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Astrosat to boost X-ray astronomy

US Observatory Praises Indian Scientists For Contribution

Swati Shinde Gole | TNN

Pune: With India's first dedicated astronomy satellite (Astrosat) scheduled to be launched by end of the year, x-ray astronomy is fast gaining popularity in the astronomy circle across the country. In fact, scientists at the Chandra X-Ray observatory, the best x-ray observatory in the US, have attributed Indian scientists in a big way for their work in x-ray astronomy.

In the city too, the Inter-University Centre for Astronomy and Astrophysics (Iucaa) is doing groundbreaking works in the field, even as their scientists are involved in the designing and the software of the Astrosat, which is equipped with four x-ray instruments.

P C Agarwal, the principal investigator to Astrosat, said, "X-ray astronomy is one of the explosively growing branches of astronomy. For example, the first black hole was discovered from x-ray observation. This was a pathbreaking discover and the importance of x-ray astronomy is clearly underlined here."

The primary emphasis of astrosat will be studies of x-ray emitting objects. This will be India's first observatory wherein x-ray observations can be taken. So far, Indian scientists have been working at observatories outside India, mainly the Chandra observatory, to take observations and analyse data.

"Once astrosat is launched, large data will be available to anybody and everybody. Plus, awareness will be created about x-ray astronomy not only within the astronomy circle, but also in general public," Agarwal said.

Dipankar Bhattacharya, involved in designing and software of the astrosat, said, "The astrosat will turn out to be a great boon for x-ray observations, especially in India, since it does not have one of its own. It will allow users to study the spectrum and time variation of emission produced by cosmic sources. Determining the size of cosmic objects will also be possible while one can measure the gravitational field."

The institutes working in x-ray astronomy, including Iucaa, Indian Institute of Science, Raman Research Institute, the Tata Institute of Fundamental Research, the Indian Institute of Astrophysics, among others, are conducting various awareness programmes on x-ray astronomy through workshops and lectures.

In fact, Iucaa has appointed 25 researchers, who are looking forward to use astrosat and are being trained and guided by experts.

Devraj Pawar, one of the 25 fellows, said, "We are studying how to work on x-ray observations, how to analyse data , what to see and what not to see, basically, all the nuances of x-ray astronomy. I am really looking forward for the launch of astrosat, as it will help us tremendously for the growth of x-ray astronomy in India." Pawar is planning for a doctorate in x-ray astronomy in the coming years.

What is X-ray astronomy?

Pune: According to Dipankar Bhattacharya, professor at Inter-University Centre for Astronomy and Astrophysics (Iucaa), "There are many objects in the universe that are faint in optical light. These objects emit lot of x-ray radiation. These objects are very hot, ranging to one million degree Kelvin. X-ray astronomy plays an important role as one can pick an x-ray telescope and point towards the sky and capture these objects. Some objects move at enormous speed, and optical light cannot catch them, but x-rays can. In particular, black holes can be spotted through x-ray."

When there is a cluster of galaxies, there is huge amount of dark matter in the centre of these galaxies, which can also be captured through x-rays. The very fact that confirmation of black holes came through the use of x-ray, validates the use of this technology.

The development of x-ray astronomy is tied up with the development of rockets and satellites that are required for carrying X-ray telescopes and detectors above the Earth's atmosphere. Beginning with simple detectors in 1962, equivalent to a naked eye, the X-ray instruments today are a billion-times more sensitive. These developments have led to observations of X-rays from planets to the distant clusters of galaxies. Today, x-ray observations are conducted to the study almost all kinds of cosmic objects including stars, galaxies and quasars (a star-like object that may send out radio waves and other forms of energy). TNN