Indian Society Of Remote Sensing
Ahmedabad Chapter

NEWSLETTER

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Dear Members,

As a new committee takes over the editorial responsibility of your newsletter, it is time for the outgoing committee to say good bye. On behalf of the committee and on my own behalf, I would like to acknowledge the cooperation and encouragement received from you all. We also wish the new team all the success and sincerely hope that Newsletter will prosper in future.

- Ex Editor

On behalf of the new editorial committee and on my own behalf, I express our sincere thanks to the new executive council for their faith in assigning us the editorial responsibility. We take-up this responsibility knowing very well that we shall continue to get the encouragement and cooperation of our member colleagues. On our part, we shall try our best to continue the excellent work ,done so far, by our predecessors. As it should always be the case, we would try to make further improvements in the quality of the Newsletter both in terms of the get-up and contents. To start with, we have attempted to introduce the articles in languages other than english, a new column on notes about the members and certain changes in the text format. Your feedback on this aspect would be of immense help.

Much of the ground work for bringing out this issue had already been done by the outgoing committee. We sincerely acknowledge them for their efforts.

- Editor

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In This Issue

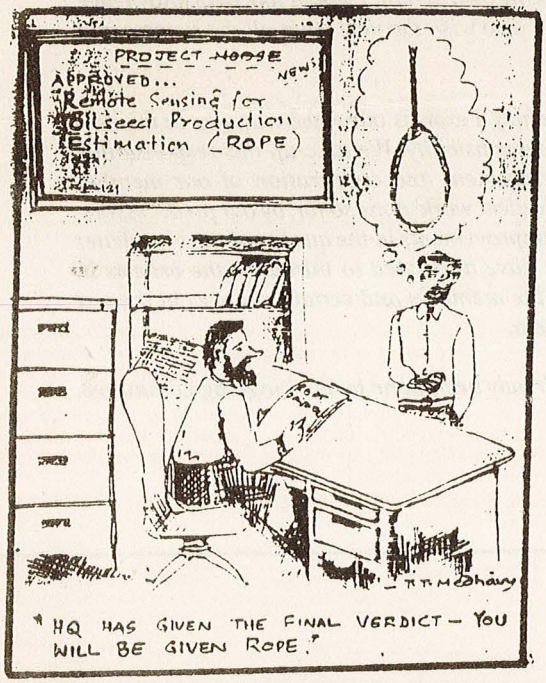
RESEARCH NOTES

Remote Sensing in Agriculture

Crop estimation using remotely sensed data has been operationally demonstrated in Crop Acreage and Production Estimation (CAPE) project of Remote Sensing Application Mission (RSAM). The project aimed at estimation of acreage and production for wheat, rice, groundnut, sorghum and mustard/rapeseed in different districts spread over nine states in the country. It provided pre-harvest acreage estimates meeting 90/90 criterion for wheat in northern plains region and for rice in Orissa. Moreover, production estimation using remotely sensed data was demonstrated for Punjab, Haryana and parts of Orissa. Attempts are underway for defining a successor to this project.

(For details contact Shri J S Parihar, LRD/RSAG/RSA/SAC)

A project on the cotton acreage and condition assessment in



selected districts of six states is in progress at SAC.

(For details contact Dr. Ajai, LRD/RSAG/RSA-SAC)

Microwave RS

Microwave Remote Sensing Techniques have been used for soil moisture assessment and crop identification. Ground based scatterometer experiments were carried out for the development of soil moisture model and paddy crop growth monitoring. It was observed that C-band sensor in near nadir incidence angle is optimum for soil moisture monitoring. For the paddy crop monitoring, higher incidence angle (40°) was found to be optimum. Further, a combination of linearly polarized data with cross- polarized data provided better information concerning to crop growth variables. X-band Airborne Synthetic Aperture Radar over parts of West Godavari districts were used for the assessment of crop identification capabilities of X-band data. The classification accuracies were improved by a margin of 10-15% when SAR data was analysed in combination with visible sensor data. In addition to this, other sensor data like ISRO-SLAR at X- band, SIR-B SAR data at L-band were also used for cotton, castor discrimination and identification of tea plantation. Plans have been made for the utilization of ERS-1, JERS-1 and SIR-C data for agricultural applications.

(For details contact Dr. Shiv Mohan, LRD/RSAG/RSA/SAC)

Macro level urban information system

A pilot project was carried out for realization of this system using a Geographical Information System (GIS) approach for Bombay Metropolitan Region (BMR). The project, executed jointly by SAC and BMRDA, was reviewed at Bombay on mar 24, 1992 by a committee comprising of the experts from Remote Sensing, Urban Planning and GIS. Among the participants were Shri P Subrahmanyan, Bombay Metropolitan Commissioner, Shri Pramod Kale, Director SAC and Dr. George Joseph, Associate Director, SAC.

The project was aimed at a) design/ organization of a spatial information system for BMR at 1:250,000 scale and b) demonstrating the concept of integrated analysis of spatial and non-special data, specifically oriented towards generating alternative scenarios for urban planning. Accordingly the analysis was carried out for suitability assessment (multiparameteric) for urban development, environmental sensitivity zones on the basis of air pollution data, landuse change, routing for the proposed new airport and growth profile of BMR for 2001.

The total work for the project was presented by the joint team of Scientists/ Engineers from SAC and BMRDA. A demonstration was also given to the review committee members with the created data base on the PC - ARC/INFO system at BMRDA.

The review committee observed that the approach developed and quality of work carried out was a demonstration of technological capabilities of integrating spatial and non- spatial data and GIS tool. They suggested that

* GIS database should be organized at large scales - 1:50,000 and 1:25,000.
* Land suitability analysis method should be refined by taking into account the economic factors.
* Environmental sensitivity analysis should be enhanced by incorporating the water quality parameters.
* Road network analysis should be expanded for minor roads.
* An attempt should be made to prepare a disaster management plan for a given area.

