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 the UGC act, 1956)

Valiamala P.O., Thiruvananthapuram 695547, India

ANNUAL REPORT 2011-2012

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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.

Director's Foreword

It is with great pleasure and joy that I present the Annual Report for the year 2011-2012. The year witnessed a host of activities in the institute concerning research and academics. We have to our credit a number of achievements also. Our first batch of students has graduated successfully and 117 students have now been placed in the various centres of Department of Space as Scientists and Engineers. I would like to briefly mention some of the other important accomplishments and events that happened during the year.

In January 2012, a UGC team visited our institute for a general appraisal. After spending two days inspecting various labs and other facilities and also interacting with the faculty and the students, they submitted a very positive and encouraging report about the institute, its infrastructure and academic accomplishments.

During this academic year, we have also submitted a self-study report to the National Assessment and Accreditation Council (NAAC).

Regarding the ongoing infrastructure development, the library, Interdisciplinary Building, Student Activity Centre, Avionics Block, and Administrative Block are coming up. The construction of three hostel buildings and the Physical Science Block is almost over. The work is moving at a fast pace in spite of a number of impediments.

This is the third time we conduct our all India entrance exam, ISAT 2012, and it proved to be a grand success.

The first ever IIST Research Scholars' Day that we conducted on 16th -17th December, 2011 is yet another major milestone during the academic year. We had participants from all over the country, from various IITs, NITs and IISERs. The two days were very enriching and fruitful for the students.

This academic year sixteen faculty members, thirteen research scholars, and two post doctoral fellows joined the institute in various departments, thus increasing our academic strength substantially.

Our faculty members are actively involved in their research and have publications in reputed journals. They are also engaged in discourses of national and international significance. The students are enthusiastically involved in curricular and extracurricular activities. IIST, in its onward journey, aims to achieve more in the annals of Indian space mission and its various programmes.

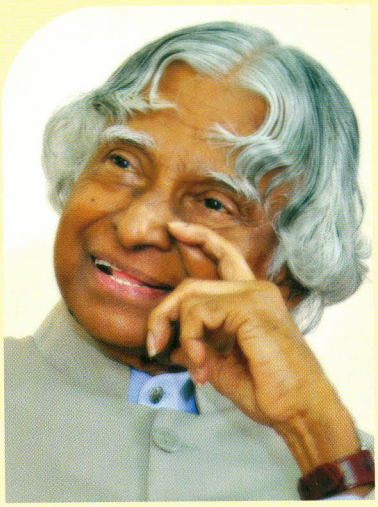
K S Dasgupta
Director

MAJOR MILESTONES

- Approval of Space Commission received on November 8, 2006.
- The institute was registered as a Society under Travancore-Cochin Literary, Scientific and Charitable Society Registration Act, 1955 (XII of 1955) on January 03, 2007.
- The Union Cabinet approved setting up of the institute, on April 26, 2007.
- The Institute was inaugurated on September 14, 2007.
- MHRD/UGC and AICTE granted sanction for the institute to function as 'Deemed to be University' on July 3, 2008.
- Dr A.P.J. Abdul Kalam assumed responsibility as Chancellor, IIST.
- Hon'ble Prime Minister of India inaugurated the institute's campus at Valiamala on August 25, 2009.
- Foundation stone laid for the proposed Space Science Complex at Ponmudi by the Principal Secretary to the Prime Minister of India on October 31, 2009.
- Institute's Campus at Valiamala started functioning from August 16, 2010.

Key Functionaries

Our Chancellor



Dr. A. P. J. Abdul Kalam

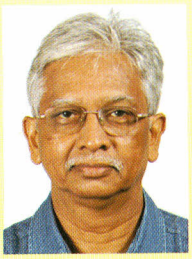
Chairman, Board of Management

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

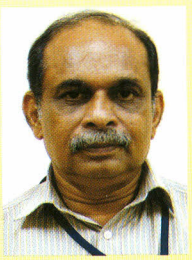
Director

Dr. K. S. Dasgupta

K. Sasikumar
Registrar



Dr. V. Adimurthy
Dean (R & D)



Dr. Thomas Kurian
Dean (Student Activities)

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

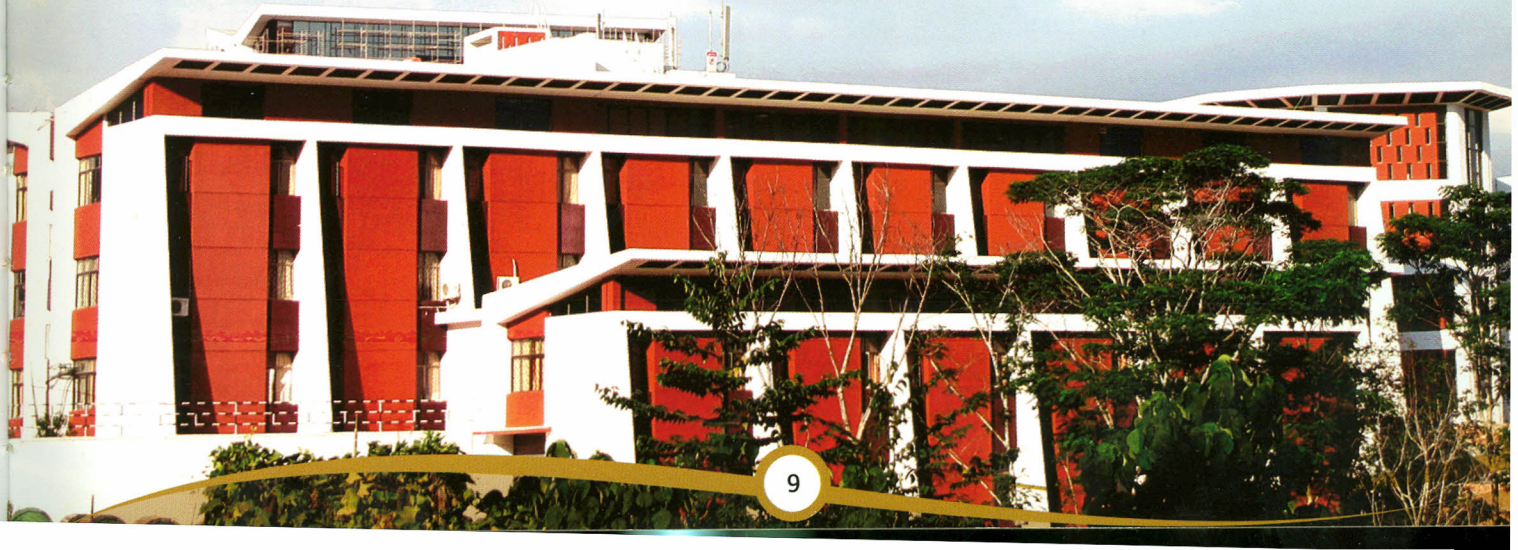
Director, IIST- Member Secretary

Introduction

The Indian Institute of Space Science and Technology (IIST), in its fourth year of establishment in 2011-12, saw the realization of its major mission of providing quality man power to ISRO. From the first batch of 138 students who completed the B Tech programmes, 117 fulfilled the required academic criteria and were placed in various ISRO centres/units in the country.

IIST in its journey forward aims to achieve many more accolades in the field of teaching, learning and R&D. The institute received a very encouraging and a positive report from the UGC team that visited the campus during January 16-17, 2012 reflecting the quality and distinction of the faculty and students. The institute submitted its five year (2007 – 2012) self study report to the National Assessment and Accreditation Council (NAAC), a body set up by UGC to monitor the development of colleges and universities in India. The campus at Valiamala, that started functioning during academic year 2010-11, has B Tech, M Tech, Ph D and Post Doctoral programmes running at present.

The campus has about 100 acres providing adequate area for the construction of the planned academic blocks, administrative buildings and student hostels. At present, two academic blocks are completed and functional while the other two academic blocks as well as the administrative block and library are expected to be commissioned shortly.



FEATURES OF THE NEW CAMPUS

The present campus has about 100 acres; half of which comprises four academic blocks, library, hostels, dining rooms, administrative block and student activity center while the other half will provide for faculty and staff housing and two large stadiums for cricket and football. The institute's academic blocks have a carpet area of 19,141m2. The Institute is currently engaged in a massive exercise of expansion of its physical infrastructure of its Valiamala campus. Besides planning and building new academic blocks, new hostels, new administrative blocks and new library, the Institute is also engaged in building student's activity center, and sports facilities. A quick overview of some of the works completed, in progress and expected to be taken up at a later stage are as follows:

Work Completed

1. Aerospace Block

2. Physical Sciences Block

3. Ten hostel blocks

Work in progress

- Interdisciplinary Block,
- Avionics Block
- Administrative block and the library
- Students Activity Centre

Work planned

- Sports facilities
- Guest house facilities
- Faculty housing and staff quarters

The institute has enhanced its infrastructural amenities with the inclusion of smart class rooms, state-of-

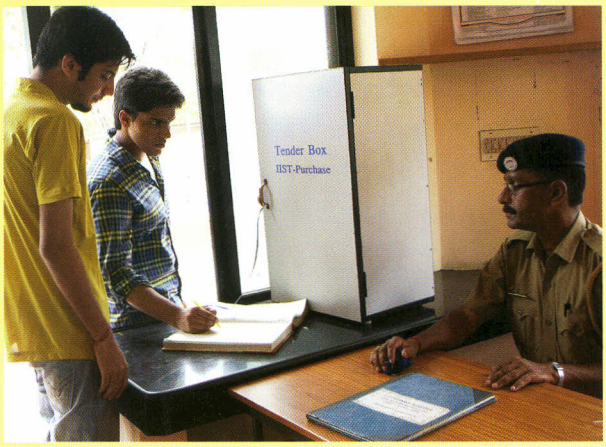
the-art laboratories, computational facilities and other ancillary services like canteen, cafeteria, gymnasium, badminton courts, music room etc.

Within the campus there is a book store, a bank and an ATM centre. The Civil and Electrical Maintenance Section play an active role in the upkeep of the campus. Medical support is available round-the-clock through in-house health clinic supported by two doctors and several paramedical staff. The institute also

provides health coverage to all students and staff which permit them to avail outside medical facilities, if required.

The services of trained instructors in the gym, and professional coaching for sports activities are available.

There are security personnel present round-the-clock on campus. A well-organized transport department provides transportation services.



ADMISSIONS & ACADEMIC PROGRAMMES 2011 – 12

Admissions to the B Tech programmes of IIST for the academic session 2010-11 was conducted through an All India Admission Test "ISAT-2011", held in 22 cities across India on April 16, 2011. A total of 80335 candidates appeared for the examination. Based on a rank list, 138 students were allotted seats after counselling sessions held at Bangalore. Academic session for the new batch commenced on July 22, 2011. The intake of students at the undergraduate level for Aerospace Engineering and Avionics was 60 each while the intake for Physical Science was 36.

Branch	Proposed intake in different categories					Actual Admission in different categories				
	SC	ST	OBC	General	Total	SC	ST	OBC	General	Total
B. Tech Avionics	9	4	16	29	58	9	4	9	36	58
B.Tech Aerospace Engineering	9	4	16	30	59	9	4	12	34	59
B. Tech Physical Sciences	6	3	10	20	39	5	3	0	13	21
TOTAL	24	11	42	79	156	23	11	21	83	138

M. Tech programmes are currently offered in Soft Computing & Machine Learning and Chemical Systems for candidates selected from ISRO Centres. IIST has initiated new post-graduate programs with direct relevance to ISRO in areas like RF & Microwave Engineering, Digital Signal Processing, Propulsion, and Optical Engineering. Presently there are 29 M. Tech students and 73 PhD students in the campus from various departments.

The selection of full time Ph D scholars is done twice a year against open advertisement. The research areas for the Ph D program are based on recommendations by faculty members and duly approved by the Research Council after appropriate review process. The selected candidates are supported by the institute through a large number of IIST fellowships and a limited number of high-value ISRO fellowships (5 per year).

The institute has also initiated post-doctoral programs in select areas with attractive fellowships on par with other national institutes.

IIST FACULTY

The faculty strength during the period of the report is 81. The institute was able to attract several well-qualified faculty members from within the country and abroad.

ACADEMIC INFRASTRUCTURE

The major laboratory and research facilities acquired by the departments in 2011-12 are as follows.

