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Hon'ble Prime Minister Dr. Manmohan Singh visits SAC



Hon'ble Prime Minister of India Dr. Manmohan Singh arrives in New Auditorium of SAC accompanied by Dr. K. Radhakrishnan, Chairman, ISRO & Dr. R. R. Navalgund, Director, SAC.



Honorable Prime Minister, Dr. Manmohan Singh visits SAC



“ India has emerged as a leader in building satellites with versatile features. It is now time to look ahead so that space will be a valuable tool for the welfare of mankind. **”**

Hon'ble Prime Minister of India, Dr. Manmohan Singh, visited the Space Applications Centre, Ahmedabad on Saturday, March 26, 2011. Dr. Manmohan Singh was accompanied by National Security Advisor, Shri Shivsankar Menon, Her Excellency, Governor of Gujarat, Dr. Kamla Benewal and Hon'ble Chief Minister of Gujarat, Shri Narendra Modi and other dignitaries. Dr. K. Radhakrishnan, Chairman, ISRO/Secretary, Department of Space and Dr. R.R. Navalgund, Director, SAC received the Hon'ble Prime Minister at SAC campus.

The Prime Minister first visited the SEDA Clean Room where all the important activities of SAC were showcased. The exhibits included the communication satellite payloads, viz., GSAT-7 and GSAT-10, the Meteorological payloads of INSAT-3D, Chandrayaan-1 cameras, other important subsystems of the RS payloads, sub systems of microwave Remote Sensing payloads. Antenna system developments, important design & development related to Disaster management using SAR data (DMSAR) and the Images obtained from the Indian remote sensing satellites related to Crop acreage, Coral & mangroves mapping, Coastal Regulation Zone (CRZ) map were exhibited. Lunar terrain 3D visualization, Earth surface 3D visualization, weather & Oceanography related information, importance of data processing and its analysis carried out on the images were highlighted.

The Prime Minister evinced keen interest in all the exhibits and interacted with the scientists/Engineers in charge of the payloads/subsystems. An atlas of The Images of the moon acquired by Chandrayaan-1 generated by SAC was presented to



Dr. Radhakrishnan, Chairman, ISRO showing the results of MW components developed at SAC



the Prime Minister by Dr. Navalgund. He interacted with groups of young Scientists and Engineers drawn from different Units and Centres of ISRO related to various facets of space activities including selected members of the ISRO Strategy group in the Multipurpose hall of the New Auditorium at SAC. He also met the members of ISRO council. Later, The Prime Minister addressed the ISRO community from the New Auditorium of the Space Applications Centre. This event was broadcast live through INSAT to all the establishments of ISRO/DOS. In his address he recalled the stellar role played by Dr Vikram Sarabhai and Prof Satish Dhawan, the founding fathers of Indian Space Programme in the formative years. He had special praise for the Space Applications Centre, located at Ahmedabad, the birthplace of Dr. Sarabhai.

He complimented ISRO on Chandrayaan-1, India's Moon mission which led to path breaking scientific discoveries and also kindled the young minds in space science. He also complimented ISRO for its excellent record of 16 successful launches with PSLV placing 44 satellites into orbit out of which 25 were launched for international customers. The Prime Minister also stated that India has emerged as a leader in building satellites with versatile features. It is now time to look ahead so that space will be a valuable tool for the welfare of mankind.

The Prime Minister paid rich tributes to Pandit Jawaharlal Nehru, who, while addressing the Indian Science Congress in 1949, stressed the need for spirit of inquiry and the role of science and technology in the development of the nation. Quoting Dr Sarabhai, the Prime Minister said that technology is not an objective to aim, but is a tool to be used for the benefit of the common man. Prime Minister called upon Scientists and Engineers to make best use of scarce orbital resources by developing high power, flexible and multi beam communication satellites, use of Ka -band in new generation satellites providing people in rural and remote areas to exploit the potential of



Dr. Navalgund, presenting the an Atlas of the Images of the Moon acquired by Chandrayaan-1 generated by SAC



Dr. Navalgund, explaining the complexities of the Payloads



Dr. Navalgund making a point



Dr. Navalgund, Director, SAC introducing the SATCOM Group



satellite based services. He expressed happiness on the efforts towards development of Indian Regional Navigation Satellite System which will enable secure transport, air traffic management and search and rescue operations saving precious human life.

Prime Minister also appreciated the contribution of Indian Remote Sensing satellites in national as well as global resource monitoring and the role of earth observation data from IRS satellites in flagship programmes like NREGA, accelerated benefit irrigation programme and Bharat Nirman. He called upon ISRO to make space based information system more comprehensive by suitably augmenting the space infrastructure for emergency management. He called upon ISRO scientists to work towards reducing the cost of access to space and to expedite the development of heavy lift launchers using advanced propulsion systems like cryogenic stages, recoverable and reusable launch vehicle systems. The role of space based observing systems, development of newer class of environmental monitoring sensors and study of weather related phenomena assumes greater importance in the backdrop of climate change. He stressed the need for mastering newer technologies in the communication satellites towards satellite based internet services which can serve the rural masses.

The Prime Minister expressed optimism that the newly established Indian Institute of Space Science and Technology would attract the best talent available in the country to serve the needs of the country's space programme. Prime Minister assured continued support of the government for the country's space programme and urged ISRO community to rededicate itself to march towards greater heights upholding the highest standards of professionalism, nurturing the spirit of scientific inquiry and striving for greater excellence.



Dr. K. Radhakrishnan, Chairman, ISRO introducing the ISRO Strategy Group



Hon'ble PM addressing the ISRO community



Hon'ble Prime Minister meeting ISRO Council



Her Excellency, Governor of Gujarat, Dr. Kamla Benewal, Hon'ble Chief Minister of Gujarat, Shri Narendra Modi, National Security Advisor, Shri Shivsankar Menon & Dr. K Radhakrishnan, Chairman, ISRO seated on the dias.

Back to the Future



The New Auditorium

A new state-of-the-art Auditorium built in the SAC main campus was inaugurated on January 11, 2011 by Dr K Radhakrishnan, Chairman, ISRO. Coinciding with the inauguration of the new auditorium, a one day programme 'Back to Future' was organised at the Space Applications Centre. Former Directors of SAC & DECU, Prof. E.V. Chitnis, Prof. P.D. Bhavsar, Shri Pramod P. Kale, Dr. George Joseph, Dr. A.K.S. Gopalan, Dr. K.N. Shankara, Shri B.S. Bhatia and Dr. K.S. Dasgupta. Dr. V. Jayaraman, Director, NRSC, also graced the occasion with his presence.

The programme began with the invocation by the SAC choir group formed by a select group of artists within the SAC community. This was followed by a 20 minute multimedia documentary on SAC and DECU produced by DECU especially for the occasion. Dr. Ranganath R Navalgund, Director, SAC welcoming the guests to this historic event at the Space Applications Centre requested the former Directors to give their views on the present activities of the centre to ascertain if it is traversing the direction envisaged by them and sought their guidance for future.

Shri Pramod P Kale, former Director, SAC spoke about the beginning of the SATCOM activities in the Centre with the establishment of ESCES and role of the Centre in development of SATCOM related activities in the country. Dr. K.N. Shankara, former Director, SAC stated that SAC has always been in the forefront of activities in ISRO and the country and should pursue the same line of action in fulfilling the demands of SATCOM and RS payloads. Dr. George Joseph, former Director, SAC speaking on the occasion became nostalgic recalling how a small group started working on the Remote Sensing activities and today we are considered among the top and we are second to none in the field of Satellite Imaging technology. Dr. A.K.S. Gopalan, former Director, SAC spoke about the team work and how the groups complimented each other and highlighted the Data Products



*Dr. K. Radhakrishnan, Chairman, ISRO inaugurating the New Auditorium
(L to R) Dr. Navalgund, Dr. George Joseph, Dr. Radhakrishnan, Prof. E. V. Chitnis & Shri Rajesh Ranjan.*



SAC Directors Seated



Mr. Shantanu Sinha & Smt. Puja Srivastava anchoring the show



Members of SAC choir group



Dr. R R Navalgund welcoming the guests

development activities at the Space Applications Centre. Shri B.S. Bhatia, former Director, DECU speaking on the occasion recalled his experiences of Satellite Instructional Television Experiment (SITE) days. He pointed out how difficult it was to prove to the outside world that the activities of SITE were relevant to the society in general. He appreciated the support Prof. Chitnis rendered whenever needed. Prof. P.D. Bhavsar, former Director, SAC became very nostalgic, took the audience back to the early days of his association with Dr. Vikram Sarabhai his vision, the personality, his motivation and how everyone associated with him were willing to take up any challenge.

