

X36a MIRI Photometric and Spectroscopic Observations of a Bright Galaxy at $z=11$

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The JWST is currently unveiling a significant number of bright galaxies at $z > 11$, both through photometry and spectroscopy. The remarkably high number density of these luminous galaxies, compared to theoretical model predictions, raises questions about potential differences in the physical properties of galaxies at such extreme redshifts and those at lower redshift. However, the exact physical mechanism responsible for this overabundance remains under debate, primarily because the currently available NIRCам and NIRSpec datasets do not cover key rest-optical continuum and emission lines such as $H\alpha$ and $[OIII]\lambda 5007$, which are essential for investigating physical properties. Here, we will present the latest results of our Cycle 3 MIRI program targeting a bright galaxy at $z = 11.04$, CEERS2_588, using MIRI imaging and spectroscopy. We detect CEERS2_588 at $> 5\sigma$ in both the MIRI F560W and F770W bands, but do not identify the $H\alpha$ and $[OIII]\lambda 5007$ emission lines, placing stringent upper limits on their line fluxes. In this talk, we will present the physical properties of this galaxy revealed by our MIRI observations and discuss the origin of the observed overabundance of bright galaxies at $z > 10$.