M82 SN2014J: X-ray Upper Limit Constrains Supernova Environment

Astronomers first detected SN 2014J in the M82 galaxy on January 21, 2014, making it one of the closest supernovas discovered in 3 decades.

Optical and infrared observations show that SN 2014J was a Type Ia supernova, the type used to measure the expansion of the universe.

Chandra set an upper limit on the X-ray emission $L_X < 7 \times 10^{35}$ erg/s.

The X-ray limit implies that the gas density around the star that exploded is very low, making it unlikely that the star became unstable because it accreted too much gas from a companion star.

Instrument: Chandra ACIS Observation

Scale:
Image is 12.75 arcmin across (42,000 light years)

Distance Estimate:
11 million light years

CXC Operated for NASA by the Smithsonian Astrophysical Observatory

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