

BY SANDHYA KRISHNAN ('99 INFO SYSTEMS)

## BITS OF PILANI AT ISRO

### CONVERSATIONS WITH DR AKS GOPALAN ('62), DIRECTOR ISRO & SPACE APPLICATIONS CENTER, AHMEDABAD



**Name – Dr AKS Gopalan ('64)**

**Awards** – Bhaskara Award for Lifetime achievement in Remote Sensing. (2002), Indian Society For Remote Sensing.

**Education** – BSc, Physics, Madras University (1959), MSc, Physics, Annamalai University (1962), M.Tech, Electronics, BITS (1964), PhD Oceanography, Andhra University (2001)

**Resident** – Hyderabad, India

**Positions Held** – Director - Advanced Data Processing Research Institute, Dept. of Space Secunderabad, Director - Space Application Centre, ISRO Ahmedabad, Program Director - National Resources Information System, President - Indian National Cartographic Association, President - Indian Geomatic Society, Chairman - Indian Meteorological society, Ahmedabad Chapter, Chairman - Indian society of Remote Sensing, Ahmedabad Chapter, Visiting Professor for Anna University, Gujarat University and ISRO

After four years of teaching at BITS, the young Gopalan had two choices, to leave to the US or to join ISRO. Luckily for us, he chose the latter and never

regretted it. We talked to Dr AKS Gopalan, winner of the Bhaskara award and '64 batch alumnus.

Originally from Tirunelveli, Dr AKS Gopalan joined the Birla College of Science for an M. Tech in Electronics. By the time he passed out in 1966, the Birla College of Science had become BITS Pilani. He then went on to teach in the EEE Department for four years.

It was in 1970 that Dr AKS Gopalan joined the Space Applications Centre, ISRO, in Ahmedabad as a System Engineer.

His first project there was called Satellite Instructional Television Experiment or SITE. At an age when TV was not so common, this project dealt with receiving television signals at remote villages in India, via a Powerful Satellite loaned by NASA for a joint project between NASA and ISRO. He then moved to the Remote sensing group to work on Image Data Processing of Remote Sensing cameras. These cameras were also designed and fabricated there. Since most of the projects were aimed at the rural masses, there was a lot of interaction with the user community and their feedback was used to improve upon existing systems and to develop new ones. Application packages were developed and they were also demonstrated to the users.

According to Dr AKS Gopalan, this was a significant part of his time at ISRO. This interesting and engaging work kept him in Ahmedabad till 1989.

From there, his work took him to Hyderabad where he initiated Advanced Satellite Image Processing and Pattern Recognition / Expert systems. He worked at the Advanced Data Processing Research Institute till 1995 as the Director. He was then called back to Ahmedabad and was made the Director of the Space Application Center in 1998. Even if not directly involved with the building of the various launch vehicles, Dr AKS Gopalan considers it a big honor just being associated with them. After a service of thirty two long years, he retired in October 2002 and has since been Visiting Professor at ISRO.



On India's space ambitions, Dr AKS Gopalan says that with an average annual budget of about Rs 3,000 crores (\$600 million), India has a vibrant space program for civilian applications. India's Remote Sensing systems are globally acclaimed and we have even been selling/leasing

satellite communications and remote sensing facilities to a number of countries, including US and Germany, for a while now on a commercial basis. Newer and better satellites are being built here every year. However, the task ahead is to improve on the space communication system and make it as sophisticated as that of the best in the world.



Does India have a plan for commercial space travel? Not in the near future, says Dr AKS Gopalan. ISRO is more occupied with meeting the needs of Indian users of space based communication systems and systems for Earth Resources, apart from ensuring continued support to the global users of our satellites. However, ISRO is currently working for an ambitious project - a mission to the moon. Called Chandrayan, it aims at mapping the moon's surface through a stereo camera. Apart from this other scientific investigations using special payloads are also in the offing.

We also have a very strong and innovative program for a powerful and cost effective Launch Vehicle for placing advanced satellites in Geosynchronous and polar orbits. We can even envision a

manned space ship in a few years, if the need arises.

According to Dr AKS Gopalan, the lack of commercial ventures on a large scale is not because of a lack of entrepreneurs. There are a lot of them setting up facilities to interpret data and provide Decision Support Systems for Remote Sensing applications. In the communications field, there are quite a number of them working on VSAT Telecom and radio/TV relay systems. The only reason could be the cost and the fact that for a huge nation like ours, it is important for any big project to be socially relevant, which are by and large handled by Central and state government agencies

As for inspiration and role models, Dr AKS Gopalan looks up to **Prof Satish Dhawan, Prof U R Rao** and **Dr Kasthurirangan**, who were ex-Chairmen of ISRO and **Dr Madhavan Nair**, architect of many launch vehicles. He adds that when he joined, it was the excellent opportunities and responsibilities given that kept the engineers active. That was an era of development of new technology. Each employee had a lot of talent to show. Currently, making space infrastructure and its applications operational demands a lot of effort. Bureaucratic problems and frequent changes in the core teams at central and state government agencies, who have to implement activities based on information available from satellite systems affects the speedy implementation of developmental activities. But things are getting better - the infrastructure at ISRO is being improved upon and India is slowly but certainly becoming one of the top countries for space research and its applications.

