faculty members, evokes the inquisitive spirit of enthused students and goes beyond the frontiers of the conventional curricula. The main objective of the weekly programme is to provide a platform to find multi disciplinary solutions to solve a real and actual problem as if in an experimental laboratory. Learning is thus made a more enjoyable and discipline-independent activity. Demonstrations on Quantum Effect, Polarisation of Light and the Phenomenon of Crystallization were very effective.

IIST @ Schools 2011

Energized by the overwhelming response of IIST @ Schools 2010, the institute organized a three-day residential programme for the second time from 7th to 9th February, 2011 for students of High School, based on the theme, 'Science for the Future of Mankind'. The main objective of the workshop was to bridge the perceptible gap between the pursuit of science and the fulfillment of societal needs and aspirations. It was also intended to motivate and inspire the participants to look at science as a way of life and to acquaint them with the achievements and challenges of the Indian Space Programme. A key attraction of the programme was the opportunity for a sky watch session at Priyadarshini Planetarium in Kerala State Science & Technology Museum, Thiruvananthapuram.

Annual Festivals

Dhanak 2010

The Annual Cultural Festival of IIST, Dhanak-2010 was organized from 23rd to 26th April 2010, with several competitions in literature, arts, music and dance. It was inaugurated by Dr Mallika Sarabhai, the famous danseuse and social activist. Students from a number of institutions across the country participated in the festival.

Conscientia 2011

The Annual Technical Festival of IIST, "Conscientia 2011", organised from 3rd-6th March 2011, was the event that saw the convergence of talent in both science and technology and the coming together of experience and novitiate. It was both a trigger for innovation and a journey into the unknown. From glider-making to Robo-wars and ethical hacking workshops to breath-taking air shows, Conscientia 2011 presented spectacular array of events. The fest witnessed enthusiastic participants from all over the country, making it a grand success.

Celebrations at IIST

IIST Day

The third "IIST Day" was celebrated on 19th May 2010 at Tagore Theatre, Thiruvananthapuram. Sri M A Baby, Honorable Minister for Education, Government of Kerala was the Chief Guest and Dr. K. Radhakrishnan, Secretary, DOS and Chairman, BOM, IIST presided over the function. The third edition of the Students' In-house Magazine "Drishtikon' was released by Dr. K. Radhakrishnan on the occasion. Awards and prizes for students in academics, sports and cultural areas were also distributed by the Chairman. Various cultural programmes were presented by the students and faculty before the elite gathering.

Independence Day

The Independence Day celebrations of 2010 was a milestone for IIST as the flag was hoisted for the first time in its permanent campus at Valiamala. A landmark in the saga of IIST, the day remains etched in the hearts of all IIST students and staff.

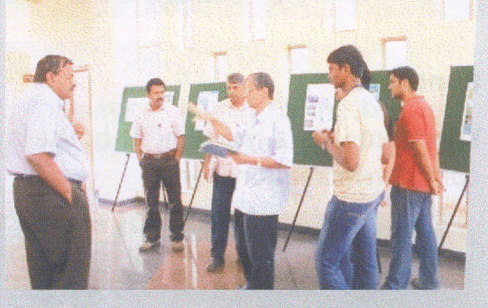
Republic Day

IIST celebrated the 61st Republic Day in its own campus. Director Dr. K. S. Dasgupta hoisted the national flag, and delivered a brief address. The event was marked by a colourful parade by CISF personnel. Cash awards were distributed to the CISF jawans who had rendered valuable service and support to IIST.

Freshers' Welcome Party

An Ice breaking session for IIST's fourth batch of students was organized on 2nd September 2010 followed by a Fresher's Welcome Party, soon after the freshers joined the Institute. The IIST community was treated to a spirited performance by students from different batches.

GIS Day



The Indian Society of Remote Sensing, Thiruvananthapuram Chapter, in association with IIST, organized the GIS Day Celebrations at IIST on 24th November, 2010. The event was marked by a special talk on "Applications of Remote Sensing, GIS and IT for Natural Resource Management" by Sri. V. N. Neelakandan, Scientist and Head, Central Geomatics Lab (CGL), Centre for Earth Science and Studies (CESS), Thiruvananthapuram. Sri. Neelakandan showcased the applications of GIS in various sectors like local planning, health monitoring and agriculture.

