SIGNATURES

Vol 10, No 1&2
November 1996

Newsletter of the Ahmedabad Chapter of the Indian Society of Remote Sensing

CONTENTS

Edited by : V. K. Dadhwal

Dear readers

We are happy to place in your hand another issue of SIGNATURES, albeit belatedly, which has the same pattern of coverage as has been followed in the previous two years.

During the period covered in this issue, ISRS-AC members had the privilege of playing host to and listening to some very distinguished guests and speakers. Dr. K. Kasturirangan spoke on 'Improving the quality of life - The space option'. Prof. R. Pisharoty was the guest at the inuagral lecture of a series instituted in his honour. The first lecture of this series was delivered by Dr. George Joseph, then President ISRS. Eighth Shri Lakshmi Narain Calla Memorial Lecture was delivered by Shri Pramod Kale also a past President of ISRS.

1997 will see the launch of 25th Indian satellite (we provide you a list of previous 24 satellites) and international RS 'scene' will hot up with arrival of new kids in the block with shining bikes (Commercial high spatial resolution satellites), which are covered in an excerpt from PERS.

Dr. S. M. Bhandari had drawn the attention of RS community of opportunity of observing total solar eclipse from space in last issue and he provides results of his observations in this issue.

Although Indian remote sensing programme ranks very high globally, our ranking in overall science continues to decline. We present one such view and analysis.

The light touch is once again provided by Dr S. D. Naik through his cartoon.

The Editorial Committee would welcome your feedback on what you would like to see in SIGNATURES. Our yardstick is to include material which would inform, educate and entertain.

- Editorial Committee.

IMPROVING THE QUALITY OF LIFE - THE SPACE OPTION

K. Kasturirangan
Secretary, Dept. of Space & Chairman ISRO

In the continuing quest for knowledge man has embarked on scientific explorations of one kind or the other for the betterment of mankind and for improving the quality of life. Among the scientific developments of the 20th century, the development of space technology and applications, stand out as one of the most revolutionary and comprehensive achievement. It has enriched scientific knowledge, provided connectivity on a planetary scale and has touched every aspect of human life. Today life on earth is unthinkable without vital inputs from space technology.

From the primitive man to present, the quality of life has undergone dramatic changes. Space technology has provided a quantum leap in improving the quality of life by providing vital inputs in economic development, nature conservation, health care, sanitation, food-security, etc. The direct benefits of space technology have been in the area of telecommunication, meteorology, resource inventory, disaster management and exploring higher and higher frontiers in the solar system and beyond.

The capability of satellite based remote sensing to provide an unbiased synoptic view of the natural resources of the earth in a timely and cost effective manner offers a valuable solution to the problem of improving environmental integrity to developmental processes at all levels.

In the area of disaster management, for example, weather forecasting and communication of advance warning of severe weather is made possible through space technology. This minimizes loss of life and damage, and facilitates timely rescue and rehabilitation of affected population. INSAT based DWS (Disaster Warning System) has proved its efficacy in the successive cyclone seasons during the last one decade. This has helped in saving thousands of lives and livestock in the country. With continuous monitoring of a vast region arounfd India, through indegenously developed INSAT-VHRR system, no cyclonic storm can go undetected.

Based on popular lecture delivered on August 12, 1996 at PRL auditorium under auspices of ISRS-AC for celebrating the National Remote Sensing Day.

—««OO »»—

RETROSPECTIVE AND PROSPECTIVE OF REMOTE SENSING IN INDIA

George Joseph
Director, Space Application Centre
Ahmedabad

" As President of the Indian Society of Remote Sensing, I would like to compliment the office bearers of the Ahmedabad Chapter for organizing such an approprite function to honour the invaluable contributions made by Prof. Pisharoty, to the field of earth observation. I consider it a great privilege and honour to speak on this occasion as Prof. Pisharoty has influenced me personally and professionally.

" Use of aerial photography is not new to the Indian community. Aerial photography was first used in India in th eyear 1920 in a survey experiment. However, in the context of modern remote sensing where one uses multispectral information for feature

identification, it started with the famous experiment on the detection of cocnut wilt disease pioneered by Prof. Pisharoty. The seed sown by Prof. Pisharoty has grown into a big banyan tree, very huge one and stands higehr and taller than many other similar programmes in the international arena.

