Indian Society of Remote Sensing

Ahmedabad Chapter

NEWSLETTER

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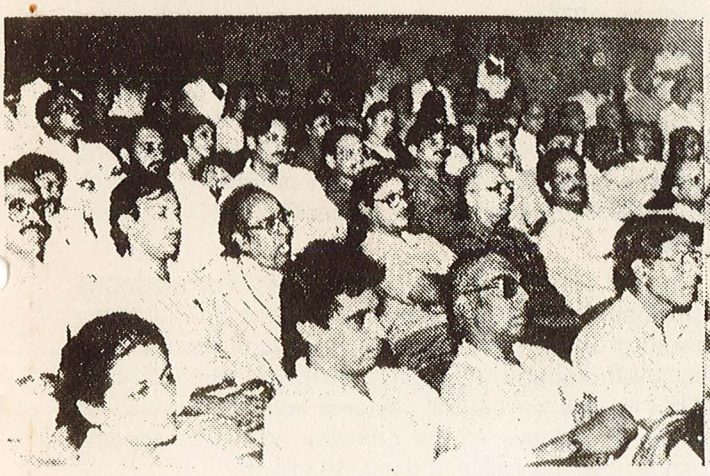

Mr. Pramod Kale, director of the Space Application Centre, discussing a point with Mr. Kartikeya Sarabhai at a panel discussion on 'Environmental scenario of Ahmedabad in 21st Century' in Ahmedabad on Wednesday. Also seen are: Mr. N. G. Mavalankar, Mr. Kirti Shah and Prof. N. I. Dani.

Times of India, Ahmedabad, July 1, 1993

ISRS-AC has proposed a National Symposium on Microwave Remote Sensing and User's Meet (MRSUM) during January, 1994. Preparations are currently underway for successful organisation of the symposium.

CONGRATULATIONS ON SUCCESSFUL LAUNCH OF INSAT II B

Editor : R K Goel

RESEARCH NOTES

EVOLUTION OF REMOTE SENSING SYSTEMS - CURRENT SCENARIO AND FUTURE PROSPECTS

Dr George Joseph, Associate Director, Space Applications Centre

Systematic earth observation from space started in 1960 with the launch of Television Infrared Observation Satellite (TIROS-1), designed primarily for meteorological observation. Space photography also became available from Gemini and Apollo missions. Though the inclusion of cameras on Gemini and Apollo missions was an offshoot of the decision to land men on the moon, the US Geological Survey (USGS) used these photographs to generate a general plan for repetitive surveys of the earth for resources and environmental investigations. The efforts by the USGS to establish an Earth Resources Observation Satellite Programme led to the Earth Resources Technology Satellite (ERTS) project under NASA and the first satellite designed specifically for earth resources survey ERTS-1 was launched in July 1972. With the launch of the 2nd satellite in January 1975, the name of the series was changed from ERTS to LANDSAT. LANDSAT 1 and 2 carried a four-band Multispectral Scanner (MSS) and a three-band RBV camera. In LANDSAT 3, a fifth band in thermal IR was added to MSS.

The large amount of data obtained from LANDSAT gave a new impetus to remote sensing scientists to apply various techniques and methodolcgies to evaluate the utility of this new technology for various applications. The systematic study using LANDSAT MSS showed the necessity of going in for a higher spatial and spectral resolution. This led to the development of the advanced scanner called Thematic Mapper (TM) with 30 m spatial resolution and the central band and band width specifically chosen for various thematic applications. The TM covered visible, near IR, middle IR and thermal IR regions of the electromagnetic spectrum in seven bands. The first Thematic Mapper was launched on LANDSAT 5.

A quantum jump has been achieved in the capability of space imaging with the French Remote Sensing System called SPOT. It has a three-band multispectral camera of 20 m resolution and a panchromatic band of 10 m resolution. There are two such cameras onboard, each providing 60 km swath. One specific advantage of the SPOT system is that the view axis of the satellite is movable off nadir by $\pm 27^{\circ}$ thereby increasing the repeat coverage of a particular scene and facilitating stereo coverage.

A number of other countries like Japan, USSR, China operate remote sensing satellites. India has joined the International community of operational remote sensing satellite operators with the launch of IRS-1A in March 1988 followed by an identical satellite IRS-1B in August 1991.

The IRS-1A/1B satellites have two types of sensors. One provides a spatial resolution of about 72 m (LISS-I) and a swath of 148 km. Another one consists of two cameras each with a spatial resolution of 36 m and swath of 74 km (LISS-II). The two LISS-II cameras combined provide a swath of 145 km. All the cameras have four spectral bands covering visible and near IR region.

In the area of microwave remote sensing the first active microwave sensor, specifically designed for ocean applications, was L band SAR carried on board SEASAT in 1978. This had a capability to produce image with 25 m spatial resolution and swath of 100 km. SEASAT was followed by Shuttle Imaging Radar (SIR-A & B) in 1982 and 1984 with capabilities similar to SEASAT. The first commercial SAR satellite is the Soviet satellite ALMAZ-1 launched in March 1991 carrying a SAR operating in L band with spatial resolution of about 15-30 m and swath 20-45 km. The European Remote Sensing Satellite (ERS-1) launched in July 1991, probably is the first satellite having various microwave sensors for land and sea applications. The data from ERS-1 has found application potential in various areas such as geology, soil moisture, physical oceanography, etc. Thus currently remote sensing user community has data coverage from visible, near infrared, middle infrared, thermal infrared and microwave regions.