Celebration of Festivals

Reflecting the diversity of IIST Campus, the students celebrated many regional and national festivals in their own way. Holi, Raksha Bhandan, Christmas, Onam, Dusshera, Ramzan and Diwali were all celebrated by the students with great bonhomie and traditional fervor.

Sports Activities

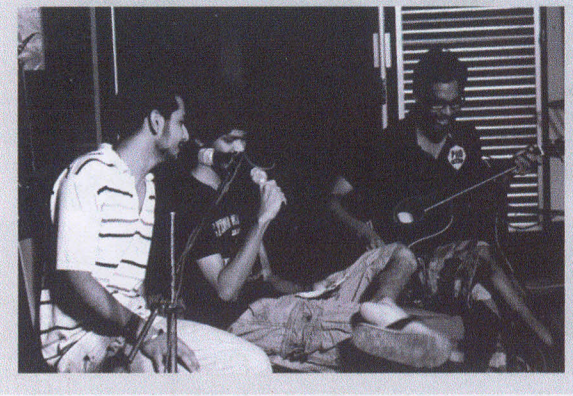
IIST Sports Council was constituted on 22nd September 2010. The newly constructed Basketball court, Volleyball court and Cricket practice pitch were inaugurated on 18th October 2010 by the Director. Medals and certificates for the winners of the sports events in the last year were distributed in the same function.

Other Sports events

- A soft ball cricket match between 2007 batch students and faculty & Staff of IIST was held on 27th November 2010.
- As part of the sports activities for the year 2010-11 the inter-house matches of volleyball, basketball and chess were conducted during November- December 2010.
- IIST teams for Cricket, badminton and basketball participated in the sports event ZEST-2011 held at College of Engineering, Pune, during 22nd – 26th January 2011.
- IIST teams participated in the tournaments organised by P.A. Aziz College Tournament, Marian College of Engineering.

Konchords

Konchords is a monthly in-house musical evening organized by the students in the common recreational area.



Film Shows

The film club of IIST screened many movies of classical and popular genre.

Extension Activities

As part of the Deepavali celebrations, the students of IIST, along with four faculty members, Ms. Gigy J. Alex, Dr. Lekshmi Nair, Dr. Anand Narayanan and Dr. Rajesh V.J visited the Nirmala Shishu Bhavan, an orphanage run by the Missionaries of Charity. They also visited an old age home in Trivandrum. The objective was to have the students spend time with the orphaned children and elders, thereby giving them a glimpse of the harsh social realities.

Auditor's Report

To

The Members of
Indian Institute of Space Science and Technology [IIST]
Thiruvananthapuram

1. We have audited the attached Balance Sheet of Indian Institute of Space Science and Technology[IIST] as at 31st March 2011, the Income and Expenditure Account and the Receipt and Payment Account for the year ended on the date both annexed thereto. These financial statements are the responsibility of the IIST's Management. Our responsibility is to express an opinion on these financial statements based on our audit.

2. We conducted our audit in accordance with the auditing standards generally accepted in India. These standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and the significant estimates made by the management, as well as evaluating the overall financial statements presentation. We believe that our audit provides a reasonable basis for our opinion.

3. We further report that :

a) We have obtained all the information and explanations which to the best of our knowledge and belief were necessary for the purposes of the audit.

b) In our opinion proper books of accounts have been maintained by IIST, so far as appears from our examination of those books.

c) The Balance Sheet, the Income and Expenditure Account and the Receipts and Payments Account dealt with by this report are in agreement with the books of Accounts.

d) In our opinion and the best of our information and according to the explanations given to us the aforesaid financial statements read with the statement on significant accounting policies and notes to the accounts show a true and fair view in conformity with the accounting principles generally accepted in India.

i. In the case of Balance Sheet of the state of affairs of IIST as at 31.03.2011,

ii. In the case of Income and Expenditure Account of the excess of Income over expenditure of IIST for the year ended on that date and

iii. In the case of Receipt and Payments Account of the receipt and payments of IIST during the year ended on that date.

