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Extremely Big Eyes at the Focus of Cosmic Telescopes (Eros Vanzella) (I)

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The identification of young massive star clusters (YMCs) at cosmological distance is becoming a real fact. The occurrence of such systems is believed to increase at high redshift, eventually enclosing a significant fraction of the star formation activity of the Universe, in an epoch when also globular clusters (GC) formed. The potential role of such stellar systems play during reionization, their demography and the physical mechanisms behind the formation of GCs are among the key questions that will require JWST and E-ELT for a crucial quantum leap. I'll present recent results from Hubble deep imaging coupled with our VLT/MUSE Deep Lensed Field (MDLF, 20 h) and VLT/X-Shooter observations boosted by strong gravitational lensing. The best cosmic lenses allow us to anticipate E-ELT high spatial resolution capabilities (a few mas) and probe new low-luminosity regimes (mag > 32), along with quantifying our current limitations when studying non-lensed sources. The same cosmic lenses observed with E-ELT will allow us to further probe star-formation at the pc scale (or sub-pc in the more extreme cases), and identify gravitationally-bound star clusters in the first Gyrs, possibly GC precursors.

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