



Indian Institute of Space Science and Technology

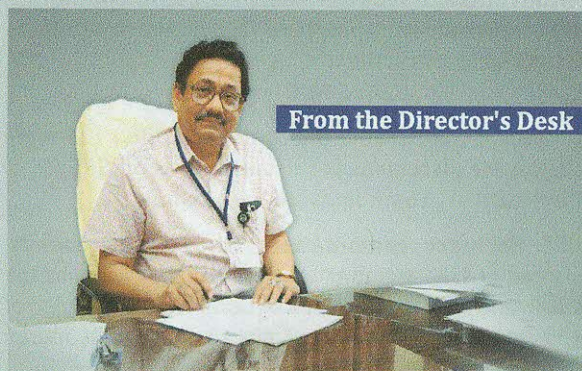
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Valiamala, Thiruvananthapuram 695 547

Newsletter June 2012-Dec 2012

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From the Director's Desk

I am extremely happy to announce the release of the sixth edition of IIST Newsletter. Quite similar to the previous editions, this time also IIST achieved a number of academic accolades. It is with extreme delight that we present this Newsletter, with the achievements we reaped during the last six months. IIST, being a unique Space Science and Technology institute offers courses with a perfect blend of Science, Engineering and Humanities. We, as an academic community believe in what we do. We always work with this passion in ourselves to achieve greater feats in science and engineering. Our second batch of students got placement in various centres in DOS. We conducted our first Convocation on 28th June 2012, and our second Research Scholars' Day during 17-19 December 2012. In this period, a number of eminent and enthusiastic faculty members have joined our institute and it is definitely a matter of great honour to us. The students and faculty from IIST organized and participated in various national and international workshops, and these deliberations definitely helped us to be more focused in our activities and to concentrate more on our goal. We progressed a lot in the academic and research field too. Our students and research scholars are working diligently and are reaping the fruits of their genuine efforts. This news letter will give a brief picture of the academic and extracurricular activities during the last semester.

K S Dasgupta

CONVOCATION



28th June 2012 will be a memorable day for everyone in IIST- it was a dream come true -the realisation of the efforts of faculty, staff and the students of IIST. We celebrated the first Convocation of IIST at the Srinivasan Auditorium, VSSC on this day. Dr. Srikumar Banerjee, Former Chairman, Atomic Energy Commission was the Chief Guest. The Function was presided over by Hon'ble Chancellor Dr. A.P.J. Abdul Kalam. Dr. K. Radhakrishnan, Chairman Board of Management (BoM), IIST and Chairman, ISRO/Secretary, DOS addressed the gathering. The function was held in the presence of Members of BoM and IIST Council members.

For an educational institute its pride lies in the achievements of its students. Our first batch of students was placed in various centres of DOS. From among the 138 students who joined in 2007, the degree was awarded to 125 meritorious students who completed the B.Tech course in June 2011, consisting of Aerospace Engineering (44 students), Avionics (56 students) and Physical science (25 students).



Indian Institute of
Space Science and Technology

BIDDING FAREWELL

Shri K Sasikumar started his career in Vikram Sarabhai Space Centre (VSSC), Thiruvananthapuram in 1975 and served DOS/ISRO at different levels in different Centres/Units of DOS/ISRO for a period of 37 years. Shri Sasikumar had functioned as Head, Administration from the day of inception of IIST. The first batch of faculty members was recruited during his period. While serving as Controller, LPSC he took over the additional charge as Registrar, IIST on 19.12.2011.



We wish him all the very best on his superannuation!

NATIONAL RECOGNITIONS

Dr. Seena V, Assistant Professor, Department of Avionics, NASI-Young Scientist Platinum Jubilee Award-2012 from The National Academy of Sciences India (NASI) on 1st December 2012 for her research work on "Low cost Ultra-sensitive Nano-mechanical Sensors for Explosive Detection".

Ms. Remya Mol, Research Fellow, Department of Chemistry, Best Paper Award, IIST Research Scholars' Day, 17th-19th December, 2012.

Dr. Deepak Mishra, Assistant Professor, Department of Avionics, the SSI Young Systems Scientist Award 2012 from Systems Society of India (SSI) on December 6, 2012.

