



Indian Institute of Space Science and Technology (IIST) NEWSLETTER

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Director's Message



Greetings!

I am delighted to announce the re-launch of IIST's News Letter from January 2019. This task has been assigned to a new Newsletter Committee which will regularly bringing out two issues annually to share and widely circulate on the important events at the institute. Featured in the current issue are the host of activities and happenings at the institute during 1st July 2018 to 31st December 2018. Highlights of the issue include the 6th convocation held on 18th July 2018, Dr. Abdul Kalam Lecture, Foundation day celebration, International and National conferences, Seminars and workshops organised by us. Brief reports on co-curricular, extra-curricular and activities of environmental and societal relevance in which our students and staff were actively engaged are also included in this issue. During the period, we also initiated several new research activities and hosted scores of students from other institutes as interns/attendees of our conferences and workshops. A glance through the pages of this newsletter would definitely provide more detailed information about our progress and achievements during the period. Happy reading and thank you for all the support extended to the growth and all round development of the institute.

Dr. Vinay Kumar Dadhwal
Director



Indian Institute of Space Science and Technology (IIST) conducted its 6th convocation on 18th July 2018 at Dr. Srinivasan Auditorium, VSSC. The convocation started at 14.00 hrs with the academic procession led by Prof. A Chandrasekar, Registrar, IIST and was joined by Dr. B N Suresh, Chancellor, IIST, Dr. K Sivan, Chairman, Governing Council, IIST, Chairman ISRO and Secretary DoS, Prof. K VijayRaghavan, Chief Guest, Principal Scientific Advisor to Government of India, Shri. S Somanath, Director, VSSC and

Dr. V K Dadhwal, Director and Chairman BoM, IIST along with Deans, Senior Professors and Heads of the Departments. Dr. B N Suresh, Chancellor, IIST opened the convocation proceedings.

Dr. V K Dadhwal, Director and Chairman, BoM, IIST in his welcome speech elaborated on the achievements of IIST over the past one year in various fields. After welcoming the esteemed Chief Guest, Chancellor, IIST and Chairman, ISRO, Guest of Honour and all invitees,

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Dr. Dadhwal gave details about the visit of UGC review team led by Prof. Sheo Narayan Pandey, Vice Chancellor of Pandit Ravishankar Shukla University, Raipur, for reviewing IIST and to extend the Deemed to be University status for another 5 years.

He reported that in general UGC team was very impressed with the progress of IIST and all the members unanimously supported IIST to apply for the stature of 'Institute of National Importance'. He informed that all UG and PG courses are approved by AICTE. IIST is ranked 10th among all Engineering institutes in NIRF ranking for its teaching and learning process and has secured over all rank of 23rd in India for the year 2018. The Director in his speech elaborated upon the details of graduating UG/PG and Ph.D students and also about annual student programs like Dhanak, Conscentia. The Director mentioned about Mr. Avinash Chandra, an alumnus of IIST and Satish Dhawan endowment student at Caltech, USA for winning Abdul Kalam award for the best academic performance. It is the second time that an IIST alumnus getting this award. Further, Director spoke about the establishment of Small Satellite Systems and Payload Centre (SSPACE) at IIST for students and faculty to carry out challenging research on space science and technology. Under this program, a team of faculty and students are actively working to develop an ionospheric plasma probe payload namely ARIS. The Director also touched upon the details of international collaborations of IIST with various academic institutes and about progress achieved in ISRO-IIST projects. In his conclusion remarks, Director acknowledged the strong support received by IIST from the Chancellor, IIST, and Chairman ISRO. Director thanked the esteemed chief guest Prof. VijayRaghavan, Principal Scientific advisor to Government of India,



Shri. Somanath, Director VSSC, Guest of Honour and all other distinguished invitees for gracing IIST's 6th convocation.

In his convocation address, Chief Guest Prof. K VijayRaghavan, the Principal Scientific Advisor to Government of India, has congratulated all the graduating students and elaborated on the creative role played by DOS/ISRO in nation building especially in telecommunications, navigation, meteorology, remote sensing, agriculture, disaster management, healthcare and education over several years. He praised IIST model as unique in this country as deserving students admitted to its UG program receive full financial support and then join ISRO after securing required CGPA. He noted that the institute selects bright young minds at a very young age and expose them to space science and technology related areas. Professor VijayRaghavan mentioned that IIST's PG and Ph.D. program will not only give quality human resources to ISRO but also for entire country. He also mentioned about IIST's outreach programs and ended his speech with Dr A P J Abdul Kalam's advise as "Don't take rest after your first victory because if you fail in the second more lips are waiting to say

that your first victory was just a luck".

Dr. K Sivan, Chairman ISRO, Secretary DoS and Chairman Governing council IIST, started his presidential address by mentioning that IIST was a dream project of ISRO and its graduates are doing extremely well and satisfying the expectation of ISRO. He congratulated all the graduating students and their proud parents. He elaborated the challenges awaiting in ISRO and mentioned about importance of nation building. He explained about ISRO missions during last 4 years such as GSLV Mark III, PSLV etc and affirmed that success in ISRO is granted. He also mentioned about how ISRO missions has progressed from failure to great success by analyzing reasons for failures. He reminded about Vikram Sarabhai's main mission - India's progress through ISRO by solving problems of common man. He explained how ISRO has addressed many common man problems through disaster management systems, navigation, communication and earth observation over the years and how India's space program helped in supporting programs such as Swatch Bharat, Digital India, Make in India and MNREGA. He mentioned how fishermen could increase their income via ISRO's



Prof. K. VijayRaghavan delivering the 6th IIST Convocation Address

Fishing Zone Advisory. Dr. Sivan reminded that this is not enough and progress have to be made in navigation for providing hand held services, disaster alerts, and health services for people. He further spoke about need for human space program, space transportation systems and making launch vehicles capable of putting manned crew module to lower earth orbit. These initiatives only will make India as major space faring nation and for that lot of R&D are required. This can be achieved only when academia, industry and ISRO centers work in tandem. Finally, Dr. Sivan concluded his speech by telling that innovation is nothing but application of ideas that are novel and useful for our country and quoted Abdul Kalam "Dream is not that you see in sleep, dream is something that does not let you sleep". New innovations for future space technology must further reduce the hardship of common man. Dr. Sivan ended his speech by saying that even if you miss the shooting of moon you will hit nearby stars and younger generation should equip themselves to take India's leadership in Science and Technology.

