

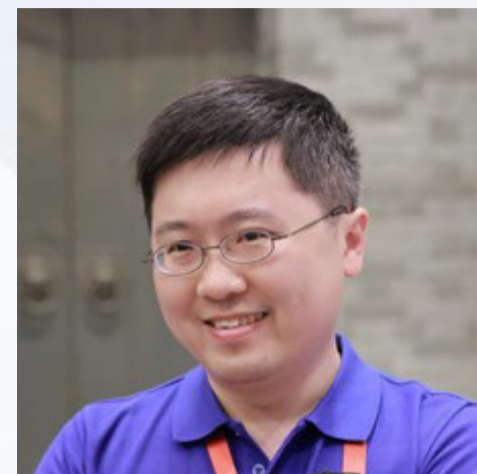


Probing dark matter self-interactions with collapsed dark matter halos

Date: October 25, 2023 (Wednesday)

Time: 4:00 p.m.

Venue: MB237, Main Building, HKU



Prof. Yiming ZHONG
City University of Hong Kong

Abstract:

Over the past decades, we have accumulated compelling evidence for the existence of dark matter, yet its nature remains elusive. Dark matter could be part of the "dark sectors," comprising hidden particles with new interactions. These new particles and interactions can alter the formation and evolution of various small-scale structures in the Universe. This talk will focus on the impacts of dark matter self-interactions, a common feature within the dark sector paradigm, on the properties of dark matter halos. Self-interacting dark matter halos experience gravothermal evolution, where the central halo initially forms a core that ultimately collapses. The core-collapsed phase diversifies the density distributions of dark matter halos. It also showcases the universality in the evolution of self-interacting dark matter halos as thermal systems. Current and future observations, such as the James Webb Space Telescope and the Large Synoptic Survey Telescope, could probe the properties of the collapsed dark matter halos through strong lensing and weak lensing and shed light on dark matter self-interactions. Furthermore, the collapsed halos may give birth to the supermassive black holes observed at high redshifts, a longstanding puzzle in astrophysics.

Biography:

Dr. Yiming Zhong is an assistant professor at the Department of Physics of the City University of Hong Kong. He received his Ph.D. at the C.N. Yang Institute for Theoretical Physics of Stony Brook University in 2016. He was then a postdoctoral associate at Boston University from 2016 to 2019 and a KICP fellow at the Kavli Institute for Cosmological Physics of the University of Chicago from 2019 to 2023. Dr. Zhong's research area lies at the intersection of theoretical particle physics, astrophysics, and cosmology. He was the Chinese translator of the popular science books "Time Reborn" and "The Greatest Story Ever Told So Far".

Anyone interested is welcome to attend!

Phone: 28592360 Fax: 25599152