THE CAPABILITY OF FUTURE SYSTEMS

Though the data available in the various sensors are adequate for most of the applications, the user community is looking for systems with better spatial, spectral and temporal resolution. In the existing current system, LANDSAT 6 will carry an improved Thematic Mapper which is called Enhanced TM (ETM). ETM has an additional band with 0.5-0.9 micrometer band width, having a spatial resolution of 15 m. The next generation SPOT (SPOT-4) is expected to carry a band in the middle infrared (1.5-1.75 micrometer). In addition it is also likely to have a Wide Field Sensor (WiFS) having coarse spatial

ISRS-AC EXECUTIVE COUNCIL 1992-94

Chairman	Shri R C Garg
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NOTABLE FUTURE REMOTE SENSING SYSTEMS						
Spacecraft/ Agency/ Year	Sensor	Spectral Specs(s)		Spatial Spec(s)		Remarks
		Range (um)/ Width	Resol (bits)	Swath (Km)	Resol. (m)	
IRS-P2/ INDIA/	MOS-A	0.76 0.763 0.766/ 0.0014	12	195	5800	
	MOS-B	0.408 0.443 0.485 0.520 0.570 0.615 0.650 0.685 0.750 0.870 1.010 0.815 0.945/ 0.01	12	196	1500	
	MOS-C	1.6 2.3/ 0.1	12	195	1500	
	LISS-II	Same Spec(s) as IRS-I A/B				
IRS-I C/D / INDIA	LISS-III	0.52-0.59 0.62-0.68 0.77-0.86	7	141	23	On-board recording for 24 minutes
		1.55-1.70	7	148	69	
	WiFS	0.62-0.68 0.77-0.86	7	770	188	
	PAN	0.5-0.75	6	70	<10	Off-nadir viewing ± 26°
LANDSAT-6/NASA	MSS	0.5-0.6 0.6-0.7 0.7-0.8 0.8-1.1	6	185	80	
		10.5-12.5			240	
	ETM	0.45-0.52 0.52-0.60 0.63-0.69 0.76-0.90 1.55-1.75 2.08-2.35	8	185	30	
		10.40-12.50			120	
	PAN	0.50-0.90			15	
SPOT-3/ FRANCE/ 1994 end	HRVIR	0,50-0.59 0.61-0.68 0.78-0.89 1.54-1.75			20	
	VEG-INST	HRVIR + 0.43-0.47	10	2200	1100	
	PAN	0.61-0.68			10	
SPOT-4/ FRANCE	HRVIR	Same as SPOT-3				
	HRG	VNIR (1 or 2 Bands)		30-60	<5	Along-track stereo : 2-3m height accuracy
NASA/ 1993	SeaWiFS	0.402-0.422 0.433-0.453 0.480-0.500 0.500-0.520 0.545-0.565 0.660-0.680 0.745-0.785 0.785-0.885	10	2800		Ocean Colour
ADEOS/Japan/ 1995	AVNIR	0.42-0.50 0.52-0.60 0.61-0.69 0.76-0.86	8	80	16	±300 Km Cross-track
		0.52-0.69	7	80	8	
	OCTS	0.412 0.443 0.49 0.52 0.565 0.665/ 0.02	10	1400		
		0.765 0.865/ 0.4				
		3.7/ 0.3				
		8.5/ 0.5				
		11.0 12.0/ 1.0				
AM-I/ NASA/ 1998	ASTER	0.52-0.60 0.63-0.69 0.76-0.86	8	60	15	±116 Km Cross-track
		1.6-1.7 2.145-2.185 2.185-2.225 2.235-2.285 2.295-2.365 2.360-2.430			30	
		8.125-8.475 8.475-8.825 8.925-9.275 10.25-10.95 10.95-11.65	12		90	
	MODIS-N	Imaging Spectrometer- Details given in note from Shri K M Mathur				
/ DLR/ Germany/ 1996	ROSIS					

resolution (1 km) covering about 2000 km so that a better temporal resolution is possible. Another improvement in the SPOT-4 is the modified spectral band in the Panchromatic channel same as the red band (0.61-0.68) of the HRV Multispectral Camera. The use of same B-2 channel for both panchromatic and multispectral imaging makes it simpler and more radiometrically accurate to produce merged product using both panchromatic and multispectral band to generate 10 meter FCC. In the case of IRS, IRS follow-on system (IRS-1C/1D) will have three bands in the visible and near infrared with about 23 m resolution and one band in the middle infrared (1.55-1.75 micrometer) with about 70 meter resolution. In addition a Panchromatic camera, better than 10 m resolution with

off axis pointing capability and a third camera (WiFS) having spatial resolution of about 188 m and swath of 770 km providing a temporal resolution of 5 days have also been included in IRS-1C/1D.