Dr. B N Suresh, Chancellor, IIST, started his inspiring speech by

mentioning about those students who could not make it to ISRO by elaborating the ample opportunities awaiting in the open market. He pointed out that in few years India is going to be a developed nation and IIST graduates will have many chances to use their skills in many areas as they are well trained by IIST. The Chancellor talked about his own experience, how as a young mechanical engineering graduate, soon after joined in ISRO in 1969, he faced his first challenge to develop one of control systems for the first SLV-3. The assignment was challenging to a young mechanical engineer and he was very hesitant to take up this challenge. But after few days of thinking and discussion with his mentors and seniors, decided to accept the challenge. Then he spent many days and nights in library and learnt the new subject with intense concentration and his quest to learn new things helped him to develop that control system successfully and till today that is the fore runner for the present advanced control systems. Thus by talking about his own experience in ISRO, he showed how one can successfully overcome new challenges with perseverance and urge to learn new things. Dr. Suresh further elaborated about how new knowledge in advanced control system helped him to get a

common wealth scholarship to do Ph.D. in one of prestigious Universities in UK. The Chancellor spoke about challenges one has to take up boldly to build up one's career and quoted "A student learn one quarter from his master, second quarter from his own intelligence, third quarter from fellow students and last quarter from time and experience". He also quoted from Swami Vivekananda's teachings "experience is greatest teacher in this world". The Chancellor dwelt upon how team work succeeded in ISRO and why it is important. Due to team work in ISRO, in spite of embargos by advanced countries, we could successfully complete Moon and Mars missions as these mission required high level of precision and accuracy. He also talked about why there is no need to go abroad for greener pastures by citing the great achievers in India, without going abroad like IIST first Chancellor and People's President Dr. A P J Abdul Kalam, Father of Indian Atomic Energy Dr. Homi Bhabha, Father of Indian Space mission Dr. Vikram Sarabhai, Dr. M S Swaminathan for bringing green revolution in India and finally Dr. Verghese Kurien, the white revolution man of India. Dr. Suresh emphasized that without complaining about shortfalls, youngsters must use every opportunity to find a solution. This will definitely help in achieving goals and for that one must have very high aspirations. He further spoke about how one can learn from failures by remembering the frustration they had undergone when ISRO's first two ASLV's failed in beginning stages. After studying carefully the reasons for failures, ISRO could now successfully launch several missions, and that was possible due to understanding of reasons for failures as the Rocket Science is highly complex. Dr. Suresh finally ended his speech by a quote from Albert Einstein's one of speeches by saying that "Bear in mind young students that the wonderful things what you have learnt in schools are the work of

many generations of brilliant people around the world and you have to receive it honor it and add to it further and hand over to your next generations”.

In all, about 111 undergraduate students (54 from Aerospace Department and 57 from Electronics and Communication Engineering (Avionics)) were awarded B.Tech. degree, 58 postgraduate (M.Tech) students (9 from Aerospace

Engineering, 20 from Avionics Department, 6 from Dept. of Chemistry 8 from Earth and Space Science graduate program, 5 from Dept. of Mathematics and 10 from Dept. of Physics and 5 students from Earth and Space Science graduated with their Master of Science program in Astronomy and Astrophysics). In all, 19 students from 6 Departments qualified for PhD degrees and that is highest so far to be conferred in a single convocation.

The convocation ended with vote of thanks given by Registrar and National Anthem jointly sung by all participants.



Convocation Procession

IIST Foundation Day Celebration

IIST Celebrated its 12th foundation day on 14th September 2018 with various programmes. Prof. Anil D Sahasrabudhe, Chairman, AICTE inaugurated Foundation Day Celebration by delivering the 3rd Dr. APJ Abdul Kalam Lecture.

1. Third Dr. A P J Abdul Kalam Lecture

The third Dr. A P J Abdul Kalam lecture was delivered by Prof. Anil Sahasrabudhe, Chairman, AICTE at 9.30 hrs on IIST Foundation Day. The programme started by invocation followed by welcome address by Dr. V. K. Dadhwal, Director, IIST. The title of the talk was 'Innovation and Excellence in Technical Education: A Roadmap and Vision for the Future'.

Professor Sahasrabudhe spoke in detail about the problems in technical education and how? it can be solved to lead to a prosperous India. The talk covered the need for innovations and excellence in technical education for India to scale high as any developed nation. He also gave detailed road map for achieving impossible goals and shared his interactions with late Dr. APJ Abdul Kalam and his vision for India via technological innovations. After one hour lecture, program ended with national anthem. IIST Students and faculty in large numbers attended the lecture.

IIST Foundation Day



Prof. Anil D Sahasrabudhe delivering the 3rd Dr. APJ Abdul Kalam Lecture on 14th September 2018

About Dr. APJ Abdul Kalam Lecture Series



Dr. V. K. Saraswat delivering the inaugural lecture of Dr. APJ Abdul Kalam Lecture Series on 14th April 2018

Dr. APJ Abdul Kalam Lecture series was launched by IIST in April 2018 in the fond memory of its first Chancellor, Dr. APJ Abdul Kalam. The first lecture was given by Dr. V K Saraswat, Member, NITI Aayog on 14.4.2018 on 'New Frontiers in Engineering'.

Seated L to R: Prof. A. Chandrasekar (Dean, Academics), Shri. S. Somanath (Director, VSSC), Dr. B. N. Suresh (Chancellor, IIST), Dr. V. K. Dadhwal (Director, IIST)

The second lecture in this series was organised on 5th September 2018 by Prof. Mustansir Barma, DAE – Homi Bhabha Chair Professor, TIFR, Hyderabad on 'Random Questions in Science'. Prof. Mustansir Barma is one of the most eminent Physicists from India and an important name in the world of Statistical Physics. In a scintillating lecture, he introduced the topic of stochastic processes using easily understandable models and daily life phenomena. "Random walks" is a simple to define, yet paradigmatic stochastic model which holds many surprises and is applicable to a large number of phenomena across the disciplines.



Prof. Mustansir Barma delivering the 2nd Dr. APJ Abdul Kalam Lecture Series on 5th September 2018

Prof. Barma introduced multiple aspects of this model, such as how a study of Brownian random motion led to establishing that molecules really exist and helped to calculate Avogadro's number. His introduction of the gambler's ruin problem brought out the kind of surprises that such a simple model could hold. The general theme of studying complex phenomena, like traffic, using simple models, and the importance of randomness in these models were revealed using various examples. A most engrossing talk, that provided a peek into the fascinating world of stochastic phenomena left everybody with questions to ponder about.

2. Open Day

IIST Foundation Day

School students of 8th to 12th standards of nearby schools in and around Thiruvananthapuram were invited to visit labs and facilities in IIST. All Departments and Various Clubs in IIST organized experiments, demonstrations, poster presentations, robotics, solar system demonstration, laser experiments etc for the school children from 11: hrs to 16:30 hrs.



Lab Visits by Students

3. IIST Alumni Meet

IIST Foundation Day



IIST Alumni with Director, Registrar and Faculties of IIST

Twenty four alumni from various ISRO Centres attended the Alumni Meet organised on IIST foundation Day. Dr. V. K. Dadhwal, Director, IIST chaired the meeting and in his address he stressed the importance of developing an alumni network for the benefit of IIST and advised to develop a structured alumni forum. During the interaction with the Director, Registrar and Faculty, the alumni has given various suggestions for fruitful interaction between IIST students and alumni for organising workshops and lectures, assisting in identifying research problems in ISRO Centres for IIST students.

