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A Sub-mm perspective on massive galaxies in the early universe

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STELLINGEN

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A Sub-mm Perspective on Massive Galaxies in the Early Universe

1. Even within UV-selected galaxy populations at $z \sim 7-8$, dust obscuration hides a significant fraction of the total star formation activity, demonstrating the necessity of sub-millimeter observations to properly measure early cosmic star formation rate densities. (Chapter 2)
2. When the dust temperature cannot be directly measured, studies of dust masses, attenuation curves and other derived quantities should present their results as continuous functions of temperature in their figures, rather than assuming a single value. (Chapters 2 & 4)
3. Blindly scanning for [CII] fine-structure emission with ALMA is a highly efficient and robust strategy for spectroscopically confirming the redshifts of UV-bright galaxies with tight photometric redshift constraints. (Chapter 3)
4. The stark difference in dust properties between $z \sim 7$ systems (where dust abundant) and $z > 8$ systems (which are virtually dust-free) points to a dramatic epoch of dust production between 300 and 700 million years after the Big Bang. (Chapters 2, 4, & 5)
5. Without a successor to JWST, either in the near- and mid-infrared or the submillimeter regime (e.g. ALMA2040), our ability to study very high redshift galaxies will be severely compromised in a post-JWST era.
6. Over-resolving high-redshift sources with excessively small synthesized beams significantly degrades the signal-to-noise ratio, frequently leading to erroneous interpretations.
7. ALMA's distributed peer review system, by restricting reviewers to isolated proposal stacks, lacks the comparative oversight of traditional panels, remains blind to broader trends and potentially fails to prevent redundant allocations of similar projects.
8. The high-redshift community has a tendency to prioritize 'shiny new toys' over more fundamental scientific research.
9. Papers should not be written on a timescale of days.
10. The hard-won skill of writing a great apology letter has become redundant with the rise of Large Language Models.
11. If you try to model the cheapest possible, yet nutritionally complete diet as a constrained linear optimization over a supermarket's database, the global minimum is a mathematically perfect culinary disaster.

Sander Schouws
Leiden, 1 september 2026