TDLI Astronomy Interview Seminar

Shu Wang (王澍)

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Title: Studying AGN Black Hole Mass Estimation and Structures using Time-domain Surveys

Time: 21:00-22:00, 7 February (Friday), Shanghai time

Host: Dong Lai

Location: Online

Join Tencent Meeting: https://meeting.tencent.com/dm/HDMLcdhXu69w

Meeting ID: 823697584 (no password)

Abstract:

Using AGN variability to study BH mass growth and accretion physics is a key science goal of time-domain surveys. Reverberation mapping (RM) has been the primary method for direct BH mass estimation. It reveals an important empirical relation between the broad-line region (BLR) size and continuum luminosity, enabling the single-epoch BH mass estimation that is crucial for high-redshift AGNs and large-sample studies. However, as the RM sample grows, this relation has exhibited increasing scatter and complexity. In this talk, I will revisit the Hβ size-luminosity relation by combining data from 32 high-luminosity AGNs from SAMP with a uniform lag reanalysis of >200 archival AGNs. Our findings reveal a larger scatter and a shallower slope than the expected 0.5. We further explore the impact of different luminosity tracers. Next, I will present our study on disk and torus sizes using continuum RM, providing a more comprehensive picture of AGN structures. Finally, I will discuss our efforts in identifying and tracking changing-look AGNs using time-domain survey data. Future time-domain surveys from next-generation spectroscopic facilities, e.g., JUST, will offer unprecedented opportunities to refine BH mass scaling relations and uncover extreme variability events, advancing our understanding of BH accretion and evolution.

Biography:

Shu Wang received his bachelor and PhD from Peking University. He joined the Seoul National University (SNU) AGN Monitoring Project (SAMP) as a postdoctoral researcher, and obtained the SNU Science Fellowship in 2022. His main research interests include BH mass estimation, and accretion disk mapping, changing-look AGNs, and high-redshift AGNs. He was involved in the SDSS reverberation mapping project, the SAMP collaboration, and is a member of LSST AGN Science Collaboration. He is interested in using time-domain surveys to expand our understanding of AGN variability and BH mass estimation.

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