❖ CSSTEAP Newsletter ❖

Quarterly Newsletter of Centre for Space Science and Technology Education in Asia and the Pacific (Affiliated to UN)

Volume 10 Issue 1 March, 2007

ISRO LAUNCHED CARTOSAT- 2 AND OTHER SPECIFIC MISSION SATELLITES

The 680 kg CARTOSAT-2, the twelfth in the Indian Remote Sensing (IRS) satellite series, along with Space capsule Recovery Experiment (SRE-1), Indonesia's LAPAN-TUBSAT and Argentina's PEHUENSAT-1, were launched into the intended 639 km high polar orbit by PSLV-C7 from Satish Dhawan Space Centre (SDSC) SHAR, Sriharikota on January 10, 2007. Soon after its separation from the Dual Launch Adopter (DLA), the two solar arrays of CARTOSAT-2 were automatically deployed. The satellite is being continuously monitored and controlled from the Spacecraft Control Centre of ISTRAC at Bangalore with the help of its network of stations at Bangalore, Lucknow, Mauritius, Bearslake in Russia and Biak in Indonesia. The Ground station at Svalbard in Sweden is also supporting the mission in its initial phase. All systems in the satellite are functioning normally.

The Panchromatic camera (PAN) on board ISRO's latest remote sensing satellite, CARTOSAT-2, was switched on at 10.05 am IST (January 12, 2007) through a series of commands issued from the Spacecraft Control Centre of ISRO Telemetry, Tracking and Command Network (ISTRAC) at Bangalore. Analysis of the first imagery received at National Remote Sensing Agency's Data Reception Station at Shadnagar, near Hyderabad, confirms excellent performance of the camera.

CARTOSAT-2, the twelfth in the Indian Remote Sensing (IRS) satellite series, is an advanced remote sensing satellite capable of providing scene-specific spot imagery. It will join the other six IRS satellites which are in service - IRS-IC, IRS-1D, OCEANSAT-I, Technology Experimental Satellite (TES), RESOURCESAT-I and CARTOSAT-I. The panchromatic camera (PAN) on board the satellite can provide imagery with a spatial resolution of better than one metre and a swath of 9.6 km. The satellite can be steered up to 45 deg along as well as across the track. The data from the satellite will be used for detailed mapping and other cartographic applications at cadastral level, urban and rural infrastructure development and management, as well as applications in Land Information System (LIS) and Geographical Information System (GIS).

CARTOSAT-2 at a Glance

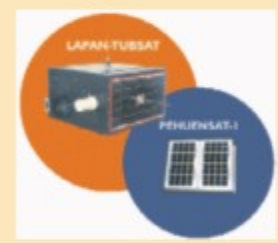
Altitude	:	630 km
Inclination	:	97.91 deg
Period	:	97.4 min

Inside this issue

Local time at descending node	:	9.30 am
Orbits/day	:	14
Revisit	:	4 days
Repetivity	:	310 days
Lift-off Mass	:	680 kg
Attitude and Orbit Control	:	3-axis body stabilised using high torque Reaction Wheels, Magnetic Torquers and Hydrazine Thrusters
Power	:	Solar Array Generating 900W, Two 18 Ah Ni-Cd batteries
Payload	:	Panchromatic
Operational Life	:	5 Years

PAN Specifications

Resolution	:	Better than one meter
Swath	:	About 9.6 km
Spectrol band	:	0.5-0.85 micrometer
Data rate	:	336 MBPS
Solid State Recorder	:	



5TH PG COURSE ON SATELLITE METEOROLOGY & GLOBAL CLIMATE

The fifth SATMET course of CSSTEAP, commenced on the August 1, 2006 at the New SAC Campus, Bopal, of Space Applications Centre (SAC), Ahmedabad. Eighteen participants from 11 countries of Asia-Pacific region are attending the course.