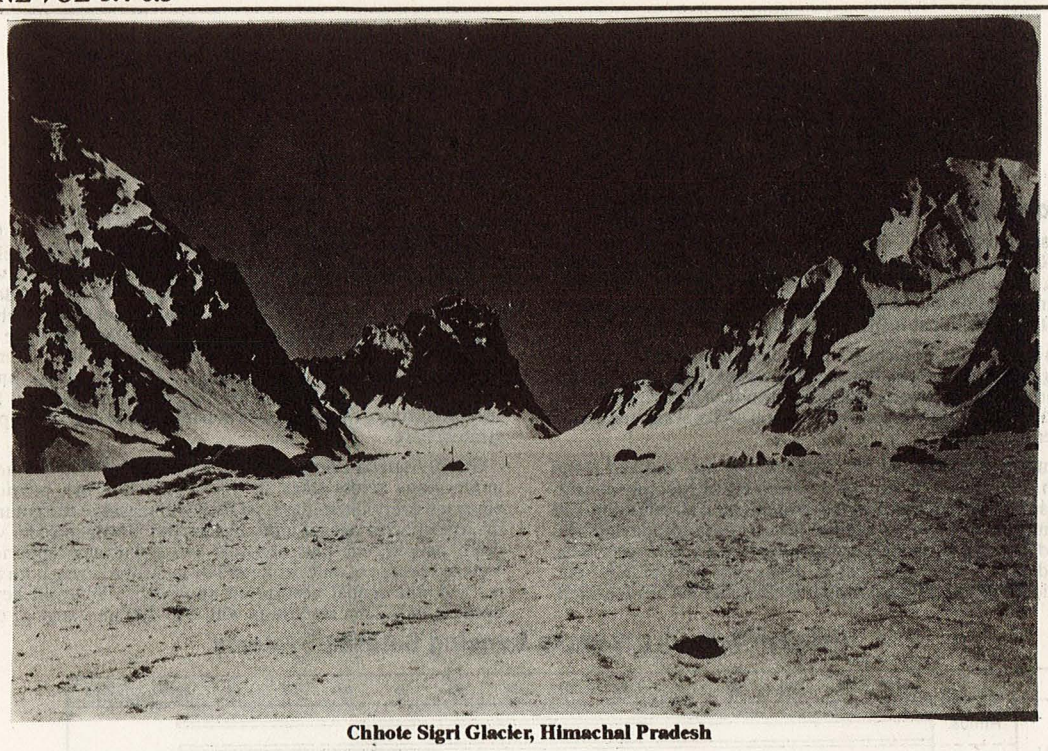
(For details contact Dr. K L Majumder, Head IPPD/IPDPG/RSA/SAC)

Members contributions

Majority of the contributions to the past issues of the newsletter has been from the members themselves. We greatly rely on continued inflow of the material in form of articles, event notes, review notes and institutional notes etc. Please send your contribution to the editor via secretary, ISRS-AC.

Glacier Atlas of Indian Himalayas

Space Applications Centre has prepared a galcier atlas of Indian Himalayas. In the atlas, glacier maps are given showing various features such as glacier boundary, ice divide snow line, ablation area, accumulation area and glacier-dammed lakes. At the end of atlas, basin-wise distribution of glacier areal extent and geomorphological type is given.



Chhote Sigri Glacier, Himachal Pradesh

The mapping were conducted on 1:250,000 scale and total 39 maps were prepared. False colour composite prepared by using Landsat and IRS satellite data were used. The study has shown total of 1702 glaciers covering an area of 23315 sq. km in the Indian Himalayas. In this study glacier identification system as suggested by UNESCO/ITS has been adopted. It is expected that this can provide compatibility with previous information and can help in monitoring various glaciers.

In this atlas basin-wise distribution of the glacial areal extent is also given. The areal extent were measured using electronic planimeter. This atlas provides valuable information regarding Himalayan glaciers which can be used for site selection of micro- mini hydroelectric power stations and understanding hazards from glacier-dammed lakes in states such as Sikkim. It is expected that this atlas can provide valuable inputs for drawing up management plans for Himalayan water resources.

(For details contact Shri Anil V Kulkarni, MWRD/RSAG/RSA/SAC)

હવામાન - ઉપગ્રહ

આપણાં જીવનમાં હવામાન ઘણો જ અગત્યનો ભાગ ભજવે છે. આપણી ઘણી પ્રવૃત્તિઓ ઉપર હવામાનના ફેરફારથી એક યા બીજ રીતે અસર થાય છે. આ દૃષ્ટિએ હવામાનના વાસ્તવિક વરતારાની આવશ્યકતા ઘણો અગત્યનો છે. ભારત જેવા કૃષિ-પ્રધાન દેશ માટે હવામાનની વિપ્રવસનોય આગાહી એક આશીર્વાદ સમાન ગણી શકાય. દર વર્ષે પૂર, અતિવૃષ્ટિ કે અનાવૃષ્ટિ વગા વાવાઝોડાથી થતાં કરોડો રૂપિયાના નુકસાનમાં હવામાન અંગેની સચોટ આગાહી દ્વારા સારો એવો ઘટાડો થઇ શકે. હવામાન ઉપગ્રહ દ્વારા આ પરિસ્થિતિમાં નોંધપાત્ર સુધારો થયો છે, જેમ કે વર્ષા ઋતુના ગાળામાં થતાં હવામાનના ફેરફારો અંગે વિપ્રવસનોય આગાહી કરવી હજુ સુધી શક્ય નથી.

