NAOJ ALMA Scientific Research Grant 2021

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■ Title

A Systematic Study of the Dust Build-up in the Epoch of Reionization

■ Summary

Recent discoveries of a handful of massive galaxies at $z > 6.5$ have rekindled long-standing questions: how were high-mass galaxies formed and how were heavy elements and dust made so rapidly in the first 1-2 billion years of the universe? We have carried out a new ALMA Large Program, the Reionization Era Bright Emission Line Survey (REBELS), to systematically identify [CII] or [OIII] emission lines and dust emission in ~30-35 of the most massive galaxies at $z > 6.5$, increasing the size of such samples by >5× . Utilizing REBELS' rich data and applying for follow-up observations with ALMA and other observatories, we will place constraints on the process of dust production, dust properties, and dust grain growth in the earliest galaxies.