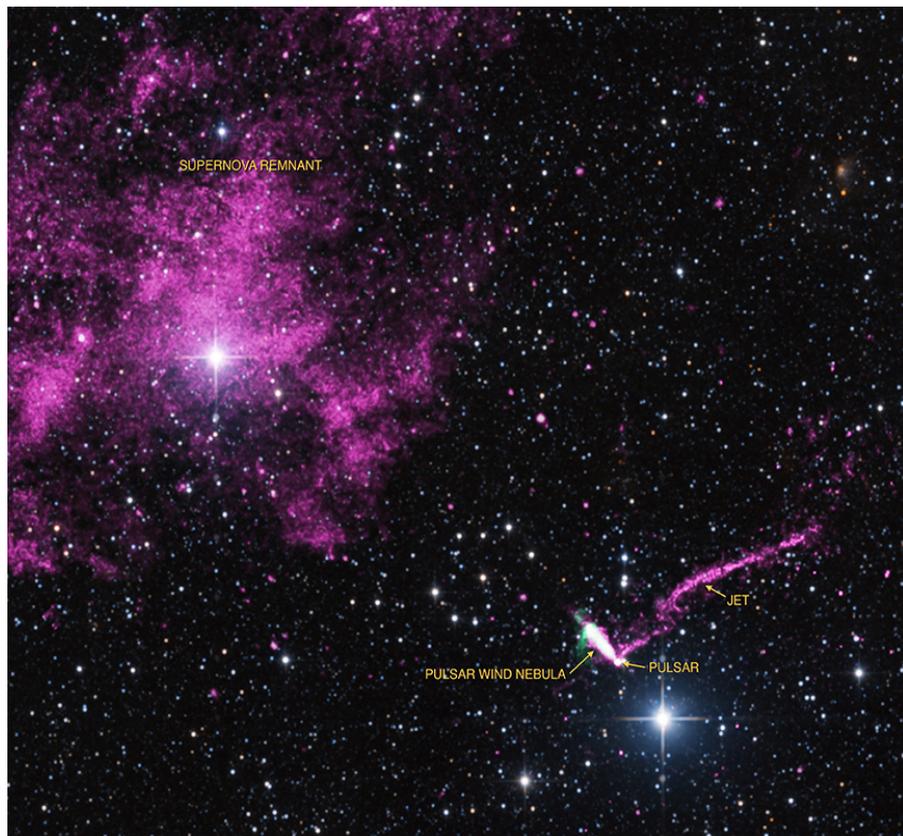




Chandra Science Highlight

IGR J11014-6103: A Runaway Pulsar With A Long Helical Jet



A composite image containing X-ray data from Chandra (purple), radio data from the Australia Compact Telescope Array (green), and optical data from the 2MASS survey (red, green, and blue) show a runaway pulsar, or neutron star, escaping from a supernova remnant, with an associated pulsar wind nebula, and a helical jet perpendicular to the pulsar's motion.

- ❑ The pulsar presumably received a strong kick during the supernova, and has traveled ~ 60 light years from the center of the supernova remnant in 10000 to 20000 years, implying a speed $>1,000$ km/s.
- ❑ The shape of the pulsar wind nebula indicates the direction of motion of the pulsar.
- ❑ Chandra detected an unusually long, corkscrew-shaped jet extending ~ 37 light years from the pulsar in a direction nearly perpendicular to the pulsar's motion.
- ❑ The jet is presumably aligned with the pulsar's spin axis, and its shape suggest that the pulsar is precessing.
- ❑ This discovery suggests that a supernova can impart high kick velocities to misaligned spinning neutron stars

Reference: Pavan, L. et al, 2014 A&A (in press),
[arXiv:1309.6792](https://arxiv.org/abs/1309.6792)

Credit: NASA/CXC/ISDC/L. Pavan et al, Radio: CSIRO/ATNF/ATCA
Optical: 2MASS/UMass/IPAC-Caltech/NASA/NSF

Scale:
Image is 22 arcmin across
(about 147 light years).

Distance Estimate:
23,000 light years

Instrument: Chandra ACIS Observation

CXC Operated for NASA by the Smithsonian Astrophysical Observatory



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