Prof. V. Radhakrishnan and **Mr. Sooraj V. S.**, Department of Aerospace Engineering, Best paper award, International Conference AIMTDR 2012, 13th - 15th December, 2012.

Prof. V. Radhakrishnan and **Mr. Sooraj V. S.**, Best paper award, Department of Aerospace Engineering, IIST Research Scholars Day, 17th -19th December, 2012.

STATUS OF INFRA-STRUCTURE DEVELOPMENT



Construction of various buildings and other facilities in the campus are progressing at a rapid pace. Part of the

Avionics Block is complete; construction of Hostel Block-H is at an advanced stage; Badminton court and Multipurpose Hall with a seating capacity of 450 are nearing completion as well. Work related to utilities such as electricity and water supply systems and the sewage system are also in progress.

ACADEMIC ACTIVITY

Faculty strength as on December 2012 is 92. The process of recruitment is in progress. IIST hopes to see more faculty members in the coming months.

Placement at ISRO/DOS: Out of 131 students who successfully completed the course in 2008, 124 were eligible for placement at various centres of ISRO/DOS. Placement of 116 students has been completed.

IIST Entrance examination: From 2013 onwards, instead of ISAT examination IIST proposes to join the single entrance examination of CBSE with weightage of 40% marks from Board examination and 60% marks from the entrance examination.

PhD Programme

The institute has plans to offer post-graduate degree programmes in several areas such as Solid State Physics and Technology, Materials Science and Technology, Astronomy and Astrophysics, Earth System Sciences, Geo-informatics, Computational Mathematics and Machine Learning, Controls, Communications, VLSI and MEMS, Flight Dynamics, Structures and Design etc.

Postdoctoral Programme

To take research activities to the next level, IIST has also initiated a Post-Doctoral Programme, initially in five areas; namely, Theoretical Molecular Physics, Development of Electro active polymers for space applications, Star Formation, Delay Tolerant Networking, and Hyper spectral Remote Sensing.

The institute has programmes to support the research talents of faculty members by funding their research projects directly. Substantial emphasis is given to encourage faculty research projects. A total of 62 research projects have been initiated over the last four years. The Institute has a fast-track research scheme wherein funding of up to Rs 10 lakhs is provided for new faculty to initiate their research. Currently eight fast-track projects are in progress and are included in the total number of projects identified in the Chart.



WORKSHOPS/ CONFERENCES

Innovations In Engineering Of Systems Through Inter-Disciplinary Research, July 19-21, 2012

A Workshop on "Innovations in Engineering of Systems through Inter-Disciplinary Research" was organized by Department of Aerospace Engineering from 19th to 21st of July 2012. Participants were faculty and students of IIST. Speakers were eminent researchers from academia and R&D organizations in India, like Prof K Sudhakar of IIT Bombay, Dr B N Suresh, former Director of IIST and of VSSC, Dr Kota Harinarayana, former Project Director of LCA Programme, and Shri R M Vasagam, former Project Director of Apple Satellite Project, and former Vice Chancellor of Anna University.

The goals of the workshop were to expose participants to (a) design of complex aerospace systems which require interdisciplinary interactions, and (b) some exciting projects like SSTO and TSTO. Participants formed teams to propose innovative projects and presented them. All the lectures were video graphed and are available for viewing.

National Workshop on Recent Trends in RF and Microwave Techniques and Measurements, July 18-20, 2012

The objective of the three-day workshop in collaboration with IIT, Kanpur and Vikram Sarabhai Space Centre, Thiruvananthapuram, was to provide the participants an insight into various aspects of the modern RF & Microwave Technologies and measurement techniques. The participants were given an overview of various instruments and equipments used in any modern RF and microwave laboratory. The concepts and procedures required for the effective usage of these instruments, including advanced measurement techniques prevalent in the RF and microwave industry for the characterization of microwave devices and circuits were also explained to participants in detail. They were also introduced to a number of state of the art topics in the frontier research

areas of RF and Microwave Theory and Technology by leading experts from Academia, R&D institutions and industries.