Prof. E.V. Chitnis, former Director, SAC and a very close associate of Dr. Vikram Sarabhai also spoke about his association with Dr. Sarabhai. He pointed out how Satellite Instructional Television Experiment (SITE) conceived and its implementation. He highlighted the achievements on both technical and its impact on the society. He also pointed out that DECU has a very important role to play in the present day scenario.

Dr. K. Radhakrishnan, Chairman, ISRO speaking on the occasion credited all the stalwarts as the architects of the modern ISRO and stated that it is only because of their vision, their guidance and the efforts that the organisation has grown up to its present size and commands the respect in the country. He appreciated their capabilities to manage large programmes with limited resources with high precision - a big quality for every one of us to emulate in our day-to-day activities.

On this occasion, Shri Pramod P Kale, released a compilation titled "Satellite Communications In India – Perspectives on Vision to reality." Dr. George Joseph released an atlas titled "Glimpses of Earth Observation- An Indian Experience". Prof. P.D. Bhavsar released a book titled "Harnessing Space Technology for Societal benefits – A Brief history of SAC." and Prof. E.V. Chitnis released an atlas on "Images of the moon Form Chandrayaan-1". The programme concluded with Dr. Namita Priyadarshee, Controller, SAC proposing the vote of thanks.



Shri Pramod P Kale speaking about the Satcom Activities



Dr K N Shankara being felicitated by Dr Navalgund



Dr. George Joseph being felicitated by Dr. Navalgund



Dr A K S Gopalan being felicitated by Dr. Navalgund



Shri B S Bhatia being felicitated by Shri V S Palsule, Director, DECU



Prof. P D Bhavsar being felicitated by Dr. Navalgund



Prof. E V chitnis being felicitated by Dr. Navalgund



Dr K Radhakrishnan, Chairman, ISRO, addressing the gallery



Dr. Namita Priyadarshee, Controller, SAC proposing vote of thanks

Books Released



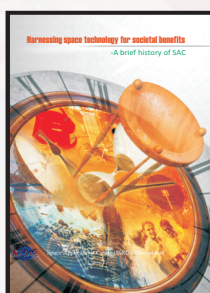
Shri Pramod P Kale, releasing the book
"Satellite Communications In India –
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Prof. E.V. Chitnis releasing the atlas
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Prof. P.D. Bhavsar releasing the book
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benefits – A Brief history of SAC."



Conference on 'SATCOM Technology - Trends & Future Perspectives'

A Conference on 'SATCOM Technology - Trends & Future Perspectives' was organised in the New Auditorium of the Space Applications Centre on January 12, 2011. The conference was jointly organised by Space Applications Centre and Antrix Corporation. A large number of Scientist/Engineers associated with the SATCOM activities of the organisation from different centres attended the conference. The past Directors of SAC, Prof. E. V. Chitnis, Prof. P.D. Bhavsar, Shri Pramod P. Kale, Dr. George Joseph, Dr. A.K.S. Gopalan, and Dr. K.N. Shankara, who were present in the Centre for the inauguration of the New Auditorium, also participated in the conference.

The conference was formally inaugurated by Shri A.S. Kiran Kumar, Associate Director, SAC. Dr. K.S. Dasgupta, Director, IIST welcomed the participants to the conference. Mr. N. Neelakantan, Director, SCNP, began the proceedings with an illustrative presentation detailing the future SATCOM programmes of ISRO. Presentations on topics such as; Mapping Market Demand to Satellite Design, Communications satellites market trends, Connecting the Other 3 Billion, An overview of Astrium's payload activities, Future Satellite Markets and Satellite Broadband in North America were presented by speakers from various MNCs including speakers from abroad.

Mr. K. Sudhakar of BSNL made a presentation on Satellite-Technology: BSNL's Applications. Mr. Sumitesh Sarkar of Space Applications Centre presented the details of the Advance Communications Satellite, GSAT-11 and beyond.

The panel discussions were chaired by former Directors of SAC Mr. Pramod P Kale, and Dr. K.N. Shankara. Prof. E.V. Chitnis, former Director, SAC and a very close associate of Dr. Vikram Sarabhai credited the Engineers of ISRO and SAC in particular and expressed his satisfaction that the directions of the SATCOM activities of ISRO are on the direction Dr. Sarabhai dreamt of. The lively deliberations of the Conference benefited the participants. The conference was open to all the scientists of the SATCOM and Navigation Payload and Applications area of SAC.



Mr. N. Neelakantan, Director, SCNP, presenting SATCOM programmes of ISRO.



Mr. Prashant Butani, Senior Analyst, NSR delivering a talk during the conference

GSAT-8 Communication and Navigation Payloads

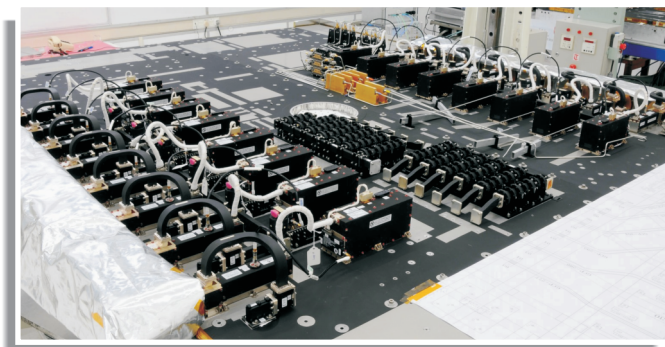
In order to provide user services with a cost-effective terminal the requirement of Communication Payload with higher capacity and power is growing exponentially. With INSAT-4B and 4CR already in orbit, the Ku-band capacity will be further augmented with the launch of ISRO's GSAT-8 spacecraft from Kourou, French Guiana by Ariane-5 launcher in May 2011. Additionally, the Navigation Payload of GSAT-8 will help in meeting the demand for precision position information and landing requirements of aircrafts with the considerable increase in Air Traffic witnessed in recent years.

GSAT-8 Spacecraft, based on an I3K Bus with a liftoff mass of 3,150 kg, is designed for a mission life of 12 years. Operating with a payload power of 5,300 Watts, the satellite will be located at an orbital position of 55 deg. East longitude following its deployment by Ariane 5. The Spacecraft structure is configured around CFRP central cylinder with radial shear frames. Two separate payload panels on the North and South faces accommodate the majority of communication payload elements like TWTA, SSPA, Multiplexers / demultiplexers, filters etc. while, the other panels house the spacecraft subsystems. The Attitude and orbit control system for GSAT-8 uses body stabilized biased momentum system with momentum / transverse momentum wheel for synchronous orbit operation and reaction control thrusters for transfer orbit operation. Telemetry and Tele-command systems, operating in C-Band with Ku-band back-up telemetry.

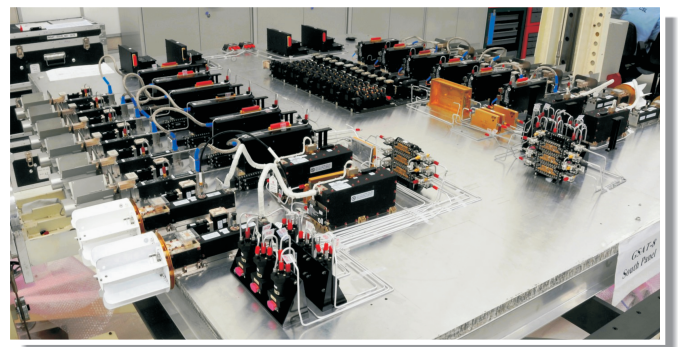
Payload Configuration and Operation:

GSAT-8 (INSAT-4G) carries Ku-Band communication payload for Fixed Satellite Services along with Geo-Augmentation for GPS Aided Geo Augmented Navigation (GAGAN-2) Payload. Out of 24 Ku-band transponders, 12 will provide high power coverage to Andaman & Nicobar Islands for the first time. Two Ku-band beacon transmitters separated by 1 MHz in frequency and having orthogonal polarization are used for easy tracking of Ku-Band Ground Antennae. The Ku-band payload makes use of polarization sensitive dual gridded shaped deployable reflectors (DGR) of 2.2 m diameter with offset feed assembly. GAGAN-2 payload with specifications similar to GAGAN-1 consists of 2 CxL-band transponders-L1&L5 having C-band reflector of 0.6m diameter with a prime focal feed. Ku-band receivers in both payloads and GAGAN SSPAs have 2:1 redundancy while 8:6 redundancies are used for 140W LTWTAs. The total capacity in Ku-Band will be 960 MHz with usable bandwidth of 36 MHz for each channel. The mass of total payload elements including antenna subsystem is 300 kg and the total DC power required is 5300 watts.

