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# A JWST View of the Dynamic ISM with Thermal Dust Echoes of Cas A

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## Abstract

The complex environment of interstellar gas and dust around the young supernova remnant Cassiopeia A hosts a spectacular system of thermal infrared echoes powered by the burst of radiation from the historical explosion. Building on nearly two decades of observations by Spitzer and NEOWISE, JWST now offers the ability to see these echoes in unprecedented detail. We present results of a new imaging (NIRCam; 0.9-4.5 micron) and spectroscopic (MIRI/MRS; 5-24 micron) observing campaign (JWST-GO 5451) that, with angular resolution of  $\sim 400$  AU, provide a path-breaking view of the 3D structure of the typical Galactic cold neutral medium. The spectrophotometric time-series reveals the compositions and physical conditions of the echoing dust clouds, constrains our picture of Cas A's massive progenitor through the luminosity, hardness and duration of the incident shock-breakout radiation, and provides a real-time view of the dynamic effects of this radiation field on the dust and molecular content of the interstellar medium.

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