Star Formation in the Early Universe: The First Stars and their Remnants

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Acronyms and Jargon

- **AGN**: active galactic nuclei
    - Supermassive black holes in the centers of galaxies that are accreting material and emitting jets and winds. These are extremely luminous sources.
- **AMR**: adaptive mesh refinement
    - Method to allow for changing and enhanced refinement on a grid within a simulation.
- **BH**: black hole
- **CCSN**: core collapse supernova
    - Supernova during which the core collapses.
- **CMB**: Cosmic Microwave Background
    - Background microwave radiation that is a relic left over from the early universe.
- **GW**: gravitational wave
    - Ripples in spacetime that are produced by massive objects moving through space.
- **Halo**: dark matter halo
    - Structure of dark matter that gathers regular matter through the force of gravity. All galaxies sit in their own dark matter halo.
- **IMF**: initial mass function
    - Refers to the distribution of stellar masses when stars form.
- **JWST**: James Webb Space Telescope
- **ΛCDM**: Lambda cold dark matter
    - Standard cosmological model including the three main components: dark energy (Λ), cold dark matter (CDM), and regular matter.
- **LW**: Lyman-Werner
    - Refers to the LW photons in the energy range of 11.2 - 13.6 eV, capable of photodissociating molecular hydrogen.
- **Metals**: elements heavier than helium
- **Mpc**: mega-parsec (10^6pc)
- **Myr**: mega-year (10^6yr)
- **NS**: neutron star
- **NSM**: neutron star merger
- **pc**: parsec (3.26 light years, 19.2 trillion miles)
- **Population II (Pop II)**: second generation stars, metal-enriched stars
- **Population III (Pop III)**: first stars, metal-free stars
- **r-process**: rapid neutron capture process
- **SED**: spectral energy distribution
    - Typically a plot of energy versus wavelength for a particular object.
- **SFE**: star formation efficiency
- **SFRD**: star formation rate density
- **SN**: supernova
- **z**: redshift
    - z = 0: today, z = infinity: Big Bang