હવામાન ઉપગ્રહ કઇ રીતે ખાસ ઉપયોગી બને છે એ સમજવા માટે એ નોંધવું ખૂબ જરૂરી છે કે હવામાનની આગાહી કરવા માટે સમગ્ર પૃથ્વી ઉપરના હવામાનની વિગતવાર ચિત્રાંકિત જાણકારી અત્યંત આવશ્યક છે. પરંપરાગત પદ્ધતિ, એટલેકે ભૂમિ - સ્થિત હવામાન મથકોમાં લેવાતાં અવલોકનો પૃથ્વી પરના ગોચ વસ્તી ધરાવતાં પ્રદેશો પૂરતા જ સીમિત રહે છે. જ્યારે ૭૦ ટકાથી પણ વધારે ક્ષેત્રફળ ધરાવતો સમુદ્ર વિસ્તાર તથા રણ, વન અને હિમાચ્છાદિત પર્વતો જેવા દુર્ગમ અને માનવ વસ્તી-વિહોન પ્રદેશો પરના હવામાન અંગે કોઇ જ માહિતી મળતી નથી. આ દૃષ્ટિએ હવામાન ઉપગ્રહ ખૂબ જ ઉપયોગી બને છે. પૃથ્વીની નજીકની ૫૦૦ થી ૯૦૦ કિ.મી. ની ભ્રમણકક્ષામાં ફરતો હવામાન ઉપગ્રહ પૃથ્વીના દરેક પ્રદેશ પરથી ક્રમશઃ પસાર થાય છે અને બે રીતે પૃથ્વી પરનાં સમગ્ર હવામાન અંગે દિવસમાં એક કે બે વખત વિસ્તૃત માહિતી પૂરી પાડે છે.

હવામાનમાં થતાં સમૂહ ફેરફારો અત્યંત ઝડપી અને અતિસોલ હોય છે, દાખલા તરીકે ચાયક્લોન અથવા વાવાઝોડા. આ પ્રકારના હવામાનના ફેરફારો વિષે માહિતી મેળવવા માટે પૃથ્વીની નજીકની ભ્રમણકક્ષામાં ફરતો ઉપગ્રહ બહુ જ મર્યાદિત રીતે ઉપયોગી બને છે, પરંતુ ૩૬,૦૦૦ કિ.મી. ની ઉંચાઇએ ભૂ-સમકક્ષિય "જિયર" ભ્રમણકક્ષામાં મૂકેલો હવામાન ઉપગ્રહ આ માટે અત્યંત ઉપયોગી બને છે અને બે દ્વારા વાવાઝોડામાં માર્ગ અંગે દર અડધા કલાકના ગાળામાં છેલ્લામાં છેલ્લી માહિતી મળે છે, જેનો ઉપયોગ કરીને વાવાઝોડાથી થતાં નુકસાનમાં સારો એવો ઘટાડો શક્ય બને છે અને જાન-માલનો ખુવારી અટકાવી શકાય છે. ભારતનો બહુ-ઉદ્દેશીય "ઇનસેટ" ઉપગ્રહ આનું એક ઉદાહરણ છે.

બધા હવામાન ઉપગ્રહો બહુ જ પ્રકારના દૂર-સંવેદન ઉપગ્રહો જ હોય છે - આ અંગે જરૂરી માહિતી કોઇ બીજા લેખમાં આપવાનો વિચાર છે.

ડો. પરંતપ પાઠક.

TECHNOLOGY TRENDS

INDIA

Airborne Synthetic Aperture Radar(ASAR)

SAC has developed a C-band airborne synthetic aperture radar(ASAR) for remote sensing applications. The bread-board model has been successfully flight tested on May 20, 1992. The system is installed on-board the Beechcraft Superking 300 aircraft belonging to the National Remote Sensing Agency(NRSA).

ASAR, a state of the art airborne imaging radar system, is capable of mapping 20 Km wide strip of the terrain across the flight path with a resolution of around 6 meters from an altitude of 8 Kms. The radar can function both during day as well as night. Also, it can map even areas under cloud cover.

The flights were conducted over Ahmedabad city and and Rann of Kutchch. The quality of the data is extremely satisfactory considering the fact that there was no on-board antenna stabilisation and motion compensation unit to correct the aircraft attitude and motion related errors. One can clearly identify roads and railway lines, runway and airport complex, built up areas, agricultural fields etc. Even individual fields with and without the crops could be identified.

Based on the engineering feedback derived from this data, the flight model will be developed and the ASAR will be made available to the users on operational basis. The flight model will have on-board motion compensation and antenna stabilisation unit and real time processor and quick look display unit.

The ASAR system is expected to be gainfully used for remote sensing applications related to Agriculture, water resources, mineral prospecting, coastal zone monitoring, oceanography etc.

(For details contact Group Director/MSDG/RSA-SAC)

