

Simulation based models for more realistic galaxy cluster mass and profile estimates

I will discuss the scatter modeling of the cluster gas pressure profiles with the aim of generating more realistic Y_{SZ} mock observables for the Baryon Pasting (BP) algorithm. To do so, I use the Illustris-TNG300 catalog to model the correlation of the intrinsic scatter of cluster gas pressures at different radial bins using the Kernel Localized Linear Regression (KLLR) method. Applying KLLR on the cluster mass removes the bias and additional scatter due to the variance in mass which can be as much as 12%. Additionally, I will present an ongoing analysis that quantifies the intrinsic correlated scatter of cluster weak lensing observables and how correcting for this additional secondary term in the mass modeling could lead to percent-level changes in cluster mass estimations. These simulation based models could set informative priors for upcoming analyzes such as DES-Y3 and the Legacy Survey of Space and Time (LSST) survey.

Primary author: ZHANG, Zhuowen

Presenter: ZHANG, Zhuowen