

## GMRT accorded prestigious IEEE Milestone status

The Giant Metrewave Radio Telescope (GMRT) has achieved yet another honour and major landmark : it has been selected as a IEEE Milestone facility. The Institute of Electrical and Electronics Engineers (IEEE) is the world's largest technical professional organization dedicated to advancing technology in all areas related to electrical and electronics engineering. The IEEE Milestones program honours significant technical achievements and excellence for the benefit of humanity found in unique products, services, seminal papers and patents, which have global or regional impact, in all areas associated with IEEE. **This is only the third such IEEE Milestone recognition for an Indian contribution, to date.** The previous two Indian IEEE milestones in India (recognized in 2012) are for the pioneering work done by Sir J.C. Bose to demonstrate the generation and reception of radio waves in 1895, and for the Nobel prize winning discovery by Sir C.V. Raman in 1928.

The GMRT is one of the largest and most sensitive low frequency radio observatories in the world. It is operated by the National Centre for Radio Astrophysics (NCRA), Pune which is a part of the Tata Institute of Fundamental Research, Mumbai. It consists of an array of 30 antennas of 45 m diameter each, spread out over a 30 km region about 80 km from Pune, with sophisticated electronics and computing for processing the data from all the antennas. The GMRT was conceived of and proposed in the late 1980s, built and made operational during the 1990s, and opened for use by the global astronomy community in 2002.

Considering the global impact of GMRT with users from over 40 countries worldwide and the fact that it was designed and built entirely in India, the IEEE India office and IEEE Pune section initiated the proposal to nominate the GMRT for this prestigious international recognition. The formal proposal was submitted, in cooperation with NCRA, to IEEE in early in 2020, after an initial review of the history and accomplishments of the GMRT by a team from IEEE India. After a fairly rigorous review process including appraisal by international experts and additional information from NCRA, the proposal was first put up to the History Committee of the IEEE which cleared it for approval in October 2020. It was then submitted to the IEEE Board of Directors for the final approval, which was granted on 23rd November 2020.

Mr. Harish Mysore, Senior Director, IEEE India Operations, commented : “IEEE has recognised 212 milestones all over the world for their scientific and engineering contributions. The GMRT is the third IEEE Milestone in India. This IEEE milestone not only recognises the contributions of scientists and engineers of India, it also helps to attract young talent towards fundamental science and engineering.”

Prof. Yashwant Gupta, Centre Director of NCRA, added “It has been fantastic to work with colleagues from IEEE on this project, and I very much appreciate their support, the sense of purpose and genuine enthusiasm towards the common objective.”

The GMRT was conceived by the late Prof. Govind Swarup and included several technical innovations, which are recognized in the citation for the award, which reads “...It (the GMRT) pioneered new techniques in antenna design, receiver systems, and signal transport over optical fiber.” The citation also recognizes the scientific work done using the GMRT, stating : “GMRT has produced important discoveries in domains such as pulsars, supernovae, galaxies, quasars, and cosmology, greatly enhancing our understanding of the Universe.”

Upon hearing the news, Prof. S. Ananthkrishnan, former senior scientist at NCRA, commented “On behalf of many of my colleagues going back to the pre-GMRT days, it makes me feel very proud and happy to learn that this IEEE milestone recognition has been accorded to the GMRT observatory, a jewel in the crown of TIFR. It is a nostalgic moment going back to the days of 1984, when GMRT was conceived of by Prof. Govind Swarup, after intense discussions. It is to the credit of a generation of scientists, engineers and supporting staff, under his leadership, that toiled to make GMRT a success, and of the current GMRT team that has further upgraded it. I hope the future generations of scientists and technologists will innovate further to keep India in the forefront of science and technology.”

Reacting to the news of the announcement, noted scientist Prof. R. Mashelkar commented “This is a fantastic news. My heartiest congratulations to the entire NCRA family, both the past and the present. What makes it special is the fact that the only other time this happened was when the pioneering work of J.C. Bose and C.V. Raman was recognised almost a century ago. Feel very proud of you all...”

The IEEE Milestone will be formalised in a special dedication ceremony that will involve unveiling of the bronze citation plaque at the GMRT premises. The event is expected to happen in 2021 soon after the Covid-19 pandemic situation allows ease of travel to India, and the IEEE President and other officials are expected to participate, in addition to several dignitaries from academia, industry and the Government of India.

Responding to the news of this latest accolade to the GMRT, Prof. Yashwant Gupta, Centre Director of NCRA, said : “It is indeed a very proud and special moment, not just for GMRT and NCRA (and the global astronomy community), but also for the entire science and technology fraternity in the country, to see a modern, made in India facility earn this international recognition. It is also a fitting tribute to the late Prof Govind Swarup, who was the driving force behind the GMRT, and all the team members whose efforts over the last 30 years or so made the GMRT a reality, culminating in the successful upgrade of the facility that we completed last year. We look forward with great anticipation to the IEEE Milestone dedication ceremony.”

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The complete citation for the GMRT, that will be on the IEEE Milestone plaque :

### **Giant Metrewave Radio Telescope (GMRT), 1994**

**GMRT, consisting of 30 antennas of 45 m diameter each, spanning 25 km near Pune, India, is one of the largest and most sensitive low frequency (110–1460 MHz) radio telescopes in the world. It pioneered new techniques in antenna design, receiver systems, and signal transport over optical fibre. GMRT has produced important discoveries in domains such as pulsars, supernovae, galaxies, quasars, and cosmology, greatly enhancing our understanding of the Universe.**