The second PSLV will carry a satellite (P2) having LISS-2 and three sensors (named Modular Optical Scanner MOS-IRS-A, B and C) developed by DLR. MOS-A sensor operates in four narrow spectral channels in the range of 755-768 nm, has swath of 195 km, ground resolution of 5.81 x 5.57 km and high radiometric sensitivity of 0.3% in 0.1 to 40 micrometer/cm^2.nm.sr. Data from MOS-A would be useful in atmospheric correction studies. The MOS-B sensor has been designed for oceanographic and atmospheric applications. It has five spectral bands in the blue-green region for chlorophyll estimation, three spectral bands in the red region for suspended sediment measurements, three bands in the near infrared for estimation of aerosol optical thickness and two water vapour absorption channels. The MOS-C sensor operates at two short wave infrared spectral bands centered at 1.6 and 2.3 micrometer. Data from MOS-C used conjunctively with IRS-LISS-II will be useful in large area plant water stress estimation and other applications.

In addition to this a number of future systems are planned by various space agencies. The Advanced Earth Observation Satellite (ADEOS) of Japan will carry a combination of sensors from various space agencies. These include Ocean Colour Temperature Scanner (OCTS) and Advanced VNIR Radiometer (AVNIR) from NASDA, Japan as core sensors. In addition there are a number of sensors termed as Announcement Opportunity Sensors (AO Sensors). These include interferometric monitor for green gases (IMG), improved limb atmospheric sounder (ILAS), Retro reflector in space (RIS) from Japan, NASA scatterometer (NSACAT), Total ozone mapping spectrometer (TOMS) from NASA, Polarisation and directionality of earth's reflectance (POLDER) from CNES. The satellite weighs about 3.5 tones and produces 4.5 kw power. It is supposed to be launched sometimes beyond 1995. Of this the AVNIR has four spectral bands very similar to IRS-1A/1B with 16 m resolution and 80 km swath, and also a Panchromatic band with 8 m resolution and 80 km swath. The instrument has a cross track pointing capability so that 300 km on either side of the sub-satellite track can be imaged.

ESA Polar platform will have a set of meteorological instruments which are primarily improved NOAA payloads such as advanced very high reso-

SOME ABBREVIATIONS

(System specifications given elsewhere)

ADEOS	Advanced Earth Observation Satellite of Japan
AIS	Airborne Imaging Spectrometer
AMSS	Advanced multispectral scanner
AOS	Announcement Opportunity Sensors
AOTF	Acousto-Optically Tunable Filter - Field Spectrometer for future NASA space exploration
ASAS	Advanced solid state array spectro-radiometer
ASTER	Advanced Spaceborne Thermal Emission and Reflection Radiometer
AVIRIS	Airborne Visible/ Infrared Imaging Spectrometer
AVNIR	Advanced VNIR Radiometer from NASDA, Japan
CERES	Cloud and Earth's Radiant Energy System
EOPP	European Observation Preparatory Programme
FIIS	Far Infrared Imaging Spectrometer
FLI/PMI	Flourescence line imager/ programmable mapping imager
HIRIS	High Resolution Imaging Spectrometer - follow on to SISEX
ILAS	Improved limb atmospheric sounder
IMG	Interferometric monitor for green gases
MERIS	Medium Resolution Imaging Spectrometer
MISR	Multi-Angle Imaging Spectro-Radiometer
MODIS	Moderate Resolution Imaging Spectrometer MODIS-T (tilt) MODIS-N (nadir)
MOPITT	Measurements of Pollution in the Troposphere
NIMS	Near IR mapping spectrometer
NSACAT	NASA scatterometer
OCTS	Ocean Colour Temperature Scanner
POLDER	Polarisation and directionality of earth's reflectance from CNES
RIS	Retro reflector in space from Japan
ROSIS	Reflective optics system imaging spectrometer
SISEX	Shuttle Imaging Spectrometer Experiment - Pushbroom approach
TIIS	Thermal IR imaging spectrometer
TOMS	Total ozone mapping spectrometer from NASA
VIMS	Visible and IR mapping spectrometer - Wishkbroom approach
WBDCS	Wide-Band Data Collection System

lution radiometer, high resolution infrared sounder and advanced microwave sounding unit. A set of facility instruments are proposed to be developed by ESA such as Altimeter-2, Medium Resolution Imaging Spectrometer, Michelson Interferometric Passive Atmosphere Sounder. In addition there are Announcement Opportunities instruments such as Global ozone monitoring by occultation of stars, scanning imaging absorption spectrometer for atmospheric cartography, advanced along-track scanning radiometer, cloud and earth's radiant energy system.

The US programme **Mission to Planet Earth** is aimed at providing support to US global change research programme by having a wide variety of observations using both space and ground based facilities. The main space components of Mission to Planet Earth are:

* unmanned earth observation system (EOS)
* earth probes (low orbits) over equator (TRMM, MFE, TOMS, etc.)
* space station freedom (manned research facility: ~ 400 km, inclination : 28.5°)
* advanced geostationary platforms
* series of NOAA free flyers.

A series of satellites have been planned under the **Earth Observation Programme**. Of these, one set of satellites termed as AM-1, will have equatorial crossing time in the forenoon and 2nd set of satellites termed as PM-1, will have equatorial crossing time in the afternoon. The first AM satellite is planned to be launched in 1998 and will carry the following payloads:

* Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER)
* Moderate Resolution Imaging Spectrometer-Nadir (MODIS-N)
* Multi-Angle Imaging Spectro-Radiometer (MISR)
* Cloud and Earth's Radiant Energy System (CERES)
* Measurements of Pollution in the Troposphere (MOPITT)
* Wide-Band Data Collection System (WBDCS)

Of these payloads, MODIS-N provides almost spectroscopic observation with coarse spatial resolution and wide swath. The ASTER has three bands in the visible and near infrared with 15 m resolution, six band in the middle infrared with 30 m resolution and 5 bands in the thermal infrared with 90 m resolution. However, all these have only 60 km swath with the cross track capability of ±116 km. The ASTER also has forward tilted camera for stereoscopic observation.

