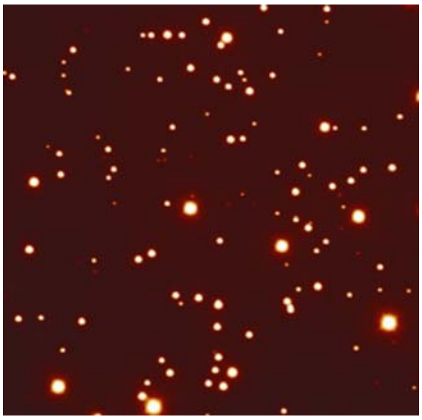
In this issue

New 130-cm optical telescope

Ram Sagar *et al.* (**page 1020**) describe the installation and commissioning of a new 130-cm optical telescope at Devasthal site near Nainital in Himalayan region in India. The telescope is operated by Aryabhatta Research Institute of Observational Sciences (ARIES), Nainital, an autonomous institute of the Department of Science and Technology, Government of India. The telescope will mainly serve to meet the growing scientific needs of the institute and country. Devasthal was identified as one of the best sites in the country for setting up new optical telescopes in the country, mainly because of excellent atmospheric conditions and less light pollution in the region. The first images presented in the article from the telescope reveals this potential of the Devasthal site. The telescopes appears very useful for carrying out deep observations of galaxies, nebulae, star clusters and transient events, such as Gamma Ray bursts and supernovae explosions. Two new facilities, namely 360 cm optical telescope and 400 cm liquid mirror telescope, both the largest aperture optical telescope in the country will come up soon at Devasthal in coming years.



High-latitude substorms characteristics and their low-latitude implications

Enormous amount of solar wind energy is transferred into the earth's magnetosphere during geomagnetic substorm phenomenon. Substorms are often triggered at nightside auroral latitudes and mark the most dramatic electric and magnetic field changes in addition to colourful auroral displays in auroral region. However, on occasions substorms may be localized poleward of auroral oval and are not identified by conventional auroral electrojet (AE) indices. The third Indian Antarctic station Bharati (geographic 69.4°S, 76.2°E) at Larsemann Hill lies in the polar region, which is ideally suited for the study of substorms localized poleward of the standard auroral oval. Singh *et al.* (**page 1073**) carried out a study of two such substorm events using magnetic data collected at Bharati in conjunction with IMAGE chain and Indian sector magnetic data as well as satellite-based auroral images. The hemispherical asymmetry in the substorm associated magnetic disturbances observed at pair of near-conjugate stations, Bharati and Hornsund, are attributed to differences in the ionospheric conditions in the two hemispheres. Though the standard AE indices failed to monitor substorms presented in this study, typical low-latitude features of substorms, for example, positive bays and Pi2 bursts on the nightside were distinctly evident.

Effectiveness of 3D geoelectrical resistivity imaging using parallel 2D profiles

The resistivity imaging is becoming a popular tool to study a variety of problems in the field of geosciences. In order to generate 3D model initially 2D data are obtained. Parallel 2D profiles with different geometry for the acquisition of 3D geoelectrical resistivity imaging were evaluated. The models, horst and trough structures, simulate the geological environment of a weathered profile and refuse dump site in a crystalline basement complex respectively. The apparent resistivity data were generated for Wenner–alpha (WA), Wenner–beta (WB), Wenner–Schlumberger (WSC) dipole–dipole (DDP), pole–dipole (PDP) and pole–pole (PP) arrays with minimum electrode separations (a = 2 m, 4 m, 5 m and 10 m) and inter-line spacing ($L = a$, $2a$, $2.5a$, $4a$, $5a$ and $10a$). The 2D apparent resistivity data for each of the arrays were collated to 3D dataset and inverted using a full 3D inversion code. The 3D imaging capability and resolution of the arrays for the set of parallel 2D profiles are presented. Grid orientation effects are observed in the inversion images produced. Inter-line spacing of not greater than four times the minimum electrode separation gives reasonable inverse models. The resolution of the inverse models can be greatly improved if the 3D dataset is built by collating sets of orthogonal 2D profiles. **See page 1036**.