FOREIGN

ERS-2 and GOME

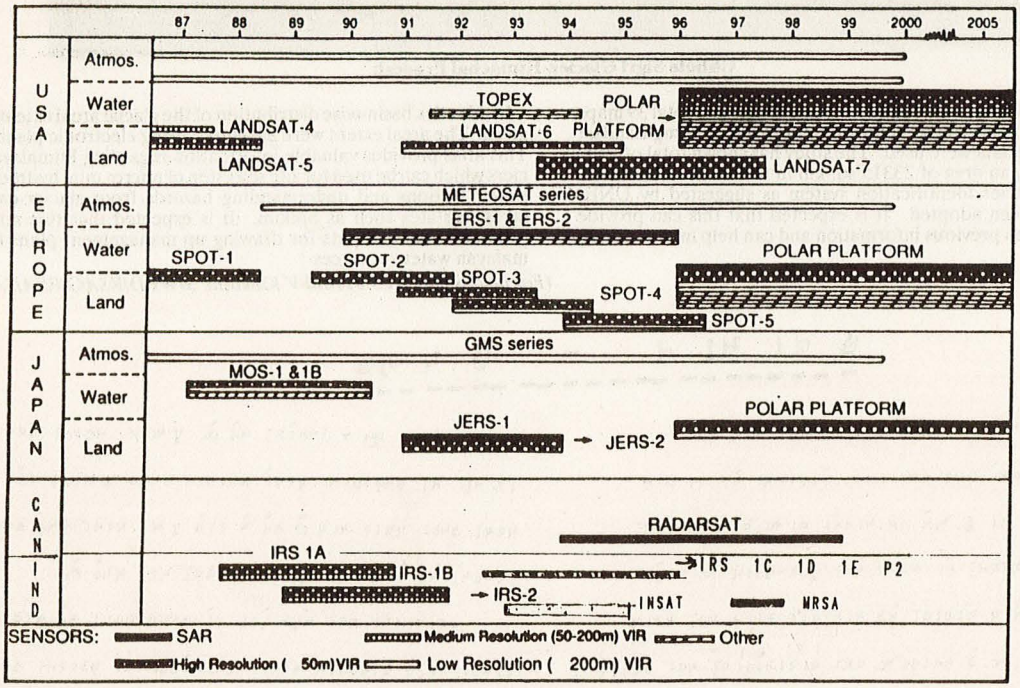
European Remote Sensing Satellite-2 (ERS-2) is the follow-on satellite system of ERS-1. Planned for 1994 launch, ERS-2 will provide data continuity to ERS-1 and address to the variety of environmental problems related to inputs for climate models, ocean circulation and energy transfer, mass balance of polar ice sheets, and monitoring of coastal processes pollution and land use changes. ERS-2 is likely to carry Along Track Scanning Radiometer (ATSR) enhanced with two visible channels, PRARE, AMI, and a new instrument called Global Ozone Monitoring Experiment (GOME) for measuring a range of trace constituents in the troposphere and stratosphere.

GOME is nadir - viewing spectrometer which in its normal viewing mode scans across track in three steps and can provide global coverage every three- days. GOME will measure the column depth of atmospheric constituents like ozone, nitrogenoxide, water vapour, oxygen, etc. plus aerosols and polar stratospheric clouds. Vertical profile of only ozone will be measured using both backscatter and differential absorption approach. This will be possible because of 0.2 nm resolution with 240-760 nm range of operating spectrum. GOME is likely to improve on the existing backscatter based methods of trace molecule monitoring because of its robust calibration system comprising sun and moon viewing plus viewing of an internal source. Moreover, differential absorption does not depend on absolute calibration but only on wavelength which is relatively easy. GOME will provide a mean for comparing the two methods of trace element measurements.

It will also give valuable lead to the proposed polar-platform based instrument SCIAMACHY (Scanning Imaging Spectrometer for Atmospheric Cartography).

(Source : ESA Earth Observation Quarterly)

Present & Future Remote Sensing Satellite Systems



(After P P Nageswara Rao et al 1991)

NEWSPIX

ASLV Launch

ASLV was launched successfully from SHAR on 20th may 1992. The event demonstrates the committment, dedication and determination of Indian scientists. ISRS-AC family compliments the efforts of ISRO scientists on this great achievement and congratulates all those who contributed for success of this mission.

INSAT-2A planned for launch on july 10,1992

As this issue was getting ready for release the first of the INSAT-2 series of spacecraft was undergoing pre-launch operations at CSG, Kourou, French Guyana. The electrical testing of the spacecraft at S1 position was completed by end May. It is scheduled for launch on Arian 44L flight V51 after completion of further operations like fueling. In addition to the payload for communications, this multipurpose spacecraft has Very High Resolution Radiometer (VHRR) operating in visible and thermal IR bands and Data Relay Transponder for meteorological applications.

STOP PRESS II

INSAT-II has been launched on July 10, 1992 at 4:12 Hrs (IST). We hope to bring a report on this event in the next issue.

U.S. Embargo

U.S. state department announced two-year ban on all U.S. licensed exports to and imports from ISRO and the Russian trader Glavkosmos. The ban was levied to punish the two organisations for the transfer of Rocket technology controlled by the Missile Technology Control Regime.

(Source : Space Business News)

Hyperplane to replace SLV by 2000 AD

The flight version of India's futuristic hyperplane, which will replace the expensive rocket based launch vehicle , will be ready by 2000 AD. This was stated by Dr. A.P.J. Abdul Kalam in the 79th session of the Indian Science Congress.

(Source: Times of India, Jan 5,1992)