For Jose And Hemachandran
Chartered Accountants
Regn. No. 001360S

Jose Zachariah. F.C.A
(Partner, Mem. No. 80570)

Place :Thiruvananthapuram
Date : 8th November 2011

INDIAN INSTITUTE OF SPACE SCIENCE AND TECHNOLOGY

Balance Sheet as at 31st March 2011

	Sch	As at 31.03.2011 Rupees	As at 31.03.2010 Rupees
Sources of Funds			
Corpus fund	1	1,518,470,425	1,006,793,058
Unspent Grant	2	1,123,588,436	1,681,926,461
Current Liabilities	3	73,354,784	54,704,944
Total		**2,715,413,645**	**2,743,424,463**
Application of Funds			
Fixed Assets	4		
Gross Block		847,129,651	269,609,259
Less: Depreciation		164,056,401	76,123,623
Net Block		683,073,250	193,485,636
Capital work-in-progress		534,116,018	553,298,385
Total		**1,217,189,268**	**746,784,021**
Current Assets and Advances			
Grant Receivable from DOS		100,000,000	-
Cash and Bank Balances	5	1,363,387,720	1,993,441,452
Advances, Deposits & Receivables	6	34,836,657	3,198,990
Total		**2,715,413,645**	**2,743,424,463**
Significant Accounting Policies and Notes to the Accounts	14		

As per our report of even date attached.

For Jose And Hemachandran
Chartered Accountants
Regn. No. 001360S

For and on behalf of
Indian Institute of Space Science and Technology (IIST)

Jose Zachariah. F.C.A
(Partner, Mem. No. 80570)

Dr. K S Dasgupta
Director

R Hari Prasad
Finance Officer

Place : Thiruvananthapuram
Date : 8th November 2011

INDIAN INSTITUTE OF SPACE SCIENCE AND TECHNOLOGY (IIST)

Income and Expenditure Account for the year ended 31st March 2011

Particulars	Sch	2010-11 Rupees	2009-10 Rupees
Income			
Revenue Grant from Government of India	7	100,000,000	174,550,000
Bank Interest	8	104,375,495	105,650,164
Fees from Students		2,514,765	2,064,858
Exam Fees		35,163,606	1,190,750
Other Income	9	168,397	252,091
Reimbursement of Retirement Benefits from VSSC		5,434,187	
Prior period Income		54,281	
Total		**247,710,731**	**283,707,863**
Expenditure			
Salary & Allowances(Admin & Faculty)	10	67,869,659	43,808,822
Staff welfare		236,764	231,367
Travel Allowances to Candidates		167,320	279,333
Recruitment Expenses		100,667	
Wages		979,834	174,346
Honararium		186,259	388,036
Medical Expenses for Staff		864,306	631,052
Office Expenses		3,960,484	3,056,773
Security Expenses		3,377,561	1,185,359
Supplies & Materials		5,218,449	271,536
Academic Expenses	11	8,595,640	15,278,464
Research and Development		5,206,307	917,484
Telephone and Internet		2,463,495	1,014,384
Repairs & Maintenance		2,383,912	1,565,012
Campus Landscaping			862,321
Mess Expenses for Students		25,953,131	18,591,466
Consultancy and Manpower Hire Charges		8,890,983	4,157,835

Particulars	Sch	2010-11 Rupees	2009-10 Rupees
Admission Expenses		22,498,299	936,327
Students Activities		1,168,873	1,045,534
Inaugural and Other Functions		42,416	1,101,839
Annual Day & Sports Day Celebration		303,063	397,950
Conveyance		13,063,651	3,981,329
Travelling Expenses-Domestic		7,051,781	4,233,904
Travelling Expenses-Foreign		1,098,485	515,995
Legal and Professional Expenses		224,290	128,812
Advertisement and Publicity		4,332,310	13,284,307
Seminars & Sponsorship		255,280	118,180
Newspaper & Periodicals		57,958	48,803
Interest on PF Contribution		132,634	290,407
Bank charges		86,820	9,100
Library Services		9,755,816	265,000
Meeting Expenses		706,574	328,838
Miscellaneous Expenditure		14,517	59,546
Temporary Construction		4,233,923	7,498,923
Electricity & Water Charges		4,907,515	365,925
Audit Fee		49,635	44,120
Depreciation		87,932,777	48,931,051
Total		**294,371,388**	**175,999,480.00**
Excess of Income over Expenditure		**(46,660,657)**	**107,708,383**
Significant Accounting Policies and Notes to the Accounts	14		

INDIAN INSTITUTE OF SPACE SCIENCE AND TECHNOLOGY (IIST)