" After having said all nice things, let me be a little critical. As members of the Remote Sensing Society, I think, we shoul look critically at our achievement. I am quite unhappy with the contibution what we have made in the area of basic sciences of remote sensing. .. . We have not gone into fundamental research inspite of having so much intellectual talent. We are still talking about MXL classifier; what prevented us to develop operationally working software to use texture ? We talk about expert systems but have not come out with anything which can be used operationally. Again look at modelling. For many of the parameter retrieval we use regression fitting. I would like some physics being used to retrieve the parameters of interest. ... Some of the other importnat areas which need attention are : atmospheric correction, parameter retrieval algorithm, data integration,....

" I would like to do some loud thinking about what could be vision for the future. We need to tackle five broad areas. Continuity of service, ... Explore newer areas of applications, ... Strengthen Infrastructure,... International Participation,... Capture remote sensing market.

" I think as an optimal constellation to meet out national and global needs... three type of satellite systems [needed are] : (i) an operational system which provides continuity of services, and with time provides newer and additional services; (ii) satellite systems designed for specific task where repetitive observation may not be required frequently, for example, a satellite system for deriving digital elevation model; and (iii) satellites which can test new concepts of sensors and applications.

" Before I conclude I would like to remind that do not consider remote sensing as a 'broad spectrum antibiotic' which can take care of all problems, the remote sensing data has to be integrated with other conventional data, socio-economic information etc. ...Lastly of the often quoted statement of Dr. Vikram Sarabhai, the operating message (according to me) is ... "We must be second to none in the application of advanced technologies to the real problems of man and society". So Ladies and Gentleman the central driving force of all our efforts should be the 'people'. Let us join together to make their life a little better.

Excerpts from booklet on inaugral lecture of Prof Pisharoty Lecture Series, delivered by Dr. George Joseph on February 23, 1996.

——««OO »»——

ISRS-Ahmedabad Chapter

Executive 1996-1998

Chairman	:	Shri A. K. S. Gopalan
Vice-Chairman		-
Secretary	:	Shri R. M. Pandya
Jt. Secreatry	:	Shri A. K. Murdia
Treasurer	:	Shri N. S. Mehta
Members	:	Shri P. S. Thakker
		Shri I. M. Bahuguna
		Dr. M. M. Kimothi
		Dr. S. M. Bhandari
		Shri P. K. Tiwari

The elections to the new executive of ISRS-AC took place on March 23, 1996 with Dr. S. D. Naik acting as Returning Officer and the new executive took charge in April 1996. There was no nomination for the post of Vice Chairman.

——««OO »»——

PROF P R PISHAROTY - THUMBNAIL SKETCH

Pishorath Rama Pisharoty was born in Kollengode (Palaghat District, Kerala) on February 10, 1909 and aftre his early education in village school, graduated in Physics from University of Madras in 1931. During the period 1931 to 1942, while working as a lecturer, he spent his vacation period carrying out research under the guidance of Prof. C.V. Raman. He joined India Meteorological Department in 1942. He also worked on deputation at University of California (Los Angeles) and obtained his PhD. Among the positions held by him are Director Colaba and Alibaug Magnetic Observatories, Bomabay, Director Institute of Tropical Meteorology Pune, Senior Professor and later Professor Emeritus Physical Research Laboratory, Ahmedabad, and Head Remoet Sensing and Meteorology Division, SPeace applications Centre, Ahmedabad. He is Fellow of INSA. He was honoured with Padamshri (1970), Raman Centenary Medal (1988), International Meteorological Prize of WMO (1989).