All these advanced systems unfortunately do not provide data for operational use. I define here operational use such that user community should be able to get data on any specific location with a specified temporal resolution. Since the intrinsic swath of these cameras are low, though a high repetitivity capability can be obtained by cross track scanning, these do not guarantee a systematic coverage of the surface of the earth. *The future sensors onboard SPOT, IRS and LANDSAT will be the systems with OIR region providing data for operational applications.* In addition the microwave data will be available on a continued basis from ERS follow ons, RADARSAT and JERS.

CHANGES IN THE RIVER GANGA AS SEEN IN THE IRS-1A IMAGES : A CASE STUDY BETWEEN DEVPRAYAG AND HARIDWAR

T V R Murthy and M V Muley, Space Applications Centre

Water through the river system is considered as the basic building block of the structure of civilization, modernization, and industrialization. The tremendous growth in this direction needs attention towards the activities that minimize environmental degradation and maximize the overall return to mankind. The present study covers the study carried out on the river Ganga between Devaprayag to Haridwar. Various geomorphic/ hydrogeomorphic, land use and urban features present along the course of the river Ganga were interpreted using IRS-1A, LISS-II false colour composites. Due to increase in the use of river's regime by man, the various activities are being concentrated in this belt. The natural and anthropogenic forces were studied and found responsible for the changes taking place in the course of the river. The changes like reduction of water channels, reduction in water flow, increase in sedimentation, channel migration etc., may have various impacts on the riverine environment. This data is useful to planners and managers of the water resources especially for those who are engaged in flood management, canal development and irrigation management. The details of this study are described in a technical report.

IMAGING SPECTROMETERS

Electro-Optic Sensors Development Group, Space Applications Centre

In the recent past the application scientists have been stressing the need of narrow band spectral data for extracting distinct spectral features contained in the multispectral remotely sensed data. The latest advancements in the detecter technology and sophisticated complex optical systems have led the sensor technologists to develop Imaging Spectrometers. The principle of acquiring spectrometer data is based on the physical phenomena of interaction of photons with molecular structure of the matter to be observed. It shows absorption features that are matter specific. Imaging spectrometer, therefore, is a tool to collect data more quantitatively. Various agencies have developed, or are developing, the imaging spectrometers. Some of these are presented in the table below.

For further details contact Shri K M Mathur

AIRBORNE IMAGING SPECTROMETERS							
Spectrometer	Agency/ Aircraft	Year	Alt. (Km)	Spectral Specs		Spatial Resolution	Applications
				Range (um)	Resol. (nm)/ Channels		
A IS-I	NASA/C-130	82-85	3	1.2 - 2.4	9.5	IFOV - 10 m	
AIS-II	-do-	early 86	6	0.9-2.4	11	FOV : 128 mrad	Optical depth data from measurement of incident solar illumination
FLI/PMI	Canadian Fisheries/ Piper Navajo Chieftain	83 - 87	3	0.43-0.805	2.6 / 288	FOV- 80.65 mrad	Chlorophyll Geobotany &Bathymetry
AVIRIS	JPLNASA/ U-2	87 - 89	20	0.4-2.45	10/ 224	IFOV- 20 m	Mining atmsopheric science plant biology hydrology etc.
ROSIS	DFVLR Germany	89 - 92	4	0.43-0.85	5/ 256	FOV- 2.2 Km IFOV - 0.55 mrad	Water colour monitoring : marine biology
ASAS	NASA / C-130B	83...	5	0.465-0.871	14	FOV- 2200 m	Geologic targets like fans
AMSS	Geoscan Australia	88 90		0.48-11.8		FOV - 28m	Mineral exploitation - Gold mining.
TIIS	NASA / C-130	90	2.438	7.5-14	100	IFOV- 10 m	Compositional Surface Mapping of terrain for categorising rock families

SPACEBORNE IMAGING SPECTROMETERS								
Spectrometer	Agency/ Carrier	Year	Orbit (Km)	Spectral Specs.		Spatial Resolution		Applications
				Range (um)/ channels	Resol. (nm)	FOV (Km)	IFOV (m)	
NIMS	JPL-NASA/ Galileo	89	10000	0.7 - 5.2 / 204		100	0.5 mrad	Mineral content and atmosphere (Jupiter)
				< 1	25			
				> 1	13			
VIMS	JPL- NASA	92	361	0.4 - 5.2 / 320		41.6	1 650	Identification of materials composition (MARS & Comet)
				0.4- 3.2	10			
				3.2- 5.2	20			
SISEX	JPL - NASA/ Shuttle	90	250	0.4 - 2.4 / 128	10	12.1	30	World wide samples of imaging spectroscopy data
ROSIS	DFVLR Germany	92	824	0.4 - 1.04 / 256	5	500	450	
MODIS-N	NASA/ EOS	95	824	0.4 - 14.2		64 / 1780	1000	
MODIS-T				0.4 - 1.0				
MERIS	ESA / EOPP	97	824	0.4 - 1.05 / 15	1.25	1500	260 / 1040	Ocean colour environmental factors
HIRIS	NASA / EOS	95	824	0.4 - 2.5 / 192		24/30	30	Detection of blue shift of chlorophyll absorption edge
				0.4 - 1.0	9.4			
				1.0 - 2.5	11.7			
FIIS	Ariane 5	Eliptical - 1000/ 70,570		80-200	Selectable			Cooling lines of inter stellar and circumstellar gas clouds
AOTF		Bread board 1990		0.4 - 2.5	Selectable	12°		Validation

