

# High Resolution Science with High Redshift Galaxies

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I will first review high resolution science that has been done with the Hubble Space Telescope on high redshift galaxies. Next, I will review the capabilities of the 6.5 meter James Webb Space Telescope (JWST), which is an optimized infrared telescope that can deploy automatically in space, slated for launch to a halo L2 orbit in 2013. I will outline how the JWST can go about measuring First Light, Reionization, and Galaxy Assembly building on lessons learned from the Hubble Space Telescope. I will show what more nearby galaxies observed in their restframe UV-optical light may look like to JWST at high redshifts.

Last, I will summarize the Generation-X mission concept for an X-ray telescope designed to study the very early universe with 1000-times greater sensitivity than current facilities. Gen-X will study the first generations of stars and black holes in the epoch  $z=10-20$ , the evolution of black holes and galaxies from high  $z$  to the present, the chemical evolution of the universe and the properties of matter under extreme conditions. This requires an effective area of  $100 \text{ m}^2$  at 1 keV, an angular resolution of  $0.1''$  (HPD) over 0.1-10 keV.