

The Role of Dust in the Early Universe: The nature of cosmological reionization sources

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■ Motivation:

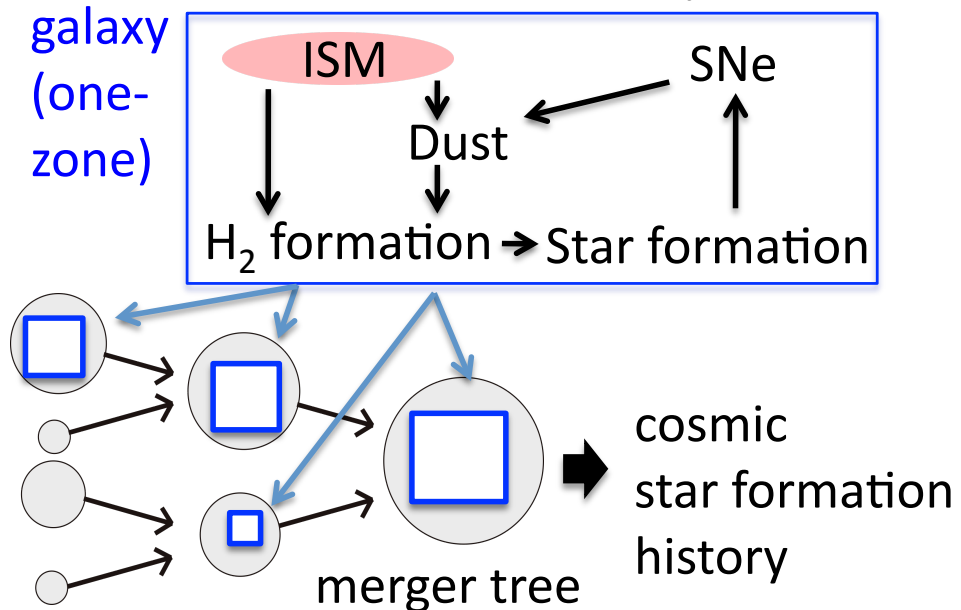
We focus on the evolution of dust mass and size distribution.

We explore the SFE and the IMF transition from Pop III to Pop II stars

for various DM halo masses and redshifts in the early universe ($z > 5$).

■ Method:

We construct a semi-analytic model.



(i) the formation and **size evolution of dust** by SNe

(ii) the time-dependent chemical reaction networks including **H₂ formation** both **on the surface of the dust grains** and in the gas phase

(iii) the gas cooling and heating

(iv) the star formation rate

which is **proportional to H₂ mass**

(v) DM halo evolution

due to the hierarchical merger tree

(vi) the IMF transition from Pop III to Pop II due to **dust cooling**