——««OO »»——

Remote Sensing and keen observation

EOSAT Notes (Vol. 11 No. 1, Spring/Summer 1996) carried a picture of Washington DC from IRS-1C PAN data. While the picture is good to look at and carries an accompanying text, keen observations and interpretation by ***Dr. S. M. Bhandari****(MOG/SAC), missed by the authors of the text are reproduced here:*

"While the description describes capture of an aeroplane approaching the airport, ... it misses the shadow of the aeroplane on waters of Potomac river. ... From the shadow of the Washington Monument which has a height of 169.3 m (555 ft.) ... it is possible to translate the aircraft shadow displacement into aircraft cruising height, which comes out as ca. 420 ft. ... More accurate estimates can be derived by analysing actual digital image data and after considering the topographic slopes, etc. "

——««OO »»——

HIGH SPATIAL RESOLUTION COMMERCIAL SATELLITES

(Source : L. W. Fritz, Photogramm. Engg. & Remote Sensing, January 1996)

By the end of 1997 we are going to enter into another era of space remote sensing, with commercial satellites being built to produce panchromatic images with spatial resolutions of 1-3m and mutlispectral resolutions of 4-15m. The new systems are characterized by their flexible pointing ability, high geometric fidelity and very rapid image-collection to customer delivery. Upto now most of the earth observing systems were built with gevernment funding. These satellites will try to satisfy the growing user need for fast and accurate geo-spatial information and bring space observation in direct competition with some form of aerial photography market.

All of the proposed systems are in smallsat/lightsat category and are not a single satellite but a constellation to increase imaging opportunities for repetitive coverage, stereo coverage and timely monitoring of events. The orbits are circular low-earth optimising revisits. The sensors are pushbroom type (exceot for two-dimensional pixel staring arrays of Early Bird) and provide 8-bit or 11-bit data. The multispectral capabilities are in red, green, blue and near-infrared. Each of the system will rely on a store-and-forward operation with capabilities for on-board storage and perhaps some pre-processing (such as data compression). To achieve precision pointing the systems use on-orbit GPS positioning. They also have ability to point to

multiple areas of interest in a very short time interval.

Summary of Satellite, communication/processing and sensor information of some of the proposed commercial earth observation satellites.

Corporation	EarthWatch				Orbital Science		Space Imaging	
System	Early Bird		Quick Bird		OrbView-1			
On-orbit date	April 1996 !!!		July 1997		Dec 1997		Dec 1997	
Payload (kg.)	< 100		ca. 150		150		225-275	
Altitude (km)	470		470		460		680	
Repeat Cycle - max	20 days		20 days		16 days		14 days	
Revisits Cycle - max	1.5 - 2.5 days		1.5 - 2.5 days		< 3 days		1-3 days	
Period (revisit/day)	15.3		15.3		15.5		14.6	
Scenes (max)	500/orbit		100/orbit		535/day		600/day	
On-board recording	500 scenes		100 scenes		250 scenes		120 Gb	
Delivery time *	15 min - 48 hr		15 min - 48 hr		15 min - 24 hr		24 hr - 48 hr	
Mode	Pan	MS	Pan	MS	Pan	MS	Pan	MS
Resolution nadir (m)	3	15	1/2	4	1/2	8	1	4
Spectral bandwidths (μm)	.45-.80	.50-.59 .61-.68 .79-.89	.45-.90	.45-.52 .53-.59 .63-.69 .77-.90	.45-.90	.45-.52 .52-.60 .63-.69 .76-.90	.45-.90	.45-.52 .52-.60 .63-.69 .76-.90
Pixel bits	8	8	11	11	8	8	11	11
Swath width (km)	6	30	36	36	8	8	11	11
Data Size	4MB	12MB	3.5GB	14.2 GB	128 MB	128 MB	-	.76- .90-
Stereo	In track		In track		In track		In & cross track	
Pointing (deg)	30/30#		30/30		45/45		45/45	
Sensor attitude	No		Star trackers		Star trackers		3 star trackers	

* : from acquisition to user; # : (in/cross) track

INSAT-VHRR IMAGING OF THE EARTH DURING THE TOTAL SOLAR ECLIPSE OF OCT. 24,1995

Dr. Satyendra M. Bhandari
MOG/RSA/SAC

The Oct. 24,1995 Total Solar Eclipse (TSE) over the Asia- Pacific region was an event of great scientific significance. Exploiting the unique circumstances offered by the TSE, a large variety of experiments were conducted by Indian and foreign scientists to study the solar corona and the Earth's atmosphere and the ionosphere. Prominent among the Indian efforts were serious attempts to detect the presence of possible dust ring around the Sun under relatively favorable conditions of low/minimum sun-spot activity. Another unique attempt was to image the Moon's shadow on the Earth's surface during the TSE from the vantage point of geostationary orbit in space.

