Astro Plasma Seminar

Dr. Zhonghai Zhao

(赵忠海)

Peking University

The generation and application of magnetic fields in HED-plasmas: from the laboratory to astrophysics

Time: 15:00-16:00, 18 July (Thursday), Shanghai time

Venue： N600（TDLI）

Host: Longqing Yi (易龙卿）

Join Tencent Meeting： https://meeting.tencent.com/dm/gy4kmcJ6Jbqa

Meeting ID: 194424467

Abstract:

The magnetic fields are prevalently present in astrophysical and laboratory plasmas, and both their origination and dynamical evolution are one of the central issues in modern plasma physics and astrophysics. With the high-energy-density (HED) plasmas created by high power lasers, we are capable of modeling a series of astrophysical processes, such as magnetogenesis, magnetic reconnection and magnetic collimating jet, in the laboratory, reproducing the typical observational characteristics and revealing the underlying physics. In this talk, I will introduce the recent progress of the High Energy Density Physics research group at Peking University on magnetized plasmas and their dynamics, including the magnetogenesis in weakly collisional plasmas driven by temperature gradient, the acceleration and collimation of super-sonic jet by laser-driven toroidal magnetic fields, the collisional-collisionless asymmetric magnetic reconnection associated with solar flares, as well as the potential QED magnetic reconnection origin of the X-ray burst associated with the fast radio burst. Finally, I will briefly look forward to the magnetized turbulent plasmas at higher laser energies and the relativistic laboratory astrophysics at higher laser intensities.

Biography:

Dr. Zhonghai Zhao is primarily engaged in numerical and experimental research in high energy density physics and magnetized plasmas. He received his bachelor's degree from Harbin Institute of Technology in 2016 and his doctoral degree from Peking University in 2022, where he is currently engaged in postdoctoral research. His current research interests include the origination and reconnection of astrophysical magnetic fields, particle acceleration and radiation in magnetized plasmas, kinetics and thermodynamics in turbulent collisionless plasmas, and he has published several papers in Science Advances, Science Bulletin, Communications Physics and Physical Review E, etc.

Astronomy and Astrophysics Division
天文与天体物理研究部