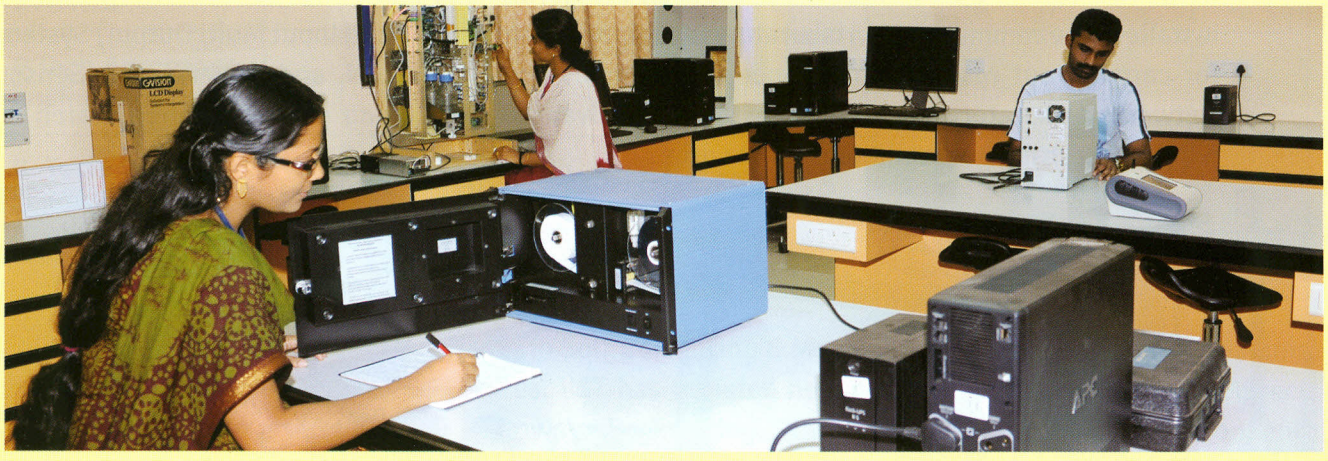
1. **The Department of Aerospace Engineering** has commissioned a Flight mechanics lab with major facilities including UAV based Flight test bed, RC flight simulators etc. CNC machine tools, Flexible Manufacturing System, Pick and Place Robots, Rapid Prototyping Machine, Jet Engine Test Rig, Pulse Jet/Ram Jet Test Rig and Creep & Rupture Testing Machine etc. are the additional facilities installed in various laboratories of the department.

2. **The Department of Avionics** has installed HEXAPOD with six degrees of freedom and an unmanned aerial vehicle system for research activities. The control system laboratory was upgraded with Active Mass Suspension Systems and Coupled Tank Systems. The VLSI laboratory has been facilitated with additional tools for FPGA based reconfigurable designs with IDE Environment. Wi-Com kit, a teaching tool for developing receiver algorithms to improve signal transmission, was installed. The communication laboratory is equipped with MIMO (Multi Input Multi Output) System for carrying out research in advance technologies like LTE, WLAN, and Wi-MAX. The Sensor Networks Laboratory is equipped with many advanced networking platforms for research in wireless mesh networks and sensor networks.

3. **The Department of Chemistry** has acquired facilities such as hot stage polarized microscope, phase contrast microscope, hydraulic press, particle size analyzer, atomic force microscope(AFM), rheometer, high performance liquid chromatography(HPLC), gel permeation chromatography (GPC), bomb calorimeter, carbon dioxide incubator and surface area analyzer. These facilities will support our academic programmes and enrich the research activities in the department. Equipment were procured for Chemical Engineering Laboratory for B.Tech and M.Tech students to facilitate

the practical knowledge on various equipment commonly used in industries such as chemical reactor set up (batch reactor, plug flow reactor and mixed flow reactor), plate and frame filter press, shell and tube heat exchanger, steam distillation unit, pressure control trainer, packed bed distillation column, leaf filter, rotary dryer and forced convection set up.

4. **The Department of Earth and Space Sciences** has added the following components to its lab and research facilities for academic and research development. Astronomy Laboratory has procured a 14-inch reflecting optical telescope, wavelength filters, hand held spectrographs, celestial sphere, CCD camera and SBIG Spectrograph. Cloud Condensation Nuclei, Condensation particle counter, Microtops, Aethalometer and Meterological sensors are purchased and installed for in Atmospheric Science Laboratory. Instruments such as Long range Spectro-radiometers, Plan canopy analyser, Laser Distometer, Differential GPS, Near Real Time Display of INSAT 3A and Kalpana 1 products, and eCognition, an Object Oriented Image processing integrated GIS software were acquired to accomplish the field and lab based activities under Remote sensing Laboratory. Earth Science Lab has procured an advanced trinocular polarizing light microscope (NIKON ECLIPSE LV 100 POL) with diascopic and episcopic illumination.



5. **The Department of Mathematics** has added Mathematica and Maple 16 computational software and HP Z800 Workstations with 48 GB DD3 RAM, 8.5 TB HDD, and Nvidia Quadro 4000 2GB Graphics have been installed using LDAP server in the Programming Lab.

6. **The Department of Physics** started its Adaptive Optics facility this year with several Optical benches (vibration free), two Spatial Light Modulators(both reflective type), four Spiral Phase Plates, Wave Front Sensors, a Turbulence Generator, Laser/Optical sources (He-Ne and Nd-YAG broad band sources) and several optical elements such as lenses, mirrors and beam splitters. The Optics lab augmented its facilities with the acquisition of a Fiber Laser and also set up a Fiber Optics workshop. The Atomic and Molecular Physics, and Spectroscopy lab acquired a Laser Raman Spectrometer, Compact X-ray Diffraction setup and a Position Sensitive Micro Channel Plate detector with Ultra High Vacuum chamber and fast multi hit data acquisition system.

LIBRARY

The IIST Library provides information resources through a carefully developed and balanced collection of books, journals and non-conventional resources. Online access to journals, data bases and documents are also offered. The facility is available during and after normal working hours and on holidays.

The Institute acquired 16 new e-resources during the year, viz. ACM Digital Library, AIAA, AIP, American Meteorological Society, APS, Annual Reviews, ASME, Cambridge Online, IEEEXplore Digital Library, IOP, JSTOR, MathSciNet, Optic Infobase, Oxford Journals, Royal Society of Chemistry, and Science Direct.

IIST Library at a Glance

A Book Bank system is in place to provide B Tech students with at least one text book per student for each course throughout the semester, ensuring essential study materials.

Major developments include computerisation of the library with the implementation of open source library management software KOHA. This ensures the availability of Online Public Access Catalogue (OPAC) and a number of other user-operated services on the campus network round-the-clock. The introduction of library portal has helped to consolidate all the e-resources on a single platform.

In order to promote the use of online resources, a series of Resource Awareness Programmes (REAP) have been planned and the first in the series was organised on Science Direct.

A Reprographic Facility, equipped with a heavy duty high speed digital printer, was installed. A book binding facility was also made operational. Students' newspaper The Sounding Rocket is printed using this facility.

At the initiative of the library, a book shop was started in the campus for purchase of books at a discount.

Books		Increase in 2011 - 12	Total
Books			
	(in Library)	1930	9740
	(in Book Bank)	6534	6534
	Total	**8464**	**16274**
E-Journals			**3467**
Print Journals		21	61
Electronic Databases			
	Full text databases	2	15
	Bibliographic databases	1	1
	Total	**3**	**16**
No of Transacting users		200	822

COMPUTER SYSTEMS GROUP (CSG)

The institute has put in place a good information and communication technology infrastructure and a centralized computing facility.

CSG provides the infrastructure for the automation of all administrative functions, computerization of library operations including the development and upkeep of the open library management software KOHA. CSG has developed software tailor-made for the smooth conduct of the B Tech counselling and other admission processes.

The following are the highlights:

(i) Computing Facility: High Performance cluster server having 3 Terra flop speed (32 HP Blade servers having 64 Dual Quad Processor). Storage - 1.20 TB SAN Storage with NAS Header. Tape Library with Backup software.

(ii) Campus Automation Servers: 8 Servers with 4CPU/Dual CPU High Performance

(iii) Computing Lab: High-end Work Stations (Quad Core Processor with 72 GB RAM, 4GB NVIDIA Graphic Card Memory and 30 inch LCD Monitor) installed with several advanced engineering and scientific software.

(iv) A programming lab for undergraduate students with 64 desktop computers and digital printers.

(v) An internet lab for the use of undergraduate students with desktop computers and digital printers.

BSNL provides a 34MBPS high-speed internet service through the National Internet Backbone. The institute also has 1GBPS internet connectivity through the National Knowledge Network. There is a campus wide area

network based on a 1GBPS Backbone Network, 100/1000 MBPS Distributor Networks and 802.11n Wireless Networks.

ON-GOING & APPROVED RESEARCH PROJECTS

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.	Study of impeller diffusion interactions	Shri.S.Anish
4.	Molecular dynamic studies on fracture of bio composites	Dr.Anup.S
5.	Investigation of deployment of an Antenna	Ms.Roshina Babu
6.	Composite materials milling	Dr.K.Jayakumar
7.	Investigation of micro-patterning of surfaces in aerospace applications	Shri .Sooraj.V.S
8.	Active suspension wheeled rovers on uneven terrain	Dr. Kurien Issac Dr.Sam Noble
9.	Whirling beam experiments for Flapping Wing Micro Aerial Vehicles (MAVs)	Dr. Kurien Issac Dr.G.Rajesh
10.	Multi-objective, Multi-disciplinary Design Optimization of a Semi-ballistic Re-entry Vehicle using High Fidelity Heat Flux Estimation	Shri.Pankaj Priyadarshi
11.	To study the effect of real gas on the aerodynamic coefficients and heat transfer coefficients of re-entry module configurations	Shri.Pankaj Priyadarshi
12.	Design of Interplanetary Trajectories for Specified Planetary arrival conditions	Dr. R. V. Ramanan
13.	Design of Autonomous walking Humanoid Robot	Mr. Sam K. Zachariah
14.	Autonomous landing system with ground Penetrating Radar	Dr. Thomas Kurien Ms. Chris Prema
15.	Pervasive computing for disaster response	Dr. B.S. Manoj
16.	Design and Implementation of Helmet Antennas	Dr. Basudeb Ghosh
17.	IIST Mesh Net: A Programmable Hybrid Wireless Mesh Network Testbed	Dr. B.S. Manoj

18.	Development of high performance impermeable membranes from halobutyl rubber nanocomposites for critical space applications	Dr. Kuruvilla Joseph
19.	Development of advanced polymer nanocomposites based on POSS	Dr. Kuruvilla Joseph
20.	Selective Protein coating on Surface Activated polymer for Enhanced Bio-and Blood Compatibility	Dr. Nirmala Rachel James Dr. Gomathi N
21.	Development of Electroactive polymers for space application	Dr. Kuruvilla Joseph
22.	Develepment of High Efficiency Organic/polymeric Solar cells	Dr. K. Y. Sandhya
23.	Development of micro and nano conducting polymers for molecular and electrooptical devices with special emphasis on the preparation technique, particles size and shape	Dr. Honey John
24.	Development of carbon foams for High Temperature Thermal Protection Application(IIST/RC/CM/3)	Dr. K. Prabhakaran Dr. K.Y. Sandhya
25.	Development of magnetoresponsive elastomers for advanced engineering application	Dr. Kuruvilla Joseph
26.	Nanostructured and surface polymerised magnetorheological fluids for strategic application	Dr. J Mary Gladis Dr. Nirmala Rachel James
27.	Functionalized nitrogen containing Heterocycles as high energy materials for insensitive explosives and propellant compositions-computational design and synthesis.	Dr. K G Sreejalekshmi
28.	Plasma Modification of CNT and Polymer Nanocomposites thereof for Space Applications	Dr. Gomathi N
29.	Impact of assimilating SAPHIR and GPS-ROS data from MEGHA TROPIQUES in high resolution mesoscale model for prediction of servere weather over India -	Dr. A. Chandrasekar
30.	Multi wavelength study of massive star forming regions	Dr. Anandamyee Tej
31.	Star formation in yough Galactic clusters associated with massive stars	Dr. Sarita Vig Dr. Anandmayee Tej
32.	Evaluation of the potential of hyperspectral remote sensing for species level classification and biophysical characterization of mangroves of Bhitarkanika National Park, Orissa	Dr. L. Gnanappazham
33.	Understanding the genesis of Anorthosites in Earth and Moon: A Geological and Remote Sensing Approach	Dr. Rajesh V J Dr. Poompavai Dr. L. Gnanappazham
34.	Investigating the Propagation Characteristics of Tropical Precipitation from Megha-Tropiques Using Image Processing Technique	Dr. Gorti R K S S Manyam

35.	Aerosol-Cloud Interaction under varying meteorological conditions	Dr. Muvva Venkata Ramana
36.	Black carbon ,Aerosol, Meteorological and Ozone Profiling Study (BAMPS)	Dr. Muvva Venkata Ramana
37.	Petrological and Hyperspectral Characteristics of Probable Martian Analogue Rocks in South India: Implications for Geological Processes on Mars?	Dr.V.J.Rajesh Dr. L. Gnanappazham
38.	SAR Data Processing and Applications	Dr. V. Poompavai
39.	Multi-scale object oriented classification of satellite image	Dr. Rama Rao Nidamanuri
40.	Multi-sensor retrieval of tropical biophysical parameters	Dr. Rama Rao Nidamanuri
41.	Local links and impacts: The influence of local institutions on regional development	Dr. C. S. Shaijumon
42.	Research project on developing communicative English software for the students of IIST	Dr. Babitha Justin
43.	Study of select issues of new product development in R&D organizations	Dr. R. Ravi
44.	A study on creative writers and artists in DOSSmt.	Gigy J. Alex
45.	Controllability of Fuzzy Systems	Dr. Raju K. George
46.	Dynamics and rheology of a suspension of periodically forced spherolds in a quiescent fluid at low Reynolds number	Dr. C.V. Anilkumar
47.	Mathematical Problems in image Processing: Practical Differential Equations and the Calculus of variations	
48.	Polymer-Nano composites for Electronic and Photonic Application	Dr. Pramod Gopinath Dr. Honey John
49.	Investigating excited state dynamics of isolated molecular ions, hybrid molecular ions and cluster ions.	Dr. Umesh Kadhane
50.	Controlled synthesis of coherence-polarization of light and its application in optical imaging	Dr. Rakesh Kumar Singh
51.	Long Term Living in Institutions: A Study of Elderly in selected institutions of Kerala (Supported by UGC)	Lekshmi V Nair
52.	Women in New Profession- A Study of Women in the Tourism Industry (Supported by ICSSR)	Lekshmi V Nair

RESEARCH PUBLICATIONS

BOOKS/ BOOK CHAPTERS

Department of Avionics

1. Reddy, T. B., B. S. Manoj, and Ramesh Rao, 2011: An Autonomous Access Point for Cognitive Wireless Networks in Cognitive Radio Mobile Ad Hoc Networks, F.R. Yu, Ed. Springer Science Media. 373-402.