Receipts and Payments Account for the year ended 31st March 2011

Particulars	Sch	2010-11 Rupees	2009-10 Rupees
RECEIPTS			
Opening Balances	12	1,928,766,106	597,804,568
Grant received from Govt. of India		-	1,776,250,000
Exam Fees		45,463,561	36,280,831
Fees from Students		2,514,765	2,064,858
Scholarship Received		48,000	16,600
Security Deposits received from Contractors		784,361	753,344
Bank Interest		124,976,938	68,188,009
Other Income		153,440	251,918
Increase in TDS Payable		283,145	(1,937,346)
Earnest Money Deposits received		812,752	-
Performance Guarantee		178,209	-
Advance for Research		178,836	-
Motor Car Advance Suspense		(45,000)	45,000
Reimbursement of Retirement Benefits from VSSC		5,434,187	-
Interest on Employee Benefit Fund		195,802	-
Decrease in Contingent Advance		7,000	-
TOTAL		**2,109,752,102**	**2,479,717,782**
PAYMENTS			
Salary & Allowances(Admin & Faculty)		61,847,513	39,542,974
Staff welfare		236,764	231,367
Travel Allowances to Candidates		167,320	279,333
Recruitment Expenses		100,667	-
Wages		979,834	174,346
Honorarium		186,259	388,036
Medical Expenses for Staff		864,306	631,052
Office Expenses		5,157,484	3,053,723

Particulars	Sch	2010-11 Rupees	2009-10 Rupees
Security Expenses		3,377,561	1,185,359
Supplies and Materials		6,012,190	271,536
Academic Expenses		8,257,726	15,239,288
Research and Development		5,206,307	917,484
Mess Expenses for Students		25,953,131	18,572,003
Telephone and Internet Expenses		3,458,610	438,632
Repairs & Maintenance		2,383,912	1,565,012
Campus Landscaping		-	862,321
Consultancy and Manpower Hire Charges		8,890,983	4,157,835
Admission Expenses		21,958,667	936,327
Students Activities		1,168,873	990,534
Inaugural and Celebration expenses		42,416	1,101,839
Annual Day & Sports Day Celebration		380,563	397,950
Travelling		8,160,616	4,735,664
Conveyance		13,032,566	3,981,329
Respond Project		5,663	231,710
Legal and Professional Expenses		224,290	128,812
Advertising and Publicity		4,332,310	13,284,307
Seminars & Sponsorship		255,280	118,180
Newspaper & Periodicals		57,958	48,803
Bank charges		86,820	9,100
Meeting Expense		706,574	328,838
Interest on PF Contribution		-	1,405
Miscellaneous Expenditure		8,854	59,546
Temporary Construction		4,233,923	7,498,923
Library Services		13,845,051	265,000
Audit Fee Paid		44,120	33,090
Electricity and Water Charges		4,907,515	365,925
Scholarship paid to students		41,000	22,600
Security Deposits repaid		540,339	1,008,720

Particulars	Sch	2010-11 Rupees	2009-10 Rupees
Earnest Money Deposits repaid		484,240	-
Security Deposits		1,210,840	-
Advances to Suppliers, staffs ,etc		-	2,603,532
Prepaid Expenses		-	570,717
Fixed Assets and Capital Work-in-progress		581,629,240	424,179,215
Sundry Creditors (2008-09)		-	539,309
Closing Balances	13	1,319,313,817	1,928,766,106
TOTAL		**2,109,752,102**	**2,479,717,782**

Significant Accounting Policies and Notes to the Accounts 14 -

As per our report of even date attached.

For Jose And Hemachandran
Chartered Accountants
Regn. No. 001360S

For and on behalf of the
Indian Institute of Space
Science and Technology (IIST)

Jose Zachariah. F.C.A
(Partner, Mem. No. 80570)