As proposed (see SIGNATURES August 1995) the author in association with his interested colleagues, successfully planned and realised the "INSAT-VHRR Campaign" to image the Earth in a quasi-continuous manner almost from the beginning to the end of the Oct. 24,1995 solar eclipse. As per the plan, the three INSAT-VHRRs onboard INSAT-1D, 2A and 2B were operated in desired sector or full-disc modes and data were acquired at AES-SAC (Ahmedabad), MCF (Hassan) and SATMET-IMD (New Delhi). INSAT-2B VHRR image data collected at SAC were analysed in near-real-time mode and the feeble visible and IR band signatures of the Moon's shadow were extracted using specialised image processing techniques. The entire sequence of images, taken at intervals of ~8 minutes, showing the gradual movement of Moon's shadow over the Indian land mass, the adjoining Bay of Bengal, the South East Asian region and finally over the Pacific, was analysed within an hour of the end of the eclipse.

The geometrical and the dynamical characteristics of the Moon's shadow were close to the simulated behavior based on the predicted circumstances of the eclipse. The intensity distribution over the shadow region was however, observed to be quite interesting; regions with different albedo values showed different types of signatures. The low albedo oceanic regions revealed the presence of the shadow much earlier than the high albedo desert or land regions. Contrary to expectation, the shadow signatures were observed to be much smoother over land than over the oceans. In fact, the highly fractured nature of the shadow over Oceania is quite intriguing and needs careful study.

The thermal-IR band VHRR images reveal clear signatures of the cooling effect over land surfaces associated with the short-duration removal of the solar radiation, especially over the central regions near totality. The cooling is however observed to begin with substantial delay and to persist much longer after the shadow has passed over the region. Further quantitative analysis is in progress.

The existing INSAT-VHRR capability in space over the Indian region in terms of vast geographical coverage, bi-spectral high space-time resolution imaging, flexibility of operational modes, multiplicity of VHRRs etc. -proved to be of the "made-for-each-other" kind for the Oct. 24,1995 TSE. As a result the above Campaign produced the most comprehensive and unprecedented quasi-continuous set of images ever taken of the Earth during a solar eclipse from the vantage point of space.

As per the established scientific

method, the above observations were undertaken on the Eclipse day as well as on the previous day i.e. Oct. 23,1995 in order to record the non-eclipse day behavior for comparison.

The INSAT-VHRR TSE Campaign could be successfully realised due to operational nature of the INSAT system and with support and cooperation from a number of groups and colleagues. The team consisted of Dr. S.M. Bhandari, Dr. W.J. Prakash, Shri S. Ilanthirayan, Shri H.I. Andharia and Dr. A. Narain, all scientists at RSA/SAC.

——««OO »»——

RS NEWS - INTERNATIONAL

Radarsat 1 was launched on November 4, 1995 on a Delta rocket from Vandenberg Air Force Base, California. It went through a four month commissioning and testing phase and began commercial service from March 1, 1996. The Canadian Space Agency (CSA) is talking to a consortium of private companies for owning and operating its successor Radarsat 2.

ADEOS (ADvanced Earth Observation Satellite) is developed by NASDA (Japan) and flies an impressive range of scientific sensors of unique capabilities contributed by international collaborative effort. It includes :

Advanced Visible and Near Infrared Radiometer-AVNIR (NASDA)
Ocean Colour and Temperature Scanner - OCTS (NASDA)
Improved Limb Atmospheric Scanner (Environment Agency of Japan, JEA)
Interferometric Monitor for Greenhouse Gases (MITI, Japan)
NASA Scatterometer -NSCAT (NASA)
POLarization and Directionality of Earth's Reflectances - POLDER (CNES, France)
Total Ozone Mapping Scatterometer - TOMS (NASA)
Retroflector in Space - (JEA)

ADEOS was launched on August 17, 1996 by H2 launch vehicle of Japan. The satellite separated 16 minutes after takeoff and during maneuvering to exact orbit one of the main thrusters failed to fire and a backup thruster was used. This delayed satellite movement to its final orbit which occurred on September 8. The scatterometer from JPL (USA) which measures speed and direction of winds over ocean was switched on September 9. The scanning mirror on Interferometer Monitor for Greenhouse Gases became stuck on September 20, but the problem was resolved by September 24.