Department of Chemistry

1. Thomas, S., T., J. Kuruvilla, S. K. Malhotra, K. Goda, M. S. Sreekala, 2012: Polymer composites Volume 1,

Ed. Wiley-VCH, 814pp.

2. Thomas, S., T., J. Kuruvilla, S. K. Malhotra, K. Goda, M. S. Sreekala, 2012: Advances in Polymer Composites: Macro- and Microcomposites – State of the Art, New Challenges and Opportunities, Polymer composites Volume 1, 3-16.

Department Of Earth and Space Sciences

1. Gnanappazham. L., and V. Selvam, 2011: Development Planning Using Spatial Data, Strengthening the Resilience of the Post in Disasters Situations: Stories, Experiences and Lessons from South Asia. Julian Gonslaves and Priyanka Mohan, Eds. Academic Foundation, New Delhi and International Development Research Centre, Ottawa. 443-452.

2. Nautiyal, S., and Nidamanuri R. R. 2012: Protected area management in biodiversity hotspots: A case study from Nagarahole National Park, India, Land Management in Marginal Mountain Regions: Adaptation and Vulnerability to Global Change, Saxena, et al Eds., United Nations University, Japan. 99–106.

3. Bala Subrahamanyam, D., and Radhika, R. 2012: Applications of Mesoscale Atmospheric Models in Short-Range Weather Predictions during Satellite Launch Campaigns in India, Atmospheric Model Applications, ISBN 978-953-51-0488-9, Ismail Yucel, Ed. InTech. 25–42.

Department of Humanities

1. Babitha, J. 2011: Es-say it Again on Literature: Useful Essays for the Perplexed Student. TES Publications, Kerala, 129 pp.

2. Shaijumon, C. S., 2012: Food Production and Food Security of India, Mathrubhumi Year Book Plus 2012, Mathrubhumi Printing and Publishing company Ltd. Kozhikode, Kerala, Vol. 2, Issue 1, December 2011, 276-297.

3. Shaijumon, C. S., M. Michaelraj, 2011: Integration of Global Markets: A Tussle of Sovereignty vs. Subjugation: A Theoretical Approach, Development vs. Deprivation in the Era of Globalization, M K Saralamm and S. N. Manju, Eds. Sonali Publications, New Delhi, Vol. 1, 143-160.

4. Lekshmi V. N., 2012: Ageing in Kerala: A Case Study, Kerala- A socio cultural analysis. New Delhi: Sage Publications. 550-562.

INTERNATIONAL/NATIONAL JOURNALS

Department of Aerospace Engineering

1. Jayakumar, K., M. Jose, M. A. Joseph, R. Suresh Kumar and P. Chakravarthy, 2012: Processing and end milling behavioural study of A356-SiCp Composite, Materials Science Forum, 710, 338-343.

2. Jayakumar, K., M. Jose and M. A. Joseph, 2012: Analysis and prediction of end milling characteristics of Al-SiCp Metal Matrix Composite using RSM and ANN, Journal for Manufacturing Science and Production, 12, 105-110.

3. Nitin Gupta, Pankaj Priyadarshi, 2012: A multi-chamber, multi-gas configuration for robust and high performance non-rigid airship, Airship Journal, 175, 17-22.

4. Md.Ishaquddin, Raveendranath, P., and Reddy, J.N., 2012: Flexure and torsion locking phenomena in out-of-plane deformation of Timoshenko curved beam element, International Journal of Finite Elements in Analysis and Design, 51, 22-30.

5. Shine, S. R., Sunil Kumar, S. and Suresh, B. N., 2012: Influence of coolant injector configuration on film cooling effectiveness for gaseous and liquid film coolants, Heat and Mass Transfer, 48, 849-861.

6. Shine, S. R., Sunil Kumar, S. and Suresh, B. N., 2012: A New Generalised Model for Liquid Film Cooling in Rocket Combustion Chambers, International Journal of Heat and Mass Transfer, 55, 5065-5075.

7. Sooraj, V. S., and Jose Mathew, 2011: An experimental investigation on the machining characteristics of microscale end milling, International Journal of advanced Manufacturing technology, 56 (9-12), 951–958.

Department of Avionics

1. Mohan, A., Singh, S. and A. Biswas, 2012: Generalized Synthesis and Design of Symmetrical Multiple Passband Filters. Progress In Electromagnetic Research (PIER) B, 42, 115-139.

2. Priyadarshan,H. and K.Harish Pillai, 2012: On "P" property and the column-W property. Linear Algebra and its Applications, 436, 1969-1989.

3. Rajesh Joseph Abraham, D. Das and Amit Patra, 2011: Load following in a bilateral market with local controllers. International Journal of Electrical Power & Energy Systems, 33, 10, 1648-1657.

4. Bharadwaj, C. K. and Rajesh Joseph Abraham, 2012: Optimised Automatic Generation Control of a Hydrothermal Power System with Capacitive Energy Storage. Journal of Electrical Systems, 8, 1, 35-46.

5. SheebaRani, J., 2012: Face recognition using hybrid approach. International Journal of Image and Graphics (IJIG), World Scientific publishers 12, 1, 1250005, 1-27.

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5. Sarvesh, K., 2011: MMOC combined with FVEM for miscible displacement problems, Proceedings of the International Conference on Advances in Modelling, Optimization and Computing (AMOC-2011), IIT Roorkee, India, December 5-7.

Department of Physics

1. Haripadmam, P. C., John, H., G. Pramod, 2011: Spherical nano ZnO for optical limiting application, IIST Research scholars Day, IIST, December 16 – 17.

2. Kumar, S. S., Mishra, P. M., Avaldi, L., Bolognesi, P., Deshmukh, P. C., and Kadhane, U. R., 2012: Novel dynamical effects due to interchannel coupling in the inner shell photoionization of Xe and Kr. , Workshop on Highly Charged Ions, March 2012, TIFR, Mumbai.

3. Mishra, P, M., Bolognesi, P., Avaldi, L., Richter, R., Prince, K., and Kadhane, U. R., 2012: Photo electron spectroscopy of Pyrene and Fluorene in extreme UV range. Twelfth International Conference on Electron Spectroscopy and Structure: ICESS-12, France.

4. Raju, M. S., Gopinath, P., Singh, R. K., and Kumar, A., 2012: Dynamics of laser produced Ba plasma expanding in uniform magnetic field, PSSI-Plasma Scholars' Colloquium at Institute for Plasma Research, Gandhinagar.

5. Sanid, C., 2011: Spin-transfer-torque driven magneto-logic gates using nano spin-valve pillars, International School and Workshop on Non-linear Dynamics in Complex Systems, The Abdus Salam International Centre for Theoretical Physics (ICTP), in collaboration with the University of Yaoundé, Cameroon.

6. Sanid, C., 2012: Spin-transfer-torque driven magneto-logic gates using nano spin-valve pillars. National Conference on Nonlinear Systems and Dynamics – 2012, IISER-Pune, July 12-15.

7. Singh, R. K., 2012: A new polarization based holographic imaging. New Age Science and Technology for

sustainable developments and 3rd Annual conference of Indian JSPS Alumni Association, 6th- 7th August 2012, NEERI , Nagpur, India.

8. Singh, R. K., 2012: Stokes holography; a new polarization based imaging technique, Workshop on recent trends in optics, CUSAT, Cochin. (Invited talk)

9. Singh, R. K., Naik, D. N., Itou, H., Miyamoto, Y., Takeda, M., 2011: Characterization of polarization speckle. ICONTOP 2011, Kolkata University, Kolkata, India.

10. Singh, R. K., Naik, D. N., Itou, H., Miyamoto, Y., Takeda, M., 2011: Stokes holography for recording and reconstructing objects using polarization fringes. Proc. SPIE 8082, Munich, Gernamy, 808208/1-10.

11. Naik, D. N., Singh, R. K., Itou, H., Miyamoto, Y., and Takeda, M., 2011: State of polarization mapping using a calibrated interferometric polarimeter- SPIE 8082, Munich Germany, 80821T/ 1-7.

12. Singh, R. K., Dinesh N. Naik, Hitoshi Itou, Yoko Miyamoto, Mitsuo Takeda, 201: Holographic control of coherence and polarization of light, Digital Holography and 3D Imaging (OSA), Tokyo, Japan.

13. Naik, D. N., Singh, R. K., Ezawa, T., Miyamoto, Y., and Takeda, M., 2012: Holographic reconstruction using intensity interferometry, Digital Holography and 3D Imaging (OSA), Tokyo, Japan.

14. Sunil, K. K., M.M. Preeti, L. Avaldi, P. Bolognesi, P. C. Deshmukh and R. K. Umesh, 2012: Novel dynamical effects due to interchannel coupling in the inner shell photoionization of Xe and Kr. , Workshop on Highly Charged Ions, TIFR, Mumbai March 2012.

15. Preeti, M. M., P. Bolognesi, L. Avaldi, R. Richter, K. Prince and R. K. Umesh, 2012: Photo electron spectroscopy of Pyrene and Fluorene in extreme UV range. Twelfth International Conference on Electron Spectroscopy and Structure: ICESS-12, France.

ACADEMIC LECTURES (INVITED TALKS/KEYNOTE ADDRESS)

Department of Aerospace Engineering

1. Aravind, V., 2012: Ultrafast Laser Diagnostics for High Speed Flows, delivered in the session on Shock Waves in Chemistry, National Symposium on Shock Waves 2(NSSW2), Periyar Maniammai University (PMU), February 27.

2. Anup S., 2011: Biomimetics, Government Engineering College, BartonHill, Thiruvananthapuram, August 12.

3. Anup S., 2011: Literature Review, College of Engineering., Thiruvananthapuram, December 21.

4. Anup S., 2011: How to write a journal paper, College of Engineering, Thiruvananthapuram, December 22.

5. Kurien Issac, K., 2012: Control of Wheeled Mobile Robots, (Invited Lecture): Interdisciplinary course on Mechatronics: status and challenges, College of Engineering Thiruvananthapuram, March 2.

6. Kurien Issac, K., 2011: Modeling, analysis and simulation : a perspective, (Inaugural address), Second international conference on Simulation, Modeling and Analysis (COSMA-2011) organized by Amritha School of Engineering Coimbatore and National Institute of Technology Calicut, December, 14-16.

7. Pankaj. P., Complex System Optimization Methodologies for Aerospace Applications, Symposium on Applied Aerodynamics and Design, SAROD-2011, Bangalore, 16-18 November 2011.

8. Pankaj. P., 2011: GA for Multi-Objective Optimization", Workshop on Biologically inspired Computing (WBIC 2011), IIST, Valiamala, July 5.

9. Pankaj, P., 2011: Role of CFD and Wind Tunnel Testing in Aerospace Vehicle Design, (Invited lecture), Naval Institute of Aviation Technology, May 9.

10. Radhakrishnan V., 2011: Challenges in Micro, Meso and Nano scale Manufacturing, IIT Kanpur and BARC, Mumbai, September 30.

11. Radhakrishnan V., 2011: Keynote address, Symposium on Nano Metrology, CMTI Bangalore, November 18.

12. Radhakrishnan V., 2012: Research Themes in Advanced Manufacturing in India, Workshop in Advanced Manufacturing Research Challenges, EPSRC, UK/DST, India, Delhi, January 30 – February 1.

13. Radhakrishnan V., 2012: Mechatronics and Intelligent Systems, College of Engineering, Trivandrum, March.

14. Ramanan, R. V., 2012: Challenges in Asteroid Missions, 12th Planex workshop on Exploration of Asteroids and Comets, PRL, Mount Abu, Rajasthan, January 2 -6.