Dr. K S Dasgupta
Director

R Hari Prasad
Finance Officer

Place : Thiruvananthapuram

Schedules Forming Part of Balance Sheet

	As at 31.03.2011 Rupees	As at 31.03.2010 Rupees
SCHEDULE 1: CORPUS FUND		
Opening Balance	1,006,793,057	464,242,234
Add: Excess of Income over Expenditure	(46,660,657)	107,708,383
Add: Grant Utlized for capital asset	558,338,025	434,842,441
	1,518,470,425.00	**1,006,793,058**
SCHEDULE 2 : UNSPENT GRANT		
Opening Balance	1,681,926,461	515,068,902
Add: Grant received during the year	-	1,776,250,000
Less: Revenue Grant	-	174,550,000
Less: Amount utilized for Capital Expenditure	558,338,025	434,842,441
	1,123,588,436.00	**1,681,926,461.00**
SCHEDULE 3 : CURRENT LIABILITIES		
Employee Benefit Fund		
Employees' Contribution	8,534,875	4,388,892
Employer's Contribution	3,638,127	1,654,665
Interest on above	713,006	384,570
	12,886,008	**6,428,127**
CREDITORS FOR FIXED ASSETS		
Advanced Micronics Device Ltd.	119,340	-
Adcom Systems	14,750	-
Kaargil Equipments	45,343	-
CNC India Tools & Services Pvt. Ltd.	162,403	162,403
Consolidated Engineering Services	186,862	-
Redington (India) Ltd.	1,556,033	-
Dell India Pvt. Ltd.	2,655,000	-
Medical and Visual Technologies Pvt. Ltd.	4,900	-
Edutech India Pvt. Limited	-	97,631
Gedee Weilfer Pvt. Ltd.	-	161,985
Holmarc Opto-Mechatronics Pvt. Ltd.	279,730	1,086,930
Innovative Instruments INC	1,040	1,040
Kadavil Electro Mechanical Industries	562	562

	As at 31.03.2011 Rupees	As at 31.03.2010 Rupees
Kitek Technologies Pvt. Ltd.	10,125	10,125
Microtek Instruments	-	5,550
Mono Tech Engineers Pvt.Ltd	-	189,880
MTAB Engineers Pvt. Ltd.	-	3,928,087
Prompt Machine Tools Co.	-	500,658
Sunshine Measurement Pvt. Ltd.	2,200,149	-
Unicorn Power Solutions Pvt. Ltd.	285,500	101,992
Printek Engineers	22,015	-
Orell Techno Systems India Pvt Ltd.	65,977	-
HCL Infosystems Ltd.	-	203,680
Electronica Machine Tools Ltd.	85,849	-
Pazhoor Ideal Systems Pvt. Ltd.	222,583	-
Ideal Systems Pvt. Ltd.	2,064,343	4,015,086
Edmund Optics Sigapore Pts Ltd	57,001	-
Canteen and Kitchen Appliances	-	8,800
Aud Viso Pvt. Ltd.	15,650	-
Alkaad	351,912	-
Microtek Grinding Machines Pvt. Ltd.	346,454	-
Voltas Ltd.	13,151	13,151
Alex Machine Tools	78,750	-
	10,845,422	**10,487,560**
CREDITORS FOR EXPENSES		
The Central Scientific	35,454	-
Current Book India Pvt. Ltd.	337,914	-
	373,368	-
OTHERS		
Group Insurance Recovery	144,400	78,540
Net Salary Payable	-	85,325
Scholarship Payable	11,000	4,000
Security Deposits	926,013	681,991
Earnest Money Deposits	328,512	-
Performance Guarantee	178,209	-
TDS Payable	2,043,345	1,760,200

	As at 31.03.2011 Rupees	As at 31.03.2010 Rupees
ISAT Examination Fee received in Advance	45,390,036	35,090,081
Motor car Advance Suspense account	-	45,000
Audit fee Payable	49,635	44,120
Advance for Research	178,836	-
	49,249,986	**37,789,257**
	73,354,784	**54,704,944**
SCHEDULE 5: CASH AND BANK BALANCES		
Cash in Hand	6,667	5,321
DD's in hand	-	27,483,001
Balances with Scheduled Banks		
in Current Accounts & MOD	243,247,333	974,826,522
in Fixed Deposits	1,076,059,817	926,451,262
Accrued Interest on Fixed Deposits	44,073,903	64,675,346
	1,363,387,720	**1,993,441,452**
SCHEDULE 6 : **ADVANCES, DEPOSITS & RECEIVABLES**		
ADVANCES		
Contingent Advances	39,000	46,000
Staff Advances	1,039,352	951,518
Travelling Advances	15,350	5,000
IIST School advance	77,500	-
Incidental expenses on Fixed Assets pending allocation	1,255,511	-
Accounts Officer, VSSC, AVN Accounts	-	819,700
Godrej & Boyce Mfg. Co.Ltd	77,239	397,575
Accounts Officer, VSSC	1,500,000	303,000
Forest industries travancore Ltd	1,608,820	-
Zeba Lab Furnishing Pvt Ltd.	1,789,546	-
Deedi motors Pvt. Ltd.	1,914,740	-
Ford India Pvt. Ltd.	666,267	-
Air Travel Enterprises India Ltd	170,092	-
Biotech	270,000	-
Blue Star Ltd.	1,485,410	-