At the end of the Module II(Jan 25, 2007), theory & practical examinations were conducted. After the examinations the participants undertook a study tour to South India to visit Goa and Bangalore. In Goa, they visited National Institute of Oceanography (NIO) and National Centre for Antarctic and Oceanic Research (NCAOR) to get familiarized with various activities of these organizations. In Bangalore, they visited ISRO Satellite Centre (ISAC), ISRO Headquarters and Regional Remote Sensing Service Centre (RRSSC). Participants got the opportunity to visit various facilities at ISAC. In ISRO Headquarters, Mr. V. Sundararamiah, Scientific Secretary along with other officials briefly met the participants.

Participants were also taken around places of tourist and historical importance such as Mysore, Srirangapattanam, North & South Goa. Few participants had the feel and experience of the ocean for the first time in their life. They enjoyed the magnificent beaches of Goa.

(Dr. Masami Tokuno, JMA delivering the lecture to the SATMET-5 participants.)

Dr. Masami Tokuno, Head, Analysis Division, Meteorological Satellite Centre of Japan Meteorological Agency, visited Ahmedabad during January 13-20, 2007 and delivered lectures to the course participants. The topics included geophysical parameter retrievals using GMS Data, METSAT Data Applications, typhoon analysis, Rainfall estimation, Neph-analysis, Aerosols etc. The demonstration of Software Package to analyze the real-time GMS data (obtained from JMA through Internet) was also arranged. The participants, particularly those in the visibility zone of GMS benefited immensely by this interaction with Dr. Tokuno.

The last three month module on Pilot Project commenced on February 10, 2007. In consultation with their parent organization in their home country, the participants have finalized the topics of the respective pilot projects. They were also given a scientific paper as basis for their pilot project and they were required to make a presentation about the formulation of their Project. The Pilot Projects were reviewed by the Focal Point (Pilot Projects) in consultation with the Project Guides, to ensure the data availability and other required software assistance to the participants.

This year a large number of projects involve use of numerical weather/Climate/Ocean models and signifies an increasing awareness about adopting latest information/techniques by participating agencies from the Asia-Pacific region.

The participants gave presentations to

5TH PG COURSE ON SPACE AND ATMOSPHERIC SCIENCE

The 5th PG Course in Space and Atmospheric Science, which started on August 1, 2006 at Physical Research Laboratory, Ahmedabad, is going to be over by April 2007. Ten participants from countries in Asia Pacific region and three from India had joined the course. However, one of the participant from Mongolia, Mrs Davaasuren, had to leave the course in between for personal reasons

The Second Semester, which began on Dec 18, 2006, is nearing completion. Astronomy and Astrophysics, along with Space Weather have been covered in this semester. Apart from faculty members from PRL, Prof J S Yadav from TIFR, Prof Tom Gehrels from USA and Prof R Haq from Canada have been invited to cover the various sections of the syllabus. During the second mid semester break, between January 31 to February 16, 2007, the participants proceeded to the second educational tour. They visited Andhra University Visakhapatnam for their registration and also nearby places of interest. The group proceeded from Visakhapatnam to Bangalore to visit ISRO Satellite Centre , ISTRAC and a few nearby places. In the last leg of the journey, the participants visited Vikram Sarabhai Space Centre (VSSC) as well as CESS at Trivandrum .

The course work resumed after return from the educational tour. A meeting of the board of studies for the course was convened on February 27, 2007. Experts from various institutions were invited along with BOS members to discuss the shortcomings of the course and suggest suitable remedies. Participants are busy in compiling information for their respective pilot projects. Participants presented their preliminary work before Dr George Joseph, Director CSSTEAP and

Students at Andhra University, at Visakhapatnam.

Students at Pink City, Jaipur

Dr. R.N. Misra & Dr. R. Sekar
Course Co-ordinators, Space & Atmospheric Science
rnmisra@prl.res.in

ELEVENTH POST GRADUATE COURSE ON REMOTE SENSING AND GIS COURSE

The Eleventh Post Graduate course on Remote Sensing and GIS (RS & GIS) of CSSTEAP which started at Indian Institute of Remote Sensing, Dehradun on October 1, 2006 is being attended by 22 participants from 14 countries of Asia-Pacific region including India. An educational visit to Andhra University, Visakhapatnam, National Remote Senisng Agency (NRSA), Hyderabad, ISAC and ISRO HQ., Bangalore was organized from January 21 to February 3, 2007. During this visit, course participants were exposed to academic activities of geo-engineering department of Andhra

university which includes deliberations of lectures and field visit to coastal environment of Visakhapatnam. Participants also visited cyclone warning center at Visakhapatnam. At NRSA, Hyderabad they have seen live satellite data acquisition at Shadnagar as well as various data processing and dissemination facilities. During their visit to Bangalore participants have seen the various facilities of ISAC and ISRO. The course participants also got opportunity to experience Indian rich historic, cultural and social heritage during the visits to various Indian cities such as Hyderabad, Visakhapatnam and Bangalore.

