X31a   Finding Cosmic Beacons - Toward A Complete Census of Galaxies in the Epoch of the Unknown through a JWST NIRCam Pure-Parallel Imaging Survey

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JWST Cycle 1 has been full of surprises, drawing our attention towards unknown aspects of galaxy evolution at high-redshift. Several teams have identified early galaxy candidates at $z > 11$, breaking the previous redshift record and reaching up to $z \sim 13$ when the universe is only ~ 400 million years old. The confirmation of the claimed remarkably high star formation efficiency in early galaxies through spectroscopic follow-up is crucial. So far, this confirmation has been limited to only a few candidates at $z > 10$, leaving the conclusion to be drawn by future large volume surveys.

In this talk, I will introduce the approved Cycle 2 program, BEACON (GO-3990), which is a NIRCam pure-parallel imaging survey specifically designed to comprehensively study galaxies in this previously unstudied epoch. BEACON will observe, within its allocated 600 hrs, approximately 220 independent sightlines, each configured with eight filters spanning the range from 0.8 to $5.0\,\mu$m, resulting in a total volume coverage of approximately 0.6 square degrees. I will demonstrate how BEACON will improve the determination of the luminosity function at $z > 10$ and provide valuable constraints on the mode of star formation and dust production in young galaxies.