Contribution ID: **178** Type: **Oral Presentation**

Equation of state of inner crust of neutron stars with finite range Gogny forces

Monday 30 March 2020 16:45 (15 minutes)

Nuclear systems exist in nature in a wide range of sizes and densities. Nuclear equation of state (EoS) is thus immensely important to know the basic nature of nucleon-nucleon interaction. As the exact nature of this interaction is still not known, there exist a huge number of EoSs in the literature based on different relativistic and non-relativistic interactions. Based on recent observations these interactions pretty much agree on the structure of the core of a neutron star. With reasonable certainty one can say that the core of neutron star is comprised of nuclear matter in beta equilibrium. However, the structure of the crust of a neutron star is not that well determined. It plays a significant role in determining the radius of the neutron star. We have used for the first time the non-relativistic finite range Gogny forces to construct the equation of state for the crust of the neutron star. There is a strong reason to believe that the shell correction and pairing interations of the nuclear force play crucial roles in determining the structure of the crust of the neutron star. The advantage of using Gogny forces over the conventional zero range forces (e.g Skyrme forces) is that the pairing can be handled in the same interaction. For consistency we used the same interaction to construct the EoS of the core of the neutron star. Results obtained with this unified EoS is compared with the existing works in the literature.

Author: Mr MONDAL, Chiranjib (University of Barcelona)

Co-authors: Prof. XAVIER, Viñas; Prof. MARIO, Centelles

Presenter: Mr MONDAL, Chiranjib (University of Barcelona)

Session Classification: Parallel 3A

Track Classification: Dense matter in neutron stars