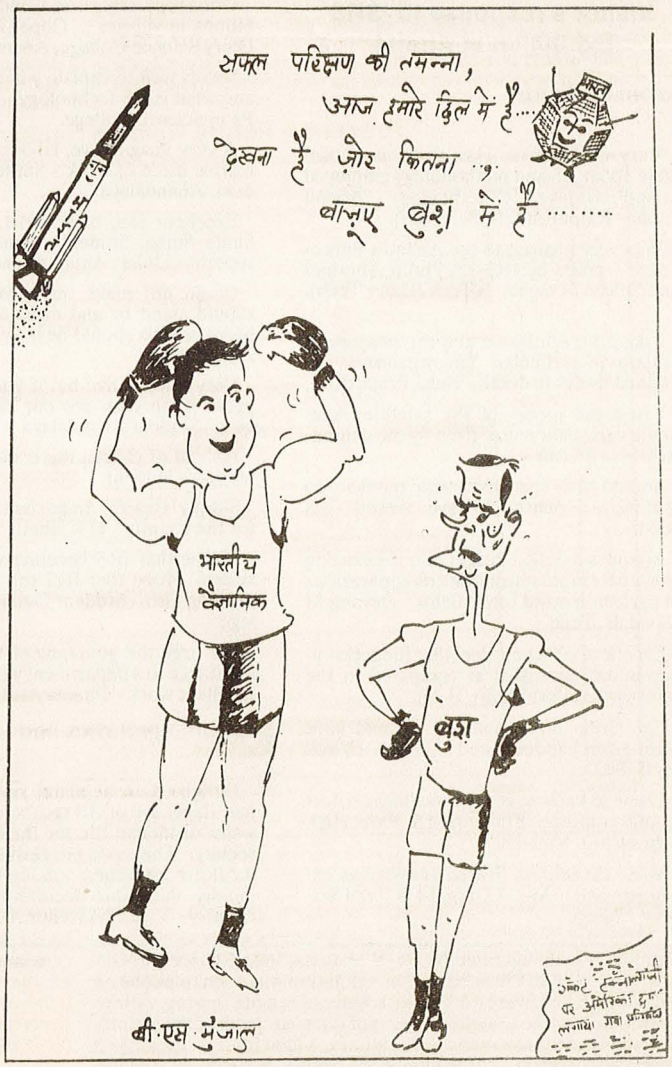
AIDS Research In Space

Astronauts orbitting in the U.S. shuttle Columbia, conducted research into one of the deadliest problems on earth - the AIDS virus. Payload specialist Larry De Lucas, his hands covered with gloves, inside a transparent, seled container, worked with an aids virus enzymethat is among a crop of protein crystals being cultivated on the record 13 day flight. Crystals grow larger and with fewer imperfections in the weightlessness of space, making them easier to analyse.

No private sector RS : US

US congressional budget office estimates that fully private RS systems are not feasible by end of current decade. EOSAT, the private firm operating Landsat system, is not expected to earn the revenue required to sustain the annual cost of approximately US$100 m for two Landsat type of satellites during 1990s and which are likely to cost US$1b. SPOT is likely to be better placed but still its choices are dim. So government money will continue to be invested for RS programs. CBO was however positive about the funding because sale of RS data/services are on rise. It concludes that full commercialisation is difficult but not impossible.

(Source : Space Exploration Technology)



Space Exploration Initiative (SEI)

NASA proposes SEI with a series of low cost, robotic missions to the Moon. These robotic precursor missions and lunar outposts form a part of the program called 'Mission from Planet Earth' with a long term goal of human exploration of Mars, and associated technology developments in the areas of space transportation and space life sciences. A strategy to carry out the mission has been defined and a National Launch System (NLS) is proposed to be developed for a range of payload requirements .

(Source:Space Exploration Technology)

REPORT ON CHAPTER ACTIVITIES

Since the last issue was delivered to you, much water has flown under the ISRS-AC bridge. We bring a report on few of the activities.

Laxminarayan Calla Memorial Lecture

The fifth lecture in the series was delivered by Dr. K Kasturirangan, Director ISAC, Bangalore on "Bio-Astronomy - A Test for Anthropomorphic Principle" at the Vikram Hall, Ahmedabad, on January 9, 1992.

Exhibition and workshop

The Exhibition and Workshop, co-sponsored by Space Applications Centre and Sardar Sarovar Narmada Nigam Ltd., Gandhinagar, were organized at Gujarat Agricultural University (GAU) during Feb 14- 15,92. Two day exhibition , organized at Anand Campus, was inaugurated by Dr. V M Jhala, Vice-Chancellor, Gujarat Agricultural University. The exhibition was open to public on both days. There were exhibits on science of remote sensing, various models of satellites, satellite images of different parts of the country and its applications in various disciplines. Video films on the subject were also screened. Large number of people, particularly students visited the exhibition. The Workshop, on application of Remote Sensing in Agricultural Research, Inventory and Management, was held at at the BA College of Agriculture, GAU, Anand on Feb 14, 1992 and was inaugurated by Shri T L Patel, Director of Campus, GAU, Anand . There were about 100 registered participants from different institutions from all over Gujarat.

Science Quiz

This new activity involving two rounds (written and oral) was started this year for the under-graduate students of science stream. The Principal of each science college was requested to nominate five students for the quiz. Written test was conducted on January 27, 1992 out of which six top students were selected for the oral round. Oral round was conducted on February 23, 1992 at the Auditorium. Ahmedabad Doordarshan telecasted this on the National Science Day i.e. Feb 28, 1992.

National Science Day Celebration

The Chapter celebrated the day jointly with SAC, Ahmedabad, on February 28, 1992. Shri Pramod Kale, Director SAC, delivered a lecture on "Colours in Nature". Prof. P D Bhavsar, Former Director, SAC presided over the function and presented the prizes to the winners of 'Science Quiz'.

Visitor's response to ISRS Exhibition at Anand

From Students

Very informative. Has given us knowledge about RS and methodology employed in applications of RS technology - Arvind Kumar Rajpurohit, M.Sc. (Agri).

Was very pleased to see Anand's Photograph taken by IRS-1A Philip Abrahim and Shishir Rangan, B.Tech (Dairy Tech).

Liked the exhibition and the imagery of Gujarat in particular. The organizers explained things in detail - Neha Prajapati.

Liked the model of the satellite. Adequate explanation was given by the demonstrators - Shashi.

Should have been given wide publicity so that more people could have visited. - S S Ravi.

Provides detailed insight into the existing world of remote sensing and its applications in agriculture and other fields - Devang M Raval, B. Tech .

Excellent effort but feel that the technology is too expensive as compared to the returns- Kamlesh Bhatt, B. Sc.

Exhibition not exhaustive. Should have been given handouts and posters - Vaysi M, B. Sc.

Came to know so many new things. Effort should continue - Student, M S Patel High School, Std. VIII, IX

Well presented. Basic knowledge explained well. - Mikki Garg, M B Patel Science College

Good representation. Conduct such exhibitions in villages - Gopal Krishnan S.S., Dairy Science College, Anand.

Serves well to explain what are satellites and what is RS technology - Student M.R. Patel Science College.

A very imaginative, laborious and informative piece of work - Smita Pardhi, Student, Anandalaya

Excellent job, nice effort, marvelous - Smita Sinha, Student Anandalaya It was superb! - Dulari Amin, Anandalaya

Could not make out anything. People should stand by and explain the exhibits. More models should be included - Student Anandalaya

Very informative but if you want to improve upon then see our exhibition next year - Student Anandalaya.

Instead of charts, there should be more models - Student

Simply superb. Important achievement for the country - H K Bhatt

I hope that IRS becomes world famous system. Hope that IRS can help in dairy farming also - Student Dairy Science College.

