Obscured dual AGN at high redshift uncovered with VLT/MUSE and JWST

I will present our exciting discovery of a tight obscured/unobscured dual AGN at z=3.3 based on deep VLT/MUSE observations. We detected a prominent point-like HeII and CIV emission-line region, dubbed JiI, located about 20kpc away within the LyA nebula of the primary unobscured AGN. Emission-line diagnostics and ionizing photon budget calculation indicate that the narrow lines are produced by an embedded obscured AGN. However, we can only indirectly probe the presence of obscured AGN via the narrow-line region and a direct proof of an accreting super-massive BH is still missing. X-ray observations are challenging, because Chandra is not sensitive enough to detect faint obscured AGN, such as JiI, at high redshift in less than a few Ms integrations. Radio observations are also not ideal since the high star formation activity can mimic the radio emission of weak AGN.
I will highlight that JWST offers a unique opportunity to detect even faint obscured AGN through the hot dust emission of the torus. The hot (500-2000K) torus emission peaks at 3-5μm (rest-frame) which can be observed with JWST/MIRI out to redshift z<4. Only, JWST will achieve the required sensitivity and angular resolution in the MIR wavelength range to verify tight, high-contrast dual AGN systems at high redshift. Based on a suite of mock observations I will present how to determine the optimal filter set and observational setup. Hence, the combination of VLT/MUSE (and later Euclid) with JWST will lead to an unprecedented characterization of unbiased dual AGN population at high redshift which is inaccessible right now. Those systems may correspond to the most massive halos at their epoch and traces the most active phase of major mergers during the early hierarchical build-up of the Universe.