

Identifying Supermassive Dark Star Candidates in JWST Data

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Early findings from the James Webb Space Telescope (JWST) defied the predictions of the Λ CDM model of cosmology. The major concern was the large overabundance of very massive, very high-redshift galaxies and quasars, at which time the universe was only a few hundred million years old. There are two major models for the nature of the first stars in the universe: Population III stars and Supermassive Dark Stars (SMDS). SMDS, in particular, offer a solution to the aforementioned paradoxes. Unlike Population III stars, SMDS are powered by dark matter annihilations, can grow to be a million times the mass of the sun, and shine a billion times brighter than the sun, and in fact as bright as an entire galaxy. At the end of their lives, SMDS would collapse directly to a black hole, and therefore could give rise to the first quasars observed. We have identified the first candidates for SMDS using the JWST Advanced Deep Extragalactic Survey (JADES): JADES-GS-z13-0, JADES-GS-z12-0, and JADES-GS-z11-0.

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