Dust Formation and Evolution in SN 1987A

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Abstract

SN 1987A is, by far, the best observed SN in history. The HST spectra and images of SN 1987A comprise a unique dataset which follows the development of a Type II SN, continuously for a longer period of time, and follows the ejecta to a later time than any other SN. In particular, these data can be used to help better understand the formation and evolution of dust in SN ejecta. The dust formation can be seen in the development of asymmetric blueshifted emission line profiles and is caused by dust forming, and preferentially extinguishing redshifted emission from the far side of the expanding ejecta. Galaxies at high redshift, less than 1 Gyr after their formation, have been observed to contain abundant amounts of dust In these early galaxies, dust production may fall completely to the Type II SNe. The study of dust formation in SN 1987A may be a Rosetta Stone for
SNe in high redshift galaxies.

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