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VP News

Inside

Uttaranchal Chief Minister Participates in VIPNET Workshop

Dehra Dun, capital of the newly-formed State of Uttaranchal, was the venue for a workshop of VIPNET Clubs of the region on 6-7 May 2001. Vigyan Prasasr has been contemplating to organize special programmes in the states which came into being recently - Uttaranchal, Jharkhand and Chhatisgarh - to create general awareness among the masses and activate science clubs to take up socially relevant projects. In this regard, the workshop at Dehra Dun assumed great significance so far as addressing to the local problems of this hill-state was concerned. Society of Pollution & Environmental Conservation Scientists (SPECS) and Students Awareness for Environment (SAFE), two prominent platforms of S & T activities in Dehra Dun, locally hosted the workshop on behalf of VP in the Press Club of Dehra Dun. Students and teachers from 35 schools of Dehra Dun, science communicators from a dozen NGOs, members of the regional and national press and electronic media, local academicians and scholars attended the event on both the days. The major activities centred around Food Adulteration Testing, Water Testing, Nature Study and Explanation of Science Behind Miracles. Prof. S. K. Kulshrestha, Head of Zoology in P.G.D.A.V. College; Dr. G. K. Sharma, Joint Director of IRDE; Dr. Brij Mohan Sharma, Coordinator of SPECS; Mrs. Geeta Srivastava, teacher in a local college; Dr. B. P. Bahuguna, Chief Medical Officer of Dehra Dun; Shri S. K. Dhar, Advocate in the High Court; Shri B. K. Tyagi, NCSTC, New Delhi; Shri Vivek Sudarshan, Secretary of SEARCH (Ghaziabad); and Smt. Anjula Tyagi, Convenor of SAFE conducted the various technical sessions and interacted with the students. VIPNET Coordinator Shri A. K. Misra introduced Vigyan Prasasr and VIPNET to the participants and the media in two separate sessions through a slide show. The workshop received a big boost when Shri Nityanand Swamy, the honorable Chief Minister of Uttaranchal, joined the participants on 07 May 2001, interacted with all of them in a very informal manner and assured VP of his full cooperation for similar programmes in other parts of the State.

EDITORIAL

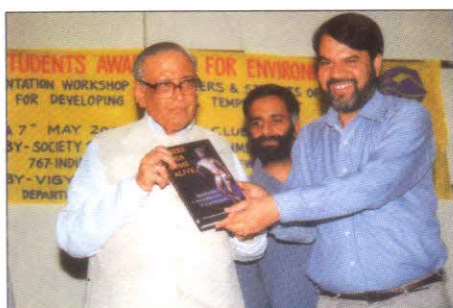
The Discovery of the Electron



Making Women Realise their Scientific Potential



Intellectual Property Rights (Part-I : Patent System)



Shri Nityanand Swamy, honorable Chief Minister of Uttaranchal, receiving a copy of "Where Gods Come Alive" from VP Fellow Shri Arup Kumar Misra.



A section of the participants of the Workshop seen engrossed in the proceedings.

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... think scientifically, act scientifically ... think scientifically, act scientifically ... think scientifically, act...

Quest for Self-Reliance

A feeling of despair swept across the nation when the launch of the Geosynchronous Satellite Launch Vehicle (GSLV) was aborted on March 28, 2001, just a second before it was to lift off, as one of the strap-on engines failed to derive the necessary thrust. However, the bright spot was that the safety mechanism worked well, and the launch vehicle was saved. April 18, 2001, barely three weeks later, highlighted the ability of nation's scientists to handle complex systems, when the GSLV blazed into the afternoon sky. Undoubtedly, they were the longest seventeen minutes for those who had contributed towards the fruition of a four-decade dream of Vikram Sarabhai. It was also a testimony to the ability of ISRO that it can quickly and accurately identify its mistakes and correct them. The Geosynchronous Satellite (GSAT-1) was injected into the Geotransfer Orbit as planned. But, soon after it was discovered that the farthest distance from the Earth after the launch was slightly less than 36,000 kms which should have been achieved. In addition, the orbital inclination, that is, the angle at which the satellite's orbit is inclined to the equator – was 19.2 degrees, compared to 19 degrees planned for. Compensating for these shortfalls required the use of on-board propellant which was meant for fine orbit trimming operations that need to be carried out throughout the life time of the Geosynchronous Satellite after it has reached its final home in orbit. As a result, the life of the satellite gets considerably reduced. Still, all seemed well. But, the on-board propellant soon got depleted due to the unequal consumption of fuels stored in two tanks. The result was a "drift" orbit, which led to GSAT-1 circling the Earth once in every 23 hours, drifting at the rate of 13 degrees a day instead of being in a geostationary orbit matching the Earth's rotation. Despite the fact that the satellite is in excellent condition, it would be visible only for 10 days in a month when the payloads, that is, the on-board equipment could be switched on for testing purposes. GSAT-1 was to be used for demonstrating digital audio broadcasts, internet services, compressed digital TV experiments and developmental communication.

Indeed, the first flight test of GSLV was intended to

validate the various systems of the vehicle in an actual flight. Though each of the subsystems had been tested on ground, it is only through a few developmental tests that the launch vehicle, as a whole, and all the associated ground systems could be validated. The project faced quite a few hurdles ranging from U.S. technology sanctions and cost overruns to supply (or non-supply!) of the appropriate cryogenic engine technology from Russia. In any case, the question still remains: what caused the underperformance of the GSLV? One reason could be the imported Russian cryogenic engine which was only ground-tested and had never before flown on any launch vehicle, could not impart the requisite velocity to GSAT-1. The other reason could be the rocket's guidance and navigation system that may need to be improved upon.

In any case, GSAT drift is only a temporary setback. We shall have to take it in its stride. One should look at it from the point of view that it has taken the country further from having had to abandon the GSLV flight earlier. If the drift has raised doubts about the satellite's usability, we shall have to resolutely move ahead in our pursuit for achieving perfection for GSAT to be completely error-proof. In addition, the success would give the Indian space establishment the confidence to proceed with its own development in cryogenic technology and indigenise it further. Today, we need engines that can lift much heavier satellites than GSAT-1. But, it has rarely happened that any country had a successful launch of a geosynchronous satellite at the first attempt. If they have become self-reliant in space technology today, it is through their own individual efforts. We, too, have no alternative.

But, the most important factor in the quest for self-reliance is attracting and retaining young and creative minds, and allowing them the freedom to tinker around. This process must begin at the school level. In this regard, it would be worth exposing school children to the exciting world of space science and its applications through activities like model rocketry, astronomy, amateur radio, and so on. Our quest for self-reliance could begin at school level. VIPNET clubs could play a significant role in accomplishing this goal.

□ **Vinay B. Kamble**

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