The DGR antenna is designed at SAC and fabricated by VSSC and will fly for the first time on GSAT-8 making this a completely indigenous development. Six out of Eight receivers and twenty eight out of thirty two Driver amplifiers are MMIC based. The Normal Ku-band receivers have the provision of a LNA output port which serves as input to the two lower Ku-band converters (fabricated using MIC technology). The Driver Amplifiers employ



North Panel



South Panel

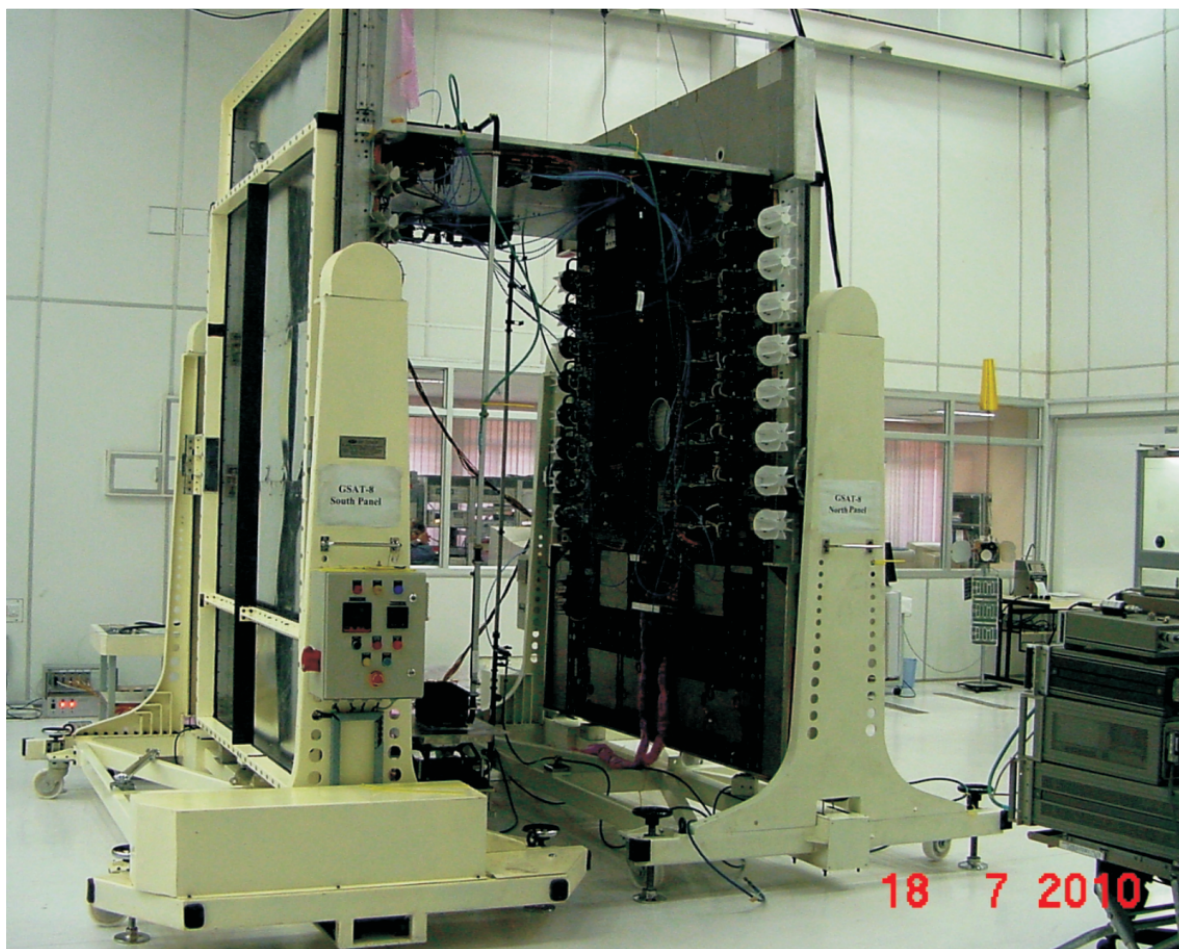


Automatic Level Control (ALC) to take care of the varying input signal conditions (e.g. rain fade). The Dielectric resonator based input multiplexers, flown earlier in C-band GEOSAT payloads, is now qualified at Ku-band also and is being used for the first time in GSAT- Ku-band payload. The C-band uplink from Indian Land Uplink Station (INLUS) to the GAGAN-2 payload is down converted to a suitable IF and subsequently channelized into L1 & L5 bands using IF SAW filters and IF to L-band Up converters. The

Parameters	Ku-band Payload Requirements	GAGAN-2 Payload Requirements
Operating Frequency	Receive: 13.75-14.5 GHz Transmit: 10.95-11.2 GHz 11.45-11.7 GHz 12.5-12.75 GHz	Receive : 6676.45 MHz & 6715.42 MHz Transmit : 1176.45 MHz & 1575.42 MHz
No. of Transponders and Bandwidth	24 Ku-Band of 36 MHz each	2 (CxL-band -L1 & L5) 24 MHz & 20 MHz (CxL)
Polarization	Receive : LP H/V Transmit : LP V/H	Receive : Linear-Vertical Transmit : RHCP (CxL)
Saturation Flux Density	-96 dBW/m ²	-92 +/- 2 dBW/m ²
EIRP (EOC)	52dBW (51dBW-Andaman & Nicobar)	>30.2 dBW
G/T (EOC)	+ 3 dB/K (+ 2 dB/K – A&N)	-5 dB/K

Table-1: GSAT-8 Payloads Specifications

Tri-Panel Assembly



-Courtesy inputs from Shri Surinder Singh & Project team, SNPA,
-Edited by : Nilesh M. Desai



Meteorological Payloads for INSAT 3D

The next generation Meteorological Payloads of INSAT-3D, the next ISRO meteorological satellite aims for a significant technological improvement in sensor capabilities as compared to earlier INSAT missions. The three-axis stabilized geostationary satellite will carry two meteorological instruments: a six channel IMAGER and an 18 IR channel SOUNDER. Along with the channels in Visible, Middle Infrared, Water Vapor and Thermal Infrared bands, the Imager includes a SWIR channel for wider applications. The Sounder will have eighteen narrow spectral channels in three IR bands in addition to a channel in visible band. INSAT-3D is configured around standard 2000 kg I2K spacecraft bus with 7-year life.

There are stringent payloads pointing requirements, which the Attitude & Orbit Control System (AOCS) has to provide. The payload short term and long term stability are required to be 2 visible pixels ($56\mu R$) and 4 visible pixels ($112\mu R$) for navigation. These requirements are met by providing compensation to scan mirror servo in terms of Mirror Motion Compensation (MMC) and Image Motion Compensation (IMC). The algorithms for these compensations are stored in control electronics, errors are computed and real-time corrections are carried out.

Imager: The Imager is a six-channel (one visible, five infrared) imaging radiometer designed to sense radiant and solar reflected energy from sampled areas of the earth. With more number of spectral channels and improved ground resolution, Imager can be

considered an enhanced version of Very High Resolution Radiometer (VHRR), the five indigenous instruments flown on INSAT 2A through INSAT 3A satellites and on Kalpana-1.

Imager uses a scan mirror mounted on two-axes gimbals for scanning the earth disk. The ground resolution at nadir varies from 1 km for Visible and SWIR channels to 8 km for a channel in Water Vapor band. A flexible scan pattern allows tradeoff between the coverage and the imaging periodicity. The instrument is capable of generating full earth disk image in 26 minutes. Table-1 lists salient instrument characteristics.

