

AstroSat Science Meet

AstroSat, the first Indian Multi-wavelength space astronomy mission has completed two years in orbit on September 28, 2017. The observatory is being utilised by the astronomy community in the country by submitting proposals online to the ISRO's Announcements of Opportunity (AO). The observatory is open to Indian and International astronomy community from this month onwards.

In order to commemorate two years completion of AstroSat in orbit, Space Science Programme Office (SSPO), ISRO Headquarters organised an "AstroSat Science Meet" at ISRO HQ, Bangalore during 26 – 27 September, 2017. The inaugural session was graced by Dr.K. Kasturirangan, Honorary Distinguished Adviser, ISRO and former Chairman ISRO and Secretary DOS, who gave the keynote address. Dr. M. Annadurai, Director, ISAC inaugurated the session and Dr.P.G. Diwakar, Scientific Secretary, ISRO released the AstroSat picture of the month.

This was followed by a talk on "Overview of Science from AstroSat (proposal driven) and Time Allocation" by Prof. R. Srianand, Chairman of AstroSat Time Allocation Committee (ATAC). He presented a summary on the third AO cycle proposals and science areas. He gave suggestions to improve the proposals and process.

Around 150 participants attended this Science Meet.

In the first session on status and science from payloads, presentations were made by the payload managers and spacecraft operations on the status of payloads, calibration and science highlights. The payloads are being operated as per the schedule.

- Ultraviolet Imaging Telescope (UVIT) payload performance is normal. Image resolution is 1.3 to 1.6 arcsec.
- The energy resolution of Soft X-ray Telescope (SXT) is 90eV@1.5keV and 136eV@5.9keV. It has observed several Active stars, Supernova Remnants, Cataclysmic Variables, X-ray binaries, Seyferts and Blazars. Analysis of many of these objects are in progress and are in different stages of completion.
- Large Area X-Ray Proportional Counters (LAXPC) has achieved timing parameters as planned and hence can be used for fast timing studies. All LAXPC detectors are providing quality data but LAXPC30 has developed a micro leak. The gain is being adjusted by HV change. The effect of this is observed in high energy efficiency. LAXPC can detect 0.1 mcrab sources in few thousand seconds.

- Cadmium Zinc Telluride Imager (CZTI) detector, imaging and spectral performance are normal as planned. Charged Particle Monitor (CPM) is used to alert South Atlantic Anomaly (SAA) for CZTI. It has best sensitivity to GRBs in 150 to 400 keV energy range along with polarisation capability.
- Transients search in the Scanning Sky Monitor (SSM) data is ongoing. Filters are applied for screening the data. Background modeling and calibration aspects are being carried out.
- Nearly 1000 Proposals were handled by APPS since PV phase. A large number of bugs/issues found during testing and also reported by users have been addressed. Software tools for proposals submission and data analysis are hosted at the AstroSat Support Cell (ASC). Suggestions are provided to improve the scheduling.
- AstroSat has completed 10787 orbits. Science data recorded continuously and dumped later during the visibility over Bangalore Ground Stations. Science data received at ground stations are transferred to ISSDC for processing, archival, storage and dissemination.

Further sessions were arranged according to astronomy theme and are based on the abstracts received from the AO and guaranteed time cycle users for this science meet. The themes were:

1. Stars and Stellar Systems
2. Galaxies
3. Compact Objects In Binaries
4. Active Galactic Nuclei (AGN) and Quasars
5. Gamma Ray Bursts (GRB), Gravitational Waves, Supernova and Remnants, Isolated Neutron Stars

25 researchers from national institutes, universities and colleges presented their work using AstroSat data during the Science Meet.

Highlights of the presentations by the researchers:

- First measurement of phase resolved polarisation for Crab pulsar using CZTI data.
- Over 110 GRBs detected till date and 11 subjected to polarisation analysis, from year 1 data.
- In 4U 1728-34 which is a neutron star X-ray binary, LAXPC found kilohertz QPO. It is first time observed in 10-20 keV band. Burst oscillation is also observed and confirmed by different methods.

- The timing information obtained from LAXPC data on X-ray binaries can be statistically modeled to reveal the nature of the variability and get quantitative physical measures of the system.
- UVIT and observations in other wavebands can be used to study the interplay between star formation and nuclear activity in low redshift AGN.

A panel discussion on “Space Astronomy Beyond AstroSat – Path Ahead” was held. Directors or representatives from TIFR, IIA, IUCAA, RRI, NCRA, ISAC, PRL and IIST presented their ideas for the next astronomy mission. Dr. K. Kasturirangan and other members in the audience provided relevant points to be taken up by the panelists. After the deliberations, it was decided that the panel will submit a report to ISRO.



Chairman, ISRO addressed the gathering and provided suggestions to the panel discussion