FIRE-PRONE AREA MAPPING OF A PART OF GIR NATIONAL PARK INTEGRATING SATELLITE AND TOPOGRAPHICAL DATA USING GEOGRAPHIC INFORMATION SYSTEM

A K Kandya, M M Kimothi and R N Jadhav, Space Applications Centre
J P Aggarwal, Gujarat State Forest Department

Occurrence of frequent fire is one of the reasons for degradation of forests in the country/elsewhere in the world. The forest fires affect (a) standing crop, (b) soil, (c) productive capacity of the forest, (d) productive value of the forest, (e) wild life and (f) recreational or scenic values. An attempt has been made to map the fire-prone areas of a part of Gir National Park. IRS- 1B, LISS-II data were visually classified to ascertain the vegetation status of the study area. The road-network and the huts/settlements were mapped through the Survey of India (SOI) topographical map. Finally, all the parameters having direct/indirect influence over the occurrence of fire were integrated using Geographic Information System (GIS) approach resulting in a 'fire-prone' map of the area.

CHAPTER ACTIVITIES

MEMBERSHIP

Our strength has increased to 268. We provide herewith a list of new members enrolled during the period Jan 1, 1993 to Jun 30, 1993.

Life Members

Shri Shravan Kumar Acharya
Shri A C Dave
Shri R K Malaviya
Shri Rajkumar Arora
Shri Markand P Oza
Shri Shashikant A Sharma
Shri Sandip R Oza
Shri K D Acharya

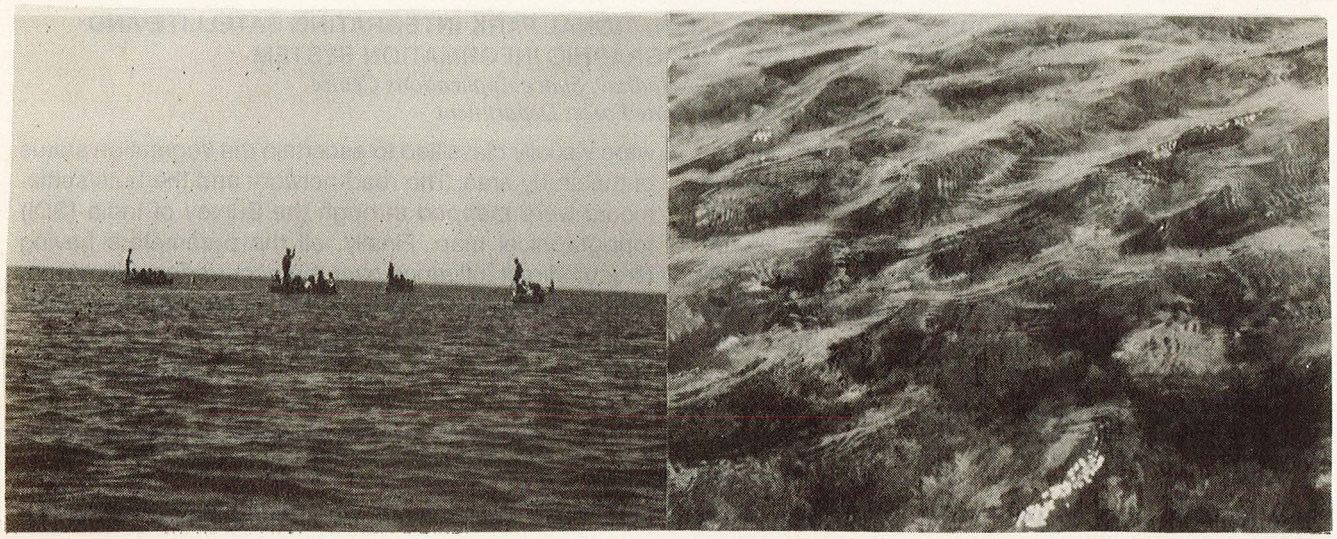
Annual Members

Shri V K Jain
Shri N J Shelat
Shri Vikram Desai
Shri S C Agrwal
Shri K Vellimalai
Shri C N Lal
Shri H K Dave
Shri Pankaj Laghate
Shri D R Rajak
Shri Raghavendra Pratap Singh
Shri R Ramakrishnan
Shri A P Shukla
Shri R M Gairola