The incoming radiation is reflected on to a 310 mm aperture telescope by a Silicon Carbide scan mirror mounted at 45° to the optical axis of the telescope. The optical system includes a specially designed beam splitting assembly for efficiently steering radiant energy simultaneously to respective band focal planes. Eight visible detectors are operated at an ambient temperature of about $25^\circ C \pm 10^\circ C$ while the eight detectors of SWIR channel are maintained at a constant temperature, selectable between $15^\circ C$ to $25^\circ C$ during the imaging period. MIR, WV and TIR detectors are maintained at cryogenic temperature of 100K (Max.) through passive radiant cooler and close loop heater control. Complete cold redundancy for all the detectors along with processing electronics is provided.

During non-imaging period, the scan mirror is kept at its reset position, ready to initiate scanning. The location of reset position depends on the pre-selected scan mode (full disk/program), as well as east west (fast scan) and north south (slow scan) offsets. On receipt of scan start command from ground, mirror drive mechanism initiates scan. The scan pattern consists of west-east (fast-scan) movement for 18° at the rate of $20^\circ/s$ (optical). At the end of this fast scan line, the mirror steps to south by $224\mu R$ and initiates east west scan again at $20^\circ/s$. The time taken for a fast scan line including south (slow scan) stepping is 1.1 s. The mirror traverses to an internal blackbody view at the end of each imaging operation, or immediately on receipt of a specific command for blackbody calibration any time during non-imaging period. The blackbody calibration sequence --both automatic and commanded-- includes pre and post calibration space looks to improve calibration accuracy. Figure 1 depicts the scanning geometry of INSAT-3D Imager for full disk and program mode in

Telescope Aperture	310 mm Φ
Number of Channels	6
IFOV	28 μR VIS & SWIR (1 km) 112 μR MIR, TIR1 & TIR2 (4 km) 224 μR WV (8 km)
Scan Rate	20 $^\circ/s$ (optical) + 0.2 s turn around
Radiometric Performance [NEDT (K)@300K scene] / SNR	MIR: 1.4, WV: 1, TIR 1&2: 0.35 SNR: Vis & SWIR > 150
Signal Quantization	10 Bits/Sample
In-flight Calibration	Full Aperture Blackbody and Space view
Down Link Data Rate	3.92 M Bits/s

Table 1: Imager Characteristics

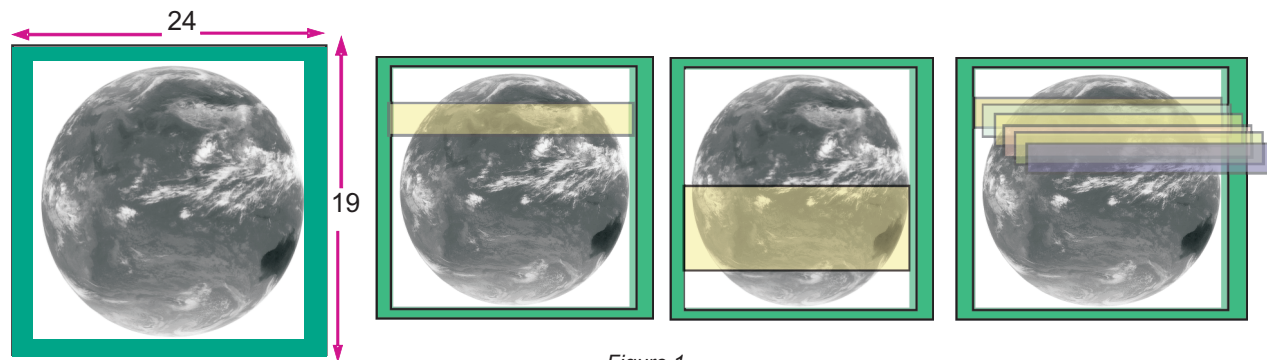


Figure 1

reference to FOR Motion of the scan mirror of companion payload, Sounder, causes a small but well-defined disturbance of spacecraft attitude. Effect of this disturbance on the pointing of Imager scan mirror is calculated in real time by spacecraft Attitude and Orbit Control System (AOCS) and a correction signal is sent to the Imager scan mechanism electronics. The AOCS also provides compensation signals that correct the scan mirror pointing for expected spacecraft attitude and orbital effects. It is planned that the expected attitude and orbital disturbance as a function of orbit position for next 24 hours will be computed on ground and corresponding correction parameters will be uploaded to AOCS. This scheme for real time correction of mirror pointing errors is expected to reduce time required to process received imagery on ground and to make both companion payloads independent of each other. Provision in the design exists to disable the correction scheme through ground command.

The INSAT-3D Imager consists of an Electro-optics (EO) module and a set of electronics packages including power-supply modules. A simplified block schematic of the instrument is shown in figure 2. The EO module, containing the telescope, scan assembly, and detectors along with cooler, is mounted external to the spacecraft. The electronics packages are mounted on an internal panel of the spacecraft. The complete Payload weighs approximately 130 kg.

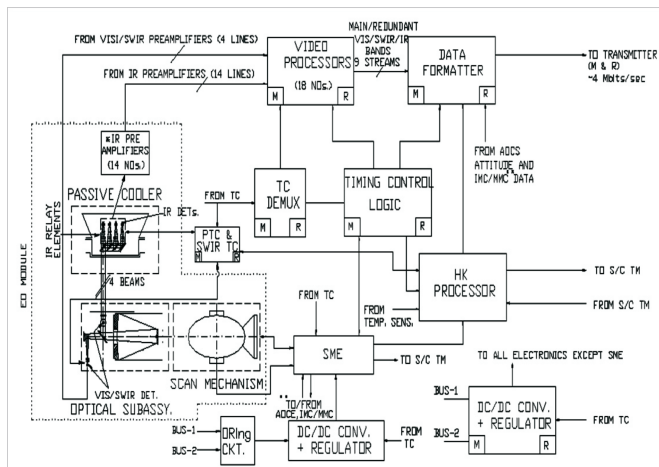
Sounder: The INSAT-3D Sounder is an IR radiometer that senses specific parameters for atmospheric vertical temperature and moisture profiles, surface and cloud top temperature, and ozone distribution. It is the first such instrument being developed by ISRO. INSAT-3D Sounder measures radiation in nineteen discrete spectral channels. Out of the nineteen channels, eighteen narrow channels are distributed over three IR bands (seven long-wave

(LW), five mid-wave (MW), six short-wave (SW)), while one is a broad visible channel. The sounding is carried out over 10 X 40km area at a time. Its scan profile is completely programmable for trading coverage v/s frequency of observations. Like Imager, the spectral channels of INSAT 3D Sounder are very similar to those of NOAA GOES Sounder instruments. Being in GEO, Sounder provides Sounding opportunity on 24x7 basis over a wide area.

The Sounder measures radiance in eighteen IR and one visible channel simultaneously over an area of 10 X 40km at nadir every 100ms. Using two-axes gimbaled scan mirror, this footprint can be positioned anywhere on the earth disk. Program mode of scanning allows sequential sounding of selected area with periodic space and calibration looks. In this mode a 'frame' consisting of multiple 'Blocks' of the size 640kmx640km can be

Number of Channels	19
NEdT (K)	LWIR: 0.15 to 1.5, MWIR: 0.15 to 0.2, SWIR: 0.15
Instantaneous Field of View	280 μ rad (E-W) x 280 μ rad (N-S) (10 km x 10 km)
Signal Quantization	12 Bits/Sample for Vis, LWIR & SWIR, 14 bits/sample for MWIR
FOR	24° E-W x 21°N-S
Space Look	Every ~ 2 minutes (1216 FW revolutions)
In-flight Calibration	Full Aperture Blackbody and Space view
Down Link Data Rate	40K Bits/Sec
System Power	< 100 Watts
System Weight	153 Kg

