

Editorial

Biman Nath, Associate Editor

Futuristic speculations by one generation can become a reality for the next. The story of Lyman Spitzer Jr. and the Hubble Space Telescope is yet another example of this age-old adage. The space telescope revolutionized modern astrophysics by its ability to observe the cosmos without the handicap of the Earth's atmosphere that blurs the visions of all ground-based telescopes. The stars do not twinkle anymore when viewed from above the blanket of the atmosphere. The detailed images accorded by the space telescope allowed astronomers to measure the distances to galaxies and the rate of the expansion of the universe more accurately than ever possible before, to get a glimpse of galaxies that existed back when the universe was a small fraction of its age now, to see the dynamics of gas close to black holes in quasars. Its ultraviolet and infrared instruments let them peer through dense clouds in which stars are born.

All this and more started with a rather innocuous article written by Lyman Spitzer Jr. who speculated once what a telescope above the Earth's atmosphere could do. The Hubble Space Telescope was launched in 1989, four decades after Spitzer wrote about the possibility, and not only fulfilled the dreams of an earlier generation of astronomers, but stoked those of the present generation to aim for more. Now there is an array of Hubble-like space telescopes bearing instruments to detect X-rays, gamma rays and infrared radiation (the last one, depicted in the cover, aptly named after Spitzer), and there are plans to send a bigger telescope to push the frontiers even farther in space, and back in time.

One could argue that large scale experiments, or 'big data science' as they call it these days, do not always lead to more insights. There are plenty of examples of how big data science have failed in recent times. But there are also examples on the contrary where a new window has been opened by going beyond



Email: nath.biman@gmail.com



what was once thought to be a limit. The era of space telescopes is one such heart-warming example.

This issue of *Resonance* commemorates the life and work of this visionary astronomer. A sketch of his life, highlighting his major works, is accompanied by an article on the physics of the interstellar medium that he helped to formalize. We bring out his thoughts behind the space telescope in the Classics feature, to remind us that scientists should not shy away from dreaming.

This is also the time of the year of Nobel Prize announcements, the details of which (for 2016) can be found in this issue. Two more general articles explore the process of fertilisation in flowering plants and freshwater science. In the Classroom section, there is an article on a mathematical analysis of resistor-capacitor (RC) circuits, a slightly different take on the topic than what is usually found in textbooks, followed by an article on sketching a 3D flower using geometric ideas.

