

To create your Chandra Fun Fact trading cards follow the directions on this sample for each question/answer pair.

Fold on solid line.

Cut on dotted line.

CHANDRA FUN FACTS

What Space Shuttle was Chandra launched on?



CHANDRA FUN FACTS



Chandra was launched aboard NASA's Space Shuttle Columbia on July 23, 1999!!!

CHANDRA FUN FACTS

How high does Chandra orbit?



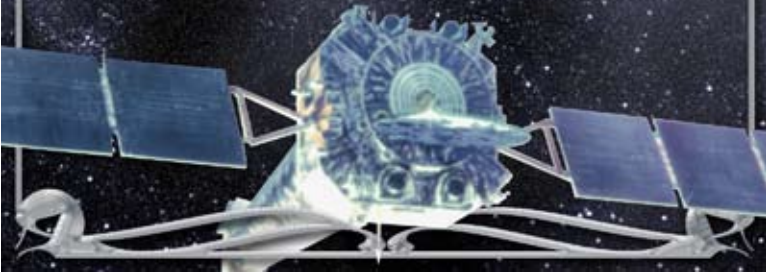
CHANDRA FUN FACTS



Chandra flies more than 1/3 of the way to the moon!

CHANDRA FUN FACTS

How quickly can Chandra move from one target to the next?



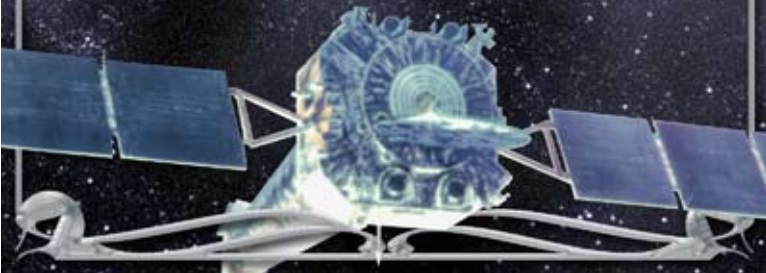
CHANDRA FUN FACTS

Chandra can move more slowly than the minute hand on a clock.



CHANDRA FUN FACTS

How does Chandra compare in size to other satellites?



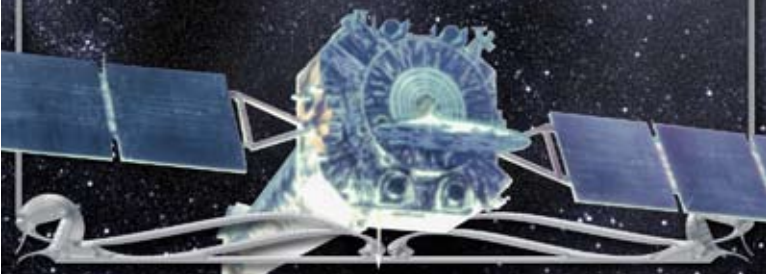
CHANDRA FUN FACTS

At 45 feet long, Chandra is the largest satellite the shuttle has ever launched.



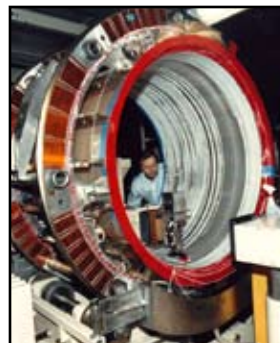
CHANDRA FUN FACTS

How smooth are Chandra's mirrors?



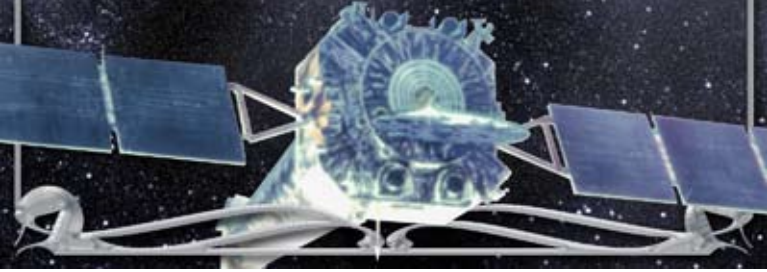
CHANDRA FUN FACTS

If Colorado were polished to the same relative smoothness as Chandra's mirrors, Pikes Peak would be less than one inch tall!