4. Cultural Programmes

IIST Foundation Day

As part of the institute's foundation day, the Cultural Committee and the Student Music Club jointly organized an evening of cultural programmes on September 14, 2018. The cultural program was held in the open-air stage opposite to the administrative block. The event started with a bharatanatyam performance by Smt. Preemu Cheruthara. This was followed by other dance and music performances from staff and students. There was overwhelming participation from the first year students with more than 15 performances. The student programs were curated by Shri. Uttam Jodawat (Fourth year student, Aerospace Engineering) and the Student Music Club.



Cultural Programme held in connection with IIST Foundation Day

MoU with NSDL

As part of Digital Initiative by Government of India, a National Academic Depository (NAD) has been created to hold the certificates of all students and Universities in the country in a common repository. IIST has signed a MOU with NSDL and the Degree certificate of 6th Convocation degree recipients is available in the common depository. Around 50 students have registered and linked with common repository.

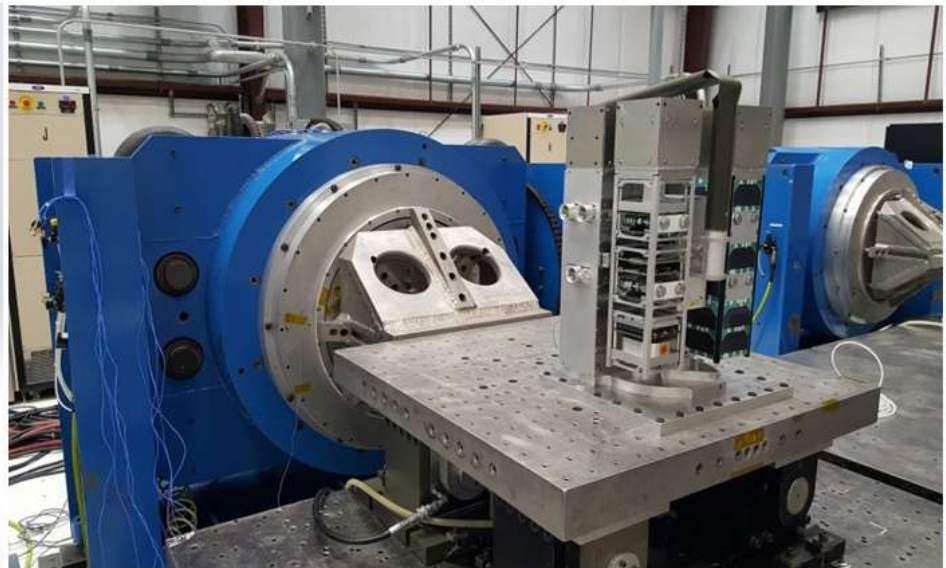
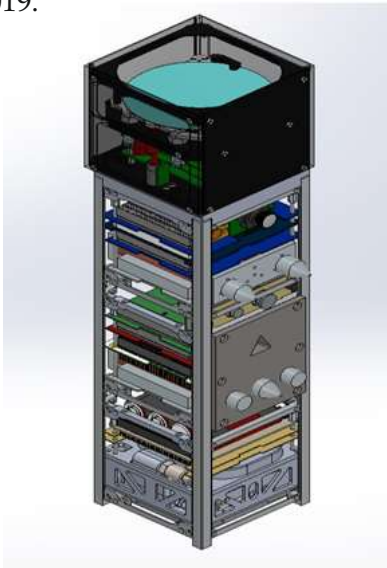
Autonomous Assembly of Reconfigurable Space telescope (AAReST)

Initiated in 2017, the Autonomous Assembly of Reconfigurable Space telescope (AAReST) is an collaborative technological development project between Caltech University, USA, University of Surrey, UK and Indian Institute of Space Science and Technology. As part of this IIST is involved in the development of a Mirror Sat for the consisting of the following subsystems: Structures, On Board Computer, Electrical Power System, Attitude determination and control system, cold gas butane propulsion system. Furthermore, IIST as part of its responsibilities will be developing the structures for the mirrorsat of University of Surrey. The AAReST mission is expected to be delivered to the launch vehicle by Dec. 2019.

The vibration tests on the integrated AAReST mass dummies which included the IIST Mirror Sat were conducted at Caltech University and the analysis was carried out during July 2018. During July -Dec2018, IIST continued the design activities of the AAReST subsystems and the modifications suggested for the structures after the vibrational analysis at Caltech. The AAReST project team consisting of Prof. Sergio Pelligrino and Mr. Charles Sommers from Caltech, Dr. Virendra Sarohia from JPL and Prof. Craig Underwood from University of Surrey, visited IIST on Dec. 10, 2018 to review the progress of IIST MirrorSat development.



Prof. Sergio Pelligrino of Caltech USA with Chancellor, IIST along with AAReST



Mirror Sat developed by IIST for AAReST

Visit of Dignitaries

1. Dr. Ricardo Ruiz-baier, University of Oxford, UK

Dr. Ricardo Ruiz-Baie, Mathematical Institute, University of Oxford, UK has visited IIST during 12 - 20 December, 2018. Dr. Sarvesh Kumar, Associate Professor, Department of Mathematics has established a fruitful collaboration with Dr. Ruiz-Baier, focusing mainly on finite volume element discretizations of flow problems. As part of this collaboration, 5 articles in reputed international journals were published and a VAJRA

(Visiting Advanced Joint Research) proposal was submitted to DST. The objective of his visit was to continue the research collaboration and also to have fruitful discussions with Ph.D and faculty members of IIST. During the visit, Dr. Ruiz-baier has delivered a talk on 'Mixed finite element methods for stress-assisted diffusion problems' which was attended by B.Tech/M.Tech/Ph.D students and faculty members.



Dr. Ricardo Ruiz-Baier of University of Oxford, UK delivering talk at IIST

2. Prof. Murali Damodaran, Senior Research Scientist , NUS

Dr. Murali Damodaran, Senior Research Scientist, NUS, Singapore, visited the campus on 20th December 2018. He had discussions with faculty of Aerospace Engineering and other Departments. Prof. Murali was a faculty of Mechanical and Aerospace Engineering at Nanyang Technological University for about 21 years. He has also taught in IIT Gandhinagar. Dr. Murali made a brief presentation on his current research, namely 'physics-informed machine learning surrogates for predictive modelling in applied aerodynamics'. He said he could host internship students in NUS, and would also like to do cross-disciplinary work with faculty of IIST.

