ASET Colloquium

Looking for Gravitational waves with a pulsar observatory
by Prof. B.C. Joshi (NCRA, TIFR, Pune)

Friday, 28 April 2017 from 16:00 to 17:00 at AG-66

Abstract:

The existence of Gravitational Waves (GW), detected indirectly first in the Hulse-Taylor pulsar, B1913+16, is a significant implication of Einstein's General Theory of Relativity. Recently, GWs were directly detected by terrestrial detector, ALIGO, which is sensitive to few Hertz GW generated in mergers of stellar-mass black holes. However, GW spectrum extends to nano-Hertz frequencies, generated by super massive black-hole binaries (SMBHB). The long wavelengths, make it difficult to construct an earth based detectors for these GW. Instead, timing an ensemble of radio pulsars, provides a celestial GW detector. The talk describes principles behind a pulsar timing array experiment and its implementation in three current international experiments, PPTA, nano-grav and EPTA. An Indian initiative, called Indian Pulsar Timing Array (InPTA), using TIFR's facilities (ORT and GMRT) is described with a presentation of recent results and the current state of art for such celestial instruments. Future proposal to use idle radio communication antennas in India is also be outlined.