



The Chandra X-ray Observatory has seen a fast-moving pulsar escaping from a supernova remnant while spewing out a record-breaking jet. This is, to date, the longest object observed in the Milky Way galaxy. The jet is nearly 37 light years long! The pulsar is 60 light years from the supernova remnant.

The supernova remnant, called SNR MSH 11-61A, is in the constellation of Carina, and located 23,000 light years from Earth.

Problem 1 – If one light year equals 9.5×10^{12} kilometers, how far is the pulsar from the supernova remnant?

Problem 2 – How long is the jet in kilometers?

Problem 3 – The supernova is estimated to have exploded about 9,000 years ago. How fast has the pulsar been traveling to get to its current location? Calculate this speed in a) km/sec and b) miles/hour.

Problem 4 – Our sun has a diameter of 1.4 million kilometers. The pulsar has a diameter of only 20 km, but carries twice the mass of our sun. Explain what would happen if the pulsar collided with a star like our sun.