Contribution ID: **648** Type: **Talk in the parallel session**

Continuous gravitational waves observations from white dwarfs to constraint modified gravity theories

Tuesday, 6 July 2021 08:30 (20 minutes)

This abstract is primarily based on my recent papers ApJ 909 (2021) 65 and ApJ 896 (2020) 69.

After predicting many sub- and super-Chandrasekhar limiting mass white dwarfs from the observations of peculiar type Ia supernovae, researchers have proposed various models to explain these two classes of white dwarfs separately. We showed that these two peculiar classes of white dwarfs, along with the regular white dwarfs, can be explained by a single form of the $f(R)$ gravity, whose effect is significant only in the high-density regime, and it almost vanishes in the low-density regime. However, since there is no direct detection of such white dwarfs, it is difficult to single out one specific theory of gravity. We estimate the amplitudes of all the relevant polarization modes of gravitational waves for the peculiar and regular white dwarfs. We further discuss their possible detections through future-based gravitational wave detectors, such as LISA, ALIA, DECIGO, BBO, or Einstein Telescope with a significant signal-to-noise ratio, thereby putting constraints or rule out various modified theories of gravity. This exploration links the theory with possible observations through the gravitational waves in $f(R)$ gravity.

Primary author: Mr KALITA, Surajit (Indian Institute of Science, Bangalore)

Presenter: Mr KALITA, Surajit (Indian Institute of Science, Bangalore)

Session Classification: Planning Gravitational Wave Detections form LISA

Track Classification: Gravitational Waves: Planning Gravitational Wave detections form LISA