15. Salih, A., 2011: Conservation Equations in Fluid Dynamics: Integral and Differential Formulation, Government Engineering College, Thrissur, October 19.

16. Salih, A., 2012: Theoretical Solution to Boundary Layer Equations , (keynote lecture): National Workshop on Advances in Theoretical and Computational Fluid Dynamics (ATCFD-2012), Directorate of Technical Education (Kerala) College of Engineering, Trivandrum, February.

Department of Avionics

1. Manoj. B. S., 2011: On the Use of Cognition in Future Wireless Networks, Department of ECE, National Institute of Technology Calicut, June 22.

2. Manoj. B. S., 2011: Importance of Space and Time in Future Network Design, IIST, August 9.

3. Manoj. B. S., 2011: Wireless Mesh Networks, M. Tech program in Wireless Networks and Applications, Amrita University, October 6.

4. Manoj. B. S., 2011: Wireless Networks, 11th Refresher Course on Computer Science, UGC-Academic Staff College, University of Kerala, Trivandrum, October 11.

5. Manoj. B. S., 2011: Wireless Mesh Networks for Future Tactical Networks, CDAC Trivandrum , December 1.

6. Manoj. B. S., 2011: Cyber-Physical interactions: Future Network Design, WoNGeN 2011, Bangalore, India, December 18.

7. Priyadarshan. H. 2012: Analysis and Feedback Regularisation of Switched Systems, Department of Electrical Engineering, IISc., Bangalore, India , Feburary 15.

8. Rajesh. J. A., 2011: Stability of Control Systems, Development Programme on Control Systems Anna University of Technology, Coimbatore, December 19.

9. Selvaganesan. N., 2011: Experiencing System Identification in Matlab – Conventional to Intelligent and Bio-Inspired Computation, Workshop on Biologically Inspired Computing, Indian Institute of Space Science and Technology, July 4-7.

10. Selvaganesan. N., 2011: System Identification by, ISA Student Chapter, Noorul Islam Centre for Higher Education, Kumaracoil, August 20.

11. Selvaganesan. N., 2011: Fuzzy Modeling with Examples at Workshop on Soft and Evolutionary Computing, Indian Institute of Space Science and Technology, December 19-21.

12. Vikraman. N., 2011: Embedded Systems and LSI, Training Programme for Engineering faculty, Mar Baselius Engineering College, Trivandrum, November 21.

13. Sheeba, R., 2012: Face Recognition Issues and Challenges, National level conference on Intelligent Techniques in Control, Optimization and Signal Processing INCOS-'12, Kalasaligam University, Tamil Nadu, March 2.

14. Zachariah, S. K., 2011: Robotics- Steps for Successful Realization, Mohandas College of Engineering and Technology, Anad, July 26.

Department of Chemistry

1. Gomathi.N, 2011: Blood Compatibility through Plasma Surface Modification, PSNA College of Engineering and Technology, Dindigul, June-10.

2. Gomathi.N., 2011: Plasma Surface Modification for Biomedical Applications, Institute of Physics, Bhubaneswar on May 11.

3. Ninan, K. N., 2011: Chemistry in Indian Space Odyssey, National Seminar on Frontiers in Chemistry, Department of Chemistry, Indian Institute of Space Science and Technology, Thiruvananthapuram, December 7 - 8.

4. Kuruvilla J., 2011: New generation composite materials, International Conference on Functional Polymers, National Institute of Technology (NIT), Calicut, January 28.

5. Kuruvilla J., Naonomaterials, Pavantma College, Murikkassery, Idukki, December 12.

6. Kuruvilla J., 2011: Nanotechnology for Space Applications, St. Xavier's College, Vaikom for International Year of Chemistry, December, 22.

7. Kuruvilla J., 2011: CSIR Programme on Youth for Leadership in Science (CPYLS Programme), National Institute for Interdisciplinary Science and Technology, Thiruvananthapuram, December 27.

8. Kuruvilla J., 2011: Nanotechnology, National Seminar on Emerging Trends in Nanotechnology, Bishop Kurialancherry College for Women, Kottayam, September 30.

9. Kuruvilla J., 2011: National Seminar on Development of Chemistry through Ages organized by Department of Chemistry, National Institute of Technology, Calicut, August 5.

10. Kuruvilla J., 2011: Special Guest, Fashion Education Seminar "Effervescence- The Design Collection 2011, Assumption College, Kottayam on June 4.

11. Kuruvilla J., 2011: Keynote address on "Nanotechnolgy for space applications", National Science day celebrations, Amrita Vishwa Vidyapeetham Unuiversity, Kollam, March 7.

12. Sreejalekshmi, K. G., 2011: Supramolecular Chemistry – from host-guest chemistry to molecular machines, Fatima Mata College, Kollam on December 8.

Department of Earth and Space Science

1. Chandrasekar, A., 2011: 3DVAR Assimilation Studies Over the Indian Region: Results of Impact Studies, International Conference on Data Assimilation in Indian Institute of Science, Bangalore, July 13-15.

2. Chandrasekar, A., 2012: Data Assimilation in Atmospheric/Climate Models, National Seminar on Climate Change and Variability, Cochin University of Science and Technology, March 26-27.

3. Chandrasekar, A., 2011: Chaos in the Atmosphere, St. Joseph's College, Tiruchirapalli, December.

4. Gnanappazham. L., 2012: Role of Remote Sensing and GIS in Mangrove Management , Inventorisation and Monitoring of Biosphere Reserves in India using Remote sensing and GIS Technology, Ministry of Environment and Forest, New Delhi, April 20 – 21.

5. Gnanappazham. L., 2012: Fundamentals of GIS, Technology Dissemination Workshop on Seagrass and Seagrass Mapping using Indian Remote Sensing Satellites, Centre for Advanced Study in Marine Biology, Annamalai University, Parangipettei, February 13 – 18.

6. Narayanan, A., 2011: Low Redshift Intergalactic Medium, Indian Conference on Cosmology & Galaxy Formation, IISER Mohali, November 6,

7. Narayanan, A., 2011: Observational Perspectives on the Cosmological Evolution of Matter, Recent Trends in Cosmology, TKM College of Arts & Sciences, Kollam, November 2.

8. Narayanan, A., 2012: Invited public lecture on Our Universe From Its Origins to the Present at the International Book Fair held at Mahatma Gandhi University, Kottayam on January 20.

9. Nidamanuri, R. R., 2012: Knowledge Based Hyperspectral Image Classification, Workshop on Advanced Methods in Spatial Data Processing and Analysis (AMSPA) Indian Statistical Institute, Bangalore, March,6 -7.

10. Mandal, S., 2012: Accretion Disk Spectrum of Quasar to Nano-Quasars: Theory Confronts Observation, ARIES, Nainital, May 18.

11. Mandal, S., 2011: Accretion and Radiative Processes Around Black Hole Candidates, Astro-Cosmology Workshop, IISER Thiruvananthapuram, November 18.

12. Sai. G, 2011: Recursive image estimation and inpainting in noise using non-Guassian Markov Random Field Priors, IIST, September 29.

13. Padmanabhan, N., 2011: Mathematical modeling for satellite data processing, IIST, October 5

14. Pandian, J. D., 2011: Studying Early Phases of High-Mass Star Formation, Astro-Cosmology Workshop, IISER Thiruvananthapuram, November 18.

15. Radhika, R., 2011: International Space Programme- An Overview, ISRO Induction Training Programme (IITP) of VSSC, IITP-23 batch of new recruits to ISRO on November 9.

16. Ramiya A. M., 2012: Satellite Image Processing, Summer training program on Geospatial Technologies and Applications, NRDMS program in DST, Kamaraj University, Madurai, May 21 – 22.

17. Sarita Vig, S., 2011: Investigation of Toroidal Candidates in Massive Star Forming Regions, Astro-Cosmology workshop, IISER, Thiruvananthapuram, November 18.

Department of Humanities

1. Lekshmi, V. N., 2011: PRA Methods – Tools and Techniques, Department of Sociology. University of Kerala, August 17-18.

2. Lekshmi, V. N., 2011: Social Science Projects – Analysis at Indian Social Institute, Bangalore, November 28-30.

3. Ravi, V., 2012: Operations Research, National Institute of Technology, Thiruchirapally, Department of Management Studies, February 4.

4. Ravi, V., 2012: Operations Research, National Institute of Technology, Thiruchirapally, Department of Management Studies, February 18.

5. Shaijumon, C. S., 2012: National Budget 2012 – what is in it, (Invited Talk), Fatima Mata National College, Kollam, March 26.

6. Shaijumon, C. S., 2012: Live Kerala Budget discussion, Manorama News, March 19.

7. Shaijumon, C. S., 2012: Technology and Economic Development, video conferencing with SB College,

Changanasserry, March 2.

8. Shaijumon, C. S., 2012: Global Financial Crisis from the perspective of India, Naipunya International Academy, Cochin, February 25.

9. Shaijumon, C. S., 2011: How Union Budget 2011-12 will affect the Indian Economy, Talk and discussion, Kerala State Civil Services Academy, Trivandrum, March 6.

Department of Mathematics

1. Anil Kumar C. V., 2012: Introduction to Dynamical Systems, Heera College of Engineering, Trivandrum, March 2.

2. Moosath, K. S. S., 2011: Workshop on Mathematical Analysis, sponsored by the three Academies of Sciences, Amrita Vishwa Vidyapeetham, June 20-22.

3. Moosath, K. S. S., 2011: Refresher Course organized by the Department of Mathematics, University of Kerala on July 8.

4. Moosath, K. S. S., 2011: Lecture on Foundations of Real Analysis at the Department of Mathematics, Calicut University on October 14.

5. Moosath, K. S. S., 2011: UGC sponsored National Seminar, Catholicate College, Pathanamthitta, Kerala December 8-9.

6. Moosath, K. S. S., 2012: One day National Seminar on Topology and Geometry, Department of Mathematics, P.M Govt. College, Chalakudy, Kerala, January 12-13.

7. Moosath, K. S. S., 2012: UGC National Seminar on Topology and Geometry, Department of Mathematics, N A M College, Kannur, Kerala, January 12-13.

8. Moosath, K. S. S., 2012: Lectured in the Department seminar, Department of Mathematics, University of Calicut. January 25.

9. Moosath, K. S. S., 2012: UGC National Seminar on 'Analysis and Geometry', S N College, Alathur, Kerala February 13-14.

10. Prosenjit D., 2012: Seminar on Planes of the form b(X,Y)Zn – a(X,Y) over a DVR, IISER Trivandrum, March.

11. Raju K. G., 2012: Importance of Mathematics for +2 students in science streams for choosing their career, Sarvodaya Central School, Nalanchira, Trivandrum, March 26, 2012.

12. Raju K. G., 2012: Using Matlab for Mathematical Problem Solving, Two-Day Seminar on Computation and Programming, University College, Trivandrum, March 23-24.

13. Raju K. G., 2012: MATLAB for, Darshana Book Exhibition on behalf of National year of Mathematics, Kottayam, February 1, 2012.

14. Raju K. G., 2012: C0-Semigroup operators for Control Systems, IISc, Bangalore, January 23 to 27, 2012

15. Raju K. G., 2011: Optimal Control of Dynamical Systems, 56th congress of the Indian Society of Theoretical and Applied Mechanism (ISTAM), NIT Surat, December 19 – 21.

16. Raju K. G., 2011: Guest Lecture, DST sponsored INSPIRE Programme, SVNIT, Surat, August 26.

17. Sumitra S. N., 2011: Introduction to Machine Learning, Short term course on Soft and Evolutionary Computing, Department of Avionics, IIST, Trivandrum, December 19-21.

Department of Physics

1. Narayanamurthy, C. S., 2011: Unification of coherence and polarization of light beams in holography

and speckle experiments, XXXVI Optical Society of India Symposium, IIT Delhi, Delhi, December 3-5.

2. Narayanamurthy, C. S., 2011: Michelson Interferometer : Revisited, Trends in Optics and Photonics II, International Conference on Trends in Optics and Photonics, University of Calcutta, Kolkata December 7 - 9.

3. Pramod, G., 2012: Emission Processes in Laser produced plasma, UGC Sponsored National Seminar on Lasers in Materials Science - Laser 2012, St. Gregorios College, Kottarakara on March 02.

4. Sudheesh, C., 2011: Dynamical Systems, Workshop on Physics Education and Research, Centre for Continuing Education and Department of Physics, December 19-24.

5. Umesh, R. K., 2012: Investigation of structural & dynamical properties of intact as well as fragmented PAH molecules & molecular ions, Workshop on Highly Charged Ions, TIFR, Mumbai, March 28-31.

AWARDS AND RECOGNITIONS

1. Nayak. A. G., V. Kumar and V. Aravind, 2011, Best paper award, Flow Visualization of Gas Centered Swirl Coaxial Injectors, Session - Advanced Propulsion Concepts for Launch Vehicles II, National Conference in Space Transportation Systems: Opportunities and Challenges, VSSC Thiruvananthapuram, December 16-18.

