



東北大学 宇宙創成物理学国際共同大学院プログラム

GP-PU (Graduate Program on Physics for the Universe) Seminar

# “Short introduction to the nuclear physics of neutron stars”

by Jinniu Hu

(Nankai University)

Time and Date : 10:30 - 12:30, Tue Nov 2<sup>nd</sup> 2021

Zoom registration :

[https://us02web.zoom.us/meeting/register/tZYqcuuqrzwwH9FWGNF-\\_aNfh9UEz87-Nt7Z](https://us02web.zoom.us/meeting/register/tZYqcuuqrzwwH9FWGNF-_aNfh9UEz87-Nt7Z)

Abstract:

The neutron star as the most compact object in the universe can be considered a natural laboratory of condensed matter in extreme conditions. It is the rest of a star after a supernova explosion and consists of atmosphere, outer crust, inner crust, outer core, and inner core, whose properties are strongly dependent on nuclear physics. Recently, with the developments of observational techniques in the field of astronomy, the golden era of neutron-star physics has arrived. In this seminar, I will shortly introduce the nuclear physics and our studies in the neutron star structure with various nuclear many-body models and machine learning methods. We mainly discuss the effects of symmetry energy, magnetic field, and finite temperature on the neutron-star inner crust and the basic properties of the neutron star, such as mass, radius, and tidal deformability. Finally, I will show our recent results about the possible hadron-quark phase transition in the neutron star.

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