量子物理学・ナノサイエンス第 386 回セミナー

Superfluid Dynamics as Inferred from the Spin Evolution of Neutron Stars

講師　：　Dr. Erbil Gügercinoğlu
National Astronomical Observatories, Chinese Academy of Sciences, China

日程　：　3 月 25 日（月）14:00-

場所　：　Zoom*

概　要

Neutron stars are objects that contain the most abundant and highest temperature superfluid in the observable universe. One way to gain information about the superfluid interior structure and dynamics of neutron stars is to study their rotational evolution. Pulsar glitches, sudden spin-ups in the rotation rate of neutron stars, are direct manifestation of their superfluidity nature. Various phases of pulsar glitches, namely formation, magnitude and relaxation, enable us to infer invaluable information and put constraints on the coupling between the superfluid and normal matter, effective masses of protons and neutrons, internal temperature of the sources, internal magnetic field configuration, equation of state, and more…[1]. In this talk, I will attempt to explain how the glitch data can be used to test existing models and to deduce related microphysical parameters by invoking application of the vortex creep model to the observations [2,3,4]. I will also show how the imprints of superfluidity can be identified from the oscillations observed in the deceleration rate of neutron stars [5].

[1] Gügercinoğlu & Alpar, 2020, MNRAS, **496**, 2506
[2] Gügercinoğlu, Ge, Yuan, Zhou, 2022, MNRAS, **511,** 425
[3] Zhou *et al*., 2023, MNRAS, **519**, 74
[4] Liu *et al*., 2023, arXiv:2312.04305
[5] Gügercinoğlu, Köksal, Güver, 2023, MNRAS, **518**, 5734

*本 ZOOM セミナーに参加されます場合には、事前に下記より登録を済ませてください。
https://zoom.us/meeting/register/tJYod-2tpj8vE9GAPRzqOEx7S_82L_DgM5WD

ご来聴を歓迎いたします。

連絡教員　　関澤　一之（内線 2463）