Table-2 Salient instrument characteristics of Sounder

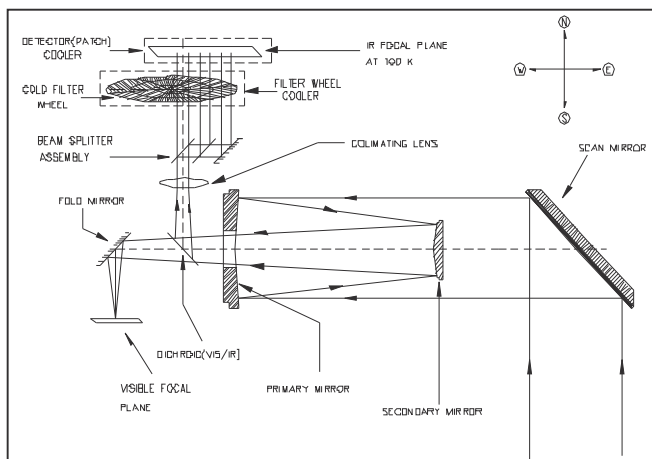


Block Schematic of Imager



IMAGER EO Module

Figure 2



Sounder Optics Schematic



Sounder EO Module

Figure 3

sounded. The selected frame can be placed anywhere in 24° (E-W) $\times$ 19° (N-S) FOR. It takes almost three hours to sound a 6400×6400 km area. As with Imager, Sounder provides adequate radiometric resolution for intended science application. A flat elliptical scan mirror with a major axis of approximately 515 mm mounted at 45° to the optical axis intercepts the incoming radiation and reflects it onto the 310 mm reflective telescope. At the telescope, the dichroic beam splitter separates the visible spectrum and three coarse IR bands. These three IR bands are called the Long Wave IR (LWIR), Medium Wave IR (MWIR) and the Short Wave IR (SWIR). They pass through three concentric rings of a cold filter wheel maintained at a constant low temperature (~ 210 K) to limit the background radiation. Each ring is further divided into a number of sectors each housing a filter for a channel. Detector array has four elements arranged in North-South direction for each band having $280 \mu\text{rad}$ IFOV. Hence the

combined IFOV in North South direction is $1120 \mu\text{rad}$. The IR detectors mounted inside the radiant cooler are maintained at a temperature of 95 K for improved noise performance.

Like the Imager, Sounder consists of an Electro-optics (EO) module and a set of electronics packages including power-supply modules. The EO module, containing the telescope, scan assembly, Filter wheel and its cooler and detectors along with their cooler, is mounted external to the spacecraft. The electronics packages that provide circuitry for signal processing functions, scan mirror control, power supply and other auxiliary functions are mounted on an internal panel of the spacecraft. The instrument weighs around 145 kg.

-Courtesy inputs from Shri K.N. Mankad
knmankad@sac.isro.gov.in
_Edited by Priya R

INSAT-3D Meteorological Payloads

INSAT-3D IMAGER and SOUNDER, Meteorological Payloads, were flagged off to ISITE, Bengaluru, on January 11, 2011 by Dr. K. Radhakrishnan, Chairman, ISRO after successful completion of T&E and PSR. It was a historic moment at the Space Applications Centre. The past Directors of SAC, Prof. E. V. Chitnis, Prof. P.D. Bhavsar, Shri Pramod P. Kale, Dr. George Joseph, Dr. A.K.S. Gopalan, Dr. K.N. Shankara, former DECU Directors, Shri B.S. Bhatia, Dr. K.S. Dasgupta and Director, NRSC, Dr. V. Jayaraman, were present in the Centre during the inauguration of the New Auditorium, witnessed the flag off. Dr.

R.R. Navalgund, Director, SAC, Shri A.S. Kirankumar, Associate Director, SAC and Shri V.S. Palsule, Director, DECU were also present on the occasion.

Shri R.K. Dave, Deputy Director, Systems Reliability Area handed over the T&E certificate to Shri S. C. Rastogi, Project Director, INSAT 3D. Shri K.N. Mankad, APD, INSAT-3D Payloads handed over the documents containing the complete data package, circuit diagrams, electrical, mechanical and thermal interface details and the test results to the Project Director.



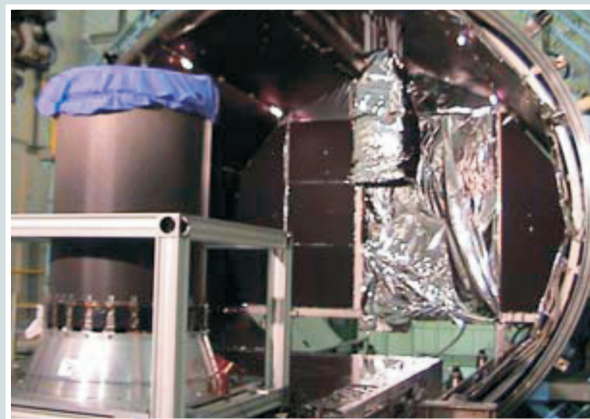
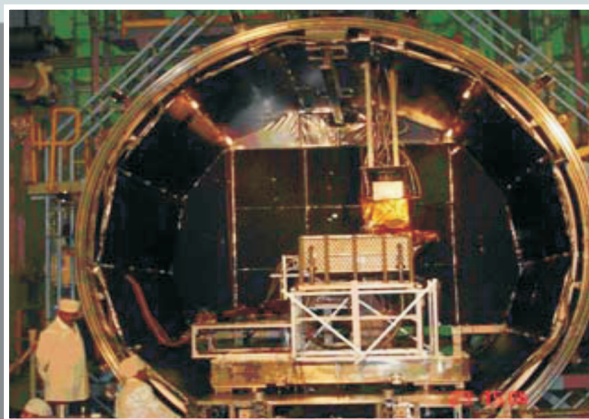
Dr. K. Radhakrishnan, Chairman ISRO flagging off the INSAT-3D Met. Payloads.



Former SAC Director : Dr. A.K.S. Gopalan, Dr. K.N. Shankara, Shri Pramod Kale, Prof. E.V. Chitnis along with Dr. K. Radhakrishnan & Dr. K.S. Dasgupta during the flag off ceremony

Largest Thermovac Chamber of SAC completes 10,000 Test Hours

5.5m Thermovac System the largest Thermovac Chamber of SAC crosses 10,000 test hours & 50 tests on various integrated payloads developed at SAC since its commissioning in 2002



हिंदी तकनीकी सेमिनार 2011

अंतरिक्ष उपयोग केंद्र (इसरो) में 25 फरवरी 2011 को ग्रहीय अन्वेषण को विशेष महत्व देते हुए अंतरिक्ष प्रौद्योगिकी एवं उपयोग विषय पर एक दिवसीय तकनीकी हिंदी सेमिनार का आयोजन किया गया। इस सेमिनार का उद्घाटन सत्र प्रातः 0930 बजे रखा गया। कार्यक्रम का प्रारंभ सैक के ध्वनि समूह द्वारा ईश्वर वंदना से किया गया। सभी महानुभावों का पुष्प गुच्छ से स्वागत किया गया। केंद्र की नियंत्रक डॉ. नमिता प्रियदर्शी ने मंच पर उपस्थित महानुभावों का स्वागत किया और केंद्र द्वारा राजभाषा के कार्यान्वयन के अंतर्गत अंतरिक्ष कार्यक्रमों को जन-मानस एवं विद्यार्थियों तक पहुँचाने संबंधी योजना की जानकारी दी। उन्होंने कहा कि केंद्र का सदैव यह प्रयास रहा है कि हम अपनी भाषा में जन-मानस तक अंतरिक्ष कार्यक्रमों की जानकारीयों पहुँचाएं। इसी अनुक्रम में विगत वर्षों में हमने इस प्रकार के सेमिनारों में विभिन्न विश्वविद्यालयों, गैर सरकारी संगठनों इत्यादि को भी शामिल किया है। गत वर्ष हमने अहमदाबाद शहर के विभिन्न पब्लिक एवं म्युनिसिपल स्कूलों के विद्यार्थियों को इस कार्यक्रम में आमंत्रित किया एवं उन्हें अंतरिक्ष विज्ञान के विभिन्न कार्यक्रमों के संबंध में जानकारी प्रदान की। अब हमारा प्रयास है कि जिला स्तर पर विशेषतया राज्य के पिछड़े इलाके के बच्चों को अंतरिक्ष कार्यक्रमों के बारे में हम जानकारी उपलब्ध कराएं।