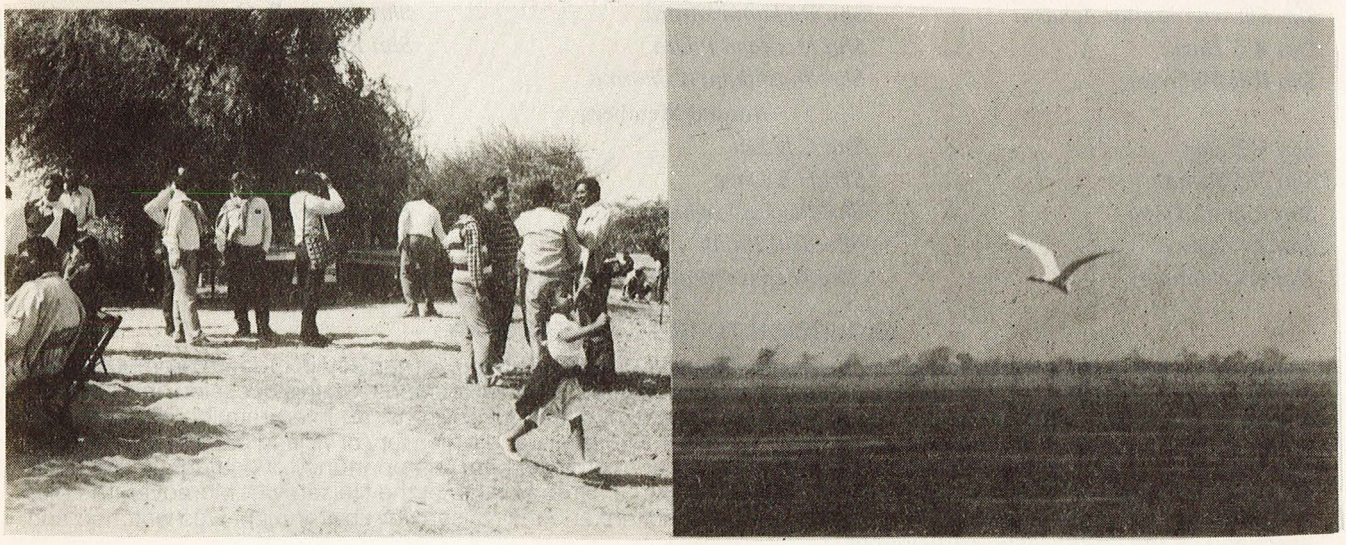
EXCURSION TOUR TO NALSAROVAR

An excursion tour to Nalsarovar was organised on January 31, 1993. The tour, organised in order to promote closer interaction amongst the members and their families and was availed of by 165 persons. On this occasion an excursion card was distributed which included satellite image of Nalsarovar and its environs, an interpretation of this image showing the use of satellite images for monitoring the lake environment and a glossary of visiting birds at the Sarovar. A boat sailing trip was organised for the participants in order to provide them an opportunity of getting the first hand information by way of practical demonstration about the aquaculture existing at the Nalsarovar. Moreover, the bird species and their population was supported by this aquaculture and the Nalsarovar environment was watched and assessed by the enthusiastic participants.

Shri J P Aggarwal, the host, welcomes the tourists and briefs them about the Sarovar



Flora and Fauna - On the way to virgin island



Birds Watching !!

FUTURE ACTIVITIES OF THE CHAPTER

SCIENCE QUIZ for higher secondary level students during october, 1993.

EXCURSION TOUR (I) during november, 1993.

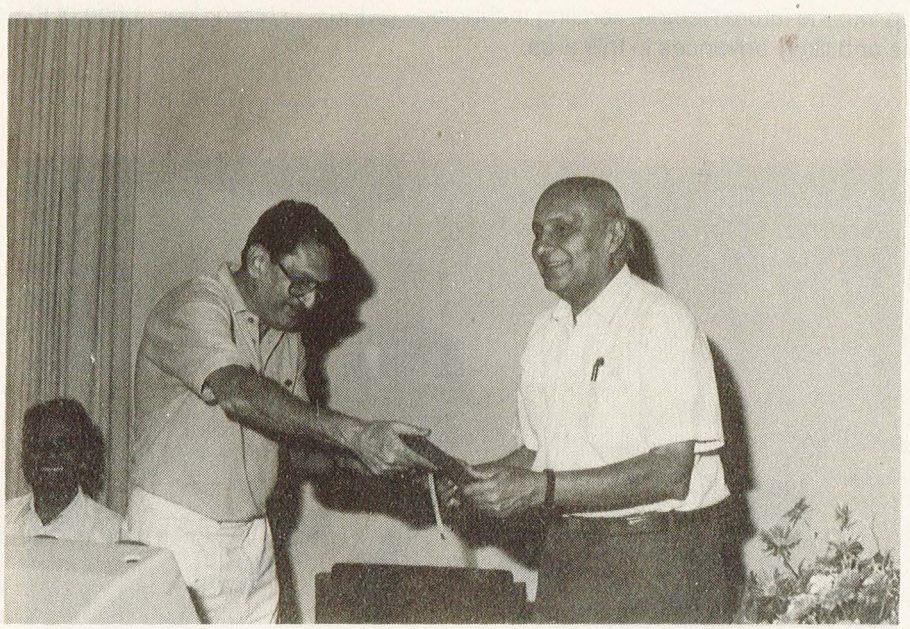
NATIONAL SYMPOSIUM on ' **Microwave Remote Sensing and Users Meet (MRSUM)**' during Jan 10 - 11, 1994.

ELECTIONS for the executive council are to be held during March, 1994. Keeping this in view the executive council , in its meeting held on july 20, 1993, decided that Dr P C Joshi of Space applications Centre will be the returning officer.

