Dust grains in attenuation and emission from cosmic noon to the early Universe

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Abstract

Dust is an important yet elusive component of galaxies; it shapes how we observe galaxies by attenuating the UV-optical light and reemitting it in the IR, and it plays a key role in the processes of star formation as well as in the physics and chemistry of the ISM. Many aspects of dust at high redshift remain uncertain, particularly the properties of dust grains (their composition and size distribution), which influence every observational signature of dust from UV to sub-mm. In recent years, the combined power of JWST and ALMA has provided new insights, as well as new puzzles, in this field. In this talk, from an observational perspective, I will review what we have learned about the smallest dust grains, the PAHs, in galaxies at cosmic noon using JWST/MIRI observations, in the context of cold gas and dust traced by ALMA. This is the first time that we can extend our knowledge about PAHs to typical galaxies beyond the local Universe. I will then move to higher redshifts to discuss recent results from JWST and ALMA on the properties of early dust, including the emerging evidence for attenuation features such as the UV bump and the shape of the attenuation curve, as well as constraints on the peak of dust emission observed with ALMA.

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