## The Bhaskara Award

The Indian Society of Remote Sensing was established in 1969 with the objective to advance and disseminate remote sensing technology and education. It is the premier professional body of about 1,800 members. This body awards the prestigious BHASKARA award, first instituted in 1999, the highest award of the Society to one outstanding individual for his contributions to the field of remote sensing in India.

The Bhaskara Award consists of a Citation, Rs. 50,000 and a Gold Plated Silver Medal (introduced in 2003). Bhaskara was a famous Hindu mathematician and astronomer and the head of the astronomical observatory at Ujjain, the leading mathematical centre in India at that time.

Past winners include:

Dr. Subba Rao Pavuluri (1999)

Dr. Baldev Sahai (2000)

Dr. LR Narayan (2001)

Engineers at ISRO from BITS or the IITs are few. It could be due to the not-so-attractive pay packages. But the perks are good comparing to other government agencies and the thrill of working for such a prestigious body is bound to leave you on a permanent high.

After a slump in recruitment due to the IT boom, things are now picking up. The various challenges, the excitement and the satisfaction gained from working for the development of

one's own country is certainly unmatched. And Dr AKS Gopalan is very glad to be a part of it all.

The BITS experience did help him a lot, he says, especially his teaching. In those days, teaching was taken very seriously and the new lecturers and established professors would attend each others' classes. That way the teaching fraternity became closely knit and the understanding of the subject was also very high.

College life wasn't very eventful, reminisces Dr AKS Gopalan. They were a bunch of serious, studious boys. Only about 10-15 of them were MTech students. Perhaps it was also because they had already finished their graduation elsewhere. But he fondly remembers one Nr Natesan who was quite a terror to all the students back then. The same

person was really friendly though, once Dr AKS Gopalan became his colleague. During his stay at Pilani as a lecturer he shared the office room with a person he affectionately calls Lakshmikant, better known to all of us as Dr L K Maheshwari.

Dr AKS Gopalan is married to **Mythili**, a Computer science teacher who also writes books for the ICSE curriculum. Their daughter works at the Environmental institute in Florida and their son is doing his dual degree in Agriculture and Water Resource Management at IIT Kharagpur. In his free time, Dr AKS Gopalan likes to read books and watch the television.

As a Visiting Professor at ISRO, he is currently working on an e-book titled 'Remote Sensing of Oceans', with special emphasis on global warming, climate change, coastal zone management & sustainable management of

fisheries. It is also the subject of his doctorate at the Andhra University.

He visited Pilani in 1992 during APOGEE for a lecture on Space Technology and its applications and also in 1998 for an IEEE seminar held at CEERI, where he gave the Keynote Address. He is looking forward to visit BITS again, this time along with his wife.

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*Dr AKS Gopalan was nominated by Mr VL Swaminathan, who was also a scientist at ISRO. Both of them were neighbours at Ahmedabad, colleagues at ISRO and room neighbours in Ashok Bhawan. Mr VL Swaminathan graduated from BITS Pilani with an M Tech and now lives in Bangalore.*



## CHANDRAYAN: INDIA'S RACE TO THE MOON

India has announced that it plans to explore the Moon and will send an unmanned probe there before 2008. The Indian Space Research Organisation (ISRO) calls the Moon flight project **Chandrayan Pratham** - First Journey to the Moon or Moonshot One. The 1,157-lb. Chandrayan-1 would be launched on one of India's own Polar Satellite Launch Vehicle (PSLV) space rockets. At first, the spacecraft would circle Earth in a geosynchronous transfer orbit (GTO). From there, it would fly on out into a polar orbit of the Moon some 60 miles above the surface. The Chandrayan-1 mission would carry X-ray and gamma-ray spectrometers and would send back data that scientists on Earth would use to produce a high-resolution digital map of the lunar surface. The project's main objectives are high-resolution photography of the lunar surface using remote-sensing instruments sensitive to visible light, near-infrared light, and low-energy and high-energy X-rays. Space aboard the satellite also will be available for instruments from scientists in other countries.

Prime Minister Atal Behari Vajpayee said a Moon flight would showcase India's scientific capabilities. A former science Minister in the Indian government, physicist M.G.K. Menon told news media that Chandrayan-1 "will excite the younger generation." Menon also said the Moon flight would have the effect of "enormously increasing the confidence of the nation".

ISRO said Chandrayan-1 is the first mission in "India's foray into a planetary exploration era in the coming decades." Chandrayan-1 will be the "forerunner of more ambitious planetary missions in the years to come, including landing robots on the Moon and visits by Indian spacecraft to other planets in the Solar System. (From [www. spaceage.org](http://www.spaceage.org))