3. Dr. Tapajyoti Dasgupta, EPFL, Lausanne, Switzerland

Dr. Tapajyoti Dasgupta, EPFL, Lausanne, Switzerland visited IIST on 19th December 2018 and delivered a talk on 'Self-assembly of nanostructured glass metasurfaces via templated fluid instabilities'

Dr. P. S. Goel Peer Review Committee



Dr. P. S. Goel Review Committee with Chancellor, Director, Registrar and Dean Academics

Dr. K. Sivan, Chairman, ISRO and Secretary DoS, constituted a peer review committee, headed by *Dr. P S Goel*, Former Secretary, Ministry of Earth Sciences, Govt. of India to comprehensively review Indian Institute of Space Science and Technology, Thiruvananthapuram in terms of its academic output relevant to space programs, as it has already completed 10 years since its inception in September 2007. The other members of the Committee are i) *Prof. Majumdar*, Dy. Director, IIT Bombay, Mumbai ii) *Prof. K P J Reddy*, Dept. of Aerospace, IISc, Bangalore, and iii) *Dr. Gangan Pratap*, Outstanding Scientist, CSIR.

The order further says that the review committee's focus also should be related to IIST's course programs and their vision for future, research activities, quality publications, sponsored projects, sufficiency of infrastructure to carry out researches, depth of collaborations with ISRO centers and other academic institutions etc.

The peer review Committee has visited IIST on 31st October 2018 and 1st November 2018 to conduct in-depth review of IIST. The Committee was ably supported by Director, IIST, Deans of IIST and all Heads of Departments. The Chancellor was

also present in the beginning to oversee the review process. The Committee interacted with faculty, students and staff separately to hear their views and also visited laboratories to assess the research programs in the institute. An interaction session with IIST alumni was also organised. In all, 71 alumni from various ISRO centres participated in the interaction. The Committee at the end of second day thanked all IIST fraternity for their co-operation and the review report is likely to be submitted to Chairman, ISRO in the month of January 2019.

Foreign Visit of IIST Faculty

Sl No	Name	Country/Organization visited	Funded by	Programme/Course/Internship	Period of conference/Workshop
1	Dr Sarvesh Kumar	UK	London Mathematical Institute	For research collaboration with Dr Ricardo Ruiz-Baier, Mathematical Institute, University of Oxford, UK. Dr Kumar has also delivered an invited talk on "On the convergence of finite volume element methods".	20.5.2018 to 09.06.2018
2	Dr. Rajesh S	Germany	Physikalisch-Technische Bundesanstalt Braunschweig, Germany	To visit Physikalisch-Technische Bundesanstalt Braunschweig, Germany as part of collaborative research in the area of turbulent combustion using optical and laser diagnostic techniques for the period from	28.05.2018 to 06.07.2018
3	Dr. Chinmoy Saha	Montreal, Canada	IEEE + Royal Military College, Canada + IIST(P)	To carry out research work	08.06.2018 to 07.07.2018
		Royal Military College, Canada		To attend 2018 IEEE International Symposium on Antennas and propagation and USNC- URSI Radio Science Meeting	08.07.2018 to 13.07.2018
		Boston, USA		To participate in COSPAR Scientific Assembly	13.07.2018 to 22.07.2018
4	Dr. Seena V	Singapore	DST	To deliver an Invited talk at 12th international conference on Ceramic materials and components for Energy and Environmental Applications (CMCEE 2016)	22.07.2018 to 27.07.2018
5	Dr. Priyadarshnam	University of Colorado, Boulder, USA	University of Colorado, Boulder USA + IIST(P)	InspireSat1 Critical Design Review	22/07/2018 to 28/07/2018
6	Dr. K Sakthivel	Rio de Janeiro, Brazil	National Board for Higher Mathematics/DAE	To deliver a talk in the International Congress of Mathematicians (ICM-2018)	01.08.2018 to 09.01.2019
7	Dr. Sarita Vig	Florence, Italy	Nil	To attend International Meeting on 'The Scientific Heritage of Matcom Walmsley'	05.10.2018 to 29.11.2018
8	Dr. Anandmayee Tej	Belgium	BINA+DST+ IIST(P)	To deliver a seminar on 04.10.2018 organized by Institute of Astrophysics and Astronomy, Liege University, Belgium and to attend and give a talk in the Belgium-Indian Network for Astronomy and Astrophysics (BINA)	09.10.2018 to 12.10.2018
9	Dr. Sarita Vig	Beijing, China	Government of India	To participate as team leader of the students representing India by National Steering Committee on Science and Astronomy Olympiads of the Homi Bhabha Centre for Science Education (HBCSE)	03.11.2018 to 11.11.2018
10	Dr. N Selvaganesan	Florida, USA	IIST (P)	To present research paper in the IEEE Conference on Decision and Control (CDC 2018)	17.12.2018 to 19.12.2018
11	Dr. R Sudharshan Kaarthik	Washington DC, USA	IIST(P)	To present two papers in the 44th Annual Conference of the IEEE Industrial Electronic Society (IECON 2018)	21.10.2018 to 23.10.2018
12	Dr. Praveen Krishna I R	Rio de Janeiro, Brazil	SERB + IIST(P)	To present two papers in the 10th IFToMM International conference on Rotordynamics	23.09.2018 to 27.09.2018
13	Dr. Kuruvilla Joseph	Hanyang University, South Korea	Hanyang University + IIST(P)	To attend JEC Asia 2018 and to deliver a lecture introducing the composite research activities in IIST.	12.11.2018 to 16.11.2018

* IIST(P) – Partial Support by IIST

Swatch Bharat Activities

Swachh Bharat Implementation Committee and Sports Committee organized a campus cleaning programme on Mahatma Gandhi's birth day i.e 2nd October 2018. The programme started at 8 am. Enthusiastic students, faculty and staff cleaned the Volleyball Court and Magudagiri Ground. The cleaning drive went up to 2:30 pm.



Photos show IIST Students, Staff and Faculty cleaning Magudagiri ground of IIST under Swatch Bharat Abhiyan

Conferences / Workshops

IIST Foundation Day

Department of Avionics

i) One Day Workshop on Awareness Programme on IEEE and Activities of IEEE AP-Society, 14th September 2018

IEEE APS Kerala Chapter, IEEE IIST APS Student Society Chapter and IEEE IIST Student Branch jointly organized an 'Awareness Programme on IEEE and Activities of IEEE APS - Kerala Chapter' along with demonstration of basic ideas/model on Antennas and Propagation on 14th September 2018, for class XIth and XIIth standard students. The event was organized during IIST Day Celebration on September 14th in IIST 2018 and was attended by more than 1000 students from various schools around Trivandrum and other parts of Kerala. A group of M.Tech and PhD students of IEEE IIST student branch with guidance of faculty members, explained / discussed the diversified role of IEEE on technical education, standardization and social/humanitarian activities. Another group of students demonstrated various fundamental concepts of electromagnetic engineering and various antennas through posters and hardware experiments.



