Rathnasree Nandivada, 1963-1921

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**Dr Rathnasree Nandivada**, who passed away on May 9, 2021, was the popular director of the Nehru Planetarium in New Delhi, for the last 21 years. She grew up in Andhra Pradesh and studied physics at the Hyderabad Central University.

After her MSc, she joined the astronomy department of the *Tata Institute of Fundamental Research* (TIFR), Mumbai, for her PhD. She was one of the few women students at the time, being junior to me by one year. There, she started work on simulating the last stages of massive stars before they explode as supernovae. Only a few months after her joining TIFR, the international astronomy community’s attention was grabbed by a spectacular supernova that exploded in the Large Magellanic Cloud (LMC), a satellite galaxy to the Milky Way. Both of us worked on the data from this tremendous supernova explosion called SN1987A, Rathna in TIFR, and myself from the Institute of Mathematical Sciences, Chennai, to which I had just moved.

After completing her PhD and several post-doctoral fellowships, she joined the Nehru Planetarium in New Delhi, of which she became the Director in 1999, at the young age of 36. Thus she combined her interest in astronomy with her passion for science popularisation through astronomy outreach; she was a true public scientist. She had a wide range of interests as a science populariser, but those who knew her will remember two things had a special place in her heart: her planetarium and the Jantar Mantars.

**Work at the Planetarium**

When Rathnasree became the Director, the planetarium projector was opto-mechanical, aided by slide projectors, and Rathnasree became scriptwriter, music director, narrator, producer and film director all at once.

When many planetaria in the country later upgraded to a fully digital system, Rathnasree realised this was not optimal and insisted on a hybrid projector – a choice planetaria in other cities subsequently adopted as well.

At the time, the digital projection system was fantastic for animations, but its output was poorer when projecting the night sky. A hybrid system allowed use of an optomechanical projection sphere to more realistically simulate the night sky, with digital projectors looped in for some advanced animation.

She was the master of the planetarium dome, and was forever looking for creative means to use it. These ranged from research on the accuracy of medieval astronomy instruments to visualising large datasets for student projects.

Another memory shared by her friends was her immense love for old Hindi film songs. Much later in her life, she even compiled a list of astronomy-themed songs sung by **Kishore Kumar** to be used in her planetarium shows.

**Work at the Jantar Mantars**

Sometime in the early 2000s, Rathnasree fell in love with the large astronomical instruments of the *Jantar Mantars*, built by **Raja Sawai Jai Singh II** of Jaipur in the mid-18th century. Where everyone else saw historical monuments, Rathnasree saw open-air physics laboratories, and she made them come alive for the school students of Delhi. She trained successive batches of students to carry out actual measurements with them. She was very proud of the fact that her students could finally measure time to an accuracy of just two seconds using one of these *yantras*.

In fact, she became the foremost expert in this field and figured out how to calibrate each instrument and use it as it was originally intended. In recognition, the Archaeological Survey of India (ASI) appointed her on the ASI’s committee to oversee maintenance and restoration of the instruments in the Jantar Mantar located in Delhi. The photo shows her at the Delhi Jantar Mantar in 2015 (Photo: *Rakesh Rao*). She became their champion and made sure the restoration work did not compromise the accuracy with which one could make measurements thereafter.

In February 2018, India hosted a prestigious event – the International Astronomical Union Symposium (IAUS340) on Solar Physics, at Jaipur. Rathnasree used this opportunity to make the Jantar Mantar in Jaipur accessible as a laboratory as well. She decided to train the tour guides on how to make measurements, and created activity sheets for the yantras so that each visitor to the Jantar Mantar could make their own measurements at each of them. The picture (Credit: Alok Mandavgane) shows Rathnasree with students at the Jaipur Jantar Mantar in 2018.

**Interactions with students**

She was the people’s astronomer, and made the Delhi planetarium an oasis for students interested in science. Rathnasree insisted that everyone was capable of doing astronomy, and came up with hands-on experiments, simple measurement exercises and calculations for her students to perform. The students she had mentored over the years became a huge family. She was forever willing to discuss astronomy with everyone, even with those who held contrary views.

When the Astronomical Society of India constituted its Public Outreach and Education Committee in 2014, the obvious choice for chairperson was Rathnasree. In that role, she set the course for many of the committee’s long-running programs and brought the team together. Most of its activities that focused on students have been her brainchild, from organising regular online discussions with astronomers to devising simple experiments around celestial events like eclipses and conjunctions.

**Astronomy and Gandhi**

She unearthed the fact that **Gandhi** had become interested in astronomy and sky-watching when he was jailed in Pune. She assiduously collected all his astronomy writing and proposed the “Bapu Khagol Mela”, for which she wished to visit every location that Gandhi had visited in India and organise a sky-watching session there for the people. She managed to cover quite a few of them, and her travel path is now dotted with telescopes that she guided the schools in each of these towns to build.

**Vera Rubin**, the astronomer who had played a central role in the discovery of dark matter, used to say, “A woman’s place is in the dome” (referring to the one crowning the telescope). Rathnasree also found her place in the planetarium dome, under the stars that she brought down to Earth for all of us, every day. She was snatched away, too young, by Covid. We will miss her.

***Adapted from the article in The Wire by Aniket Sule, Homi Bhabha Centre for Science Education (HBCSE-TIFR), Mumbai, and Niruj Mohan Ramanujam, Indian Institute of Astrophysics, Bengaluru.***