Polish Academy of Sciences
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Neutron Stars

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A monograph lecture course in the fall term of 2018/2019

This course will focus on neutron stars. One of the end-points of stellar evolution, these are incredibly compact stars that pack a mass comparable to that of the sun in a 10 km radius. As a result interior densities exceed nuclear saturation density and allow us to probe fundamental physics in a regime inaccessible to terrestrial experiments. In fact, the extreme conditions in and around these objects require us to account for the behaviour of the strong and weak interactions at high density, general relativity, strong magnetic fields, and rapid rotation.

The approach will be mainly theoretical but the main observations used to measure stellar parameters will also be discussed. Topics will include a discussion of the Equation of State (EoS) of dense matter, supernovae and neutron star formation, relativistic equilibria, rotation and magnetic fields, Superfluidity and Superconductivity, cooling and gravitational wave emission.

The lectures will take place on Tuesdays from 11:00-12:30 in the small seminar room at the Nicolaus Copernicus Astronomical Centre, Bartycka 18, Warsaw, and will be transmitted to the seminar room in CAMK/Toruń. The first lecture will take place on October 9th, 2018.