Please be on the lookout for detailed announcement

POPULAR LECTURE BY Dr M K Mehta

Dr M K Mehta, Director, Vikram Sarabhai Community Science Centre, Ahmedabad, delivered a popular lecture **Nuclear Physics : Techniques and Applications** on March 1, 1993, at SAC Ahmedabad. The lecture was jointly organised by ISRS-AC, SAC Society of Mechanical Engineers (SSME) and Indian Meteorological Society, Ahmedabad chapter(IMSA).



Memento of remembrence to Dr Mehta - presented by Shri Pramod Kale.

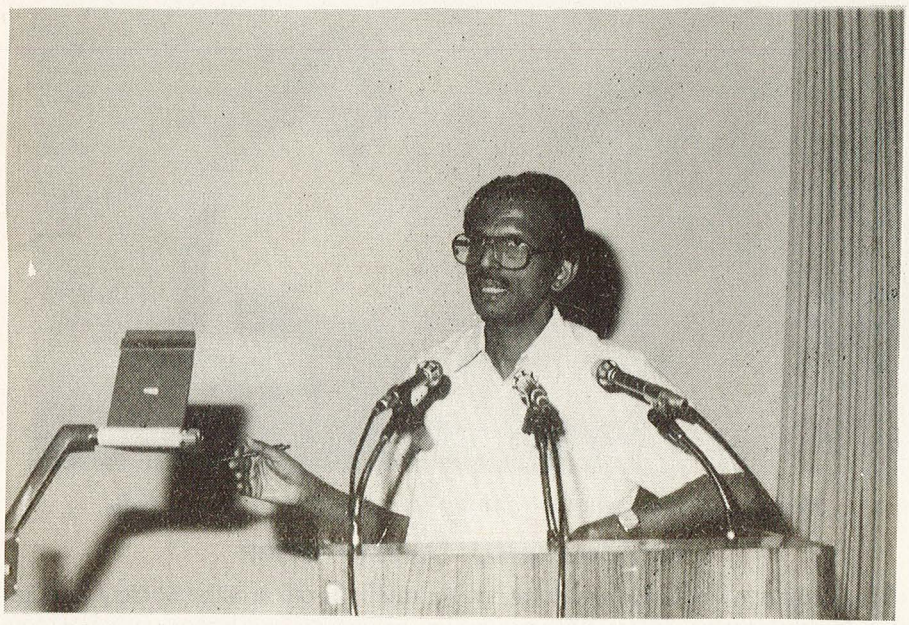
INAUGURATION OF SOCIETY OFFICE

Shri Pramod Kale, Director Space Applications Centre, inaugurated the office of the Society Chapter at SAC premises (Bldg no. 34, Room No. 23)on March 1, 1993. The inauguration, witnessed by a large number of members was, graced by lighting of a lamp. The office, kindly provided by Director SAC is to be shared with two other professional bodies, viz. SAC Society of Mechanical Engineers (SSME) and Indian Meteorological Society, Ahmedabad chapter(IMSA). The office will remain open on weekdays starting from Aug 1, 1993 during 1300 - 1400 hrs.

Shri Pramod Kale, Director SAC, Inaugurates the society office in SAC Campus.

POPULAR LECTURE BY Dr George Joseph

Dr. George Joseph, Associate Director, Space Applications Centre, delivered a popular lecture **IRS-1A and Beyond the world Scenario of Remote Sensing** on March 17, 1993 at SAC Ahmedabad. The lecture delivered on the occasion of the successful completion of 5 years of IRS-1A in orbit, was attended by more than 250 participants. Lecture covered all the aspects related to IRS-1A and put it in a perspective vis-a-vis contemporary RS satellites in global scenario. It also provided a peep into the future Remote sensing technology giving a detailed description of the proposed sensors on satellite platforms and likely advances in this area.



Dr George Joseph addressing the space enthusiasts

ANNUAL GENERAL BODY MEET

Annual General Body Meeting of the Society chapter was held on May 5, 1993 at 1600 hrs in Vikram hall within the premises of Space Applications Centre, Ahmedabad. The meeting was attended by a total of 77 members.

PANEL DISCUSSION

The Ahmedabad Chapter of Indian Society of Remote Sensing organized a Panel discussion on the **Environmental Scenario of Ahmedabad in 21st Century**. The panel discussion was held at Vikram Hall, Space Applications Centre. The panel consisted of eminent personalities representing vide canvas of environmental aspects, specifically in the context of Ahmedabad city and included

- Shri Pramod Kale, President Indian Society of Remote Sensing and Director, Space Applications Centre
- Shri Kartikeya Sarabhai, Director, Centre for Environment Education, Ahmedabad
- Shri J P Aggarwal, Conservator of Forests, Government of Gujarat
- Shri S C Sharma, Director, Gujarat Water Resources Development Corporation
- Shri N G Mavalankar, Industrialist
- Shri Kirti Shah, Ahmedabad Study Action Group
- Prof. N I Dani, Head, Biology Department, M G Science Institute

The discussions were initiated and moderated by Shri Pramod Kale. The audience, including ISRS members,specialists from various state and central government agencies, academic institutions and the members from

Member's Views about Newsletter

My compliments on the Jan 1993 Special Issue of ISRS-NL. Everyone must appreciate the amount of effort that has gone into the thoughtful preparation and presentation of extensive material.

