

# The Kinematics of the Shocked and Unshocked Ejecta in Cassiopeia A

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We present Doppler velocity images of the young supernova remnant Cassiopeia A in the infrared emission lines of Ar, Ne, Si, and S observed with the Spitzer IRS and covering nearly the whole extent of the remnant. The measured infrared velocities of the shocked ejecta are consistent with the optical velocities. The Si and S emission near the center of the remnant, that is associated with ejecta that have not yet encountered the reverse shock, also shows both red- and blue-shifted structures with velocities between  $\pm 3000$  km/s. These unshocked ejecta provide a unique opportunity to study the kinematics of the explosion free from the influences of the reverse shock and CSM.