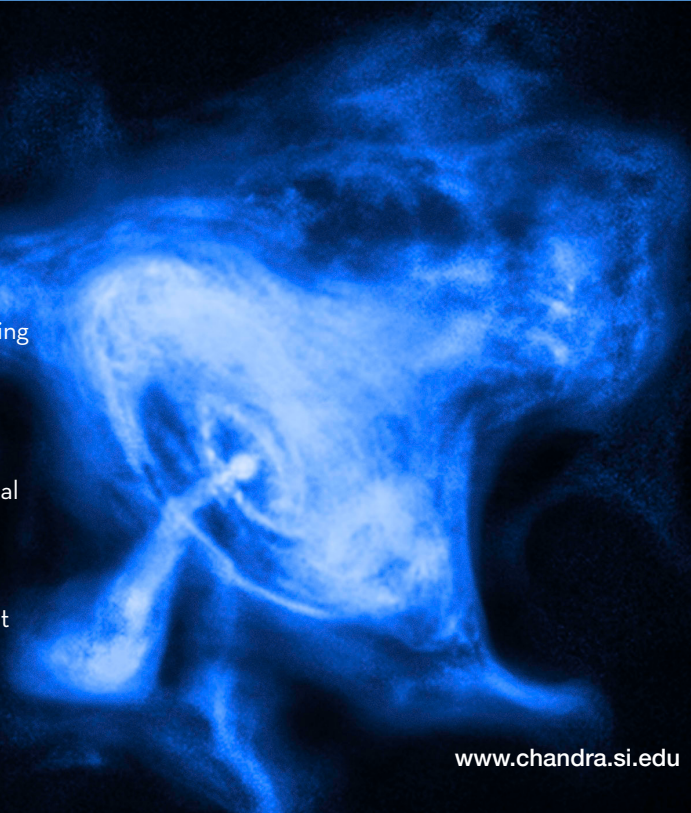




3D Print

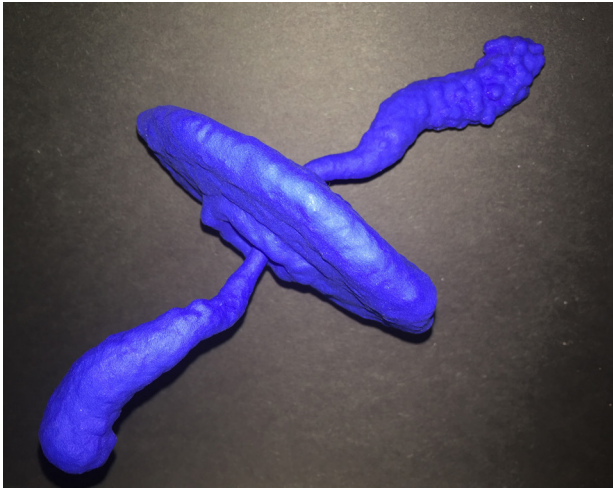
CRAB NEBULA

The Crab Nebula shows the remains of an exploded star located about 6,500 light years from Earth. The powerhouse “engine” energizing the Crab system is a pulsar, a rapidly spinning neutron star, shooting out pulses of radiation 30 times a second. X-ray information from NASA’s Chandra X-ray Observatory was used to create a three-dimensional representation of the Crab. The X-ray structure shows the pulsar and a ringed disk of energized material, with jets of particles that fire off from opposite ends of the energetic pulsar.



How to Create Your Own Pulsar

3D files and instructions are available at chandra.si.edu/3dprint



Credit: NASA/STScI/F.Summers, et al.; NASA/Caltech/IPAC/R.Hurt; NASA/CXC/SAO/N.Wolk, et al.

The three-dimensional model serves as a scientifically informed approximation for visualizing the nebula in X-ray light. The nested structures of the Crab show that the nebula is not a classic supernova remnant, but a pulsar wind nebula. A traditional supernova remnant consists of a blast wave, and debris from the supernova that has been heated to millions of degrees. In a pulsar wind nebula, the system's inner region consists of lower-temperature gas that is heated up to thousands of degrees by the high-energy synchrotron radiation.

Select the 3D printer of your choice to make your own Crab pulsar. Download the files from chandra.si.edu/3dprint/ For our 3D-printed example one color of PLA filament was used. Support structures were required, and removed after printing by using a dissolvable substrate with minimal hand-cleaning required.