2. Bharath D. B. and R. R. Nidamanuri, 2011, Best Poster presentation award, Multiple Classifier Systems for Hyperspectral Image Classification, National Symposium on Empowering Rural India through Space Technology, Indian Society of Remote Sensing, Bhopal, November 8 -11.

3. Chaudhary. R. K., S. Bhattacharyya, K. V. Srivastava and A. Biswas, 2012, Best Paper Award in Session, Design of a Wide-Band Dual Segment Half-split Cylindrical Dielectric Resonator Antenna, 5th Antenna Test & Measurement Society (ATMS) Conference, Mumbai, India.February 01 – 03, 58 - 61.

4. Chaudhary. R. K., S. Bhattacharyya, K. V. Srivastava and A. Biswas, 2012, Best Paper Award, GA optimised PID controller for two area hydrothermal AGC considering capacity energy storage, Second International Conference on Emerging Technology Trends in Advanced Engineering Research, Kerala, February 20 - 21.

5. Haripadmam, P. C., J. Honey, G. Pramod, 2011, Best Poster Award, Spherical nano ZnO for optical limiting application", IIST Research scholars Day, December 16 – 17.

6. Kavitha, M. K., P. C., Haripadmam, G. Pramod, J. Honey, 2012, Best Poster Award, Synthesis, characterization and photoluminescence of Triangular ZnO nanostructures, NanoSciTech 2012 - International Conference on Frontiers of Nanoscience, Nanotechnology and their Applications, Punjab University Chandigarh, February 15-18.

7. Priyadarshan, H., 2012, Excellence in Thesis Award for Phd, Analysis and Feedback Regularisation of Switched Systems, IIT Bombay, August 18.

8. Priyadarshi. P., 2012, ISRO Team Excellence Award 2008 for Computational Fluid Dynamic Activities on 19 January.

9. Poompavai, V., 2011, Erasmus Mundus Fellowship (EMEA) for post-doctoral research at the University of Vienna, Austria in 2011. (Not availed)

10. Poompavai, V., 2011, Member, Board of Studies, M.Tech (GIS) programme, Bharathidasan University, Tiruchirapalli, Tamilnadu from April, 2011

11. Poompavai, V., 2011, Member, Working Group on Climate Change, Formulation of Twelfth Five year Plan, State Planning Board, Kerala.

12. Radhika R., 2012, ISRO-ASI award for Space Science Applications, awarded by the Astronautical Society of India for 2008 received at ISRO Head quarters on February 21.

13. Rajesh, J. A., 2012, IEI Young Engineers Award 2011-12, Electrical Engineering, Institution of Engineers (India), Kolkata, India.

14. Ramanan R. V., 2012, ISRO Team Excellence Award 2008 for 'Chandrayaan-1 including MIP', January 19.

15. Mukundan. V., G. P. Sahoo and R.V. Ramanan, 2011, Best paper award, Optimal Moon landing Trajectory Design with Solid and Liquid Propulsion Using SQP, National conference on Space Transportation Systems, Indian national Academy of Engineering, Thiruvananthapuram, India, Decemeber 16-18.

16. Sanjay. M. A. and R. V. Ramanan, 2011, Best paper award, Design Analysis of configuration and Mission of Solar sail for interplanetary Missions, Mission design session of National conference on Space Transportation Systems, Indian national Academy of Engineering, Thiruvananthapuram, India, Decemeber 16-18.

17. Rashmi. M., 2011, First Prize under humanities category, Safe Fishing and Technology: A Descriptive Study on the Fishermen Community in Wadi Coastal Village, Kollam, IIST Research Scholars Day, December 16- 18.

OTHER ACADEMIC ACTIVITIES

1. Dr. Ramanan was deputed to participate in the 2nd IAA Planetary Defence Conference, Bucharest, Romania, May 9-12, 2011.

2. Deepak, T. G. Served as the chairman of the Judging committee for the "All Kerala Mathematics Talent search Examination for +1 and +2 students conducted by centre for Research in Mathematics, CMS College, Kottayam on January 25, 2012

3. PhD awarded to Bipin John for Investigations on Foam Composites base on Thermosetting Polymers, University of Kerala, 2011. Guides: C. P. Reghunadhan Nair and K. N. Ninan.

4. PhD awarded to B Swaminathan, Studies on Silicon containing Inorganic and Organometallic polymers, University of Kerala, 2012, Guides: S. Packirisamy and K. N. Ninan.

5. IIST Research Scholars' Day: The institute celebrated its first ever Research Scholars' Day from December 16 – 17, 2011. The programme was formally inaugurated by our Chancellor Dr. A. P. J. Abdul Kalam and had participants from IIST as well as participants from leading institutes across the country. The technical session comprised of paper presentation and poster exhibition for science, engineering and humanities.

6. Visit of UGC Review Committee: The UGC Review committee visited IIST during January 16 – 17, 2012. The eight member committee was drawn from various IITs/universities. The committee inspected the facilities of IIST and held detailed discussion with the faculty and the students. A detailed report was submitted before the committee detailing the efforts

taken by the institute in the four years since its inception for building a Centre of Eminence in space science & technology.

CONFERENCES/WORKSHOPS/SEMINARS ORGANIZED BY IIST

A Workshop on "Biologically Inspired Computing" was organized by Department of Mathematics, IIST during 4-7 July 2011.

A Self Development and Successful Communication Seminar for Young Scientist of ISRO was organized by Department of Humanities, IIST during 17-19 July 2011.

A National Seminar on Frontiers in Chemistry was organized by Department of Chemistry, IIST during 7-8 December 2011.

A Short-Term Course in "Soft and Evolutionary Computing" was organized by Department of Avionics, IIST during December 19-21, 2011.

A Workshop on "Multi-wavelength astronomy with ASTROSAT" was organized by Department of Earth and Space Sciences, IIST jointly with ISAC, Bangalore during January 9-12, 2012.

A one day workshop on Navigation systems and sensors by Mr. Amitava Bose, Former Director ISRO Inertial Systems Unit was conducted on February 4, 2012.

A workshop on "Adaptive Finite Element Methods" was organized by Department of Mathematics, IIST during March 16-25, 2012.

IIST Library is subscribing to 16 electronic resources and few individual e-journals. They have planned to conduct 'Resources Awareness Programme' (REAP -1) on each resource subscribed by Library so that users can understand and use the 'special features' of each resource and set personal options and alerts. This will also help to understand the advanced features offered by the publisher from time to time. The first 'Resource Awareness Programme' on Science Direct was conducted on March 15, 2012. Representatives from Elsevier Publishers made special presentation specifically.

Induction (Orientation) Programme: A six day intensive induction program was offered for the first semester students by the Department of Humanities during August, 2011. The objective of this workshop was to foster dynamic thinking essential in the current global scenario. Some of the topics covered include Self Esteem and

Motivation, Positive Attitude, Goal Setting, and Creativity. The program had classroom sessions and outdoor training activities.

Neuro-Linguistic Programme (NLP): The Department of Humanities organized an NLP programme for the first semester students during October 25 – 29, 2011. The course was offered by Dr. Abraham Abraham (Mind Masters fame). This three hour programme covered:

- Better ways of human communication and language skills
- Wholesome behavioural development in individual and groups
- Pneumonics, or the memory development programme, which would train students in listening skills in class, note taking ability, etc.
- Stress management skills so as to manage emotional and academic stress at the time of examination, etc.
- Better social skills along with communicative skills

SEMINARS AND INVITED LECTURES AT IIST

1. Shri. Gopinath Pai, Visiting Scientist, VSSC, Materials for Space Programme, August 17, 2011.
2. Shri. S Gopala Krishnan, CEO Pune Instrumentation Pvt Limited, Pune, Robotics and Control, August 24, 2011.
3. Dr. Anshu Manik, Technical Services, Wolfram Research and Sonali DeSouza, International Training Executive, Wolfram Research, Use of Mathematica in Education and Research on September 16, 2011.
4. Dr. V K Vijayakumar, Investment Strategist, Geojit BNP Paribas, Financial Planning and Wealth Management, September 28, 2011.
5. Prof R. V. G. Menon, Former Director, ANERT and retired Professor CET, a popular figure in science programs in media, History of Science and Technology October 10, 2011.
6. Dr. Ruta Kale, Inter-University Center for Astronomy & Astrophysics (IUCAA), Non-thermal Phenomena in Clusters of Galaxies, October 14, 2011.
7. Shri. Sasidhar, Chief General Manger, NABARD , How scientists can make use of NABARD, October 14, 2011.
8. Shri. R. Shyamaprasad., Malayalam Film Director (of movies Agnisakshi, Akale, Ore Kadaal and Kerala Café), The history, development and changes of Indian film industry, October 24, 2011.
9. Dr. C.G. Ramachandran, The History of Science, November 1 to 7, 2011.
10. Dr. Sukavanam, IIT Roorkee, Kinematics, Dynamics and Control of Robot Manipulators, October 21 – 23, 2011.
11. Dr. D. J. Saikia (National Centre of Radio Astrophysics, NCRA-TIFR), Blackholes and Active Galaxies, November 23, 2011.
12. Dr. Sanjay Limaye, Space Science and Engineering Centre, University of Wisconsin, Madison, USA, Exploring the Venus – current status of Venus exploration, November 30, 2011.
13. Prof. M. Sitaramayya (Central University, Hyderabad) on the Differential Geometry and Applications, December 15, 2011.
14. Prof. Davide Bonifazi, Department of Chemistry, University of Namur, Belgium, Supramolecular and Covalent Derivatization of CNTs: Challenges and Promises for Advanced Materials and Biomedical Applications, December 21, 2011.

15. Prof Vijayamohanan Pillai, Director, Central Electrochemical Research Institute, CSIR, Karaikudi, Nanotechnology and Periodic Table for International Year of Chemistry, December 28, 2011..

16. Prof. Peter J. Fleming, Professor of Industrial Systems and Control, Deptartment of Automatic Control and Systems Engineering, The University of Sheffield, UK, Multicriteria Optimization in Control and Systems Design, January 6, 2012.

17. Prof. Phoolan Prasad from IISC, Bangalore, Basic properties of waves and the wave equation, January 30 - 31, 2012.

18. Dr. Som R. Soni, Associate Professor of Systems Engineering, Air Force Institute of Technology(AFIT), Wright Patterson Air Force Base, Ohio, US, Research in Structural Health Monitoring of Aging Aircrafts, February 3, 2012.

19. Dr. Solomon Ivan, Raman Research Institute, Bangalore delivered two talks. The first talk was on Introduction to Quantum Information on February 14, 2012 and the second talk on Operator sum representation of Bosonic Gaussian Channels on February 15, 2012.

20. Dr. Virendra Mahajan, Aerospace Corporation, El Sugundo, USA, Aberrated Imaging And Wavefront Analysis, March 9, 2012

21. Prof. R. Shankar, Institute of Mathematical Science, Chennai, Quasiparticles with fractional charge and statistics, March 16, 2012.

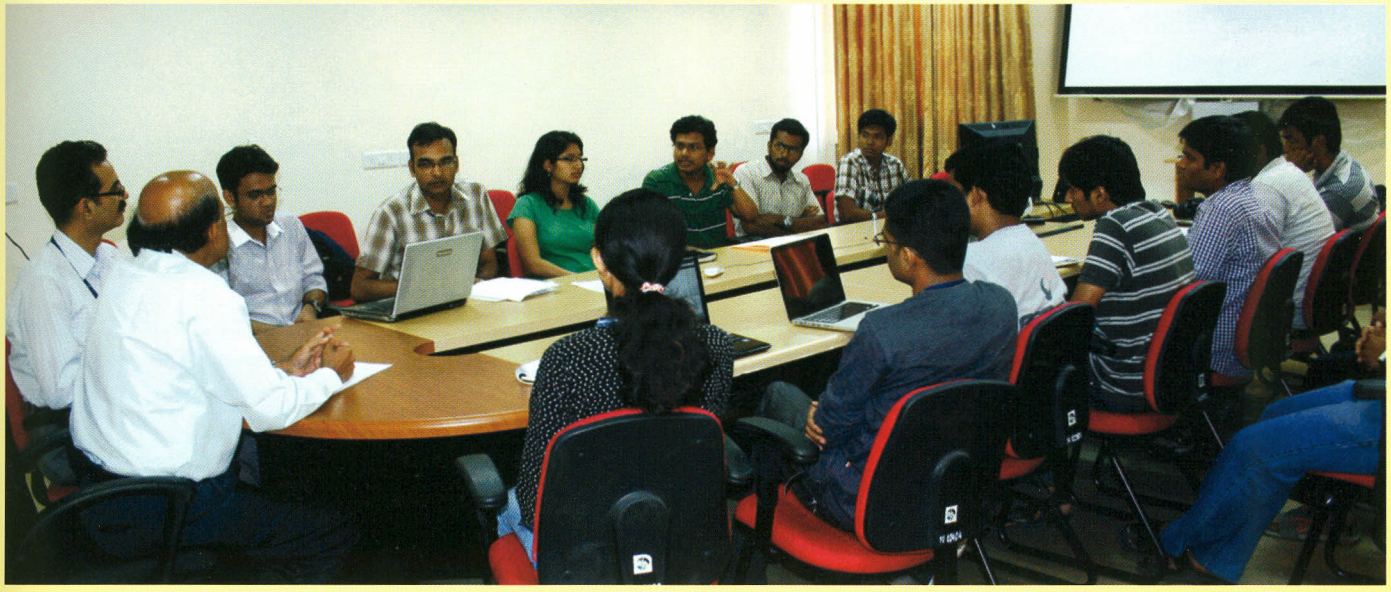
22. Prof. Prasanta K. Panigrahi, IISER Kolkata, PT-symmetric systems: Scattering and bound state properties March 19, 2012.