Two French Objects Meet in Space : Cerise, a 50 kg French military research microsatellite designed to eavesdrop on weak high frequency cummunications, which was launced on July 7, 1995 by Ariane launcher as a secondary payload with Helios-1A (military surveillance satellite), met a piece of Ariane rocket left in space from November 1986 launch of SPOT-1 satellite. The Ariane booster upper stage had broken into many pieces. This meeting led to cutting of 6m long boom that stabilized Cerise into half and the satellite tumbled. This is the first time that two objects previously catalogued by ground radars have collided.

——««OO »»——

RS NEWS - NATIONAL

PSLV-D3 Launch : The third development flight of Polar Satellite Launch Vehicle was a complete success. The launch of 44 m tall and 283 tonne vehicle took place from Sriharikota on march 21, 1996 at 10.23 am. The vehicle placed 930 kg Indian Remote Sensing Satellite IRS-P3 in precise orbit. The IRS-P3 carries German built MOS Payload and 3 band WiFS (MOS details were covered in previous issue).

The Indian Space community eagerly waits for launch of 25th Indian satellite this year. The two favourite contenders for this honour are INSAT-2D and IRS-1D. We provide below the launch summary of previous 24 Indian Satellites.

Sl No	Name	R/C *	Date of launch	Weight (kg)	Launch Vehicle	Country	S/F#
1	ARYABHATA	S	19-04-1974	358	Inter Cosmos	USSR	S
2	BHASKARA-1	R	07-06-1979	444	Inter Cosmos	USSR	S
3	RS-1	R	18-07-1980	35	SLV-3	India	S
4	RS-D1	R	31-05-1981	38	SLV-3	India	S
5	APPLE	C	19-06-1981	670	ARIANE	France	S
6	BHASKARA-2	R	20-11-1981	436	Inter Cosmos	USSR	S
7	INSAT-1A	RC	10-04-1982	1150	US DELTA	USA	F
8	RS-D2	R	17-04-1983	41.5	SLV-3	India	S
9	INSAT-1B	RC	30-08-1983	1194	Space Shuttle	USA	S
10	SROSS-1	S	24-03-1987	150	ASLV-D1	India	F
11	IRS-1A	R	17-03-1988	980	VOSTOK	USSR	S
12	SROSS-2	S	13-07-1988	150	ASLV-D2	India	F
13	INSAT-1C	RC	22-07-1988	1190	ARIANE	France	F
14	INSAT-1D	RC	12-06-1990	1293	US DELTA	USA	S
15	IRS-1B	R	29-08-1991	990	VOSTOK	USSR	S
16	SROSS-C	R	20-05-1992	106	ASLV-D3	India	S
17	INSAT-2A	RC	10-07-1992	1906	ARIANE	France	S
18	INSAT-2B	RC	23-07-1993	1932	ARIANE	France	F
19	IRS-1E	R	20-09-1993	845	PSLV-D1	India	F
20	SROSS-C2	R	04-05-1994	113	ASLV-D4	India	S
21	IRS-P2	R	15-10-1994	904	PSLV-D2	India	S
22	INSAT-2C	C	07-12-1995	2050	ARIANE	France	S
23	IRS-1C	R	28-12-1995	1250	MOLNIYA	USSR	S
24	IRS-P3	RS	21-03-1996	920	PSLV-D3	India	S

