Contribution ID: **13** Type: **Talk**

Effect of hyperons on f-mode oscillations in neutron stars: A general relativistic treatment and role of nuclear parameters

Tuesday 13 December 2022 15:15 (15 minutes)

As the densities in the interior of neutron stars exceed those of terrestrial nuclear experiments, they provide scope for studying the nature of dense matter under extreme conditions. The composition of the inner core of neutron stars is highly uncertain, and it is speculated that exotic forms of matter such as hyperons may appear there. Gravitational waves emitted by unstable oscillation modes in neutron stars contain information about their interior composition and therefore allow us to probe the interior directly. In this work, we study the influence of the appearance of hyperons on f-mode oscillations and therefore on the emission of gravitational waves. We also speculate whether a future detection of f-modes could provide a possibility of probing the presence of hyperons in the neutron star core. We further show the importance of General Relativity in calculating the f-mode characteristics and also investigate their possible correlations with nuclear/hyper-nuclear empirical parameters as well as NS observable properties.

Session

Astroparticle Physics and Cosmology

Author: PRADHAN, Bikram (Inter-University Center for Astronomy and Astrophysics)

Co-author: Prof. CHATTERJEE, Debarati (Inter-University Center for Astronomy and Astrophysics)

Presenter: PRADHAN, Bikram (Inter-University Center for Astronomy and Astrophysics)

Session Classification: WG1-Astroparticle Physics and Cosmology