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Dust in supernova 1987A

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Core-collapse supernovae (SNe) are considered to play a dual role in the production and destruction of dust in the interstellar media of galaxies. Currently, the subjects of intense investigations are the questions of how much dust SNe form, and how much dust survives SN shocks.

Supernova 1987A is the nearest supernova explosion detected in the last 400 years, and provides a unique opportunity for detailed studies of dust in a supernova. Both dust formation and destruction can be observed in a single object: it has freshly formed dust in the ejecta, while the fast expanding blast waves collide with circumstellar dust, which was expelled from the progenitor when this star was in the red-supergiant phase 40,000 years ago. We report recent SOFIA and VLT observations of dust in the ring of Supernova 1987A.

Mid-infrared VLT and SOFIA observations has captured the time development of ring dust in Supernova 1987A. Our VLT image shows that the 10-micron emission is now emitted from the west part of the ring, where the shock interaction is on-going. On the east side of the ring, the flux is declining, as the shock waves have passed the ring. Furthermore, our recent SOFIA observations detected that the 35-micron flux has increased since the last Spitzer observations 10 years ago. It might be possible that dust grains have been re-formed in the post shocked region.

Consider for a poster?

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