

Illuminating the Dark Universe with fluorescent Lyman-alpha emission

Tuesday, 6 February 2018 15:10 (20 minutes)

Gravitational collapse during the Universe's first billion years transformed a nearly homogeneous matter distribution into a network of filaments - the Cosmic Web - where galaxies form and evolve. In this talk, I will present the results of a new program to directly detect and study the baryonic component of the Cosmic Web in emission using bright quasars and galaxies as external "sources of illumination". In particular, I will show results from ultra-deep narrow-band imaging and recent integral-field-spectroscopy as a part of the MUSE Guaranteed Time of Observation program that revealed numerous giant Lyman-alpha emitting filaments extending up to several hundred kpc around quasars and bright galaxies. I will discuss how the unexpectedly high luminosities of these systems represent a challenge for our current understanding of cosmological structure formation. In particular, I will show that current observations suggest that a large amount of "cold" and dense gaseous "clumps" should be present around high-redshift galaxies and I will present our first attempts to understand the origin and nature of these structures.

Presenter: CANTALUPO, Sebastiano (ETH Zurich)