

Dark-Matter & Baryons in Early-type Lens Galaxies

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The internal structure and evolution of early-type (E/S0) galaxies are important probes of the Λ CDM structure-formation model. Their stellar structure and kinematics have been studied in detail (e.g. through the Fundamental Plane), yet comparatively little is known about their dark-matter halos. One reason is that both strong gravitational lensing and stellar kinematic studies have inherent degeneracies between e.g. their mass, mass-profile and anisotropy of the stellar velocity ellipsoid, that can limit detailed modeling of the dark-matter halos of distant E/S0 galaxies. In my presentation, I will first explain how the techniques of strong gravitational lensing and stellar kinematics can be combined to break the dominant mass-model degeneracy in early-type galaxies (i.e. that between mass and mass-profile). This will be illustrated through recent results - based on Hubble Space Telescope imaging and Keck spectroscopic data of a sample of early-type galaxies reaching a redshift of $z \sim 1$ - focusing on the measurement of their baryonic/dark-matter mass fractions and their total and dark-matter density profiles. A comparison will be made with results from other techniques, lower-redshift galaxies and numerical simulations.

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