**: R(Remote Sensing), C(Communication), S(Scientific); #: S(Success), F(Failure)*

IRS-1C - LAUNCH & COMMISSIONING EVENTS

- IRS-1C airlifted from Bangalore on November 18, 1995.
- Satellite mated with rocket and fuel filling operations completed on December 24, 1995 at Baikonur Cosmodrome, Kazakhastan.
- IRS-1C launched by Russian Molniya Rocket at 1215 hours IST on December 28, 1995.
- IRS-1C was injected into orbit 15 minutes after launch around 21 N and 56 E.
- About 93 seconds after injection the two solar panels were automatically deployed by an on-board sequencer.
- During the 14th orbit on December 29, 1995 the star-sensor which provides attitude information was switched on. During the same orbit at 1038 hours IST, the camera hold down mechanism of PAN was released.
- The three cameras onboard IRS-1C were swithced on January 5, 1996. PAN was swithched on at 9.25 am (IST) during the 113th orbit while LISS-III and WiFS were switched

on during subsequent orbit.

- In addition to NRSA station at Hyderabad, the IRS-1C data is also being received and processed at EOSAT ground station at Norman, Oklahoma, USA and German Aeropsace Research Establishment ground station at Neustralitz.

——«OO»——

Shri Lakshmi Narayan Calla Memorial Lecture Series

This lecture series was started in 1987 and is named after Late Shri L. N. Calla, father of Shri O.P.N. Calla, first Chairman of ISRS-AC who has provided funds for this series. The distinguished list of past speakers is provided below :

I. **Prof. P. R. Pisharoty** : Remote sensing of ocean floor topography (Dec 30, 1987).

II. **Shri P. A. Raj** : Sardar Sarovar Project - A lifeline of Gujarat (Dec 30, 1988).

III. **Prof. S. S. Merh** : Sea-level changes along Gujarat coast (Dec 11, 1989).

IV. **Prof. B. L. Deekshatulu** : Remote Sensing for national development (Jan 11, 1991).

V. **Dr. K. Kasturirangan** :Bio-Astronomy - A test for anthropomorphic principle (Jan 9, 1992).

VI. **Prof. V. K. Gaur** : International decade of natural disaster reduction : An Indian experience (May 24, 1995).

VII. **Prof. P. D. Bhavsar** : Global Climatic Changes (Oct. 19, 1995)

VIII. **Prof. Pramod Kale** : Educational Prospects in Remote Sensing and GIS (Jan. 30, 1996).

IX Shri Chandi Prasad Bhatt.

X. & Prof. K. S. Valdiya.

ISRS-AC ACTIVITIES

♂ A new lecture series, "Prof P R Pisharoty Lecture Series" was initiated this year. The first lecture was delivered by Dr George Joseph, President ISRS. Details of the series and lecture are reported elsewhere in this issue.

♂ Two lectures were arranged under Shri Laxmi Narain Calla Memorial Lecture Series. They were delivered by Prof P Bhavsar and Prof Pramod Kale. Prof. Kale spoke on 'Educational Prospects in Remote Sensing and GIS' on Jan 30, 1996 at Vikram Hall, SAC.

♂ The World Environment Day was celebrated with an invited lecture by Dr. S. A. Chavan, Chief Conservator of Forests, Gujarat Forest Department on June 5, 1996 at Vikram Hall (SAC) who spoke on 'Environment and biodiversity of Gujarat'..

♂ The National Remote Sensing Day (1996) was celebrated by ISR-AC. On this occasion Dr. K Kasturirangan, Chairman ISRO gave a popular lecture on 'Improving the quality of life - The space option' on August 12, 1996 at PRL Auditorium.

♂ A painting competition was organised for school children on the theme '**Space and National Development**' at Central School, Vastrapur on October 20, 1996. The school children surprised us by their knowledge as well as artistic skills.

♂ The IX Shri Laxmi Narain Calla Memorial Lecture will be delivered by noted environmentalist Shri Chandi Prasad Bhatt on December 2, 1996 at ATIRA Auditorium.

——«OO»——

FORTHCOMING SYMPOSIA

ICORG-97 (International Conference on Remote Sensing and GIS/GPS) -March 16-19, 1997, Hyderabad
-Prof. I.V. Muralikrishna, Centre for Remote Sensing, JNTU, Mahavir Marg, Hyderabad-500028.