ईश वंदना करते हुए सैक का ध्वनि गुप



वक्तव्य प्रस्तुत करते हुए मुख्य अतिथि श्री आर.एन. त्रिपाठी

मंच पर उपस्थित सभी महानुभावों द्वारा दीप प्रज्जवलित कर कार्यक्रम का शुभारंभ किया गया। कार्यक्रम के मुख्य अतिथि श्री आर.एन. त्रिपाठी, आईआरएस, मुख्य आयकर आयुक्त, आयकर कार्यालय, अमहादाबाद एवं अध्यक्ष, नगर राजभाषा कार्यान्वयन समिति थे। श्रीमती नीलू सेठ, हिन्दी अधिकारी द्वारा अतिथि परिचय दिया गया। मुख्य अतिथि ने अपने वक्तव्य में कहा कि हिंदी भारत में सबसे अधिक बोली एवं समझी जाने वाली भाषा है। हम बोलचाल की भाषा एवं मनोरंजन के साधन के रूप में तो हिन्दी भाषा का प्रयोग करते हैं, किंतु कार्यालयीन कार्य राजभाषा हिन्दी में करने से झिझकते हैं। किंतु यदि हम यह संकल्प लें कि कार्यालयीन कार्य के लिए हमारी लेखनी मात्र हिन्दी लिखने के लिए ही उठेगी तो हम शत-प्रतिशत कार्यालयीन कार्य हिन्दी में करने में सक्षम हो सकेंगे। उन्होंने यह भी कहा कि मैंने यह तय किया है कि मेरी लेखनी यदि चलेगी तो बस हिन्दी में ही चलेगी।

कार्यक्रम की अध्यक्षता श्री ए.एस. किरणकुमार, सह निदेशक, सैक ने की। उन्होंने अपने वक्तव्य में कहा कि हमारे कार्यालय में वैज्ञानिक एवं तकनीकी प्रकृति के कार्य संपन्न होते हैं और इन कार्यों के लिए वर्षों से अंग्रेजी का प्रयोग होता रहा है। किंतु अब स्थिति बदल रही है। हमारे युवा वैज्ञानिक अपने तकनीकी प्रकृति के कार्यों में राजभाषा हिन्दी के प्रयोग को बढ़ा रहे हैं और तकनीकी हिन्दी संगोष्ठियों का आयोजन इसी दिशा में महत्वपूर्ण कदम है। इस वर्ष आयोजित की जा रही संगोष्ठी का विषय इसरो के कार्यक्रमों का अगला लक्ष्य है। ग्रहीय अन्वेषण का प्रारंभ हम चंद्रयान-1 अभियान के द्वारा पहले ही कर चुके हैं। हमारी प्राथमिकताओं में अब अन्य ग्रहीय मिशन भी हैं।

यह संगोष्ठी हमारे लक्ष्य निर्धारण, अनुसंधान एवं समाधान की दिशा में हमारा मार्गदर्शन करेगी।



सभा को संबोधित करते हुए श्री ए.एस. किरणकुमार

श्री विलास पलसुले, निदेशक, डेक् ने मुख्य भाषण दिया । उन्होंने कहा कि ग्रहीय अन्वेषण करने की इच्छा मानव हृदय में सृष्टि के प्रारंभ से ही रही है । किंतु अंतरिक्ष प्रौद्योगिकी एवं उपयोग के क्षेत्र में वैज्ञानिक प्रगति के साथ-साथ हम ग्रहीय अन्वेषण को विशेष महत्व दे रहे हैं । कार्यक्रम के दौरान संगोष्ठी में प्रस्तुत किए जाने वाले 31 लेखों के लेख संग्रह का विमोचन श्री आर.एन. त्रिपाठी जी द्वारा किया गया ।

कार्यक्रम के दौरान मंच संचालन श्री सी.एन. लाल, सदस्य, राजभाषा कार्यान्वयन समिति द्वारा किया गया । उद्घाटन समारोह के अंत में केंद्र के वरिष्ठ हिन्दी अधिकारी श्री बी.आर. राजपूत ने धन्यवाद ज्ञापित किया । इस संगोष्ठी के दौरान पूरे दिन में 6 सत्रों - सुदूर संवेदन-नीतभार, संचार उपग्रह-नीतभार, सुदूर संवेदन उपयोग, चंद्रयान एवं अंतरग्रहीय अन्वेषण, संचार नीतभार तकनीक, सामाजिक उपयोग के अंतर्गत निम्नलिखित 31 लेख प्रस्तुत किए गए । ये सभी लेख सरल हिन्दी भाषा में अत्यंत ज्ञानप्रद रूप से प्रस्तुत किए गए । सेमिनार के अंत में पैनल चर्चा एवं पुरस्कार तथा प्रमाणपत्र विवरण कार्यक्रम आयोजित किया गया । पैनल चर्चा के दौरान सभी सत्राध्यक्षों- डॉ. अजय, श्री डी. बालासुब्रमण्यम, डॉ. पी.के. पाल, श्री अरूप राय चौधरी, श्री वी. रामकृष्णा एवं सुश्री हंसा जोषी ने प्रस्तुत किए गए लेखों की समीक्षा की और उपयोगी सुझाव दिए ।



कार्यक्रम के अंत में डॉ. रं.रा. नवलगुंद, निदेशक, सैक ने अपनी महती उपस्थिति से लेखकों को प्रोत्साहित किया एवं सभी लेखकों को पुरस्कार एवं प्रमाणपत्र प्रदान किए । संगोष्ठी के दौरान श्री एल.बी. कुशवाह, श्री वी.के. जैन, डॉ. राजकुमार एवं श्री आर.के. गोयल ने निर्णायक की भूमिका निभाई । विक्रम हॉल के मेन लेक्चर हॉल में आयोजित सत्र 1, 3, एवं 5 में प्रस्तुत लेखों में से निम्नलिखित लेखों को पुरस्कृत किया गया-

क्र.सं.	लेख का शीर्षक	लेखक का नाम	पुरस्कार
1.	सुदूर संवेदी आंकड़ों द्वारा भारतीय वनों के पर्णक्षेत्र घातांक का अध्ययन	आभा एवं सुष्मा पाणिग्रही	प्रथम
2.	उपग्रहों और ग्रहों के अन्वेषण में फुलने वाली (इनफ्लेटेबल) संरचनाओं का अनुप्रयोग	कृपा शंकर सिंह, ए.सी. माथुर	द्वितीय
3.	सीबहुसंकेतक (निर्गत) चैनल आउटपुट 12 बैंड-समुच्चय के तापीय संरचनात्मक विश्लेषण	राकेश आरप्रशांतो /भावसार . यौवन दवे/दास	तृतीय

विक्रम हॉल के सेमिनार हॉल में आयोजित सत्र 2, 4, एवं 6 में प्रस्तुत लेखों में से निम्नलिखित लेखों को पुरस्कृत किया गया-

क्र.सं.	लेख का शीर्षक	लेखक का नाम	पुरस्कार
1.	चंद्रयान-1 के द्वारा प्राप्त सुदूर संवेदन आंकड़ों से चन्द्रमा के खनिज तत्वों का अध्ययन	डॉ. प्रकाश चौहान	प्रथम
2.	बहुकिरणपुंज भूस्थिर उपग्रहों के लिए ऐंटेना अभिलक्षण त्रुटियों का अध्ययन	राजेश सिंह, नेहा एवं डी .के. सिंह	द्वितीय
3.	अंतरिक्ष में जनहित एवं ग्रहीय अन्वेषण हेतु उपग्रहों का तापीय परिवेश	कमलेश कुमार बराया	तृतीय

अंत में श्री बी.आर. राजपूत, वरिष्ठ हिन्दी अधिकारी के धन्यवाद ज्ञापन के साथ कार्यक्रम समाप्त हुआ ।

हिंदी कार्यशाला - 25 जनवरी 2011 की रिपोर्ट

राजभाषा विभाग द्वारा जारी वार्षिक कार्यक्रम में हिंदी कार्यशाला हेतु निर्धारित लक्ष्य के अनुसार अंतरिक्ष उपयोग केंद्र में राजभाषा हिंदी के प्रयोग में वृद्धि करने तथा स्टाफ सदस्यों को राजभाषा नीति की जानकारी प्रदान करने के उद्देश्य से राजभाषा कार्यशाला का आयोजन 25 जनवरी 2011 को किया गया। इस एक दिवसीय कार्यशाला में वरिष्ठ परियोजना सहायक, परियोजना वैयक्तिक सचिव एवं वरिष्ठ वैयक्तिक सचिव स्तर के 35 स्टाफ सदस्यों एवं पीआरएल के 3 स्टाफ सदस्यों ने भाग लिया।

श्रीमती नीलू सेठ ने कार्यशाला में सभी का स्वागत किया तथा श्री एम.एन.मुदकवि, प्रधान, लेखा एवं आ.वि.स. ने हिंदी कार्यशाला का उद्घाटन किया और अपने संबोधन में नामित प्रतिभागियों को हिंदी में कार्य हेतु प्रोत्साहित किया।

कार्यशाला के दौरान स्टाफ सदस्यों के लिए राजभाषा नीति, हिंदी पत्राचार, टिप्पणी लेखन एवं कंप्यूटर पर हिंदी में कार्य करने के लिए उपलब्ध सॉफ्टवेयर तथा उनके उपयोग संबंधी विषयों पर कक्षाओं का आयोजन किया गया। प्रतिभागियों को कंप्यूटर में हिंदी युनिकोड को सक्रिय करने और कार्य करने के संबंध में विस्तार से बताया गया। अधिकारियों को स्वराधारित रोमन कुंजीपटल के प्रयोग से कंप्यूटर पर हिंदी में कार्य करने की सरल विधि के बारे में भी अवगत कराया गया।

सरकारी कामकाज में हिंदी के प्रयोग को बढ़ाने में उनके योगदान तथा धन्यवाद ज्ञापन के साथ कार्यक्रम संपन्न हुआ।

NOSTALGIA



At the ARVI Antenna installation site Shri Ramaswamy, a expert in antenna alignment shares a lighter moment with Shri N.C. Bhavsar



Prof. Satish Dhawan, Chairman, ISRO Inaugurating the Vikram Hall. While Prof. Yash Pal, Director, SAC lights the lamp.

