

# Observations confirm neutron star merger

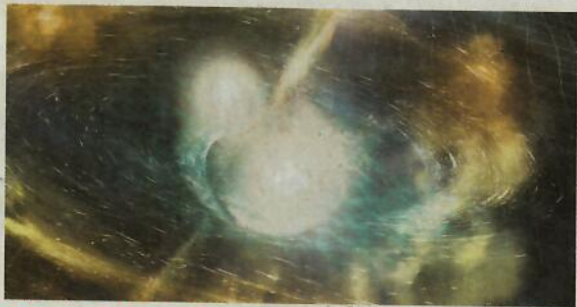
Indian scientists play a significant role in source modelling

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The announcement of the neutron star merger, detected on August 17 by the LIGO-VIRGO collaboration of gravitational wave detectors, has been reinforced by the observation of short gamma ray (light waves) bursts almost simultaneously by other space and earth-based observatories.

“This discovery is so fundamental that it is definitely a strong candidate for another Nobel prize,” K.G. Arun, who was part of the team that studied the astrophysical implications of the joint detection, said in a press release from the Indian Institute of Technology-Madras.

Dr. Arun is one of nearly 40 members of the LIGO-VIRGO scientific collaboration who have contributed to the source modelling, developing the algorithms that search for binary mergers amid noisy data from many detectors, testing Einstein’s theory and separating signals from experi-



**Cataclysmic collision:** An illustration of two merging neutron stars. ■ NSF/LIGO/SONOMA STATE UNIVERSITY/A. SIMONNET

mental and environmental artefacts. The second part of the discovery – the observation of Gamma ray bursts by several telescopes – includes the observations by the Giant Metrewave Radio Telescope (GMRT), the Himalayan Chandra Telescope (HCT) and AstroSat.

The sensitive CZTI instrument on AstroSat helped narrow down the location of the gamma-ray flashes. The HCT obtained optical images at locations of neutrinos detected by other telescopes at the same time as the burst, and showed that they were unrelated to

the gravitational-wave trigger. The GMRT played a key role in understanding jet physics and refining models of radio emission from the remnant formed by the merging neutron stars.

P. Ajith of ICTS-TIFR, Bengaluru, one of the leading scientists in the LIGO-VIRGO collaboration, on the importance of the discovery, said: “Neutron-star mergers are incredibly rich and complex phenomena. Virtually every area of physics and astrophysics can learn something from this unique laboratory set up by nature!”