	As at 31.03.2011 Rupees	As at 31.03.2010 Rupees
Edutech India Pvt. Ltd.	1,554,734	-
Jinan Testing Equipments IE Corporation	1,902,439	-
Jyothi CNC Automation Pvt. Ltd.	2,773,575	-
Locuz Enterprise Solutions Ltd.	833,580	-
Mels Impex America INC USA	1,321,691	-
Microtek Instruments	32,707	-
P.A Hilton ltd	4,380,965	-
PBI Dansensor-Denmark	1,672,121	-
Tesa SA Instruments ET Systems De Mesure	1,057,997	-
Thermosystems	153,199	-
Allied Publishers Subscription Agency	121,337	-
Arrowhead Media Pvt Ltd.	650	-
Efy enterprise	750	-
Executive knowledge lines	200	-
Indian Aviation News Service Pvt. Ltd.	1,667	-
Indian Journal of Management	800	-
International Book House Pvt Ltd.	143,206	-
One India One People	333	-
The Circulation Department	3,512	-
The Rotary Wing Society of India	300	-
Vayu Aerospace Review	417	-
Lancers Publishers and Distributors	750	-
National Remote Sensing Centre	829,185	-
Telephone and Internet - Prepaid	992,700	-
Library Services- Prepaid	3,815,313	-
Other Prepaid Expenses	-	570,717
Netaji Agency	10	-
	33,502,965	**3,093,510**
Security Deposits	**1,316,320**	**105,480**
RECEIVABLES		
Rent Receivable	14,957	-
Amount Receivable from DOS	2,415	-
	17,372	-
	34,836,657	**3,198,990**

SCHEDULE 4 : FIXED ASSETS

	Gross Block (at cost) as at 01.04.2010	Additons during the year	Gross Block (at cost) as at 31.03.2011	Depreciation as at 01.04.2010	Depreciation for the year	Depreciation as at 31.03.2011	Net Block as at 31.03.2011	Net Block as at 01.04.2010
Land	33,252,000	-	33,252,000	-	-	-	33,252,000	33,252,000
Building		440,999,840	440,999,840	-	22,049,992	22,049,992	418,949,848	-
Plant & Machinery	108,500,702	41,699,481	150,200,183	15,319,555	18,761,895	34,081,450	116,118,733	93,181,147
Campus Networking		16,537,290	16,537,290	-	2,300,337	2,300,337	14,236,953	-
Furniture & Fittings	41,752,172	50,364,524	92,116,696	16,477,216	19,583,061	36,060,277	56,056,419	25,274,956
Motor Cars	6,346,839	107,960	6,454,799	3,118,057	863,883	3,981,940	2,472,859	3,228,782
Motor Buses & Trucks	3,464,533	-	3,464,533	2,021,555	432,893	2,454,448	1,010,085	1,442,978
Canteen Equipments	3,748,791	6,527,419	10,276,210	901,868	1,303,971	2,205,839	8,070,371	2,846,923
Computers	48,172,844	10,667,141	58,839,985	24,547,818	13,716,867	38,264,685	20,575,300	23,625,026
Software	14,335,833	4,696,023	19,031,856	7,866,234	4,466,249	12,332,483	6,699,373	6,469,599
Library Books	9,691,945	5,221,291	14,913,236	5,527,721	3,754,206	9,281,927	5,631,309	4,164,224
Soft Furnishings	343,600	699,423	1,043,023	343,600	699,423	1,043,023	-	-
Total	269,609,259	577,520,392	847,129,651	76,123,624	87,932,777	164,056,401	683,073,250	193,485,635
Prev. Year	107,985,423	161,623,836	269,609,259	27,192,572	48,931,051	76,123,624	193,485,635	80,792,851