23. Prof. A. K. Pani, IIT Mumbai, Industrial mathematics with a case study from finance, March 21, 2012.

24. Prof. Toshiyuki Azuma from RIKEN, Japan, Expanding atomic physics of highly charged ions: from slow collisions in the solar wind to high-energy irradiation for cancer therapy, March 26, 2012.

STUDENT PROJECTS

Student projects are carried out in IIST under the guidance of IIST faculty and ISRO scientists. The objective is to provide the students with knowledge and hands-on experience to work as a team in the design, development and building of space systems.



Sounding Rocket Project: Vyom, a single stage sounding rocket capable of carrying a payload to an altitude of 10 to 15 km was successfully designed. The rocket motors for Vyom were made at the Rocket Propellant Plant of VSSC and successfully tested on ground. A payload was designed to monitor the acceleration, velocity and altitude of the rocket and it is being fabricated at VSSC. Computational Fluid Dynamics simulations were carried out to verify the aerodynamic data of the rocket.

Model Airship: Three IIST students, Sattwik, Shashank and Tanveer made a model airship as part of their B.Tech project. They also made a 5 minute video clip from the the 4 flight tests carried out to characterise it

Nano-Satellite Project: The students have conceived a 3-axis stabilized nano-satellite of mass less than 2 kilograms. The conceptual design of the satellite has been completed and the payload and components have been identified, based on the functional requirements and availability. The nano-satellite is proposed to be launched in a polar sun synchronous orbit of about 670 km altitude as a piggyback payload in the PSLV rocket.

Study Tours

- Visit to Waynad from October 5 – 9, 2011 was organized by the Department of Humanities to study the impact of technological development on rural economy and Village Resource Centres (VRC) in the region.
- A geological field survey from October 13 – 16, 2011 was organized by the Department of Earth & Space Sciences in the Sittampudi and Salem areas of Tamil Nadu.
- A visit to Ooty to study the Toda community was organized by the Department of Humanities from October 28 – 31, 2011.
- A visit to the Vainu Bappu Observatory (VBO) in Kavalur, Tamil Nadu which houses the largest telescope in India was organized by Department of Earth and Space Sciences from November 4 - 7, 2011.

STUDENT ACTIVITIES

Model United Nations (MUN) is an academic endeavour initiated by the United Nations, and it aims to educate students about current events, topics in international relations, diplomacy and the agenda of United Nations. Participants assume the role of diplomats representing a nation or an NGO in a simulated session of the United Nations, such as the Security Council or the General Assembly. Participants are expected to study current international issues and hold debates and deliberations to come up with solutions.

IIST organized its first Model United Nations on the following two agenda:

1. Space Militarization: Control and Management
2. Non-Proliferation Treaty: Future Prospects and Implementation

The event was judged by Prof. G. Gopakumar (Dean, Social Service, University of Kerala) and Dr. C. A Josekutty (Assistant Professor, Department of Political Science, University of Kerala)

Fresher's Day

A welcome party and an ice-breaking session were organized on September 7, 2011 by the second year students for the fresh batch of students of IIST 2011. There were cultural performances showcasing the talents of the incoming batch to an audience consisting of students, faculty and staff.

Dhanak 2011

The annual cultural festival of IIST, Dhanak-2011 was held in IIST from September 30 to October 3, 2011. The festival was inaugurated by the renowned playback singer Shri. K. J. Yesudas. Shri. N Krishnamoorthy, founder-director of the Soorya Stage & Film Society was the guest of honour. There were inter-collegiate competitions in literature, arts, music and dance with participation from students country-wide.

Quiz Competition

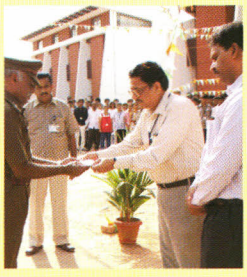
IIST Students Quiz Club organized an Inter-Collegiate Quiz Competition for undergraduate students on February 11, 2012 at YMCA Hall, Trivandrum. It was attended by students from the various colleges of Trivandrum. The team from IIST came first, followed by Mar Baselius College of Enginnering, Trivandrum as the runners up.

Conscientia 2012

The annual technical festival of IIST, Conscientia 2012 was held in IIST from March 3 – 6, 2012. The festival was inaugurated by Shri. N. Viswanathan, founder – director of Mitraniketan, an NGO based out of Trivandrum. The event saw the convergence of talent in both science and technology. Glider making, robo-wars, ethical computer hacking, and night sky observing were some of the unique events. The event had participants from all over the country.

A **photography exhibition** was organized by the photography club. Photographs taken by students and faculty were kept on display.

CELEBRATIONS AT IIST



Independence and Republic Day Celebrations

The Republic Day and Independence Day were celebrated on campus. Director Dr. K. S. Dasgupta hoisted the national flag and addressed the audience on the achievements of the

institute. There was a parade by the CISF personnel. The director received guard of honour and distributed awards for meritorious service.

IIST Day

The Institute Day was celebrated on September 14, 2011. The programme was inaugurated by Hon'ble Speaker, Kerala Legislative Assembly, Sri G Karthikeyan. Sri Palode Ravi MLA delivered the presidential address. Smt. Lekha Suresh, Municipal Chairperson, Nedumangad Muncipality released the student magazine 'Drishtikone' on the occasion. Felicitations were made by Sri PS Veeraraghavan, Director, VSSC/ISRO. Dr Suresh Das, Director, NIIST, Sri G Ravindranath, Director, IISU /ISRO) and Sri S. Ramakrishnan, Director, LPSC/ISRO also spoke on the occasion. The inauguration was followed by cultural programme staged by the students, faculty and staff of IIST.

Women's Day Celebrations

Women Cell of IIST celebrated Women's day on March 14, 2012. Prof. Dr. Jameela Begum, Professor, Institute of English and Director, UGC Area Study Centre for Canadian Studies, University of Kerala was the chief guest. A debate on the topic "Women Empowerment: A myth?" was held as part of the programme. There was an exhibition and sale of art and craft products made by women of Kudumbasree and SISP (Sebastian Indian Social Projects) NGO units.

Cultural Festivals

Onam, Holi, Dusshera, Raksha Bandan and Diwali were celebrated in IIST. Sri. TP Sreenivasan, IFS, Former Ambassador was the chief guest for the Onam celebrations. Competitions and cultural programs showcasing the cultural heritage of the State were the highlights of the Onam celebrations.

SPORTS ACTIVITIES

The 5th Annual Sports Meet of IIST was held on March 10, 2012 at the University Stadium, in Thiruvananthapuram. The meet was inaugurated by Shri Amit Malik, IFS, Director, Youth and Sports Affairs, Govt.

of Kerala. The competitions were conducted under various categories, for students, staff and faculty.

Intramural competitions of the institute were held earlier during September – October, 2011. A friendly cricket match took place between the faculty and staff on February 25, 2012 at the VSSC central ground.

EXTENSION ACTIVITIES

VASTRA-SAMMAN, a student initiative for a social cause, was conducted during March – April, 2012. The students collected discarded clothes & footwear from students and staff and donated to 'GOONJ', an internationally known NGO. GOONJ is concerned with the social issue of clothing and resource mobilization. The donated resources are recycled into assets and distributed to those who are in need of it.

INDIAN INSTITUTE OF SPACE SCIENCE AND TECHNOLOGY
THIRUVANANTHAPURAM

BALANCE SHEET AS AT 31ST MARCH, 2012

(Amount in Rs.)

	Schedule	As at 31.03.2012	As at 31.03.2011
CORPUS/CAPITAL FUND AND LIABILITIES			
Corpus / Capital Fund	1	2,330,737,351	2,642,058,861
Earmarked Funds / Endowment Funds	2	10,033,826	178,836
Current Liabilities and Provisions	3	107,924,648	73,175,948
TOTAL		**2,448,695,825**	**2,715,413,645**
ASSETS			
Fixed Assets	4	1,529,295,695	1,217,189,268
Current Assets, Loans, Advances etc	5	919,400,130	1,498,224,377
TOTAL		**2,448,695,825**	**2,715,413,645**

Significant Accounting Policies & Notes on Accounts 14

As per our report of even date attached.

For ARSB & Associates
Chartered Accountants
FRN : 009803S

CA. C. Suresh Babu
(Partner, Mem No. 025522)

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

Dr. K. S. Dasgupta
Director

R. Hari Prasad
Finance Officer

Place : Thiruvananthapuram
Date : 31st October, 2012

INDIAN INSTITUTE OF SPACE SCIENCE AND TECHNOLOGY
THIRUVANANTHAPURAM

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 2012

(Amount in Rs.)

	Schedule	2011-12	2010-11
INCOME			
Grants / Subsidies	6	0	100,000,000
Fees / Subscriptions	7	50,790,293	37,678,371
Interest Earned	8	86,480,470	104,375,495
Other Income	9	514,790	5,602,584
TOTAL (A)		**137,785,553**	**247,656,450**
EXPENDITURE			
Establishment Expenses - Regular	10	78,795,372	53,297,582
Establishment Expenses - Support Services	11	51,668,065	37,257,481
Academic & Other Student Expenses	12	70,327,499	56,785,235
Other Administrative Expenses	13	92,239,976	59,098,313
Depreciation	4	124,998,897	87,932,777
TOTAL (B)		**418,029,809**	**294,371,388**
Excess of Income over Expenditure (A-B)		(280,244,255)	(46,714,938)
Less : Prior period items		31,077,255	(54,281)
Balance being Surplus/(Deficit) carried over to Corpus/Capital Fund		**(311,321,511)**	**(46,660,657)**
Significant Accounting Policies & Notes on Accounts	14		

As per our report of even date attached.

For ARSB & Associates
Chartered Accountants
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Date : 31st October, 2012

INDIAN INSTITUTE OF SPACE SCIENCE AND TECHNOLOGY
THIRUVANANTHAPURAM

SCHEDULES TO BALANCE SHEET AS AT 31ST MARCH, 2012

(Amount in Rs.)

	As at 31.03.2012	As at 31.03.2011
Schedule 1 :: CORPUS / CAPITAL FUND		
Total Grant Received		
Opening Balance of Total Grant Received	2,949,424,987	2,849,424,987
Add : Grant received during the year	0	100,000,000
	2,949,424,987	2,949,424,987
Less :- Total transfer to Revenue Grant		
Opening Balance of amount transferred to Revenue Grant	394,590,882	294,590,882
Add : Transfer to Revenue Grant during the year	0	100,000,000
	394,590,882	394,590,882
Add/(Deduct) :- Balance of net income/(expenditure) transferred from Income & Expenditure Account		
Opening Balance of net income / (expenditure)	87,224,756	133,885,413
Add/Deduct : - Current Year Surplus / (Deficit)	(311,321,511)	(46,660,657)
	(224,096,754)	87,224,756
Balance at the year end	2,330,737,351	2,642,058,861
Schedule 3 :: CURRENT LIABILITIES AND PROVISIONS		
a) CURRENT LIABILITIES		
1. Sundry Creditors		
- For Goods		
Capital Goods	23,234,110	10,845,422
Revenue Expenditure	383,391	0
- Others	7,084,805	373,368
2. Statutory Liabilities		
- Overdue	0	0
- Others	15,333,231	14,929,353
3. Other Current Liabilities	61,889,111	47,027,805
Sub Total (a)	**107,924,648**	**73,175,948**
TOTAL	**107,924,648**	**73,175,948**

INDIAN INSTITUTE OF SPACE SCIENCE AND TECHNOLOGY
THIRUVANANTHAPURAM

SCHEDULES TO BALANCE SHEET AS AT 31ST MARCH, 2012

Schedule 5 :: CURRENT ASSETS, LOANS, ADVANCES ETC

a) CURRENT ASSETS		
1. Sundry Debtors		
- Debtors outstanding for a period exceeding six months	0	0
- Others	83,083	0
2. Cash Balances in hand (including cheques/drafts and imprest)	6,625	6,667
3. Bank Balances		
a) With Scheduled Banks		
- On Current Accounts	54,406,747	155,760,630
- On Deposit Accounts	782,904,075	1,150,707,369
- On Savings Accounts	13,776,232	12,839,151
Total (a)	**851,176,762**	**1,319,313,817**
b) Loans, Advances and Other Assets		
1. Loans		
- Staff	1,033,867	978,615
2. Advances and other amounts recoverable in cash or in kind or for value to be received		
- On Capital Account	19,837,019	24,920,633
- Prepayments	17,903,137	4,929,350
- Others	4,393,274	2,691,739
3. Income Accrued		
- On Bank Deposits	23,796,951	44,073,903
4. Grants in Aid receivable from Government of India	0	100,000,000
5. Security Deposits	1,259,120	1,316,320
Total (b)	**68,223,368**	**178,910,560**
TOTAL (a+b)	**919,400,130**	**1,498,224,377**