We urge the government to provide all assistance to a department which does such excellent work - Ghadia Atul, B.Sc.

From Dignitaries and Citizens

Delighted to acquaint myself with the multifacet use of RS technology in various walks of human life for the benefit of the society. The more interesting aspect is to inculcate awareness among student community, the future decision makers of the country - Vice Chancellor, GAU.

An excellent job. Would provide much-needed exposure to the students. Avoiding the jargons - Assistant Conservator of Forests GEER, Gandhinagar.

The wide application of RS technology as exhibited in this exhibition will open new vistas for developing countries like India - Dr. G Sandhya, MSU, Baroda.

Gave us idea in the working of satellite and progress made by our scientists - RM Amin, Vallabh Vidyanagar, HOD Polytechnic. Very informative - Uday Trivedi, Lecturer Polytechnic, VV Nagar

Gives overall idea of RS and its application - Manoj Parmar, Lecturer Polytechnic, VV Nagar

Hold this exhibition in villages also - Jagadish Patel, Lecturer Polytechnic, VV Nagar

Exciting and very interesting exhibition. It looks as though India has yet to strive hard to reach the heights achieved by developed nations. This is one example where Government organization is doing such an excellent job. My congratulations to all - Pandya, Retd. Dy District Officer

The tremendous potential of RS technology has come out clearly through the excellent representations - NJ Shroff and others, ISTE Chapter, Civil Engg Department.

An excellent job, would be idealtaken to school - Staff members, Anandalaya, Anand.

Got a lot of information. This technique is of immense use for a fisherman like me - Abdul Miya, Umreth

An excellent educational display. I realized that space science is very useful in development. With you success - R K Patel, Scientist, NDDB

POPULAR LECTURES

Indian Earth Observation System

By Shri A S Kirankumar, Head SSD/EOSDG/RSA-SAC on Oct 11,1991

Earth observations from space platforms began with the launch of satellite for Earth Observation (SEO). Two satellites called Bhaskara I and Bhaskara II were launched in 1979 and 1981 respectively. These satellites carried two-channel (Red/Near IR) TV cameras and passive microwave radiometers (two and three- channels for respective satellites). Both the spin-stabilized satellites were

positioned in low (550 km) earth orbit at an inclination of 59 deg. to the equator. These features and the sensor characteristics were not ideal for remote sensing but the launch of satellites provided valuable experience in design of sensor and satellite systems and the related activities. INSAT VHRR is another satellite sensor designed for meteorological purposes. It is a two-channel (visible/thermal IR) sensor equipped with bi- directional scanning mirror covering, from geosynchronous altitude, area corresponding to +- 52 deg north/south and 32 to 50 deg. east. This historical scenario is completed with mention of another development called smart sensor on Rohini satellite which was actually a CCD-based two-channel sensor. Present Indian capability in earth observations is centred around two orbiting RS satellite - IRS-1A launched in 1988 and IRS-1B launched in 1991. The satellites carry identical 4-channel CCD-based sensors and provide a combined repetivity of 11 days. Design of earth observations system has three main considerations, viz. platforms (low earth, sun-synchronous, polar, geosynchronous, inclined, equatorial),type of observations (imaging or non- imaging type, active and passive sensors) and resolution (temporal, spectral, polarization and radiometric). While low earth orbits provide high resolution and facilitate active measurements, these orbits suffer from lacunae like large perturbations, instability and short life. Sun-synchronous orbits feature full earth coverage and fixed observation geometry and conditions required for quantitative studies. The geo- synchronous orbits facilitate continuous half-globe observation ($\pm$50 deg. N/S, $\pm$ 100 deg. E/W) but suffer from low resolution unless bulky sensors are used.

Future of Indian Earth Observation Programme centres around IRS- 1C/1D satellites to be launched in 1993. IRS-1C/1D will have three CCD based sensors, viz.

* PAN, single channel (0.5-0.75 um) panchromatic camera
* Multispectral sensors, three channel (vis-NIR- SWIR, 1.55- 1.75 um)

Wide Field Sensor (WiFS), 2-channel (Red/NIR) camera

PAN sensor will be a steerable (along tract) in the range of $\pm$ 26 deg. (or $\pm$ 390 km) giving stereo imaging with base-to-height ratio of 0.5-1.0. The IRS- 1C/1D orbit (817 km) achieves 5 day repeat coverage by WiFS and 24-days by LISS-III.

Meteorological sensor of future, INSAT-2 VHRR will feature improved resolution in visible/IR (2 and 8 km instead of 25 and 10 km). It will also carry splited IR channel for atmospheric correction and a water vapour channel. A two-band CCD camera with 1 km resolution and 6000 km swath is also envisaged.

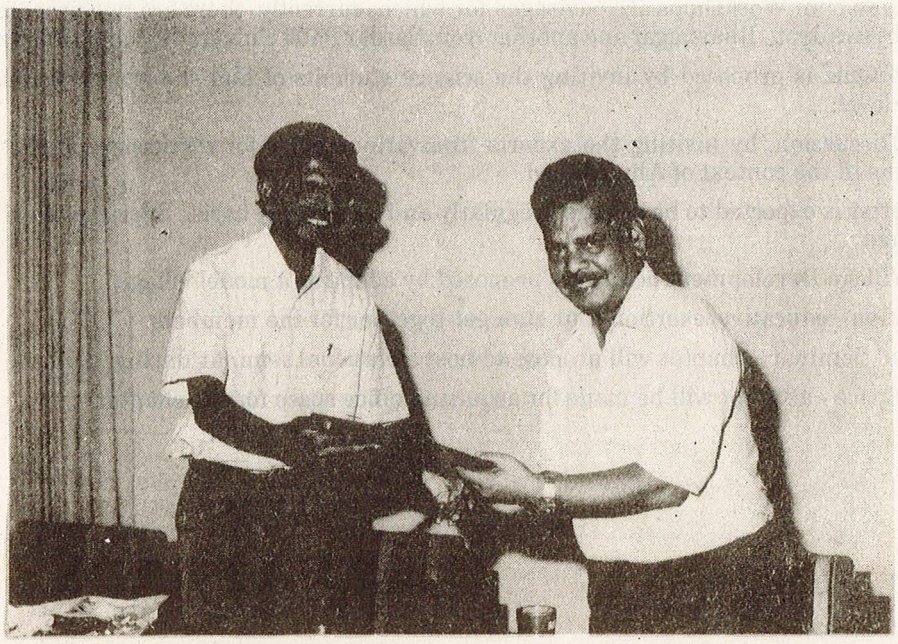
Indian earth observation programme has a comparable sophistication to the existing systems in the world. Future systems are likely to further enhance the comparative capabilities. Certain system studies are also being considered in the modern context of EOS which is a means for monitoring all encompassing changes in earth's hydrogeological, geo-chemical and biological cycle in totality.