(a)



(b)



(c)



(d)



(e)



(f)

Awareness Programme on IEEE and Activities of IEEE AP-Society on 14.09.2018, during IIST Day Celebrations. IEEE IIST Student branch counsellor Prof. B S Manoj and IEEE APS Kerala Chapter chair, Dr. Chinmoy Saha are seen with the students

ii) IEEE-INAIE Workshop on Electromagnetics (IIWE 2018), 6-8 December 2018, Thiruvananthapuram



Inauguration of IIWE 2018 on Dec 6, 2018

IEEE-INAIE Workshop on Electromagnetics (IIWE 2018), a three day workshop, held during 6-8, December 2018 in Thiruvananthapuram jointly organized by IEEE-APS Kerala Chapter, Indian Institute of Space Science and Technology and Indian National Academy of Engineering (INAIE). There were, 2 Keynote Talks, 9 Invited talks, 4 talks by Young Scientist Speakers and a total of 50 Research paper presentations. IIWE and RAICS (Recent Advances in Intelligent Computation Systems) were jointly inaugurated on 6th December by Dr. V.K. Dadhwal (Director, IIST), Prof. Tapan K. Sarkar (Syracuse University, USA), Dr. Sameer (Chair, IEEE-Kerala Section) and Dr. Chinmoy Saha (Chair, IEEE-APS Kerala) by releasing the proceedings of the conferences. This was followed by Keynote address given by Dr. V.K. Dadhwal on 'Applications of Spaceborne Microwave Remote Sensing' and Keynote by

Prof. Tapan. K. Sarkar on 'Generation of Non-Minimum phase response from Amplitude only data'. The first day of three days meet, concluded with invited talks from Basudeb Ghosh (IIST, Thiruvananthapuram) and Uday Khankojee (IIT-Madras) followed by 3 contributory sessions. Day 2 began with lectures from Prof. Magdalena Salazar Palma (Universidad Carlos III de Madrid, Spain), Prof. K. P. Ray (DIAT, Pune) and Dr. Chinmoy Saha (IIST, Thiruvananthapuram), followed by Contributory Session.

The workshop not only brought together the eminent researchers and academicians in the field of Electromagnetics but also provided an opportunity for young researchers to share their research

experience. Day 2 featured four young speakers, namely Debdeep Sarkar (RMC, Canada), Sandip Shankar Roy (NRSC(ISRO), Hyderabad), Hemant Kumar (VJITI, Mumbai), and Pratigya Mathur (VJITI, Mumbai). Second day concluded with another interactive Contributory Session. The third and final day began with a talk by Dr. Tapan. K. Sarkar on 'The use of Higher Order Basis in Computational Electromagnetics' followed by lectures by Chandrakanta Kumar (UR Rao Satellite Centre, Bangalore) Raghavan (NIT, Trichy) and Shiv Narayan (CSIR NAL, Bangalore). The valedictory function was preceded by an Industry Talks delivered by the speakers from CST and Entuple Technologies.

The three day event concluded with a valedictory where, the best paper in each Contributory Session was awarded. Apart from the individual session awards, three papers were selected among all the contributory sessions for the Dr. P J Abdul Kalam Award, Vikram Sarabhai Award and the Satish Dhawan Award along with a cash prize. The IEEE-APS Student Branch of IIST was also inaugurated by Prof. Tapan. K. Sarkar and Prof. Magdalena Salazar Palma. The valedictory session concluded with Vote of Thanks by Basudeb Ghosh (IIST, Thiruvananthapuram). The workshop was highly successful in bringing together academicians and professionals in the field of Electromagnetics to share their ideas, research work, and also to motivate the young researchers and students for their future research endeavors.

iii) IEEE Technical Poster Competition on Antennas for Space Application, 12th November, 2018

IEEE APS Kerala chapter, IEEE IIST Student Branch and IEEE IIST APS Student society chapter organized State level Technical Poster Competition for undergraduates and graduate students in IIST, Thiruvananthapuram on 12th November 2018. The program was an exclusive platform for the students to present their work to the experts in the field.

The event started with the registration followed by the inauguration of the event. Prof. Kuruvilla Jospeh, Dean, Student Activities, Prof. BS Manoj, HoD Avionics, IIST and Dr. Chinmoy Saha, Chair IEEE APS Kerala Chapter delivered the inaugural addresses. The inauguration was followed by the Expert Talk by the chief guest Prof. Abdulla P of CUSAT on Electromagnetic Interference/ Electromagnetic Compatibility. After the lunch break first round of the competition



Group photo during the inauguration of the event

started. In the first round, 17 teams who got selected after scrutinizing the abstracts displayed their posters. The exhibited posters were reviewed by the judges and the audience. Out of the 17 teams 10 teams were selected for the second round. In the second round, the finalists have given a power point presentation of their idea before the expert panel. From the final round first 3 positions were declared. The second and third prize was shared by two teams. All the 48 members of 17 teams received participation certificates. The prize winners were awarded on 21st December 2018 during 'Distinguished Lecture and One Day Workshop on Recent Advances in Wireless and Space Antennas'.

Department of Chemistry

International Conference on Recent Trends in Materials Science and Technology (ICMST 2018), October 10-13, 2018, VSSC, Thiruvananthapuram



Inaugural Function of ICMST 2018 @ Dr. Srinivasan Auditorium, VSSC, Trivandrum

L to R- Dr. Kuruvilla Joseph, Dr. A. Ajayaghosh, Dr. B. N. Suresh, Shri. S. Somanath, Dr. V. K. Dadhwal, Dr. Sung Kyu Ha

The International Conference on Recent Trends in Materials Science and Technology (ICMST-2018), jointly organized by Indian Institute of Space Science and Technology (IIIST) Thiruvananthapuram and Materials Research Society of India (MRSI) Thiruvananthapuram Chapter was conducted during 10 -13 October 2018 at ATF campus, Vikram Sarabhai Space Center, Thiruvananthapuram. The chief patrons of the conference were Dr. K. Sivan, Chairman ISRO and Secretary, Department of Space; Dr.B.N. Suresh, Chancellor, IIST; Dr.GirishSahni, Director General, CSIR and Dr. Ashuthosh Sharma, Secretary, Department of Science and Technology. The inaugural function was on 10th October 2018 at 3 PM. Dr. K. Sivan, Chairman ISRO and Secretary DOS, inaugurated the seminar on video mode. Dr.B.N Suresh, Chancellor IIST delivered presidential address. Shri. S. Somanath, Director VSSC, Thiruvananthapuram and

Dr.A. Ajayaghosh, Director, NIIST Thiruvananthapuram delivered felicitation address. Dr. V.K Dadhwal, Director IIST welcomed the guest and gathering and Prof. Kuruvilla Joseph, Chairman Local Organizing committee expressed vote of thanks. The inaugural function, attended by nearly 500 participants was followed

by two keynote lectures. In the subsequent three days, there were invited and contributory technical presentations by eminent scientist/faculty members and research students, respectively, in four parallel sessions. Deliberations were on the focal themes such as energy storage/conversion materials, ceramics, polymers and



Poster Presentations at ATF Area, VSSC

blends, composites, metals and alloys, smart materials, Nanomaterials, electronic materials aerospace materials, Materials for sensors, green materials and bio-materials. There were 80 invited lectures and 30 contributory lectures covering the entire conference theme. In addition, there were 260 poster presentations by young researchers. The posters were evaluated by a panel of experts and 10 best poster awards were distributed. There was active participation of scientist from various laboratories of CSIR, DRDO, atomic energy and faculty members from leading institutes and universities in India and abroad.



