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Type : **Contributed talk**

Galaxies in JWST's mirror may be more massive than they appear: bottom-heavy initial mass functions at $z \sim 0.7$ from JWST-IMFERNO

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JWST's discovery of extremely massive, quiescent galaxies in the early Universe has introduced significant tension with current galaxy formation models, implying that galaxies formed and quenched faster and earlier than expected. However, estimates of distant galaxy masses are highly uncertain. They assume a stellar initial mass function (IMF) similar to that in the Milky Way, despite evidence that the cores of massive, local ellipticals (the likely descendants of these massive, high-redshift galaxies) are richer in low-mass stars (i.e. they have a bottom-heavy IMF). Until now, it has been impossible to robustly measure the IMF beyond the low-redshift Universe in individual galaxies, as extremely deep spectra covering both optical and near-infrared wavelengths are required. The JWST-IMFERNO program, which combines deep, optical spectra from the LEGA-C survey with extremely deep, near-infrared, JWST/NIRSpec-MSA spectra, has unlocked this challenging constraint. I will present the first robust measurements of the IMF beyond the local Universe. Using a sample of 9 massive, quiescent galaxies at $z \sim 0.7$, I will demonstrate that distant galaxies have bottom-heavy IMFs compared to the Milky Way, implying higher stellar masses than previously estimated. Finally, I will discuss how our galaxies, which are direct descendants of JWST's "impossibly early" galaxies, amplify tensions with galaxy formation models.

Did you give a contributed talk at CASCA 2026?

No

If you are selected for a poster, would you be interested in giving a short flash talk on your work?

Yes

What is your career level?

Postdoctoral

Which keyword describes the area of focus of this talk?

Galaxies

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