Environment and Man

By Dr. S K Nigam, Dy Director, National Institute of Occupational Health on World Environment day

Lecture organized by ISRS-AC on June 5,1992 at SAC, was attended by more than 100 participants. The function was chaired by Dr. George Joseph, Associate Director SAC. In his presidential address Dr. George Joseph underlined the urgency of environment protection owing to the rapid increase in the pollution rate so much so that the pollution during the last 30 years is much more than past 200 years. He pointed out that the current focus being on global environment, the local aspects like wasteland also need proper attention. This is an area where remote sensing has been very effective.

Main focus of Dr. Nigam's talk was on the causes and impact of environmental imbalances on human health. Imbalances are caused due to lack of coordination/coherence between man and environment which are direct result of increased population pressure due to alarming rate of population growth. Overpopulation has resulted in urbanization with about 27% of total population living in urban areas. Majority of these people live in most brutal inhuman conditions facing acute shortage of water and sanitation, severe health problems, high levels of air, water and noise pollution. Urban industrial challenges has lead man to careless (almost reckless) practices with regard to processing of raw materials like asbestos, silica dust, hazardous chemicals operations of thermal power stations. The most visible impact can be seen in form of streets/roads congested with automobiles. Alarmity of the situation can be gazed with the fact that number of automobiles which was 1891 during



A Memento of Remembrence to Dr Nigam, Presented by Dr George Joseph

All-in all, the lecture was very informative and a welcome departure from usual RS talks. It is hoped that the Remote Sensing community in Ahmedabad would have received many tips with regard to their professional dispensation as well as their social and personnel obligations towards keeping environment clean and worthy of human living.

Dr. Nigam, three times Hari Om Ashram Awardee, has published 75 papers in the field of toxicology and cancer. He has been awarded a gold medal in 1991 by PGI Alumni for his contributions in the field of medical research. His scientific activities at the moment are the role of immunology in the pathogenesis of many occupational diseases and on aluminium toxicity.

Letters to the editor

Your Newsletter could be a good platform for expressing your views on the developments in Remote Sensing and related fields. It is proposed to include this column in the newsletter on a regular basis. So, please send your views to the Editor via Secretary ISRS-AC.

FUTURE ACTIVITIES/EVENTS ENVISAGED

In its meeting on Apr. 29,92, the executive council Of ISRS-AC decided on an agenda of activities for the year 1992. A gist of the proposed/planned activities is as follows:

* Exhibition cum Workshops are envisaged for which, currently, there are two proposals. One from physics dept., Bhavnagar and another from Sardar Patel University, Vallabh Vidyanagar.
* Science Quiz is proposed by inviting the science students of higher secondary and college (B.Sc.) level.
* Panel Discussion, by inviting the experts fromvarious fields for discussion on the current problems in the context of Ahmedabad.
* Newsletter is expected to be released regularly and on a timely basis. Special annual issue is envisaged.
* Area/Village Development activity is proposed by adopting a model village.
* Recreation - educative/exertion tour cum get-together for the members.
* National Seminar - chapter will propose to host a National seminar during 1993.
* Office Space - attempt will be made for acquiring office space for the chapter.

ABOUT THE MEMBERS

Awards

ISRS-AC family feels elated and congratulates Dr. S.B. Sharma on being selected for Hari Om Ashram prerit Vikram Sarabhai award on space technology and Dr. P.C. Pandey on being conferred Shanti Swarup Bhatnagar award for earth atmospheric and planetary sciences.

Promotions

On behalf of ISRS-AC, we congratulate the following member colleagues who have achieved an important milestone in their career by gaining departmental promotion.

Shri I M Bahuguna as Sci 'SD', SAC
Mrs Anjali Bahuguna as Sci 'SD', SAC
Shri T T Medhavi as Sci 'SD', SAC
Dr. R Ghosh as Sci 'SE', SAC
Shri Mukund Rao as Sci 'SE', SAC
Shri D R M Samudraiah as Sci 'SF', SAC
Dr. P K Srivastav as Sci 'SF', SAC
Dr. Manab Chakraborty as Sci 'SF', SAC
Dr. K P Sharma as Sci 'SF', SAC
Shri Tapan Majumdar as Sci 'SF', SAC
Dr. S D Naik as Sci 'SF', SAC
Dr. R R Navalgund as Sci 'SG', SAC
Dr. P C Pandey as Sci 'SG', SAC

Review on Radar Remote Sensing for Land Resources

Dr. S Mohan, Shri N.S. Mehta and Ms Parul Patel of SAC has written a review report Radar Remote Sensing for Land Resources. The report starts with introductory topics like microwave remote sensing technique, radar-target interaction mechanism and radar image characteristics. It discusses radar's potential for various land applications , with suitable illustrations and review of the work done by various investigators. Eight applications discussed in the report are on soil moisture, flood mapping, crop identification snow studies, geological and geomorphological mapping, radar stereo mapping, forestry and urban land use. A summary of work done in India has also been discussed. A few SAR images covering various geographical regions of Indian land mass have been shown. Report also covers the recent trends in the field of radar remote sensing.

