Astronomy Colloquium

Prof. Yichen Zhang（张沂忱）

(SJTU)

Understanding Accretion Status of High-mass Protostars

Time: 15:00-16:00, 21 May(Tuesday), Shanghai time

Venue： N602（TDLI）

Host: Zhen Pan

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Abstract：

Similar to low-mass star formation, disk-mediated accretion is also likely to be the way massive stars grow and form. While rotation structures are commonly found in massive young stellar objects, number of confirmed disks or disk candidates are still rare. The disk properties and their roles in massive star formation are not yet well constrained observationally. In this talk, I will present some of our high-resolution observations toward massive young stellar objects with ALMA and JWST.

Our main findings are 1) rotational structures can be consistently found down to tens of au scale around forming massive stars, consistent with relatively order disk accretion scenario; 2) Disks around massive protostars can have both neutral and ionized components, and very compact ionized components are found common even in early stage sources; 3) misalignments of rotation (angular momentum) directions can be found on different scales, even for close binary members apparently embedded in a same disk; 4) Some massive disks show a characteristic chemical pattern including salt (NaCl, KCl), silicon compounds (SiO, SiS), and hot water lines at a scale <100 au, indicating dust destruction in very inner region, complementary to volatile hot-core molecules tracing the material on 1000-au scale. This may provide a window for studying dust evolution, in conditions similar to those of very inner regions of low-mass disks which are too small to observe.

Biography:

Yichen Zhang is a Tenure-track Associate Professor at the Department of Astronomy in Shanghai Jiao Tong University. He received his Ph.D. from University of Florida in 2013. Since then, he has conducted postdoctoral research at Yale University, Universidad de Chile, RIKEN (Japan), and University of Virginia. He joined Shanghai Jiao Tong University in last September. His research focuses on star formation, especially massive star formation, using mostly IR/sub-mm/mm/radio observations.