ISRO launches new version of IGIS, image and vector-data processing software

Space Application Centre along with its joint venture partner Scanpoint Geomatics Limited launched the latest version of IGIS, India's first indigenous integrated GIS image processing software. The up dated version 1.1 (IGIS V 1.1) was released by Dr. R R Navalgund, Director, SAC on January 27, 2011 at a function held at the Ahmedabad Management Association, at Ahmedabad. Speaking on this occasion Dr. Navalgund, Director, SAC said that IGIS is a software which is indigenously developed catering to the needs of our own satellite data and is available at a low cost to academic institutions. He congratulated the team and added that he would look forward to an advanced version which will also provide solutions for microwave remote-sensing. It would be useful for all natural resources like crop production in India, ground water availability, change in water levels of reservoirs etc. The IGIS 1.1 version offers multi-criteria and multi-objective evaluation techniques with decision alternatives. The product also includes image processing tools for automated feature extraction, object segmentation, change detection and time series analysis.



L to R : Mrs. Geeta Vardhan, Mr. Ravi Saxena, Dr. Navalgund, Director, SAC, Mr. R. Sojitra & Mr. A.R. Dasgupta of Scanpoint Geomatics

SNPA, SNAA & ESSA Areas of SAC Reorganised

SATCOM and Navigation Payload Area (SNPA) is reorganised into three groups viz., SATCOM & Navigation Systems Engineering, Integration and Checkout Group (SNSICG), RF Systems Group (RFSG) and Optical & Digital Communication Group (ODCG).

SATCOM and Navigation Applications Area (SNAA) is reorganised into three groups comprising of: Digital Communication and Technology Group (DCTG), Satcom Systems Technology Group (SSTG), Operational Experiments & Capacity building Group (OECG).

Electronics Support Services Area (ESSA) is reorganised into three groups comprising of: Micro-Electronics Group (MEG), Electronic Fabrication and Maintenance Group (EFMG) and Environmental test Systems group (EnTSG).

Shri V.S. Palsule, Deputy Director, SNAA / SAC takes over Directorship of DECU



Shri V.S. Palsule joined SAC on June 1, 1979 after completing ME in Communication systems. He began his career with design & development of Spread Spectrum Communication Systems for Apple Utilisation Programme in the Digital Communication Division of Satellite Communications Area. Later he was associated with the development of various CDMA systems for defence and was Project Manager of PSSMA project (1989). As a Team leader for defining MSS system was responsible for realization of end to end MSS Type C system for messaging (1996).

He became Head, ACTD / SITAA in 2000. He was also Associate Project Director, EDUSAT R & D and later he was Project Director for EDUSAT Ground Systems (2003). He was also Associate Project Director, IRNSS Critical Technologies (2006). He became Group Director, ADTCG / SITAA in 2008 and became Deputy Director, Satellite & Navigation Applications Area in March 2010. He assumed charge as Director, DECU in Oct 2010.

SAC Courier congratulates him and wishes many more laurels in his career.

Republic Day Celebration

Republic day was celebrated in SAC Main campus on January 26, 2011. Dr. R.R. Navalgund, Director, SAC unfurled the National flag. Speaking on the occasion Dr. Navalgund highlighted the achievements of the organisation and the Centre in particular. He pointed out that there are many more challenges in the coming years to be completed timely with precision and ingenuity. Dr. Navalgund appreciated the overall performance of the centre including in the implementation of the official language in the Centre. A large number of employees and their family members participated in the celebrations.

A special programme was organised in the New Auditorium which included the screening of documentary film 'Back to Future' of SAC & DECU compiled and produced by DECU was screened for the benefit of the SAC family members. This was followed by the Children's award to the meritorious students of SAC & DECU who had scored highest marks in X & XII CBSE/ICSE & state board exams during the academic year 2009-2010. The prizes were given away by Director, SAC.

Director, SAC also presented the Excellence Awards to the Administrative staff for their meritorious services. Dr. Namita Priyadarshree, Controller, SAC gave away the prizes for the official language implementation in the Centre. Winners of the Mini Marathon organised by the SAC Sports Council were also awarded prizes by Director, SAC.

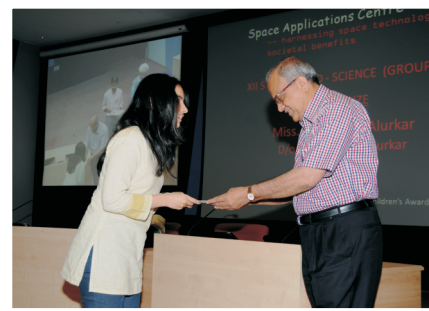
A New RESIPA building at the Bopal campus was inaugurated by Director, SAC. The building will cater to the demands of EPSA and SIPA.



SAC choir group singing patriotic songs on the eve of Republic Day celebrations



New RESIPA Building at Bopal campus



Director SAC presenting the Meritorious award

'Retrospect 2010 – Prospect 2011'

'Retrospect 2010 – Prospect 2011' was organised on Dec 31, 2010 to summarise the achievements and to review the proposed area activities for the year 2011. Deputy Directors of the concerned areas presented the accomplishments and plans. The programme was a rare opportunity for the Scientists/Engineers, Technicians and the Administrative staff of SAC to know about the activities being carried, the achievements and also got a glimpse of what is in the offing.

SAC organizes OCEANSAT-2 AO Science Meet

The Science Meeting of OCEANSAT-2 Announcement of Opportunity Principal Investigators was held at SAC, Bopal Campus during March 23-25, 2011. During the deliberations, presentations were made by International AO PIs and National PIs/CIs, besides the Oceansat-2 Utilisation Project Functionaries on Sensors, Data Products, Retrievals, CAL-VAL, Applications and Value-Additions. This was followed by detailed discussion on data dissemination issues. The discussions were highly interactive, lively and useful. The prime focus of the Meet was Quantity & Quality of Oceansat-2 data products and early applications demonstration by the scientists involved in the project.

ISRO-CNES SARAL-AltiKa Science meet held in SAC

The Second SARAL-AltiKa Science Workshop a joint collaborative project of ISRO-CNES was held at SAC, during March 15-17, 2011. Thirty foreign and forty five Indian nationals participated in the meeting. Retrieval & range corrections and CalVal were the main themes. The Science & Applications included (Ocean Meso-scale variability studies, Data assimilation in global and regional ocean models, Coastal Altimetry, Climate Studies Continental waters & Inland ice sheet monitoring, Light rainfall & cloud climatology Climate and Mean sea level monitoring).

Workshops & Trainings

- The first training course in the field of Agricultural Monitoring under the C V Raman Fellowship of DST for African Researchers organised by ABHG started on February 1, 2011
- Seventh and eight RISAT UP training courses were organized at SAC, Ahmedabad and RRSC-C, Nagpur from 14th to 25th Feb 2011. About 45 participants from DOS and user department participated in the programme.
- A workshop on Trends in antenna diagnostic & Measurement techniques was held on 14th February, 2010
- A National Workshop on 'Lunar Geosciences using Chandrayan-1 data' was convened at SAC during March 30-31, 2011.
- Indian Meteorological Society-ahmedabad chapter organized Prof. Satish Dhawan lecture on 'The Beginnings of Satellite Meteorological Remote Sensing 50 years Ago' by Prof. Paul Menzel on 7th February, 2011.