Schedules to Income and Expenditure Account

	2010-11 Rupees	2009-10 Rupees
SCHEDULE 7: REVENUE GRANT FROM GOVERNMENT OF INDIA		
Grant from Govt. of India DOS	100,000,000	1,450,000,000
Less: Amount attributable to Capital Grant	-	1,275,450,000
	100,000,000	**174,550,000**
SCHEDULE 8: BANK INTEREST		
Interest on Deposits received	60,301,592	40,974,818
Add: Accrued Interest	44,073,903	64,675,346
	104,375,495	**105,650,164**
SCHEDULE 9: OTHER INCOME		
Sponsorship for IIST Cultural Fest	-	200,000
Penal Interest	838	42,240
Sale of Tender Document	62,007	5,074
Miscellaneous Income	5,095	4,777
Rent from Snacks Bar	100,457	-
	168,397	**252,091**

	2010-11 Rupees	2009-10 Rupees
SCHEDULE 10: SALARY & ALLOWANCES(ADMIN & FACULTY)		
Salary and Allowances	50,038,887	32,576,707
Leave Encashment	137,526	106,494
Salary for Contract Employee	15,805,781	9,700,010
Children Education Assistance to Staff	470,163	321,650
LTC	1,063,902	728,761
Pension	353,400	375,200
	67,869,659	**43,808,822**
SCHEDULE 11: ACADEMIC EXPENSES		
Books to Students	2,178,402	1,473,705
Lab Expenses	1,856,520	11,342,880
Medical Expenses	1,362,109	794,994
Hostel Expenses	475,191	667,465
Travelling Expenses	1,101,829	171,898
Sports Expenses	155,248	291,086
Faculty Development Programme	338,534	408,391
Exam expenses	273,815	-
Publishing of Text Books	150,000	-
Lectures and Seminars	684,373	119,360
Other Expenses	19,619	8,685
	8,595,640	**15,278,464**

Schedules to Receipts and Payments Account

	2010-11 Rupees	2009-10 Rupees
SCHEDULE 12: OPENING BALANCES		
Balances with the scheduled Banks		
In Current Accounts & MOD	974,826,522	340,955,362
In Fixed Deposits	926,451,262	256,841,206
Cash in Hand	5,321	8,000
DD's in hand	27,483,001	-
	1,928,766,106	**597,804,568**
SCHEDULE 13: CLOSING BALANCES		
Balances with the scheduled Banks		
In Current Accounts & MOD	243,247,333	974,826,522
In Fixed Deposits	1,076,059,817	926,451,262
Cash in Hand	6,667	5,321
DD's in hand	-	27,483,001
	1,319,313,817	**1,928,766,106**

SCHEDULE 14

Statement on Significant Accounting Policies and Notes to the Accounts

A. **Significant Accounting Policies**

1. **Basis of Accounting**

The financial statements have been prepared under the historical cost convention, on accrual basis of accounting and in conformity with accounting principles generally accepted in India except in few cases like i). Leave Encashment, ii). Mess Expenses for students and iii) Conveyance which are accounted on cash basis.

2. **Fixed Assets and Depreciation**

Land is valued at cost of acquisition. Buildings, construction of which has almost been completed and put to use, are transferred from capital work-in-progress to Buildings Account based on actual payments made. The cost of buildings may undergo changes at the time of final settlement with the contractors. Buildings and other Fixed assets are shown at cost of acquisition less depreciation. Cost comprises the purchase price or acquisition cost, installation charges and any attributable cost of bringing the assets to working condition for its intended use.

3. **Revenue Recognition**

Out of the total grant received the amount provided in the budget towards revenue is treated as Revenue Grant. Fee, fines and other recoveries from students are accounted on cash basis. Exam fee is recognized as income only after conducting the same.

4. **Taxation**

Being an institution existing solely for education purposes and not for the purpose of profit and is wholly financed by Government of India, the income of the institution is exempt under section 10[(23C)][iiiab] of the Income Tax Act 1961.

5. **Capital Grant**

Out of the total grant received the amount spent towards capital expenditure is added to Corpus Fund. The unutilized portion of the capital grant is treated as Unspent Grant.

B. **Notes to the Accounts**

1. **Depreciation**

Depreciation on fixed assets has been provided in the accounts on written down value basis at the rates prescribed under the Companies Act 1956 disregarding the period for which it has been put to use. However, soft furnishings in hostels have been fully written off during the year and library books are depreciated at 40%.