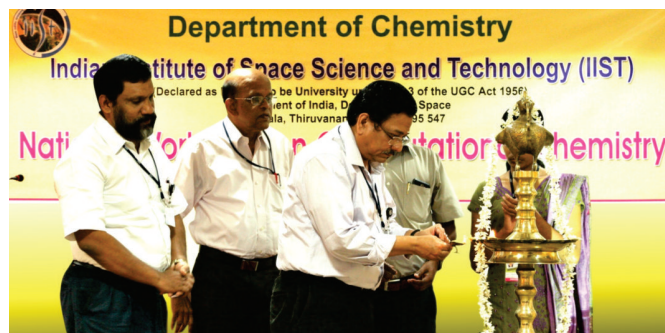
The course was designed for academia, R & D institutes and industry working in the field of RF & Microwaves, as well, for students interested to work in this specialized field.

Short term course Control System Design, December 4-8, 2012

The short term course on Control Sytem Design was aimed to provide a forum for sharing knowledge, experience and research results among different control design techniques for the given plant / process. The main objective of the workshop was to bridge the gap between technology providers, working professionals, R&D Institutions and Industries. Forty-eight participants included teachers from engineering colleges/Universities, Engineers, Scientists from industry, Research scholars and MTech Students. The experts were invited from IITB-Mumbai, VSSC-Trivandrum and IIST.

**National Workshop On Computational Chemistry, December 3-7, 2012**

Department of Chemistry conducted a five day workshop on 'Computational Chemistry' during December 3-7, 2012. Computational Chemistry is a powerful tool in the hands of researchers to design, simulate, predict and validate properties of molecules and materials. Aim of the workshop was to provide an opportunity for the researchers in computational Chemistry field to update their knowledge and serve as an introduction for those who are new to this field. Sixty delegates including post graduate students, research scholars and faculty members from research institutes, universities and IIST participated in the workshop.



Gopinathan (IISER, Tvm), Dr. T. K. Manoj Kumar (IIITM, K), Dr. C. H. Suresh (NIIST, Tvm), Dr. R. S. Swathi (IISER, Tvm), Dr. Jorly Joseph (IIRBS, Kottayam) and Dr. G. P. Krishnamohan (IIST) handled the technical sessions. Lectures in “Introduction to theoretical chemistry, ab initio methods, semi empirical methods, computational methods in organic chemistry, establishing reaction mechanism by computation” were included. Along with lectures, practical sessions in molecular mechanics, ab initio methods and semi empirical methods, tutorial sessions which provided hands on experience in handling relevant computational programmes and demonstration of latest software were also organized.

Solar Physics Workshop, November 29-December 1, 2012



A three-day workshop on Solar Physics was organized at IIST, in collaboration with IUCAA, from 29th November to 1st December 2012. The workshop was attended by the Astronomy Stream students of the final year of B.Tech (Physical Sciences) of IIST (12 students) and a selected few (14 students) from other institutes and universities. The focus of the workshop on Sun was driven by the upcoming Solar Missions of ISRO like Aditya-I. The workshop was primarily designed to provide a flavour of solar physics to undergraduate and post-graduate students and to underline its importance in understanding the dynamics of the Sun.

The workshop was coordinated by the faculty members of the Astronomy Group of Dept. of Earth and Space Sciences, IIST and Durgesh Tripathi of IUCAA. Lectures were delivered by P Venkatakrishnan, Ramitendranath Bhattacharyya and Shibu K Mathew of Udaipur Solar Observatory, P Janardhan of Physical Research Laboratory and Durgesh Tripathi of IUCAA. The lectures spanned a range of topics in Solar Physics – Solar Dynamo, Solar Magneto-Hydrodynamics, Solar Interior, Helioseismology, Solar Magnetic Field, Solar Activity, Eruptive Phenomena, and Solar Wind including Sun-Earth Connection. A couple of lectures were focused on Solar Instrumentation and on upcoming national and international observing facilities.