नगर राजभाषा कार्यान्वयन समिति, अहमदाबाद द्वारा अंतरिक्ष उपयोग केंद्र को सर्वोत्तम कार्य निष्पादन के लिए प्रथम पुरस्कार

वर्ष 2009-2010 के दौरान राजभाषा नीति के कार्यान्वयन में सर्वोत्तम कार्य निष्पादन के लिए नगर राजभाषा कार्यान्वयन समिति, अहमदाबाद द्वारा केंद्रीय सरकार की श्रेणी के कार्यालयों में अंतरिक्ष उपयोग केंद्र, अहमदाबाद को प्रथम पुरस्कार से सम्मानित किया गया। यह पुरस्कार दिनांक 14 मार्च, 2011 को आयोजित नराकास की 58वीं बैठक के दौरान श्री आर.एन. त्रिपाठी, मुख्य आयुक्त आयुक्त (सीसीए) एवं अध्यक्ष, नगर राजभाषा कार्यान्वयन समिति के करकमलों से केंद्र की नियंत्रक महोदया, डॉ. नमिता प्रियदर्शी ने ग्रहण किया। केंद्र के वरिष्ठ हिन्दी अधिकारी, श्री बी.आर. राजपूत को प्रशस्ति पत्र प्रदान किया गया। बैठक के दौरान केंद्र के निदेशक, डॉ. रं.रा. नवलगुंद भी मंच पर आसीन थे।

इस वर्ष नगर राजभाषा कार्यान्वयन समिति द्वारा आयोजित प्रतियोगिताओं में केंद्र के निम्नलिखित कर्मचारियों को पुरस्कार प्रदान किए गए -

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|---------------------------|------------------------------|----------------|
| 1. श्री सच्चिदानंद | हिन्दी वाद विवाद प्रतियोगिता | प्रथम पुरस्कार |
| 2. श्री संगीत कुमार मिश्र | हिन्दी निबंध प्रतियोगिता | प्रथम पुरस्कार |



श्री आर.एन. त्रिपाठी, मुख्य आयुक्त आयुक्त (सीसीए) एवं अध्यक्ष, नगर राजभाषा कार्यान्वयन समिति के करकमलों से शौल्ड प्राप्त करती हुई केंद्र की नियंत्रक महोदया, डॉ. नमिता प्रियदर्शी एवं वरिष्ठ हिन्दी अधिकारी, श्री बी.आर. राजपूत

SAC Lecture Series



Shri Parakramsinh Jadeja, CEO, M/s. Jyoti CNC Automation Pvt. Ltd., Ahmedabad delivered a lecture on 'Propelling Technology - Prospering Life' on January 07, 2011.



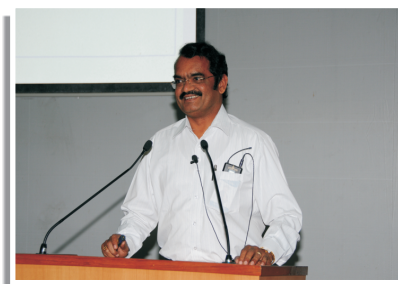
Mrs. Jolly Dhar, Scientist/Engineer SF, Space Applications Centre delivered a Lecture on "Roadmap for Asteroid Mining" on Feb 18, 2011.



Dr. K J Rangra, Scientist, CEERI-Pilani delivered a Lecture on "MEMS Devices for RF & Optical Communications/Applications" on Feb 24, 2011.



Dr. Sandip Oza, Scientist/Engineer SF, SAC delivered a lecture on 'Remote Sensing of Polar Ice' on March 29, 2011, under Knowledge Sharing Series.



Shri M Annadurai, PD, CY-2 delivered a lecture on 'Chandrayan-2 Mission' at SAC on March 30, 2011.



Co-ordination of Educational Visit of trainees from Raksha Shakti University, Ahmedabad on March 30, 2011.

Workshop on Personnel Effectiveness



HRDD Organised a Workshop on Personal Effectiveness for Admn. Assistants in association with Apremeyah Technologies, Ahmedabad during Feb 4-5, 2011. 24 participants of the level of Assistants attended the workshop.

Refresher Training Programme for Defensive Driving



HRDD organized a training programme for defensive driving on January 29 (Saturday), 2011 in association with Centre for Advanced Training in Driving (CATD), Ahmedabad. In this batch total of 26 (4 Regular, 22 Contract) drivers) attended the programme.

The Following Colleagues Superannuated from SAC during October-December,2010.Space Applications Centre appreciates the valuable services rendered by all of them during their tenure in SAC. SAC Courier wishes them a happy, peaceful and healthy retired life.

Details indicate the Name, Division and Date of joining

January 2011



Shri Rajvir Singh
SNPA
20-Oct-72



Shri George Abraham K
DECU
21-May-73



Shri Virendra P Chudgar
MISA
01-Aug-74



Shri H J Trivedi
P&S OFF
26-Sept-75



Shri R N Keswani
SRA-REG-TED
18-April-78



Shri P K Sharma
SNAA-SEOG-D
12-Sept-83

February 2011



Shri M P Gohel
DIR-OFF-CMD
9-May-74



Shri K H Bharadiya
EPSA-UPDG-RAF
14-Aug-78



Dr P V B A S Sarma
MESA-AO
09-Feb-79



Dr M B Potdar
EPSA-ATDG-ATD
13-Jan-83



Shri Ghanshyam K Kapse
ADMIN-PGA-P & GA
6-Aug-74



Shri V A Patel
SRA-REG-TED
20-Dec-73



Smt Khairunnisa K Kazi
SNAA-SGSTG-SEID
1-Aug-72



Shri Ramesh M Mistry
MESA-MSFG-MFF
27-Sept-79

March 2011



Shri J S Patel
MESA-MSFG-MFF
10-Aug-73



Shri P D Panchal
DIR-OFF-CMD
1-April-77



Shri Ramesh Malhotra
SNAA-SEOG-D
22-March-75

New Entrants to SAC

Sr. No.	Name	Designation	Division	Joining Date
1	Sachin Kumar Maurya	TECH ASST	DIR-OFF-CMD	14-Feb-2011
2	Ashok Kumar	TECH ASST	PPG	21-Feb-2011
3	Kapadia Manishbhai Ravjibhai	TECH ASST	DIR-OFF-CMD	07-March-2011
4	Ram Babu Meena	TECH ASST	DIR-OFF-CMD	11-March-2011
5	Vinod Choudhary	ASSISTANT	ADMIN-PGA-P & GA	18-March-2011

VSSE-Activities

National Science Day was celebrated at Vikram Sarabhai Space Exhibition (VSSE) on February 28, 2011. A face to face programme involving a meeting of visitors and SAC Scientists was arranged at the exhibition on this occasion. More than 575 visitors from in an around Ahmedabad visited the exhibition on this day.

Special Lectures on different topics by SAC Scientists were arranged for the benefit of visiting institutes/colleges at the exhibition. Many local schools had approached SAC to help them create awareness on Science to their students. VSSE with the support of Scientists of SAC carried out Science activities in the schools. VSSE also encouraged student awareness by extending the mobile exhibition to the schools. A total of about four such mobile exhibitions were arranged. More than 3000 visitors visited the exhibition during this quarter.



SAC Celebrates National Safety Week

National Safety week was celebrated at SAC from March 4 to 11, 2011. The Centre Safety Committee organized various events on this occasion to create awareness.

A mock fire drill was carried out at the Bopal Campus, by the CISF, Fire Safety Team led by Mr. S.K. Singh, Inspector, CISF Fire wing. Thirty five staff members participated in this demonstration. Eleven members had hands on experience by operating different class of fire extinguishers. This was aimed to build confidence amongst the staff to operate such equipments in exigencies.



Poster painting and essay writing competitions too were organized as a part of the safety week celebrations. A large number of staff members participated in these events. Safety at workplace was the topic of the Poster painting competition. The largest participation was in the essay writing competition, 49 staff members participated in different language groups like; Hindi, English and Gujarati.

The celebrations concluded with the prize distribution ceremony. Prizes were awarded to the winners of the competitions by Controller, SAC. The CISF Fire Safety Team too was honoured with special prizes for their services. The safety committee was supported by the evaluation committees and Shri Randhir Kumar and Shri MSF Khedawala of SAC Administration.



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