Contribution ID: **14** Type: **Oral**

Neutron star equation of state from the Bayesian analysis

Friday 5 September 2025 14:40 (20 minutes)

We constrain the nuclear matter equation of state within the relativistic mean field model by including the isoscalar-vector and isovector-vector coupling term at a fundamental level using the Bayesian analysis. We used the nuclear saturation properties and recent astrophysical observations to constrain the dense matter equation of state. We obtained about 20000 sets of equations of states out of sampling about 60 million sets of equations of states. All 20000 equations of state satisfy nuclear matter saturation properties at saturation densities and produce high mass neutron stars. In our findings, we find that the non-zero value of the scalar-vector and isovector-vector coupling parameter and the negative value of the sigma meson self-coupling stiffen the equation of state. Our sets of equations of state produce neutron stars of mass larger than 2.5 $M_{\odot}$ to include the recent gravitational waves observation GW190419.

Authors: Dr KUMAR, Deepak (Institute of Physics); Prof. SAHU, Pradip K (Institute of Physics Bhubaneswar)

Presenter: Dr KUMAR, Deepak (Institute of Physics)

Session Classification: Parallel Session