Chandra X-ray Observatory ACIS image.

This image was generated from 8.7 days of Chandra observations of the remnant of Kepler’s supernova of AD 1604. In the image, red represents low-energy X-rays and shows circumstellar material that has been heated up by a shock wave from the star’s explosion. The yellow color shows slightly higher energy X-rays from the iron-rich supernova ejecta, while green (medium-energy X-rays) shows other elements from the exploded star. The blue color represents the highest energy X-rays and shows the “forward” shock wave generated by the explosion.

- The strength of the iron line emission, and the absence of oxygen-rich ejecta support the longstanding claim that the Kepler supernova remnant resulted from the thermonuclear explosion of a white dwarf star that produced a high abundance of iron relative to oxygen.
- The ejecta are stratified, with silicon and sulfur extending beyond the iron emission. This chemical stratification conflicts with the predictions of well-mixed ejecta in some thermonuclear explosion models.
- High-energy X-ray continuum emission (blue), almost certainly due to synchrotron radiation from extremely high energy electrons, surrounds the remnant in thin filaments, as seen in other young remnants.
- Distance to Kepler SNR: About 13,000 light years.

REFERENCES: S. Reynolds et al. 2007 209th Meeting of the American Astronomical Society

CXC operated for NASA by the Smithsonian Astrophysical Observatory