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## $C^+$ as Tracer of Molecular Hydrogen and Star Formation Rate in Galaxies

Understanding the distribution of molecular hydrogen ( $H_2$ ) is essential for studying star formation in galaxies. However, direct observations of  $H_2$  are difficult. Carbon species such as carbon monoxide (CO) and ionized carbon ( $C^+$ ) might be used as good tracers of molecular hydrogen, as their formation is closely related to the presence of  $H_2$ .

In this study, we perform high-resolution galaxy simulations using the GIZMO code, and conduct post-processing to calculate the abundance and emission of  $C^+$ . We aim to investigate how well the tracer correlates with  $H_2$  and star formation, especially in low-metallicity environment. This work will help to improve our understanding of molecular gas tracer and its connection to star formation.

### Section

Galaxy/Extragalactic

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