Transfers/Deputations

Dr. K.P. Sharma , Scientist, SAC, has been transferred to RRSSC Dehradun. We wish him a continued successful career.

Elected

Shri Pramod Kale as President, Indian Society Of Remote Sensing. Chapter feels elated on having contributed yet another President to the national body, and looks forward to Shri Kale for his support and guidance for this chapter.

Dr. Sailesh R. Nayak as joint secretary of the national body of Indian Society of Remote Sensing. Dr. Nayak ,as treasurer and secretary of the Ahemedabad chapter during its formative phase, had done a commendable job of giving shape to the chapter. We are confident that he will come out with flying colours in the case of national body as well.

Visits Abroad

Shri R K Dave visited Kourou, French Guyana as a member of the INSAT-2 Launch campaign team.

Dr. R.R. Navalgund visited Montreal, Canada for attending the 41st IAF congress and presented a paper on remote sensing in agriculture.

Grieved

We feel deep sense of loss and express our condolences on the sad demise of Shri A S Ramamoorthy and Dr.(Mrs.) K A Bhagawat, who had long association with the Remote Sensing activities in the country.

May God almighty give strength to the grief stricken family members of the deceased.

Welcome to ISRS-AC

Our strength has increased to 226. We introduce herewith the names of the new entrants to the ISRS-AC family.

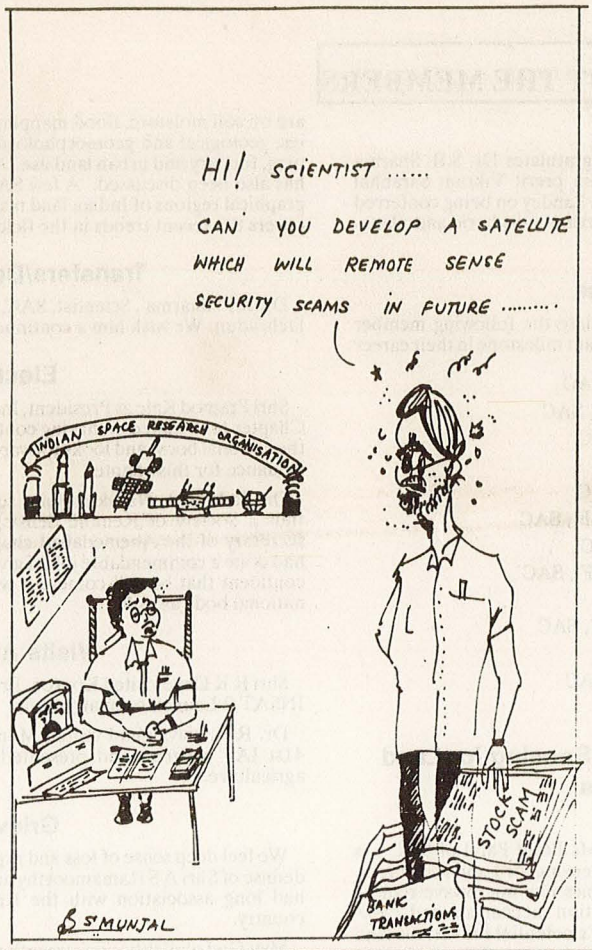
Life Members

Shri Gopal Sharma, SAC (ISRO)
Shri K.L.N.Shastri, SAC (ISRO)
Shri J.G.Patel, SAC (ISRO)
Shri T.G.B.Shrikanth, SAC (ISRO)
Shri B S Lole, SAC (ISRO)
Shri G. Ram Mohan Rao, CGWB
Dr. S B Sharma, SAC (ISRO)
Shri K.M.Mathur, SAC (ISRO)
Shri B.K.Sharma, Ahmedabad
Shri G.S.Bhatia , SAC (ISRO)
Shri Rajeev Saxena, CGWB
Shri Arun Kumar, CGWB
Shri Anil Kumar Jain, CGWB
Shri Lalit Kumar Mathur, CGWB
Shri P.R.Gupte, CGWB
Shri V.S.R.Krishna, CGWB
Shri Sunil Kumar, CGWB
Shri J.N.Bhagat, CGWB
Shri A.Kannan, CGWB
Shri Ashok Kumar, CGWB
Shri Gaurang B. Parekh, Ahmedabad
Shri R.C.Jain, CGWB
Shri S.Pandey, CGWB
Shri D.R.M.Samudrariah, SAC (ISRO)
Shri R.P.Prajapati, SAC (ISRO)
Dr. P.K.Gupta, SAC (ISRO)
Dr. Ranendu Ghosh, SAC (ISRO)
Shri P.D.Yadav, SAC (ISRO)
Shri Ketan R.Kotak, SAC (ISRO)
Shri Hari Shanker, SAC (ISRO)
Shri Arijit Dey, CGWB
Shri Arumugam, CGWB
Shri Anoop Nayar, Ahmedabad
Shri P K Jain, CGWB
Shri Ajit Malavia, SAC (ISRO)
Shri A D Vyas, Gujarat Univ.
Shri Kannan V Iyer, SAC (ISRO)

Annual Members

Shri R.J.Bhanderi, SAC (ISRO)

This newsletter is by the members for the members. We plan to include, on a regular basis, the notes on the events in the life of our member colleagues. Notes could be on promotions, appointments, transfers, awards, visits abroad ,publications outside ISRS, personal memorabilia or on any other event highlighting the professional-cum-personal life of the members. The communications received from the members in this regard would greatly enhance the scope of this column. Please send your notes to the editor or secretary, ISRS- AC.



BOOK POST

Shri J.K. Garg
MWRD/RSAG/RSA

If undelivered, return to :
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C/O. Remote Sensing Area
Space Applications Centre
Ahmedabad 380 053

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