Technical Session at ATF Area, VSSC

Nearly 300 participants and 80 invited resource persons attended the conference. There were active discussions on the emerging areas of materials science and Technology. The discussions led to many research collaborations among the participants/resource persons.

Department of Earth and Space Science

Department of Earth & Space Sciences, IIST conducted the annual astronomy and astrophysics school from December 10 – 19, 2018. The school had 45 participants from various colleges across India.



Participants of Astronomy and Astrophysics School

Dhanak 2018



Inauguration of Dhanak 2018 by the noted Malayalam filmmaker Roshini Dinaker

Dhanak, the annual cultural fest of IIST for the 2018-2019 academic year, was conducted from September 28 – October 1, 2018. This was the tenth edition of Dhanak since its inception. This year, the event achieved the highest footfall in its history. Union Bank of India and the institute were the main sponsors of the event. Dhanak was preceded by a variety of online events and competitions. Dhanak 2018 was Inaugurated by the eminent film maker Roshni Dinaker. The Union Bank of India Zonal Head and other dignitaries were present at this ceremony. Dean of Student Activities, Dr. Kuruvilla Joseph and Registrar, Dr. A Chandrasekhar spoke on the occasion. The Chief Co-ordinator, Mr. Aswin Sunil shared his thoughts organizing one of the biggest fests of South India. Events Co-ordinator Ms. Reema Mathew put forward Dhanak at a glance, and



Cultural Program held as part of the inauguration of Dhanak 2018

the inaugural ceremony concluded with Dhanak's Vice Chief Co-ordinator, Mr. Ashfaque Karingappara delivering the Vote of Thanks. Dhanak had several music and cultural events and competition, with teams from several colleges participating. The event also had a pronite with Ms. Neha Venugopal and the band Organised Madness performing. The cultural committee, CMD, transport, library and canteen departments of the institute provided various logistical support for the cultural fest.

Independence Day Celebration



Dr. V K Dadhwal, Director, IIST inspecting the guard of honour



IIST celebrated Independence Day at 9 AM on 15th August 2018 with patriotic fervour and enthusiasm. Dr. V. K. Dadhwal, Director, IIST hoisted the national flag and inspected the guard of honour. Students, faculty and staff joined in the celebration with their family

members. In his Independence Day speech, Director has emphasised on the responsibilities that have to be shouldered by the younger generation for the progress of the country and reminded them that the country has high hopes from the current generation. He gave details

of achievement and progress IIST has made during last year and also throw light on future programme of IIST. The programme was followed by presentation of patriotic songs by IIST students.

Library Week Celebration

Library week was celebrated in IIST during 14-20 November 2018. The celebration was inaugurated by Prof. Y V N Krishna Murthy, Senior Professor and Registrar, IIST. He has delivered a talk on ISRO's Space Programmes and how it helped to improve common man life. Talks on 'How to write quality technical paper' (Dr. Dhanu pattanshetty, IEEE), 'How to avoid plagiarism' (Shri. Akshay Prasanna, IEEE) and 'Tools for Information Management' (Shri. Abdunnasar, IIST) were conducted. As part of celebration, 'Book donation campaign for flood affected library' was initiated. Through this programme, about 2000 books were collected from the academic community of IIST and the collected books were handed over to Govt. Engineering College, Munnar by Dr. V. K. Dadhwal, Director, IIST.



Director, IIST receiving 'Certificate of Appreciation' from Dr. P. Ramesh, HoD, Department of Electronics & Communication, Govt. Engineering College, Munnar for Book Donation Programme

आईआईएसटी में आयोजित विविध हिंदी कार्यक्रम

1. संस्थान के अधिकारियों/कर्मचारियों के लिए हिंदी कार्यशालाओं का आयोजन

i) संकाय सदस्यों के लिए हिंदी कार्यशाला

संकाय सदस्यों के लिए **सितंबर 12** को हिंदी कार्यशाला चलाई गई। इस कार्यशाला का औपचारिक उद्घाटन डॉ. ए. चंद्रशेखर, कुलसचिव, आईआईएसटी द्वारा किया गया। डॉ. एन. सुरेश, निदेशक, अनुवाद व अनुवाद अध्ययन केंद्र, केरल विश्वविद्यालय ने **भारत सरकार की राजभाषा नीति: बुनियादी बातें** विषय पर विस्तृत व्याख्यान दिया। डॉ. सुरेश ने बहुत ही सरलता से इस विषय को प्रस्तुत किया।

ii) प्रशासनिक क्षेत्र के सहायकों के लिए हिंदी कार्यशाला

संस्थान के सहायकों, वरिष्ठ सहायकों, वैयक्तिक सहायकों तथा लिपिक वर्ग के संविदागत कर्मचारियों के लिए **20 व 21 दिसंबर** को हिंदी कार्यशाला का आयोजन किया गया। श्रीमती आर. महेश्वरी अम्मा, हिंदी अधिकारी, आईआईएसटी तिरुवनंतपुरम ने **राजभाषा नीति कार्यान्वयन-अद्यतन आदेश/निर्धारित लक्ष्य** तथा श्री. ए. सोमदत्तन, पूर्व उप निदेशक, आयकर विभाग ने **हिंदी में टिप्पण एवं आलेखन** विषय पर अभ्यास कराया। श्री. आर. जयपाल, वरिष्ठ हिंदी अधिकारी, आईआईएसटी ने **कंप्यूटर के सहारे राजभाषा हिंदी में कार्य** विषय पर कक्षा का संचालन किया। श्री. एम. जी. सोम. शेखरन नायर, वरिष्ठ हिंदी अधिकारी, वीएसएससी ने **'हिंदी की प्रशासनिक शब्दावली एवं उसका प्रयोग'** विषय पर अभ्यास कराया।