GIS DAY 2012 - NOVEMBER 7-8, 2012



Department of Earth and Space Sciences celebrated GIS Day, 2012 during 7 - 8 November, 2012 to highlight the importance of Geographic Information System (GIS) including other Geospatial technologies such as Remote sensing, Global Positioning System, Photogrammetry and Cartography. As a part of GIS day, a special lecture on “Geo-spatial Technologies for Societal benefits - Challenges and Opportunities”, was arranged on November 7th, 2012. The lecture was delivered by Dr. Y.V.N. Krishnamurthy, Director Indian Institute of Remote Sensing (IIRS), Dehradun. He brought out the significant role played by satellite remote sensing, GIS and GPS technologies in the country from macro level planning such as national and state development schemes, to micro level applications such as advisories on cropping practices to tail-end farmer having small land holding. On 8th November 2012, GIS day was celebrated along with children invited from different schools of Thiruvananthapuram and Nedumangad. They participated in Quiz competition on “Geography and GIS” and Painting competition on the theme “Beauty of God's own country” conducted by the department faculties. The celebrations concluded with prize distribution to the winners and certificate distribution to all children.

Conference on Science Technology and Society- Emerging Scenario, December 7-9, 2012



Department of Humanities, IIST in association with the Indian Sociological Society and its Kerala chapter organized a conference on Science, Technology and Society- Emerging Scenario from December 7th to 9th 2012. The objectives of the workshop were to understand how and why a scientific mode of thinking has acquired acceptance and legitimacy over other systems of knowledge throughout the world; how globalization and privatization affected scientific research and development; how the development of science and technology affected the social, economic



and political life of society. The conference highlighted the role and impact of science and technology vis-à-vis the prevailing socio economic position of the backward classes of Indian society, the impact of new media on society, the role of information society in India, and how could man utilize science and technology for the good of mankind. The conference was inaugurated by Sri TP Srinivasan IFS and the key note address was delivered by Prof MN Panini, Retd Professor, JNU. Other speakers were Prof Achuth Shankar, Head, Dept of Bio Informatics, Prof Subhash, Pro Vice Chancellor, University of Kerala, Prof L Thara Bhai, Retd Professor, Madhurai Kamaraj University and Prof Antony Palackal, Associate Professor, Loyola College. 326 delegates took part in this three day seminar. Over 63 papers were presented.

Advanced Workshop on Mathematical Theory of Controls and Numerics (MTCN-2012), November 21-30, 2012



A ten-day workshop on “Mathematical Theory of Controls and Numerics” was organised at IIST by the department of Mathematics in collaboration with IIT Bombay, funded by National Programme on Differential Equations (NPDE), DST. The topics covered were introduction to system of ordinary differential equations, controllability, observability and optimal control problems and their numerics. Spatial Operator Algebra approach for interconnected system, Frequency Domain approach to control system were also dealt with. The Resource persons were from IIT Kanpur, IISc Bangalore, BU Coimbatore, VSSC Trivandrum, IIT Madras, IIT Bombay, BITS Goa, IIT Roorkee and from IIST Trivandrum.

Workshop on Machine Learning and Evolutionary Computing (MLEC-2012), December 16, 2012

A one-day work shop on “Machine Learning and Evolutionary Computing” was organized in the Department of Mathematics on 16 December 2012. The topics covered were Genetic Algorithms and Machine Learning Techniques with case studies. The Resource Persons were from Infosys, Bangalore, IISc Bangalore and IIST Trivandrum.



Short term training programme on Numerical Methods for Fluid Dynamics (NMFD-2012), December 18-20, 2012



The three days' programme trained around 40 participants from IITs, NITs and Indian Universities along with ISRO scientists. Talks were given in areas of Numerical methods such as Finite difference, Finite element and Finite volume method. Around 6 resource persons from IIT Madras, IIT Guwahati, IIST and VSSC have given lectures for three days.

Workshop on Recent Development in Neural Networks and Applications (RDNN-2012), was held during December 20-22, 2012. The resource persons were from NTU Singapore and from IIST. 18 people participated in the workshop.

Workshop on Communication, December 6-8, 2012

Mr. Dave Eager, a leading UK based D-J and presenter of several BBC shows, took a Workshop on Communication and Presentation Skills for the First Semester Students of B.Tech, during December 6-8, 2012. His novel idea on Fusion Communication Skills where the cultural, societal and linguistic features of the non native speakers were taken into consideration.



