

Abstract Submitted
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Finding the First Cosmic Explosions: Hypernovae and Pair-Instability Supernovae¹ BRANDON WIGGINS, Brigham Young University — The cosmic Dark Ages ended with the formation of the first stars at $z \sim 20$, or ~ 200 Myr after the Big Bang. Because they literally lie at the edge of the observable universe Pop III stars will be beyond the reach of even next generation observatories like JWST and the Thirty-Meter Telescope. But primordial supernovae could soon directly probe the properties of the first stars because they can be observed at high redshifts and their masses can be inferred from their light curves. I will present results from numerical simulations of Pop III hypernovae and pair-instability supernovae and their light curves computed with the Los Alamos National Laboratory's RAGE and SPECTRUM codes. We find that these two types of explosions will be visible at $z \sim 10 - 15$, revealing the positions of ancient dim galaxies on the sky and tracing their star formation rates.

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Brandon Wiggins
Brigham Young University

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