The course is now in Module II which started on February 4, 2007. This module consists of RS & GIS applications to Thematic optical stream. The thematic optional stream covers several disciplines such as Agriculture and Soils; Forestry and Ecology; Geosciences; Marine Science; Human Settlement & Urban Analysis; Water Resources and Advances in RS & GIS. Each of the course participants has chosen one optional thematic application discipline based on his/her academic qualification, professional experience and requirements of their parent organizations.

The course curriculum of this module is covered by the faculty of IIRS and additional guest lectures on specialized topics is also arranged for the academic benefit of course participants. The guest lecturers who delivered lectures were from various Indian Organizations/Institutes/Universities such as IMD,

Course Participants at ISRO HQRS., with Chairman, GB

At Space Museum in ISRO HQRS., Bangalore

Dr. S.K. Saha, Course Director, RS & GIS
sksaha@iirs.gov.in
Dr. S.P. Aggarwal, Course Co-ordinator
spa@iirs.gov.in

BACKGROUND OF CSSTEAP

In response to the UN General Assembly Resolution (45/72 of 11th December, 1990) endorsing the recommendations of UNISPACE-82 the United Nations Office for Outer Space Affairs (UN-OOSA) prepared a project document (A/AC.105/534) envisaging the establishment of Centres for Space Science & Technology Education in the developing countries. The Objective of the Centres is to enhance the capabilities of the member states in different areas of space science and technology that can advance their social and economic development. The first of such centres, named as Centre for Space Science & Technology

CSSTEAP Building

Education in Asia & the Pacific (CSSTEAP) was established in India in November 1995. Department of Space, Government of India has made available appropriate facilities and expertise to the Centre through the Indian Institute of Remote Sensing (IIRS) Dehradun, Space Applications Centre (SAC) & Physical Research Laboratory (PRL) Ahmedabad. The Centre is an education and training institution that is capable of high attainments in the development and transfer of knowledge in the fields of space science & technology. The emphasis of the Centre is on in-depth education, training and application programmes, linkage to global programmes / databases; execution of pilot projects, continuing education and awareness and appraisal programmes. The Centre offers Post Graduate level and short courses in the fields of (a) Remote Sensing and Geographic Information System, (b) Satellite Communications and GPS, (c) Satellite Meteorology and Global Climate, (d) Space and Atmospheric Sciences. A set of standard curricula developed by the

CSSTEAP (Affiliated to UN)
Headquarters, **IIRS** Campus,
4, Kalidas Road,
Dehra Dun-248001, INDIA
Ph: +91-135-2740737, 2740787,
Fax: +91-135-2740785
Email: cssteap@iirs.gov.in,

Onging Courses

- Fifth 9 month Post Graduate course in Satellite Meteorology & Global Climate at SAC, Ahmedabad from August 1, 2006.
- Fifth 9 month Post Graduate course in Space & Atmospheric Science at PRL, Ahmedabad from August 1, 2006.
- Eleventh 9 month Post Graduate course in RS & GIS at IIRS, Dehradun from October 1, 2006.

Forthcoming Courses

- Sixth 9 month Post Graduate course in Satellite Communication at SAC, Ahmedabad from August 1, 2007.
- Tweleth 9 month Post Graduate course in RS & GIS at IIRS, Dehradun from October 1, 2007.
- Short course on Application of Space Technology for Disaster

CSSTEAP welcomes the views and opinions of the readers of Newsletter. Short communications on space science and technology education which may be relevant to Asia Pacific Region are also

Designed & Printed at Allied Printers, Dehradun Ph. 0135-2654505