In this issue

GSLV

Indian Space Research Organization (ISRO) carried out the first developmental test flight of India's Geosynchronous Satellite Launch Vehicle (GSLV) on 18 April 2001 from Sriharikota. A news item regarding this major milestone achievement was carried in *Current Science* earlier (*Curr. Sci.*, 2001, **80**, 1254–1259). This project had been achieved over a ten-year period since its initiation and the news item has described the history going back to the 1960s and 1970s.

The General Article by R. V. Perumal *et al.* (**page 167**), of the Vikram Sarabhai Space Centre and ISRO goes into the nitty-gritty of the launch vehicle GSLV. After dealing with the configuration of the vehicle, it explains the reasons for choosing the cryogenic stage that provides a higher propulsion. The different propulsive stages, the navigation and guidance systems are then dealt with. A launch vehicle that puts a payload of the order of 1500 kg in a geosynchronous orbit calls for development and assembly of a variety of technologies to work in a synchronic way. The first launch of GSLV faced a glitch on 28 March 2001. The launch had to be safely aborted. But it was subsequently picked up on 16 April 2001 to result in a successful launch on 18 April 2001. This event speaks of the safety aspects and capabilities built in at ISRO to handle incidents before they turn to catastrophes.

The article provides, for the first time, details of performance profiles of various stages of propulsion system with adequate data, and gives comparison of predicted and achieved performance parameters. There is remarkable agreement between the two sets which is a reflection on the mastery and understanding of the dynamics of such a mission. However, because of complete usage of on-board propellant, the GSAT-1 satellite itself could not be put in a true geosynchronous orbit. The satellite is in a drifting orbit with a period of 23 h 2 min. In spite of this deficiency, data is being acquired whenever the satellite appears in the viewing domain. The GSLV itself will prove to be forerunner to a series of satellite launches into GS orbits in the near future.

K. R. Rao

Rehydrating cyanobacteria

Cyanobacteria are likely to have been the first oxygen evolving phototrophic organisms on earth. They are widely distributed and remarkably tolerant to extreme environments. Interestingly in desert soils, cyanobacteria can form crusts and 'hibernate' during much of the year and suddenly come alive in the brief rainy period. On the surface of barks of trees, cyanobacteria can be exposed to extremes of desiccation, during the dry season, regaining their metabolic abilities upon rehydration. Tripathi and Srivastava (**page 197**) report an investigation of the active oxygen species (AOS) scavenging enzymes of the cyanobacterium *Lyngbya arboricola* in the 'dry' state of the organism. The choice of the AOS scavenging enzymes, superoxide dismutase, ascorbate peroxidase and catalase were dictated by the importance of reactive oxygen species, produced as a stress response. Dry bacterial mats, as much as two years old, display considerable levels of all three scavenging enzymes. Notably, the authors observe a sharp recovery in the early phases after wetting the bacterial mats; arguing against increased levels of protein synthesis immediately upon rehydration. Rather, they lean towards a model for stabilizing the proteins in a desiccated state, by osmolyte involvement. In support of their contention they cite an interesting example of active catalase, 'after millions of years' in permafrost. While such studies are still a considerable distance from understanding the molecular mechanisms involved in the almost magical resurrection of 'dried' organisms, they are a useful step in delineating the strategies adopted by microbes in surviving environmental extremes.

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