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■ Title

ALMA study of the cosmic history of metal enrichment: Why did such a large amount of dust exist in the epoch of reionization?

■ Summary

How and when metal enrichment happened in the earliest Universe is one of the most fundamental questions in modern astronomy. The proposed study will obtain the understanding of the cosmic history of metal/dust enrichment starting from the epoch of reionization by performing either or both of the following studies: (1) We will place a constraint on "the first dust production in the Universe" by means of ALMA observations of dust emission and atomic lines in star-forming galaxies in the epoch of reionization, along with a state-of-the-art model of dust production. (2) We will reveal the assembly of "the most massive dust reservoir in the Universe" by building a sample of submillimeter-luminous galaxies across the cosmic time and by obtaining a comprehensive understanding of star-formation activity and interstellar medium of the sample using ALMA observations of dust emission, atomic and molecular lines.