It is indeed a good idea to intersperse densely packed scientific material with some light reading. However, I feel that the place allotted to Funtoons could have been better utilized as their quality is certainly not up to the mark. And they are to many. More stricter censure is called for. Also, it would be a good idea to devote a separate issue covering the subject "Information about Remote Sensing", i.e. source of data, lists of RS books and journals, training programs, RS education, RS policy etc.

Dr. Satyendra Bhandari

press, took active part in the discussions. Open discussions amongst the panelists and the audience were really open. Many of the points made by the panelists were supplemented, challenged or argued.

It was concluded that the role of citizinery in terms of their being alert, protestive, demanding and at the same time accountable about the surroundings would be crucial for the development of Ahmedabad city as a city worth living in the 21st century. We reproduce below the report by the two national dailies i.e Times of India and Indian Express.

REPORT ON PANEL DISCUSSION BY THE TWO NATIONAL DAILIES PUBLISHED FROM AHMEDABAD

Times of India, July 1, 1993

City's environmental degradation decried

By A Staff Reporter

AHMEDABAD, June 30.

THAT the environmental scenario of the Ahmedabad city was extremely bad, no one had any doubt and the participants at a panel discussion had various answers such as massive tree plantation, recycling of waste water. But what marked the discussion organised here by the local branch of the Indian Society of Remote Sensing was the angry outburst by Mr. Kirti Shah of Ahmedabad Study Action Group, who felt that the people had become insensitive to the deteriorating standard and there was absolutely no hope for the city as it was "at the worst stage of its development".

There were also conflicting views on many aspects of development and organisational structure. For instance, Prof. N. I. Dani, educationist, suggested dispersal of industries to various parts of the state to minimise concentration of the pollutants. But this was immediately contested by Mr. Shah, who was very critical of the city's inability to generate new employment potential.

Even the panel moderator, Mr. Pramod Kale, director of Space Application Centre, did not agree with the views of Prof. Dani that the city was too vast and unmanageable and should be developed as different smaller entities, which could be provided with better infrastructural facilities.

Mr. Shah also differred with the views of Mr. Kartikeya Sarabhai of the Centre for Environment Education that the non-government agencies (NGOs) should link up their activities for better coordination and strength in unity. This was a long drawn out process, Mr. Shah felt and suggested evolution of a new sector, people's sector. Mr. Shah said that the tendency of increased dependence on NGOs for every bit was a dangerous portent.

In his opening remarks, Mr. Kale said that what the city would need in the coming decade was a proper planning for constructing inner and outer ring roads, circular railway line, three to four additional bridges over the Sabarmati river, and more fly-overs over the railway tract, huge water recovery system, massive tree plantation, restoration of the two lakes of Kankaria and Chandola, new campus of the university and last but not least an additional airport somewhere between Ahmedabad and Baroda. This was essential to cater to the need of the increasing city population, which was likely to increase to 65 lakhs in the coming four decades.

Mr. Kartikeya Sarabhai was of the opinion that the city now lacked leadership, of which it once rightfully boasted and had the vision to create so many institutions and will to put these in reality. He still felt that the city was still vibrant and active. What was required was for the people to give up their passivity.

Indian Express, July 2 , 1993

City sliding into rot, feel observers

EXPRESS NEWS SERVICE

AHMEDABAD – A panel discussion on "Environmental scenario of Ahmedabad in the 21st century" organised by the Indian Society for Remote Sensing (ISRS) here on Wednesday, painted grim prospects for the city which is burdened with unemployment, poverty, and besieged by a combination of poor political leadership and increasing mafia influence.

Director of Ahmedabad Study Action Group Kirti Shah said it was shocking that the city elected a bootlegger like Latif from as many as five constituencies. "It shows the hold the mafia has on the city," he said.

Shah said the growing unemployment could spell real danger in the 21st century.

Director of the Space Application Centre Pramod Kale said it was important to find out why a city which had survived so many centuries was now on the downslide. He said the industrial development in the Bombay city corridor during the past 30 years had contributed to significant environmental degradation and suggested application of remote sensing to understand the problem better.

Director of the Centre for Environment Education Kartikeya Sarabhai suggested an imaginative leadership for the city, the identity of which had changed over the years. The city which was one whole entity had got fragmented into different suburban areas. Green belt had vanished. People's participation is essential, in and NGOs cannot be burdened with solving the city's problems, he said.

Conservator of forests J. P. Agarwal said that total forest cover of the state had come down to six per cent from 10 per cent. The forest department's social forestry programme has lost out to the pressure of population growth, he said.

Director of Water Resources Development Corporation S. C. Sharma said industrial effluents had polluted the ground water.

CONDOLENCE

With profound shock we learned the sad demise of Sq. Ldr. Dastidar and Capt. V Ramakrishna from NRSA and Shri Anjenayalu and Shri Sudhir Panda from Airworks India on july 15, 1993. This shocking event occured near Bombay on jul 15, 1993 when the Beachcraft plane crashed while returning after completion of an aerial survey campaign around Ahmedabad. We had long association with them. The chapter feels deep sense of loss and expresses condolence on the sad demise. May God almighty give strength to the grief stricken family members.

What kind of remote sensing expert you are when you can't even identify me in this group photo ?

BOOK POST

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