National Workshop on Remote Sensing & GIS Application for Watershed Management - Jan 21 & 22, 1997, Bhopal.
-Dr. N. K. Tiwari, remote Sensing Applications Cemtre, MP Council of S&T., 26 Kisan Bhawan, Jail Road, Arera Hills, Bhopal - 462004.

National Symposium on GIS and Geological Remote Sensing, Feb 5-7, 1997, Tiruchirapalli.
-Prof. S. M. Ramasamy, Centre for Remote Sensing, School of Earth Sciences, Bharathidasan University, Tiruchirapalli - 620 023.

TROPMET' 97 : Monsoon, Climate and Agriculture, Feb 10-14, 1997, Bangalore.
-Prof. B. N. Goswami, CAOS, Indian Institute of Science, Bangalore - 560 012.

——««OO »»——

ABOUT ISRS-AC MEMBERS

***Signatures** joins all ISRS-AC family in congratulating out illustrious members. We are sure that this list is incomplete at best, we request you to bring to our notice all such recent accomplishemnts which will be covered in the next issue.*

Dr. Shiv Mohan (SAC) shared *Indian National Remote Sensing Award (1995)* with Dr. R. S. Dwivedi of NRSA. With this, the total awardees from ISRS-AC rises to five (Dr. R. R. Navalgund - 1992, Dr. R. N. Jadhav -1993, Dr. S. R. Nayak and Shri A. S. Kirankumar - 1994) and for four continuous years.

ISRS award for *best paper in Photonirvachak - 1994* was given to **Ms T. Sharma** and **Shri T.T. Medhavy** for their paper 'Procedures for computation of Saturation radiances: A case study for proposed sensors onboard Indian Remote Sensing Satellite - 1C'.

The *SPECK Award -1994* for best paper presentation at ISRS Symposium at Ludhiana was jointly awarded to **Ms. T. Sharma** (SAC) and Dr. D. Dutta (RRSSC, Jodhpur).

Shri S. K. Pathan (SAC) received *ESRI-NIIT Best Paper Presentation Award* at First ESRI/ERDAS User Conference (Nov., 15-16, 1996, N. Delhi) for their paper on 'The potential of GIS network techniques in utilities planning and management' authored by S.K. Pathan, R.J. Bhanderi (SAC) and B.M. Patel, B.S. Shah (GSRTC, Govt. of Gujarat).

Shri Ram Rattan (SAC) received the *Astronautical Society of India - Annual Award* for the year 1994 for Spacecraft and related Technology at their recent meeting in Bangalore.

Dr. S. S. Pokharna (SAC) was honoured with a *Shiromani award of The Indian Board of Alternative Medicines* for proposing interdisciplinary approach for better understanding of human system in context of problems of environment and sustainable development. *(This shows how multidisciplinary practitioners of remote sensing are !!!).*

SCIENCE RANKING OF INDIA DECLINES

In a letter to ***Nature*** published in Oct 17, 1996 issue of the journal, N. Raghuram of CSE (N. Delhi) and Y. Madhavi of NISTADS (N. Delhi) have brought to attention a decline in scientific output from India as measured by number of publications in journals covered by the **Science Citation Index (SCI)** between the period 1981 and 1995 of order of 32 %. No other country in the world has suffered such a decline except Commonwealth of Independent States. This contrasts with significant increase in contribution by China and other South East Asian countries. While the number of Indian publications has stagnated since 1984, the world output continues to grow. The decline is not totally due to reduced number of Indian Journals covered by SCI since in earlier years Indian journals contributed only 35% of the total Indian output even when SCI coverage was at its best. This drop could not be attributed to publishing bias against Indian articles or reduced preference for submission of Indian manuscripts in SCI journals. The decline is also accompanied with fall in India's rank by citation impact from 57 in 1985 to 81 in 1989. The authors believe that manuscripts by Indian authors are facing more rejections now than before. They attribute the decline to brain drain, decline in growth rate of funding for science, ageing of scientific institutions, lack of motivation, a feudal work culture and absence of dynamic and inspiring leadership.