Additions to Fixed Asset - 2011-12

Particulars		Opening WDV	Additions	Depreciation
Land	0.00%	33252000.00	0.00	0.00
Building				
Academic Block - D4	10.00%	175644918.00	10063911.00	18570883.00
Hostel - H1	10.00%	38640109.00	0.00	3864011.00
Hostel - H10	10.00%	27465055.00	0.00	2746506.00
Hostel - H11	10.00%	27465056.00	0.00	2746506.00
Hostel - H12	10.00%	0.00	30516729.00	3051673.00
Hostel - H13	10.00%	0.00	29499504.00	2949950.00
Hostel - H14	10.00%	33263238.00	0.00	3326324.00
Hostel - H2	10.00%	33086447.00	0.00	3308645.00
Hostel - H3	10.00%	27098854.00	0.00	2709885.00
Hostel - H6	10.00%	0.00	30177653.00	3017765.00
Hostel - H7	10.00%	25573018.00	1695374.00	2726839.00
HT cable for campus	10.00%	408150.00	0.00	40815.00
Mess-2	10.00%	0.00	8078162.00	807816.00
Mess-3	10.00%	6029255.00	0.00	602926.00
Security Cabin	10.00%	0.00	692789.00	69279.00
Snack Bar	10.00%	1134019.00	722089.00	185611.00
Pipe Line	10.00%	1091737.00	0.00	109174.00
Open Well	10.00%	0.00	2976163.00	297616.00
BioGas Plant	10.00%	0.00	699921.00	69992.00
Sub Total		**396899856.00**	**115122295.00**	**51202216.00**
Plant & Machinery				
a) Airconditioner	15.00%	1615368.00	420749.00	305418.00
b) Laboratory Equipments	15.00%	106840765.00	82619936.00	28419105.00
c) Office Equipment	15.00%	1712428.00	3482058.00	779173.00
d) Sports Equipment	15.00%	76656.00	522614.00	89891.00
e) Musical Equipment	15.00%	274619.00	66695.00	51197.00
e) Electricals & Electronics	15.00%	6995813.00	548981.00	1131719.00
f) Plant & Machinery-Others	15.00%	91766.00	280052.00	55773.00
Sub total		**117607415.00**	**87941085.00**	**30832276.00**
Furniture				
Furniture & Fittings	10.00%	72542482.00	12950867.00	8549335.00
Lab Furniture	10.00%	0.00	15229873.00	1522987.00
Sub Total			**28180740.00**	**10072322.00**
Motor Cars	15.00%	3731203.00	4837932.00	1285370.00
Motor Buses & Truck	15.00%	1968082.00	133993.00	315311.00
Computers	60.00%	9972598.00	6939605.00	10147322.00
Software	60.00%	3367080.00	7564978.00	6559235.00
Library Books	60.00%	2992434.00	7723907.00	6429805.00
Campus networking	60.00%	6614916.00	4110801.00	6435430.00
Tools- Vehicle		0.00	0.00	0.00
Canteen Equipments	15.00%	7913066.00	3550999.00	1719610.00
Soft Furnishing	100.00%	0.00	0.00	0.00
TOTAL			**266106335.00**	**124998897.00**

INDIAN INSTITUTE OF SPACE SCIENCE AND TECHNOLOGY
THIRUVANANTHAPURAM

SCHEDULES FORMING PART OF INCOME AND EXPENDITURE ACCOUNT
FOR THE YEAR ENDED 31ST MARCH, 2012

(Amount in Rs.)

	2011-12	2010-11
Schedule 6 :: GRANTS / SUBSIDIES		
(irrevocable Grants & Subsidies Recovered)		
1. Central Government	0	100,000,000
TOTAL	**0**	**100,000,000**
Schedule 7 :: FEES / SUBSCRIPTIONS		
1. Entrance Fees	45,588,386	35,163,606
2. Annual Fees/Subscriptions	5,201,907	2,514,765
TOTAL	**50,790,293**	**37,678,371**
Schedule 8 :: INTEREST EARNED		
1. On Term Deposit		
a) With Scheduled Banks	86,476,100	104,375,495
2. On Loans / Advances		
a) Employee/Staff	4,370	0
TOTAL	**86,480,470**	**104,375,495**
Schedule 9 :: OTHER INCOME		
1. Rent Receipts	306,237	100,457
2. Sale of Tender Forms	157,215	62,007
3. Miscellaneous Income	51,338	5,933
4. Reimbursement of Retirement Benefits from VSSC	0	5,434,187
TOTAL	**514,790**	**5,602,584**
Schedule 10 :: ESTABLISHMENT EXPENSES - REGULAR		
1. Salaries & Allowances	72,999,667	49,617,296
2. Contribution to NPS	3,252,520	1,936,347
3. Contribution to CPF	163,813	156,835
4. Medical Expense- Staff	1,315,009	864,306
5. Expense on Employees Retirement & Terminal Benefits	560,000	353,400
6. Interest on PF Contribution	504,363	132,634
7. Staff Welfare Expense	0	236,764
TOTAL	**78,795,372**	**53,297,582**

INDIAN INSTITUTE OF SPACE SCIENCE AND TECHNOLOGY
THIRUVANANTHAPURAM

SCHEDULES FORMING PART OF INCOME AND EXPENDITURE ACCOUNT
FOR THE YEAR ENDED 31ST MARCH, 2012

Schedule 11 :: ESTABLISHMENT EXPENSES - SUPPORT SERVICES		
1. Consultancy & Manpower Charges	33,917,075	21,451,700
2. Remuneration to Contract Employees	17,750,990	15,805,781
TOTAL	**51,668,065**	**37,257,481**
Schedule 12 :: ACADEMIC & OTHER STUDENT EXPENSES		
1. Admission Expense	23,585,662	22,498,299
2. Assistanceship to Students	19,760,952	18,387,950
3. Library Services	18,045,450	9,755,816
4. Academic Expense	6,070,608	4,679,970
5. Student Activities Expense	2,864,827	1,463,200
TOTAL	**70,327,499**	**56,785,235**
Schedule 13 :: OTHER ADMINISTRATIVE EXPENSES		
1. Maintenance & Upkeep		
Repairs & Maintenance	6,006,488	2,383,912
Temporary Construction	2,952,947	4,233,923
House Keeping Expense	641,961	1,007,348
Campus Landscaping	211,252	0
Sub Total (a)	**9,812,648**	**7,625,183**
2. Professional Charges		
Audit Fees	50,562	49,635
Legal Expense	23,901	224,290
Sub Total (b)	**74,463**	**273,925**
3. Administrative Expenses - Others		
Vehicle Operating Expense	21,724,190	13,063,651
Electricity & Water Charges	14,012,009	4,907,515
Travelling Expense	10,177,090	8,150,266
Research & Development Expense	10,164,616	5,206,307
Printing & Stationery	6,350,628	2,631,691
Supplies & Materials	5,662,894	5,218,449
Advertisement & Publicity	5,322,512	4,332,310
Canteen Expense	3,312,406	0
Telephone & Internet Expense	3,037,334	2,463,495
Office Expense	1,552,330	1,306,894
Recruitment Expense	837,544	454,246
Security Expense - Others	179,479	3,377,561
Bank Charges	19,833	86,820
Sub Total (c)	**82,352,865**	**51,199,205**
TOTAL	**92,239,976**	**59,098,313**

INDIAN INSTITUTE OF SPACE SCIENCE AND TECHNOLOGY
THIRUVANANTHAPURAM

RECEIPTS AND PAYMENTS FOR THE YEAR ENDED 31ST MARCH, 2012

(Amount in Rs.)

Receipts	2011-12	2010-11	Payments	2011-12	2010-11
I. Opening Balance			**I. Expenses**		
a.Cash and DD's in hand	6,667	27,488,322	**a.Establishment Expenses - Regular**		
b.Bank Balances			Salaries & Allowances (admin & faculty)	76,577,840	43,595,150
In current accounts	155,760,630	968,618,613	Contribution to NPS	3,252,520	1,936,347
In deposit accounts	1,150,707,369	926,451,262	Contribution to CPF	163,813	156,835
In savings accounts	12,839,151	6,207,909	Medical Expense- Staff	1,212,822	864,306
			Employees Retirement Benefits	560,000	353,400
II.Grants Received			Interest on PF Contribution	206,682	0
a.From Government of India	100,000,000	0	Staff Welfare Expense	0	236,764
III. Interest Received			**b.Establishment Expenses - Support Services**		
a.On Bank Deposits	106,753,053	124,976,938	Consultancy & Manpower Charges	33,916,499	21,451,700
b.Loans, Advances etc.	4,370	0	Remuneration to Contract Employees	17,750,990	15,805,781
IV. Other Income			**c. Academic & Other Student Expenses**		
a.Entrance Fees	59,369,286	45,463,561	Admission Expense	23,130,617	21,958,667
b.Annual Fees/Subscriptions	5,201,907	2,514,765	Assistanceship to Students	19,731,972	14,372,248
c.Other Income	529,747	153,440	Library Services	33,055,463	13,845,051
d.Reimbursement of Retirement Benefits from VSSC	0	5,434,187	Academic Expense	6,339,887	8,513,006
			Student Activities Expense	2,756,597	1,591,852
V. Any other receipts			**d. Other Administrative Expenses**		
a.Scholarship Received	72,600	48,000	Repairs & Maintenance	5,728,260	2,383,912
b.Security Deposits received	0	784,361	Temporary Construction	2,569,556	4,233,923
c.Increase in TDS Payable	0	283,145	House Keeping Expense	553,615	1,007,348
d.Earnest Money Deposits received	1,051,225	812,752	Campus Landscaping	211,252	0
e.Performance Guarantee	545,692	178,209	Audit Fees	49,635	44,120
f.Advance for Research & Seminars	10,135,000	178,836	Legal Expense	23,901	224,290
g.Interest on Employee Benefit Fund	0	195,802	Vehicle Operating Expense	20,125,118	13,032,566
h.Decrease in Contingent Advance	0	7,000	Electricity & Water Charges	12,781,134	4,907,515
i.Caution Deposit from Students	414,000	0	Travelling Expense	9,646,776	8,160,616
j.Security Deposit (Asset)	57,200	0	Research & Development Expense	9,342,514	5,206,307
k.Stale cheques	37,344	0	Printing & Stationery	5,361,696	2,631,691
			Supplies & Materials	5,430,408	6,012,190
			Advertisement & Publicity	4,276,643	4,332,310
			Canteen Expense	2,772,918	0
			Telephone & Internet Expense	4,413,223	3,458,610
			Office Expense	1,325,834	2,297,494
			Recruitment Expense	833,844	454,246
			Security Expense - Others	166,159	3,377,561
			Bank Charges	19,833	86,820
			II. Payments made against funds for various projects		
			Astrosat	113,019	0
			Ministry of Earth & Space Science (CTCZ)	79,574	0
			III. Expenditure on Fixed Assets & Capital Work-in-Progress		
			a.Purchase of Fixed Assets	147,711,545	159,811,767
			b.Expenditure on Capital Work-in-progress	298,133,595	421,817,473
			IV. Other Payments		
			Research Fund refunded (SAC)	87,417	0
			Scholarship paid to students	59,600	41,000
			Security Deposits (Asset) paid	0	1,751,179
			Security Deposits repaid to Contractors	1,209	0
			Earnest Money Deposits repaid	831,670	484,240

INDIAN INSTITUTE OF SPACE SCIENCE AND TECHNOLOGY
THIRUVANANTHAPURAM

RECEIPTS AND PAYMENTS FOR THE YEAR ENDED 31ST MARCH, 2012

(Amount in Rs.)

Receipts	2011-12	2010-11	Payments	2011-12	2010-11
			Decrease in TDS Payable	926,549	0
			Contingency Advance to Staff	52,369	0
			Advances - Branches	51,742	0
			Loans to staff	55,252	45,000
			V. Closing Balances		
			a.Cash in hand	6,625	6,667
			b.Bank Balances		
			In current accounts	54,406,747	155,760,630
			In deposit accounts	782,904,075	1,150,707,369
			In savings accounts	13,776,232	12,839,151
Total	**1,603,485,241**	**2,109,797,102**	**Total**	**1,603,485,241**	**2,109,797,102**

Significant Accounting Policies & Notes on Accounts 14

As per our report of even date attached.

