

# A deep multi-wavelength imaging and spectroscopic investigation of a reionized bubble at $z = 7$ (Marco Castellano)

*Wednesday, 11 September 2019 09:44 (18 minutes)*

The detection and characterization of early reionized regions will be a key topic for future Extremely Large Telescopes. In this talk I will present the first confirmation of a reionized overdensity at  $z \sim 7$  in the BDF field, based on a combination of deep HST and VLT multi-band imaging and VLT-FORS2 spectroscopy. The BDF field hosts a factor of  $\sim 3-4$  overdensity of faint LBGs and three confirmed Ly-alpha emitters within 4 physical Mpc. The two brightest Ly-alpha emitters are at the very same redshift ( $z=7.008$ ) and at only 90 kpc physical distance from each other. A quantitative assessment of the Ly-alpha fraction shows that the number of detected emitters is much higher than the average found at  $z \sim 7$  and more consistent with the Ly-alpha visibility at  $z \sim 6$ . I will discuss current constraints on the physical properties of the bright and faint members and their contribution to the creation of the reionized bubble. I will present plans for a thorough assessment of the nature of this region using future facilities, and prospects for a detailed characterization of other early reionized regions. In particular, I will highlight the need for a careful synergy between JWST, EUCLID and AO-assisted imaging and IR multi-object spectroscopy from ELTs.

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**Track Classification:** Reionization and First Light