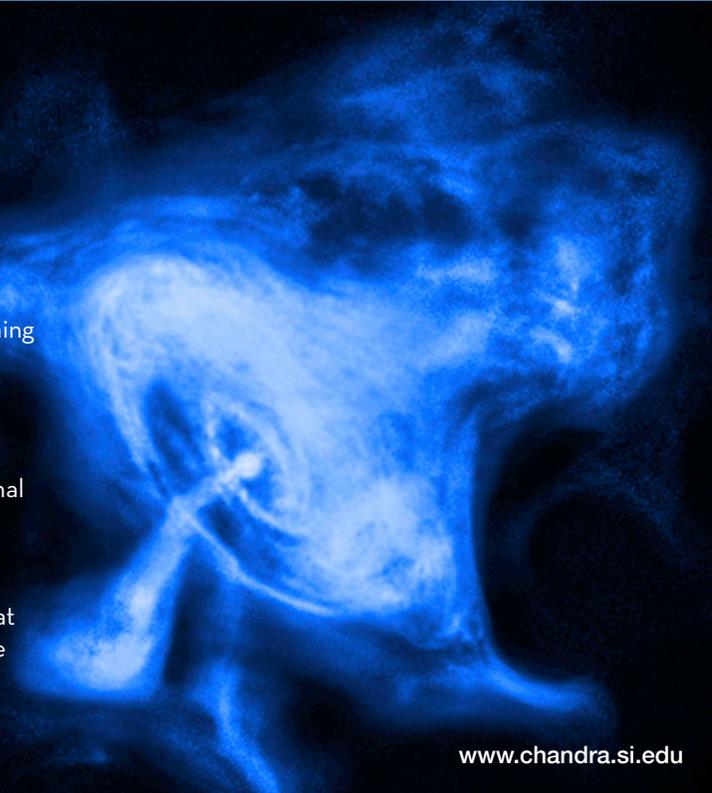




# 3D Print

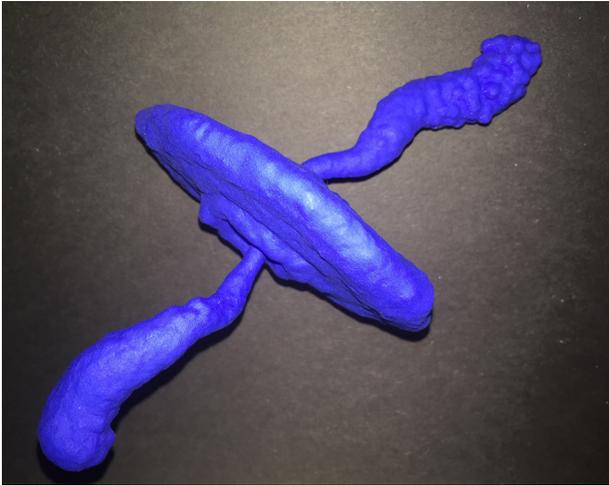
## CRAB NEBULA

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](http://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/](http://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.