



# BULLET CLUSTER

**WHO:** The "Bullet Cluster," named for its distinctive shape, is formally known as 1E 0657-56, and is the result of the collision of two enormous clusters of galaxies.

**WHAT:** The collision that created the Bullet Cluster was one of the most energetic events since the Big Bang.

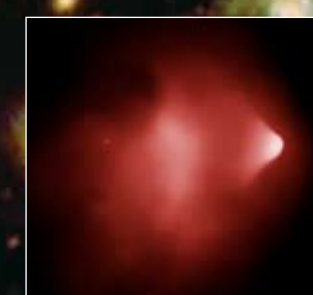
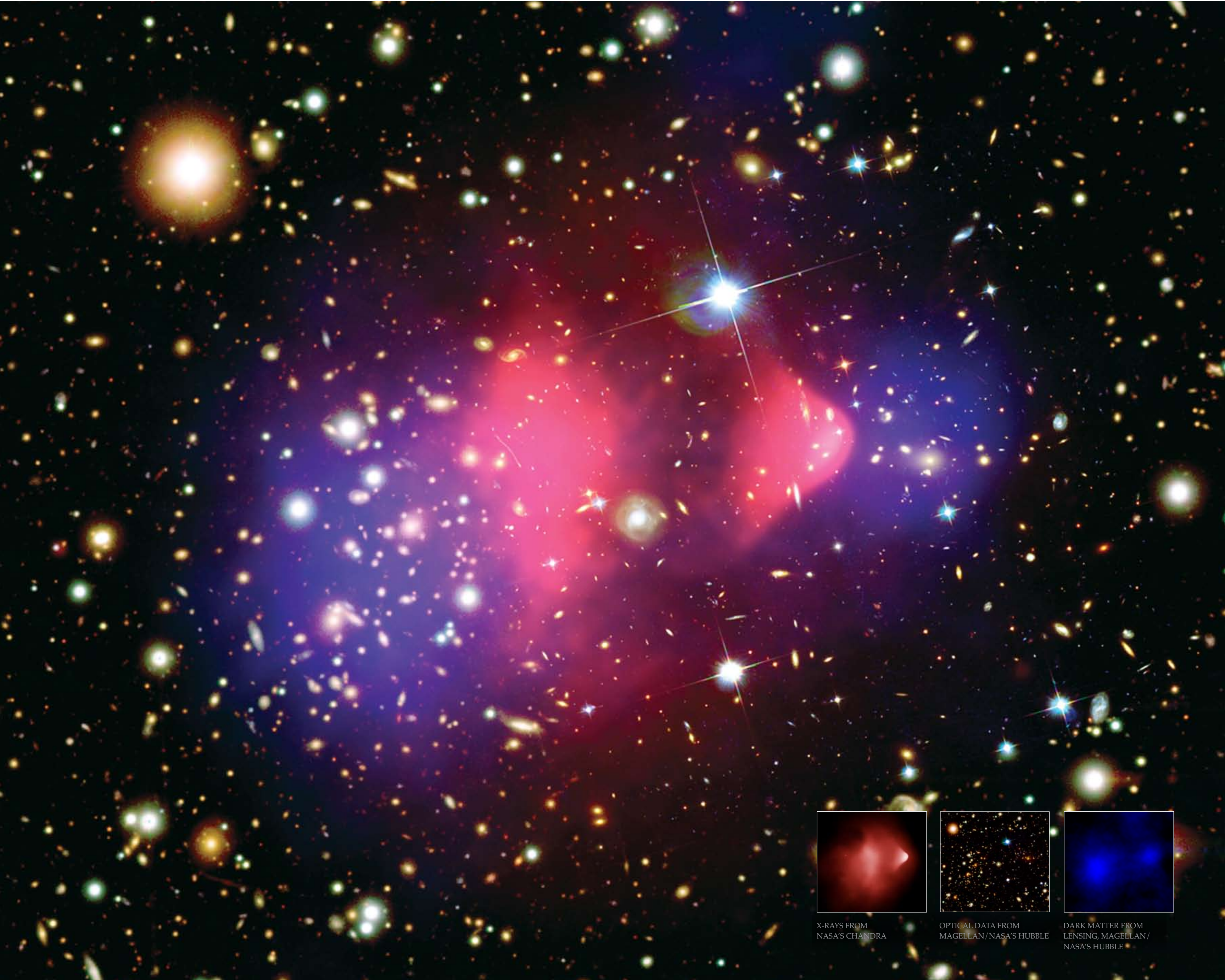
**WHERE:** At a distance of nearly 4 billion light years from Earth, the Bullet Cluster is located in the constellation Carina, or the "keel" (bottom of a ship).

**WHEN:** The speed and shape of the bullet, and other information from various telescopes suggest

that the smaller cluster passed through the core of the larger one about 150 million years earlier.

**HOW:** When these two enormous objects collided, they did so at speeds of several million miles an hour. The force of this event was so great that it wrenched the "normal" matter in the form of hot gas (seen in pink) away from the dark matter (blue).

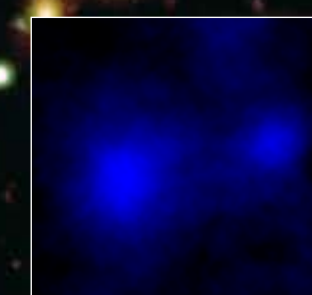
**WHY:** The separation between the hot gas and the dark matter in this system is direct evidence that dark matter does, in fact, exist. The exact nature of dark matter remains unknown, but it is thought to account for about 25% of the matter in the Universe. More at: <http://chandra.harvard.edu>



X-RAYS FROM NASA'S CHANDRA



OPTICAL DATA FROM MAGELLAN/NASA'S HUBBLE



DARK MATTER FROM LENSING, MAGELLAN/NASA'S HUBBLE

## JELLY BEAN UNIVERSE

The jelly beans in this jar represent how the Universe consists mostly of dark energy and dark matter. Only about 5% including the stars, planets and us is made of familiar atomic matter.

Jar Photo: Fermilab

