Contribution ID: **28** Type: **Plenary Talk**

Theoretical Predictions and the Little Red Dots in the Universe

Tuesday, 23 June 2026 10:00 (30 minutes)

James Webb Space Telescope (JWST) discovered remarkably numerous Little Red Dots (LRDs) in the Universe for a wide redshift z range from ˜2 to ˜7. Such LRDs, characterized by prominent V shaped continuum spectra with unusually broad Hα and Hβ lines (FWHM ˜10ˆ3 to ˜10ˆ4 km/s), are inferred to be extremely luminous, compact, massive, metal poor yet without detectable X-ray and radio emissions. We have been working on self-similar dynamic formation of black holes in a wide mass range within giant mass reservoirs containing normal and dark matters in general. In particular, we predicted the possibility of hypermassive black holes (HMBHs; ˜10ˆ{10} to 10ˆ{12} solar masses or even higher) and supermassive black holes (SMBHs; ˜10ˆ{6} to several 10ˆ{9} solar masses) in the Universe including the early Universe. We also suggested the progenitors of the LIGO/Virgo black holes in the forbidden mass zone, magnetars, and classes of supernovae, γ-ray bursts, X-ray bursts, fast radio bursts are likely to be magnetized massive stars. As a CUSPEA scholar of 1980, I also share anecdotes of Professor T. D. Lee.

References:

【01】Lian B., Lou Y.-Q., Relativistic self-similar dynamic collapses of black holes in general polytropic spherical clouds, MNRAS 438, 1242–1255 (2014); Advance Access publication 2013 December 20

【02】 Lou Y.-Q., Jiang Y.-F., Supermassive black holes in galactic bulges, MNRAS Lett. 391, L44–L48 (2008)

【03】 Lou Y.-Q., Wu Y., Intermediate-mass black holes in globular clusters, MNRAS Lett. 422, L28–L32 (2012)

【04】 Lou Y.-Q., Ma J.-Z., Supermassi v e stars with random transverse magnetic fields, MNRAS 516, 1481–1500 (2022); Advance Access publication 2021 September 15 https://doi.org/10.1093/mnras/stab2631

【05】 Hu R.-Y., Lou Y.-Q., Magnetized massive stars as magnetar progenitors,MNRAS 396, 878–886 (2009)

Primary author: LOU, YU QING (Tsinghua University)

Presenter: LOU, YU QING (Tsinghua University)

Session Classification: Session I (Day 2)