2. **Land**

There is a stay by the Honorable High Court of Kerala on carrying out construction activities on approximately 80 acres of land purchased at Ponmudi in Trivandrum District for setting up the Institute.

3. **Temporary Construction**

Constructions carried out in the land owned by ISRO at Trivandrum, being a temporary measure for running the Institute, is debited to Income and Expenditure Account. Expenditure incurred for establishing the institute at Valiyamala which are temporary in nature is also charged to revenue.

4. **Unspent Grant**

Unspent Grant represents grant received towards capital expenditure less additions to

fixed assets and capital work in progress.

5. **Revenue Grant**

A grant of Rs.10,00,00,000 sanctioned by Department of Space for 2010-11 is treated as Revenue grant for the current year.

6. **Interest on PF Contribution**

This represents the interest paid by the institute on the individual balances of the employees. The interest earned from funds contributed by employer and employees parked in a separate account have been accounted as income.

7. **Capital Work-in-progress**

Capital Work-in-progress includes a sum of Rs. 1,10,51,630/- towards project management and consultancy charges and service tax of Rs.3,15,95,101/-, both pending for appropriation to fixed assets in due course.

8. **Prior period Income**

Prior period income represents cost of printer wrongly debited to Income and Expenditure Account in the year 2009-10 brought back to Asset during the year.

9. **Furniture and Fittings**

Office Equipments and Furniture meant for laboratories are also included in Furniture and Fittings.

10. **Supplies and Materials**

Supplies and Materials mostly consist of lab consumables.

11. **Students Assistanceship**

As per the approval of The Chairman, Board of Management-IIST/Secretary, DOS vide Letter No. PP & PM : IIST : 09-10 dated July 17, 2009 the students are entitled for an assistanceship of Rs.49,000/- for each semester under various heads. Though this amount is not directly paid to the students, expenditure is incurred on their behalf under these heads by the Institute.

12. **IIST Students Activities Account**

The Institute maintains a separate account exclusively for students' activities which is operated by the Dean (Students Activities) and the Registrar. This does not form part of the Institute's accounts and amounts transferred to this account is treated as a revenue expenditure.

13. **Figure for the previous year.**

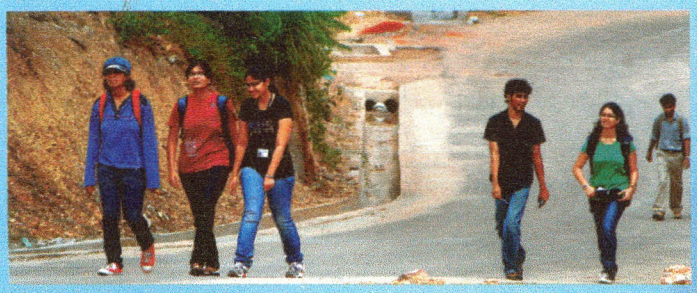
Figures of the previous year have been regrouped wherever found necessary.

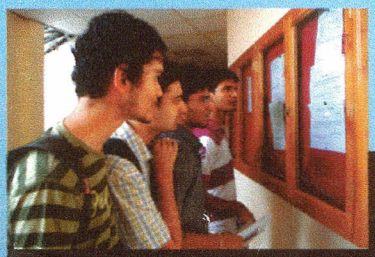
As per our report of even date attached.

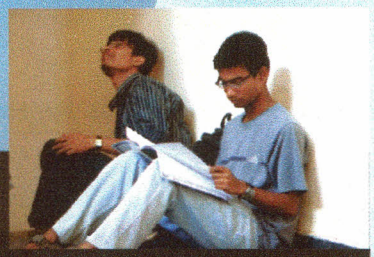
For Jose And Hemachandran	For and on behalf of	
Chartered Accountants	Indian Institute of Space Science and Technology (IIST)	
Regn. No. 001360S		
Jose Zachariah. F.C.A	Dr. K S Dasgupta	R Hari Prasad
(Partner, Mem. No. 80570)	Director	Finance Officer

Place : Thiruvananthapuram

Date : 8th November 2011








Indian Institute of Space Science and Technology

Declared as deemed to be University under section 3 of UGC Act, 1956

Valiamala, Thiruvananthapuram 695 547, India

Ph: +91 471 2568452, 2568422, 2568453 Fax: +91 471 2568462

www.iist.ac.in