2. हिंदी माह का आयोजन

संस्थान में **सितंबर 03 से 28 तक हिंदी माह** मनाया गया। इस सिलसिले में विविध कार्यक्रमों का आयोजन किया गया। **सितंबर 03** को हिंदी सॉफ्टवेयर प्रशिक्षण कार्यक्रम चलाया गया। हिंदी दिवस के महत्व को उजागर करने के उद्देश्य से **सितंबर 14** को **हिंदी दिवस व्याख्यान** का आयोजन भी किया गया। **केरल विश्वविद्यालय के कुलसचिव डॉ. आर. जयचंद्रन** ने व्याख्यान दिया। हिंदी माह समारोह - 2018 के उपलक्ष्य में संस्थान के कर्मचारियों के लिए **सितंबर 04, 05, व 21, 2018** को तथा छात्रों के लिए **सितंबर 10, 11, 12 व 13, 2018** को विविध हिंदी प्रतियोगिताओं का आयोजन किया गया। नवंबर 30, 2018 को **पुरस्कार वितरण समारोह** आयोजित किया गया। प्रतियोगिताओं के विजेताओं को निदेशक महोदय द्वारा नकद पुरस्कार एवं प्रमाण पत्र वितरित किए गए।



हिंदी दिवस व्याख्यान

3. हिंदी तकनीकी संगोष्ठी

इस वर्ष अंतरिक्ष विभाग के तिरुवनंतपुरम पूल के वीएसएससी, एलपीएससी, आईपीआरसी, आईआईएसटी एवं एपीईपी के सहयोग से आईआईएसटी में **अक्टूबर 30 व 31**, को **'अंतरिक्ष विज्ञान एवं प्रौद्योगिकी में हाल की प्रगति'** विषय पर हिंदी तकनीकी संगोष्ठी का आयोजन किया गया। इस संगोष्ठी के दौरान **'राजभाषा हिंदी का बदलता स्वरूप'** विषय पर राजभाषा सत्र भी शामिल किया गया। डॉ. बी. एन. सुरेश, माननीय कुलाधिपति, आईआईएसटी ने संगोष्ठी का उद्घाटन किया। श्री. एम. वी. डेक्के, प्रोफसर सतीश धवन प्रोफसर, आईआईएसटी ने संगोष्ठी के तकनीकी सत्र का मुख्य भाषण दिया। प्रोफसर बी. वाई. ललितांबा, हिंदी विद्वान व सदस्य, संयुक्त हिंदी सलाहकार समिति ने आमंत्रित भाषण दिया। वीएसएससी, एलपीएससी, आईपीआरसी, आईआईएसटी, एपीईपी एवं आईआईएसटी से कुल 36 लेख दो दिवसीय संगोष्ठी के दौरान प्रस्तुत किए गए जिनमें आईआईएसटी के छह लेख भी शामिल थे। चार तकनीकी सत्र और एक राजभाषा सत्र रखे गए। प्रत्येक सत्र में हिंदी भाषी एवं हिंदीतर भाषी प्रवर्ग के उत्कृष्ट प्रस्तुतकर्ता को पुरस्कार भी दिए गए। सभी लेखों पर संगोष्ठी में सार्थक चर्चा हुई तथा अद्यतन ज्ञान का आदान प्रदान हुआ जिससे सभी प्रतिभागी लाभान्वित हुए।

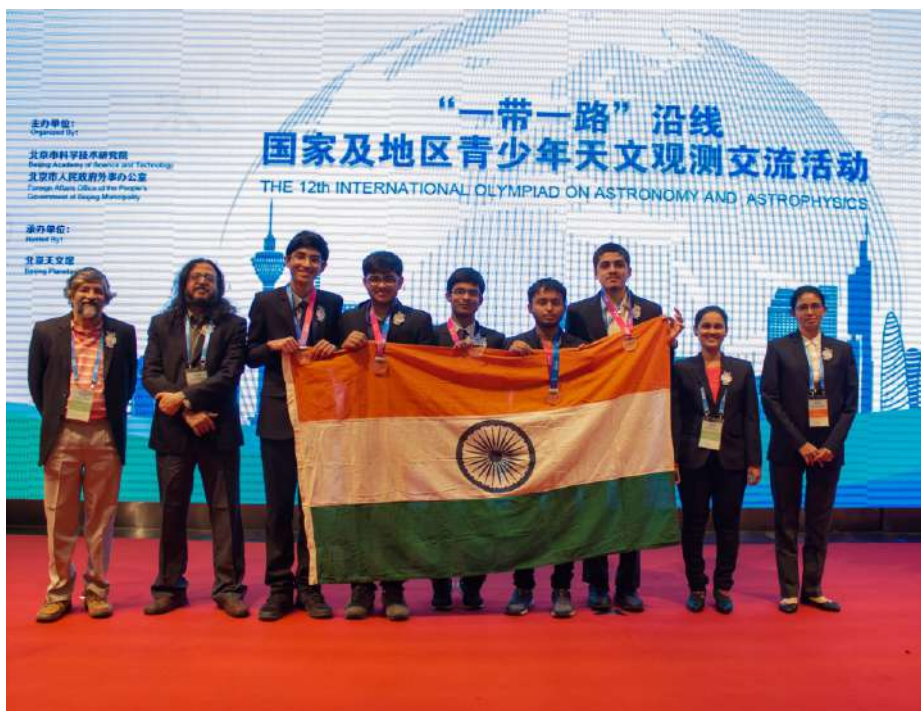


लेख संग्रह का विमोचन

Research / Training / Outreach Activity (organized or participated)

Department of Earth and Space Science

Dr. Sarita Vig, Associate Professor, Dept. of Earth & Space Sciences, IIST participated as team leader of the Indian team at the 12th IOAA: The International Olympiad program provides a platform to the secondary and higher secondary school students to engage and compete in an amicable atmosphere at the highest level. In India, the Olympiad programs are coordinated by the Homi Bhabha Centre for Science Education (HBCSE-TIFR), Mumbai and students selected through national level tests. The International Olympiad on Astronomy and Astrophysics (IOAA) is a competition for higher secondary school students which involve an assessment of both theoretical and observational skills in Astronomy and Astrophysics. Every year, IOAA is hosted by a different country.



Dr. Sarita Vig with Indian Team @ 12 IOAA

This year, the 12th IOAA was held at Beijing, China between 3-11 Nov, 2018. In all, 46 teams from 38 countries were participated, with each team comprises 5 student members and team leaders. The Indian students were accompanied by two team leaders and two observers. One of the team leaders was Dr. Sarita Vig. All the team members went on to win medals, three silver and two bronze. In addition, one of the Indian team members was awarded a special prize for scoring full marks in the sky observation test.

NIRMAAN

a) Lecture Series

A series of lectures were given to the students of Government Girls Higher Secondary School (GHSS), Nedumangad from September – November, 2018. The topics discussed and experimented were, 1. Backyard Science - Seeing science in simple things around, 2. Vihang - Workshop on water rocket making and the science behind it, 3. Lumière - Demonstrations and discussion on various optical phenomena, 4. Star Trek- Lectures on astronomy. 5. Khula Aasmaan-Personality development, and 6. Hakuna Matata- Competitions and certificate distribution.