Workshop on The History and Evolution of Photography, October 20-November 4, 2012

Ms. Seema K. K., Freelance Graphic Designer based in Thiruvananthapuram conducted a workshop on “The History and Evolution of Photography” on 20th October and 4th November, 2012. She also conducted a practical class on photography in Adimalathura, a coastal village in Kerala.

INVITED TALKS/ SEMINARS

Department of Aerospace Engineering

- Talk on “Chace to Moon by Moon Impact Probe: Success Story of Chandrayaan 1” by Dr. S.M. Ahmed, University of Hyderabad, September 12, 2012.
- Talk on “Thermal protection systems”, by Dr.Ajith, SF,AMCD, VSSC, October 11, 2012.
- Talk on “Manufacturing of liquid engines” by Shri Narayanan, GD, SQRA, LPSC, August 16, 2012.
- Talk on “Powder Metallurgy” by Dr.R. Sureshkumar, SG, SMF, VSSC, September 20, 2012.
- Talk on “Aerospace Materials” by Shri Gopinath Pai, IIST, July 26, 2012.

Department of Physics.

- Prof. S. Lakshmi Bala (IIT Madras), The Talbot effect and its quantum analogue, 07th November 2012.
- Dr. Mamata Sahoo (Max Plank Institute of Colloids and Interfaces, Potsdam, Germany), Transcriptional proof reading in dense RNA polymerase traffic, 19th September 2012.
- Dr. Abey Issac (University of Beyreuth, Germany), Single molecule spectroscopy: What can we learn, 15th June 2012.

Department of Mathematics

- A Series of lectures on Research Methodology by Prof. C. G. Ramachandran Nair, September 3-14, 2012.
- A Series of lectures on “History and Philosophy of Science” by Prof. R.V.G. Menon, September 24-26, 2012.
- A Series of lectures on “Distribution Theory” by Prof. V. Krishna Kumar (NISER, Bhubaneswar), September 24-25, 2012.
- A talk on “Control, Inverse Problem and Stochastic Analysis of Partial Differential Equations” by Dr. Sakthivel Kumarasamy (IIST), October 12, 2012.
- A Series of lectures on Research Methodology by Prof. N. Sundararajan (NTU, Singapore), October 29 – 31, 2012.
- A Series of lectures on “Intelligent Agents” by Dr. R. Krishnan, October 31 – November 2, 2012.

Department of Chemistry

- Talk on “Computational Modelling and Simulations” by Dr. C. H. Suresh, Scientist, IIST

Thiruvananthapuram, February 17, 2012.

- Talk on “Synthesis and Applications of Carbon based Nanomaterials” by Dr. S. Ramaprabhu, Professor, Physics IIT Madras, March 19, 2012.
- Talk on “Scaling up of Process Equipments” by Dr.S.K.Manu, Manager, PDSS, VSSC, March 21, 2012.
- Talk on “High Energy Materials and Space Ordinance System” by Dr. Hari Hara Nath, Scientist, SOG, April 9, 2012.
- Talk on “X-ray Diffraction Methods” by Dr. Bhoje Gowd, Senior Scientist, NIIST Thiruvananthapuram, November 14, 2012.
- Talk on “Supramolecular aspects of the conjugates of calixerenes, carbohydrates and proteins resulting in organic -inorganic hybrid materials” by Prof. C.P. Rao, Professor, Department of Chemistry, IIT Bombay, July 2, 2012.
- Talk on “Atom Transfer Radical Polymerisation” by Nikhil Kumar Singha, Rubber Technology Center, IIT Kharagpur, December 20, 2012.
- Talk on “Polymeric Substrate as Safer Fuel System for Rocket Propulsion” by Dr. Joseph Paul, Senior Lecturer, Built Environment Research Institute, Ulster, UK, October 25, 2012.