For ARSB & Associates
Chartered Accountants
FRN : 009803S

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

CA. C. Suresh Babu
(Partner, Mem No. 025522)

Dr. K. S. Dasgupta
Director

R. Hari Prasad
Finance Officer

Place : Thiruvananthapuram
Date : 31st October, 2012

INDIAN INSTITUTE OF SPACE SCIENCE AND TECHNOLOGY
THIRUVANANTHAPURAM

Schedule 14 :: SIGNIFICANT ACCOUNTING POLICIES AND NOTES TO THE ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 2012

A. Significant Accounting Policies

1. Basis of Accounting

The financial statements have been prepared in accordance with the Generally Accepted Accounting Principles in India (Indian GAAP) and are prepared on accrual basis under the historical cost convention except those referred to in point no. 6c of accounting policies. The accounting policies adopted in the preparation of the financial statements are consistent with those followed in the previous year except for change in the accounting policy for depreciation as more fully described in Note 1.

2. Use of estimates

The preparation of the financial statements in conformity with Indian GAAP requires the Management to make estimates and assumptions considered in the reported amounts of assets and liabilities (including contingent liabilities) and the reported income and expenses during the year. The Management believes that the estimates used in preparation of the financial statements are prudent and reasonable. Future results could differ due to these estimates and the differences between the actual results and the estimates are recognized in the periods in which the results are known / materialize.

3. Inventories

The institute has not been recognizing canteen inventories and the entire purchases have been charged to revenue.

4. Events occurring after Balance Sheet date

One of the main revenue streams of the institute is collection of fees for entrance examination conducted by it for admission of students to the institute. The government has instructed the institute to admit candidates only through the common entrance examination and the advance receipt of such fees during the financial year 2012-13 and onwards is not certain.

5. Depreciation

a. Depreciation has been provided on the written down value method as per the rates prescribed in the Income Tax Act, 1961.

b. Depreciation on assets acquired in a particular year is provided for the whole year irrespective of date of addition.

6. Revenue Recognition

a. Grant in aid received from the Department of Space, is accounted on accrual basis. Out of the total grant received, the amount provided in the budget towards revenue is treated as Revenue Grant / income over the period necessary to match them with the costs for which they are intended to compensate, on a systematic basis. The remaining grant forms part of the Corpus Fund along with other grant received.

b. Exam fee received towards the Institute's Annual Entrance Exam for B.Tech admission (ISAT) is recognized as income only on conduct of the said exam. c. Tuition fees, fines and other recoveries from underperforming students (as per the policy of the institute) are accounted on cash basis.

d. Interest income is accounted on accrual basis.

7. Fixed Assets

a. Land - Land at Ponmudi has been valued at cost of acquisition. The present activity of the Institute is in the Valiamala campus which has been handed over by LPSC vide letter no.

VSSC/CMG/2010 dated 05.08.2010, and has been measured at 53.43 acres. No value has been provided in the books.

a. Building – Construction of buildings is still in progress. Buildings, the construction of which are more than 90% complete, certified by the Construction and Maintenance Division and which have been put into use have been transferred from Capital Work-in-Progress to Buildings based on actual payments made.

b. Plant and Machinery – It mainly constitutes Laboratory equipment, Office Equipment, Electricals & Electronics and other Machinery.

c. Buildings and other Fixed Assets are carried at cost less accumulated 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. Exchange differences arising on restatement / settlement of foreign currency payables relating to acquisition of depreciable fixed assets are adjusted to the cost of the respective assets and depreciated over the remaining useful life of such assets.

d. Capital Work-in-Progress mainly pertains to construction in progress at Ponmudi and Valiamala.

8. Foreign currency transactions

Foreign currency monetary items outstanding at the Balance Sheet date are restated at the year-end rates. Non-monetary items are carried at historical cost. The exchange differences arising on restatement / settlement of long-term foreign currency monetary items are capitalised as part of the depreciable fixed assets to which the monetary item relates and depreciated over the remaining useful life of such assets.

9. Earmarked / Endowment Funds

Earmarked / Endowment Funds mainly include external agency funding received for research & development purpose and conduct of seminars & workshops. Value of assets procured out of such funds for the purpose specified have gone to reduce the value of Fund in hand and have not been treated as an asset of the Institute as the ownership of the same vests with the funding agency.

10. Employee Benefits

Employee benefits include General Provident Fund (GPF), Contributory Provident Fund (CPF), New Pension Scheme (NPS), and Group Insurance Scheme (GIS). The Institute's contribution to CPF and NPS are considered as defined contribution plans and are charged as an expense as they fall due based on the amount of contribution required to be made. GPF and CPF funds are maintained separately by the Institute in a Savings Bank Account. Retirement Benefits consisting of pension fund, gratuity and leave encashment received from previous employers of employees joining from other Government organizations have been maintained separately in a Savings Bank Account.

11. Taxes on income

Being a non-profit institution existing solely for education purposes and being wholly financed by the Government of India, the income of the Institute is exempt under section 10[(23C)][iiiab] of the Income Tax Act, 1961.

12. Research and Development Expenses

Revenue expenditure pertaining to research is charged to the Income and Expenditure Account. Fixed assets utilized for research and development are capitalized and depreciated in accordance with the policies stated for Fixed Assets.

INDIAN INSTITUTE OF SPACE SCIENCE AND TECHNOLOGY
THIRUVANANTHAPURAM

Schedule 14 :: SIGNIFICANT ACCOUNTING POLICIES AND NOTES TO THE ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 2012 (contd)

13. Provisions and Contingencies

A provision is recognised when the Institute has a present obligation as a result of past events and it is probable that an outflow of resources will be required to settle the obligation in respect of which a reliable estimate can be made. Provisions (excluding retirement benefits) are not discounted to their present value and are determined based on the best estimate required to settle the obligation at the Balance Sheet date. These are reviewed at each Balance Sheet date and adjusted to reflect the current best estimates.

14. Impairment of Assets

The carrying values of assets / cash generating units at each Balance Sheet date are reviewed for impairment. If any indication of impairment exists, the recoverable amount of such assets is estimated and impairment is recognised, if the carrying amount of these assets exceeds their recoverable amount. The recoverable amount is the greater of the net selling price and their value in use. Value in use is arrived at by discounting the future cash flows to their present value based on an appropriate discount factor. When there is indication that an impairment loss recognised for an asset in earlier accounting periods no longer exists or may have decreased, such reversal of impairment loss is recognised in the Statement of Income and Expenditure, except in case of revalued assets.

B. Notes to the Accounts

1. Depreciation

Till 31.03.2011, depreciation has been charged at written down value method as per the rates prescribed in the Companies Act, 1956. From 2011-12, in order to comply with the recommendation of the Office of the Principal Director of Audit, Scientific Departments, Bangalore the Institute has adopted depreciation at written down value method as per rates prescribed in the Income Tax Act, 1961, with retrospective effect. The change in accounting policy has resulted in an amount of Rs. 2,62,12,118.46 being charged to the Income and Expenditure Account as prior period depreciation.

2. Inventories

Canteen inventories as on 31st March 2012 has not been recognized. The value of the same comes to Rs. 5,44,785.94 (Opening Stock as on 01.04.2011 – Rs. 8,22,763.74)

3. Revenue

a. No Grant has been received for the year 2011-12. The claim for the revenue grant has not been recognized in the accounts as no positive communication has been received in this regard from the Department of Space.

b. Exam fees amounting to Rs. 5,91,70,936.02 received for ISAT 2012 has been shown as a Current Liability as on 31.03.2012.

c. Interest earned (actually received) on funds from grant-in-aid maintained in fixed deposits is refundable to DOS. The total interest earned till 31.03.2012 on Fixed Deposits (excluding the interest liability for the Provident Fund Accounts) comes to Rs. 32,43,85,992.80.

INDIAN INSTITUTE OF SPACE SCIENCE AND TECHNOLOGY
THIRUVANANTHAPURAM

Schedule 14 :: SIGNIFICANT ACCOUNTING POLICIES AND NOTES TO THE ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 2012 (contd)

4. Fixed Assets

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

b. Capital Work-in-Progress includes a sum of Rs. 1,61,25,430/- towards project management and consultancy charges and service tax of Rs. 3,75,04,182/-, both pending for appropriation to fixed assets on final completion of all buildings.

c. Additions to Office Equipment and Electricals & Electronics during 2010-11 that have been grouped under Furniture & Fittings have been regrouped and classified under Plant &Machinery during 2011-12.

5. Foreign Currency Translations

Foreign currency advances for procurement of fixed assets has not been restated as on the closing balance sheet date.

6. Employee Benefits

a. Employer and Employee contribution to New Pension Scheme from 2007 which had been maintained in a separate savings account has been transferred to NSDL only during 2011-12. Interest earned till date of transfer has also been deposited to the respective employee NPS accounts.

b. The Institute has entered into a Group Insurance Scheme (GIS) agreement with Life Insurance Corporation of India from 2011-12 onwards.

c. Provision for interest on PF Contribution at the rates prescribed have been made. Interest earned on GPF and CPF funds parked in Savings Accounts have been accounted as income. An amount of Rs. 2,58,157/- towards interest liability on GPF accounts and Rs. 21,697/- towards interest liability on CPF accounts is to be transferred to the respective savings accounts maintained for respective PF accounts. The same is being done in 2012-13.

d. Provision for liability in respect of gratuity, pension and leave encashment has not been made. Permission for maintenance of a separate pension fund has been received during 2012-13. From 2012-13, provision for liabilities on account of retirement benefits will be provided.

7. Prior period Item

Details of prior period items are as given below :-

Details	Prior period expenses
Shortfall in GPF interest provision for previous years	1,487.00
E-Journal Subscription	26,51,857.00
Retirement benefit received wrongly accounted as Income in 2010-11	23,16,288.00
Depreciation	2,62,12,118.46
Total (A)	**3,11,81,750.46**

Details	Prior period income
Excess CPF & NPS interest provision for previous years	52,579.00
Cancelled cheques	576.00
GIS Premium for 2008-2011	51,340.00
Total (B)	**1,04,495.00**

Net prior period item (A-B) = Rs. 3,10,77,255.46

INDIAN INSTITUTE OF SPACE SCIENCE AND TECHNOLOGY
THIRUVANANTHAPURAM

Schedule 14 :: SIGNIFICANT ACCOUNTING POLICIES AND NOTES TO THE ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 2012 (contd)

8. Academic Expenses

Academic Expenses mainly include expenses towards Lectures for students, Project & Internship expenses and expenses incurred on Seminars, Symposiums and Conferences.

9. Admission Expenses

Admission expenses include expenses incurred towards conduct of ISAT exam and subsequent admission expenses. The same have been accounted on accrual basis and date of conduct of exam has not been considered for accounting of the same as has been adopted for accounting of ISAT revenue.

10. Assistanceship to Students

As per the approval of The Chairman, Board of Management-IIST / Secretary, DOS vide Letter No. PP & PM : IIST : 09-10 dated July 17th, 2009, the B. Tech students of the Institute are entitled for an assistanceship of Rs. 49,000/- for each semester towards Statutory Semester Fee, Student Amenity Fee, Hostel & Dining, Establishment charges and Medical cover. Though this amount is not directly disbursed to the students, expenditure is incurred on their behalf under these heads by the Institute.

11. 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 account does not form part of the Institutes accounts and amounts transferred to this account are treated as revenue expenditure of the Institute.

12. Research and Development expenses

Research and Development expenses include stipend paid to Ph.D students.

13. Supplies and Materials

Supplies and Materials mostly consist of lab consumables.

14. Temporary Construction

Expenditure of a temporary nature incurred for establishing the Institute at Valiamala has been charged to revenue.

15. Format of accounts

The accounts of the Institute are prepared as per proforma suggested by the Office of the Principal Director of Audit, Scientific Departments, Bangalore.

16. Insurance

The Institute being an autonomous body under the control of the Department of Space (DOS), it is governed by the rules and regulations as applicable to DOS. As per the "Book of Financial Powers" prescribed by DOS "No Government property whether movable or immovable shall be insured. No liability shall be incurred in connection with the insurance of such property without the prior approval of the Department of Space in consultation with the Member for Finance." The matter will be taken up for consultation with the Department of Space during 2012-13.

17. Balances in personal accounts

Balances in personal accounts are subject to confirmation from respective parties.

INDIAN INSTITUTE OF SPACE SCIENCE AND TECHNOLOGY
THIRUVANANTHAPURAM

Schedule 14 :: SIGNIFICANT ACCOUNTING POLICIES AND NOTES TO THE ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 2012 (contd)

18. Contingent Liabilities

The unexecuted portion of the contracts entered into by the Institute will form part of the current liability of the Institute. However, the same could not be quantified.

19. Figures for the previous year

Figures for the previous year have been regrouped and/or reclassified wherever considered necessary.

As per our report of even date attached
For ARSB & Associates
Chartered Accountants
FRN : 009803S

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

CA. C. Suresh Babu
(Partner, Mem No. 025522)

Dr. K. S. Dasgupta
Director

R. Hari Prasad
Finance Officer

Place : Thiruvananthapuram
Date : 31st October, 2012

Indian Institute of Space Science and Technology

(Declared as Deemed to be University under section 3 of the UGC act, 1956)

Valiamala P.O., Thiruvananthapuram 695547, India

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