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Pop III Supernova feedback on The Formation of The First Galaxies

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Modern cosmological simulations suggest that the hierarchical assembly of dark matter halos provided the gravitational wells that allowed the primordial gases to form stars and galaxies inside them. The first galaxies comprised of the first systems of stars gravitationally bound in dark matter halos are naturally recognized as the building blocks of early Universe. To understand the formation of the first galaxies, we use an adaptive mesh refinement (AMR) cosmological code, ENZO to simulate the formation and evolution of the first galaxies. We first model an isolated galaxy by considering much microphysics such as gas dynamics, self-gravity, star formation, stellar feedback, and primordial gas cooling. To examine the effect of Pop III supernovae feedback to the first galaxy formation, we set up the initial temperature, density, and metallicity distributions of Pop III supernova bubbles by assuming different IMF of Pop III stars. Our results suggest that star formation in the first galaxies is sensitive to yields and energetics of the first supernovae. Therefore, our study can provide a channel to correlate the populations of the first stars and supernovae to star formation inside these first galaxies which may be soon observed by the JWST.

Affiliation

Academia Sinica Institute of Astronomy and Astrophysics / National Taiwan University

Talk/Poster

Talk

Primary authors: Ms CHEN, Li-Hsin (Academia Sinica Institute of Astronomy and Astrophysics / National Taiwan University); Dr CHEN, Ke-Jung (Academia Sinica Institute of Astronomy and Astrophysics)

Presenter: Ms CHEN, Li-Hsin (Academia Sinica Institute of Astronomy and Astrophysics / National Taiwan University)

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