NIRMAAN team with school students

b) Flood Relief

IIST had its own unique contributions to flood ravaged places of Kerala last year. NIRMAAN volunteers collected money for flood relief in Kerala and also got involved in voluntary work at relief collection centers which were functioning in all areas of city. IIST student volunteers were working tirelessly from Monday to Sunday. Student volunteers, Neeraj K, Arnob N. P, Abhishek Accot, Adeeb Hassan, Sharon Jose, Ashwin Khan, Althaf Arshraf and Bastin Baijo, developed power banks out of batteries in just few hours and distributed it to the flood affected people. District Collector Dr. K. Vasuki, IAS and team transported these power banks to Wayanad where some places could not be reached.

Colloquia /special talks organized by the Departments at IIST

Department of Earth and Space Sciences

1. Dr. Pushkar Kopparla from CalTech, USA visited the institute on August 1, 2018 and gave a seminar in astrophysics on the new insights gained in characterizing the properties of planets around other stars using polarimetric observations and modeling.

Department of Physics

1. Prof. Takanori Nomura, Department of Opto-Mechatronics, Faculty of Systems Engineering, Wakayama University, Japan, delivered a talk on 'Computational imaging using random amplitude/phase modulation' on 18 September 2018.

Department of Humanities

1. Prof. V K Vijayakumar, Geogith BNP Paribus on Strategic financial advisor delivered a talk on 'Introduction to Stock Market', September 19, 2018.
2. Dr. Abraham Abraham, MD, Director and Life Coach of Mind Masters gave series of talks on the topic 'Nero Linguistic Programme (NLP)' on October 22, 23, 25 and 26, 2018.
3. Dr. Shabu B Raj, Faculty, CET & GIFT, spoke on 'Going Deep into Psychology', Date : 30.08. 2018
4. Dr. Manoj AS, Faculty, ICT Academy of Kerala, lectured on ' Interpersonal Relationships', Date : 12.10. 2018

List of Patents Granted

1. Indian Patent No. 299379; K.Y. Sandhya and MuhamedMukthar Ali: Water Soluble Complex of Fullerenes and Process for Preparation Thereof
2. Indian Patent No. 302079; KG Sreejalekshmi and Sarah Titus: Substituted 4-Hydrazinothiazoles and Processes for their Preparation
3. Indian Patent No. 305530; K. Prabhakaran and SujithVijayan: A Method of Preparation of Macroporous Ceramics with Wide Range of Porosities.

Empowered Apex Committee for IIST-ISRO Projects

First Meeting of Empowered Apex Committee for IIST-ISRO Projects was held on 6 August 2018. All members participated in the meeting by video conference mode. Review of ongoing IIST-ISRO projects was carried out and ISRO members requested to forward major research needs from each centre to identify future research activities.

Students Corner

Fellowships and other Laurels

- 1) **Aditya Manuwal**, Masters Student in the Astronomy & Astrophysics program of the Department of Earth & Space Sciences was awarded the International Centre for Radio Astronomy Research's doctoral scholarship and the Scholarships for International Research (SIRF) which enabled him to start his doctoral studies at University of Western Australia.
- 2) **Jayadev Pradeep**, dual degree student of astronomy & astrophysics in the Department of Earth & Space Sciences, was selected for the LEAPS program (Leiden and European Space Agency Astrophysics Program for Summer students), which allowed him to spend three months at Leiden University Netherlands for research.
- 3) **Veena V. S.**, doctoral student in the department won the Alexander von Humboldt postdoctoral fellowship to pursue post-doctoral research at University of Cologne, Germany. She joins in April 2019. She also received K. D. Abhayankar Best Thesis Award at the XXXVII Astronomical Society of India meeting held in Bangalore on Feb 2019.
- 4) **Ameen Yasir**, Research Scholar in the department of physics secured first prize in oral presentation in optical society of India's "International Symposium on Optics" at IIT Kanpur during Sep 19-22, 2018.

Programmes Organised

IEEE Student Branch and Computer Club of IIST organized a workshop on 'Programming in Python' during 23-25 October, 2018. Around 45 students participated in the workshop.



Proud Moment

Honourable Chairman ISRO, Secretary DOS, Dr. K. Sivan is flanked by IIST's Prof. Satish Dhawan Fellowship students Mr. Padmanabha Prasanna Simha of B.Tech (Aerospace Engineering) and Shri. Prashant G Iyer B.Tech (ECE) of the 2014-2018 batch during his visit to Cal Tech, USA in October 2018.

Sports News

ISRO INTER CENTRE SPORTS MEET

ISRO-DOS Inter Centre Sports Meet-2018 for Athletics and Indoor games was held in SDSC SHAR in two phases from 27.08.2018 to 06.09.2018. A Fifteen member sports squad from staff and faculty represented IIST in the Sports Meet.

Dr.Manu K V, Assistant Professor, Dept. of Aerospace Engineering won the **Individual Chess Championship** adding IIST to the points tally.

Fair Play Award: IIST's Bridge team squad comprising of *Shri. Prakash R S, Shri. Girish Kumar K R, Shri. Abhilash S, and Shri. Muhammed Rijas* won the **Fair Play Award in the tournament.**

The Global Pioneer Award by INCOSE for the year 2018

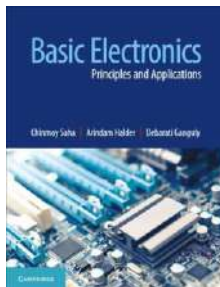
The Global Pioneer Award by International Council for System Engineering (INCOSE) is the highest award, which recognizes outstanding engineer for pioneer-applications of systems engineering in the development of successful products or services for the benefit of the society. For the year 2018, this award was bestowed on Dr. B N Suresh, Chancellor, IIST for his pioneer work in Space Systems Engineering which is the backbone of successful launches by ISRO. He is an outstanding practitioner and researcher in Systems Engineering of Complex Space Systems such as Control, Actuation, Simulation, Test and Launch Vehicle Systems. As a thought leader, he has made significant contributions to Design, Mission planning and R&D Management for the Indian space program. This award was received by him at Washington DC in the annual convention of INCOSE in July 2018, in the presence of more than 1000 delegates from all over the globe.



Dr. B N Suresh, Chancellor, IIST
receiving Global Pioneer Award

Book Published

Dr. Chinmoy Saha, Associate Professor, Department of Avionics along with, A. Halder and D. Ganguly, have published a book on 'Basic Electronics: Principles and Applications', Cambridge University Press, Shaftesbury Road, Cambridge, UK, June'2018 (ISBN: 9781316632932).



Welcome



Dr. YVN Krishna Murthy
Sr. Professor and Registrar
(Former Scientific Secretary, ISRO)
(Former Director, NRSC, IIRS)



Smt. Srividya Parthasarathy
Administrative Officer

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