Dynamical and structural analysis of a large-scale structure at $z = 0.65$ in CANDELS UDS

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Abstract

We report the discovery of a large-scale galaxy structure at $z = 0.65$ within the UKIDSS Ultra-Deep Survey. Several galaxy overdensities at $z_{phot} \sim 0.65$ were discovered in the CANDELS UDS field. An extended analysis over the full UKIDSS field of view shows that the structure is composed of a couple of tens galaxy clumps and spreads over more than $10h_{70}^{-1}$ Mpc. We have recently conducted a spectroscopic follow-up of the main knots of the structure and intra-structure filaments using the multi-object spectrograph VIMOS on VLT. We confirm the physical association of at least ten sub-structures. A background extended structure of several clumps at $z = 0.69$ as well as a number of foreground clusters at $z > 0.6$ were also spectroscopically confirmed. Embedded within one of the most observed astronomical wide fields and covered by extensive UV-to-mid-IR imaging, including HST imaging for the 5 Mpc inner part, this structure is one of the most optimal laboratory to investigate the environmental dependence of galaxy properties. We will present the general geometry of the structure, the nature of its different sub-components and the dynamical analysis of the system. We will also present preliminary absorption line measurements derived from the (medium resolution) optical spectroscopy that coupled with structural parameters from the high-resolution HST data permit to investigate the dependence with density of classical scaling relations e.g., between stellar masses, galaxy effective radii and measured velocity dispersion.