(Before seeing their name in print, the authors submit manuscripts to editors who get them refereed by anonymous peers. We bring to you here a sample of one such author-referee interaction which is taken from IEEE Trans. Professional Communication)

Mice have four feet. *Elaborate ! M*

Mice have five appendages, and four of them are feet.

No discussion of the 5th appendage ! HSP

Mice have five appendages: four of them are feet; one is a tail.

What ? ! Feet and no legs ? ! R&N

Mice have four legs, four feet, and one tail per unit-mouse.

Confusing – is that a total of 9 appendages ? J&M

Mice have four leg-foot assemblies and one tail assembly per body.

DOES NOT FULLY DISCUSS THE ISSUE ! W.M.

Each mouse comes equipped with four legs and a tail. Each leg is equipped with a foot at the end opposite the body; the tail is not equipped with a foot.

Descriptive, but not forceful. WA.

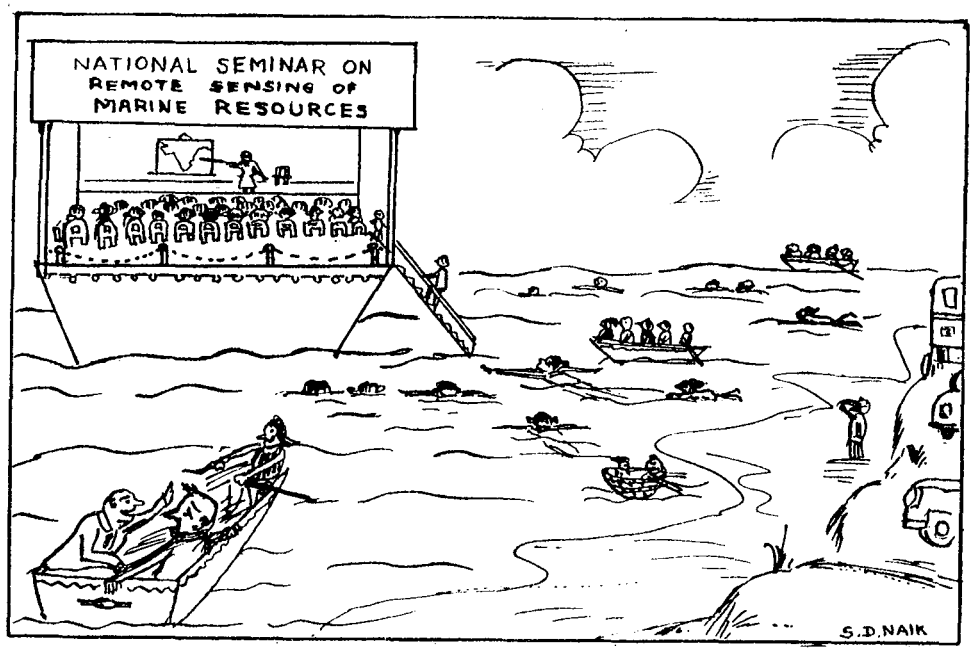
Allotment of appendages for mice will be: four foot-leg assembalies, one tail. Deviation from this policy is not permitted as it would constitute misappropriation of scarce appendage assets.

Too authoritarian; stifled creativity ! gh

Mice have four feet; each foot is attached to a small leg joined integrally with the overall mouse structural subsystem. Also attached to the mouse structural subsystem is a thin tail, nonfunctional and ornamental in nature.

Too verbose/scientific. Answer the question ! LP.

Mice have four feet.



Perhaps this is the first time we could perfectly match the venue with seminar theme

BOOK POST

If undelivered, please return to :
Secretary, ISRS-Ahmedabad Chapter
c/o Remote Sensing Area
Space Applications Centre (ISRO)
Ahmedabad - 380 053

Edited by :
V. K. Dadhwal, S.K. Kothari, R. M. Gairola, N. Ravi , Anjali Bahuguna, N. Padmanabhan, Space Applications Centre, Ahmedabad
A. A. Ahluwalia, Botany Department, Ahmedabad
Printed at :
Library, Space Applications Centre, Ahmedabad