RESEARCH SCHOLARS' DAY



The second IIST Research Scholars' Day was held during 17th -19th December 2012. The formal inauguration of the programme was held at Dr. Srinivasan Auditorium, VSSC. Dr. K. Radhakrishnan, Dr. S. C Gupta, Dr. K S Dasgupta, Dr. P. S Veeraraghavan, and Dr. B. N Suresh were the chief guests for the inaugural ceremony. The paper presentations were held under three categories, Engineering, Science and Humanities. Dr. R Balasubramaniam, Editor, Journal of Aerospace Science and Technology & Director, Grade Scientist and Advisor (Retd.), NAL, Bangalore was the lead speaker for the Engineering session. Dr. P. P. Nageswara Rao, Program Director, IGBP, ISRO-HQ, Bangaloredelivered the lead talk for Science session and Dr. Meena T Pillai, Assoc. Prof, Institute of English, & Director, Centre for Comparative Literature, University of Kerala,



Trivandrum, gave the lead lecture for Humanities session. This year's research scholars' day was received with great response by the students. Fourteen research scholars from outside universities and IITs, and sixty three in house research scholars participated in this three-day intellectual fiesta. The paper and poster presentations of the research scholars were appreciated very well by the peer group as well as by the external judges. Based on oral and poster presentations, best papers were chosen from each category by a panel of judges.

Official Language (OL) Orientation Programme - 2012



As part of the implementation of OL Hindi in Indian Institute of Space Science and Technology, a Two-day Official Language Orientation Programme was organized on 23rd and 24th of August, 2012 for the Hindi personnel of various Centres/Units/ Offices under the Department of Space. The theme of the programme was Effective Implementation of Official Language Hindi - In the Perspective of Computerization. Officers / Employees associated with the implementation of the Official Language Hindi in various centres/units/offices under the Department of Space, actively participated in the programme. Fifteen papers were presented in total.

The function was formally inaugurated by Shri. N. K. Gupta, Former Director, LPSC at 09.00 am on August 23, 2012 in the inaugural function presided by Dr. P. Ravindra, JD (OL) DOS, Bangalore. In his inaugural address he expressed his views on the effective implementation of Official Language Hindi in various Centers/Units/Offices of Department of Space. Dr. K. S. Dasgupta, Director, IIST released the proceedings. Shri. K. Sasikumar, Registrar, IIST welcomed the guests and participants and Shri. R. Jayapal, Hindi Officer proposed vote of thanks.

Dr. T. K. Narayana Pillai, Former Director, Central Hindi Institute, Agra, Sri. C. N. Lal, Head, EQCD, Space Application Centre and Shri. Mahendra Savant, Assistant Professor, LNCPE, Karyavattom were the special invitees for the programme.

On the second day of OL Orientation Programme, all participants visited LPSC premises in the forenoon.

Shri. Chandrakanth D. Senior Technical Officer, C-DAC, Pune made a presentation on various software that are useful for Official Language. This presentation proved to be useful for all the officers/employees associated with the implementation of Official Language Hindi. A prize distribution function was held at 04.00 pm. Director, IIST distributed Certificate of Participation to all delegates and participants and awarded cash prize for the presentation of Articles.

EXTRA CURRICULAR ACTIVITIES

Dhanak 2012



The annual cultural festival of IIST, Dhanak-2012 was held in IIST from September 21 to September 24, 2012. The festival was inaugurated by the renowned director, and actor Shri. Balachandra Menon. Inter-collegiate competitions were held in literature, arts, music and dance.



Cultural and National Festivals

Independence day, Republic Day, Onam, Holi, Dusshera, Rakshabandhan, Christmas, Id and Diwali were celebrated in IIST.



Onam celebrations

Onam was celebrated in all pomp and splendour in August 2012. Dr Alexander Jacob I.P.S., ADGP (Prisons) 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.



EXTENSION ACTIVITIES

Eco club

Eco Club is an initiative for the students so that they learn to live responsibly within the campus. This would also give everyone involved a chance to identify themselves with nature and to boost an interest in sustainable development. By effective management of waste it also aims to make the campus 'green'. Bio-fertilized vegetable garden and floral garden within the campus are also envisaged under this activity by students and faculty. The strategic location of the campus at Valiamala, with a wide range of flora and fauna, is indeed a boon to promote this activity. An Eco club in the campus is bound to raise the consciousness and responsibility of the students. It will be incorporating activities to maintain the cleanliness of the campus, by helping students to adopt healthy life style practices and make them cautious about our environment and its sustainability.



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