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国台学术报告 NAOC COLLOQUIUM

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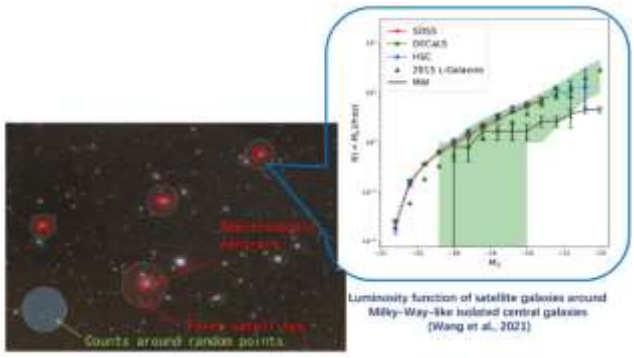
Time: Wednesday 2:30 PM, Mar.24th Location: A601, NAOC

Studies on low-mass satellite galaxies and faint diffuse stellar halos of isolated central galaxies

Dr. Wenting Wang (SJTU)

By combining both observational data and numerical simulations, Wenting Wang mainly works on galaxy formation and evolution, galaxy-halo connection and dynamical modelling of the Milky Way Galaxy. Wenting got her PhD. at Shanghai Astronomical Observatory in 2012, and meanwhile she visited the Max-Planck Institute for Astrophysics as an exchange student, working with Simon White. Afterwards, she worked as a postdoc at Durham University with Carlos Frenk and Shaun Cole (Durham Junior Research Fellowship), and at Kavli-IPMU (Tokyo University), before joining the Astronomy department of Shanghai Jiaotong University in 2019, as an associate researcher. In 2020, Wenting obtained the support from the Youqing fundation of NSFC.

Abstract



In the standard cosmic structure formation paradigm, galaxies form in dark matter halos. Smaller galaxies merge with larger halos, becoming satellite galaxies. Satellites lose their mass due to tidal stripping, which form stellar halos and streams around the central dominating galaxy. Low-mass satellites are particularly helpful in terms of distinguishing different dark matter models. We developed a statistical method to study these low-mass satellites, when their spectroscopic redshifts are not available. It has been applied to three surveys (HSC, DECaLS and SDSS). I will introduce the properties of these faint satellites and the connection to their central galaxies and host halos. A comparison is made against MW satellites, indicating our MW system is statistically atypical. In the second part, I will introduce our efforts of measuring the faint diffuse stellar halos by stacking galaxy images. The PSF-deconvolved surface brightness profiles are close to universal once scaled by the halo virial radius. Red galaxies have more extended stellar halos, redder and shallower color profiles and more satellites than blue counterparts, consistent with the galaxy formation theory that red galaxies stopped forming stars due to feedback, while their host halos, population of satellites and stellar halos keep growing. In the end, I will briefly introduce the measurement of proper motions for main sequence stars based on two deep surveys (HSC and SDSS Stripe 82).