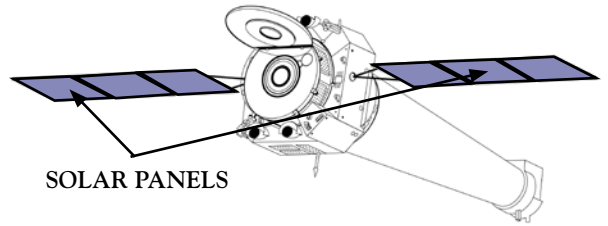


CHANDRA FUN FACTS

**How much power
does it take
to operate Chandra?**



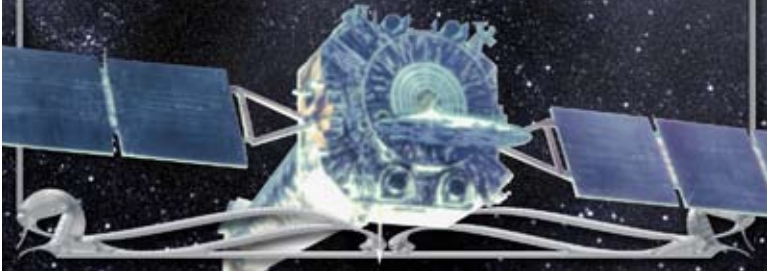
CHANDRA FUN FACTS



The electrical power required to operate the satellite is about 2000 watts, roughly the same power as a hair dryer.

CHANDRA FUN FACTS

**What was the first NASA
space shuttle mission
commanded by a woman?**



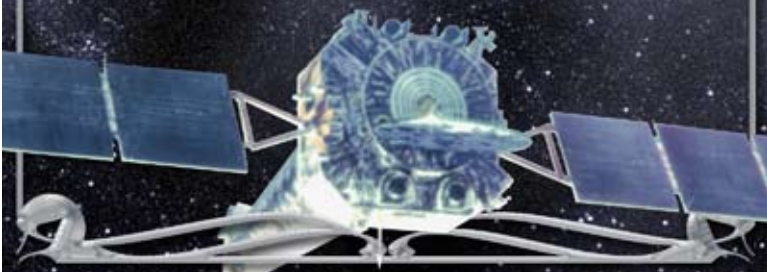
CHANDRA FUN FACTS



STS-93, the space shuttle mission that deployed Chandra, was commanded by Col. Eileen Collins.

CHANDRA FUN FACTS

**What are the largest
cosmic objects that
Chandra can observe?**



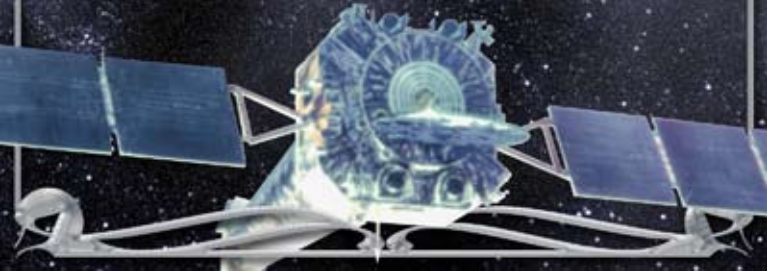
CHANDRA FUN FACTS



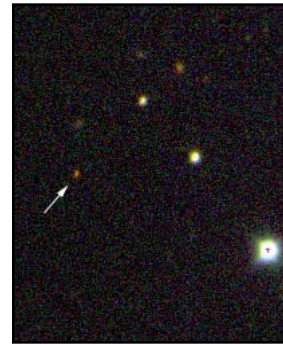
Chandra can image the X-rays in galaxy clusters so vast that it takes light 5 million years to go from one side to the other!

CHANDRA FUN FACTS

**How far back in time
can Chandra look?**



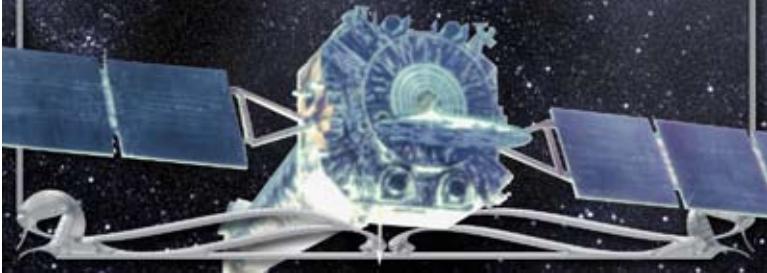
CHANDRA FUN FACTS



The light from some of the quasars Chandra can observe has been traveling through space for over 14 billion years.

CHANDRA FUN FACTS

**What are the largest
cosmic objects that
Chandra can observe?**



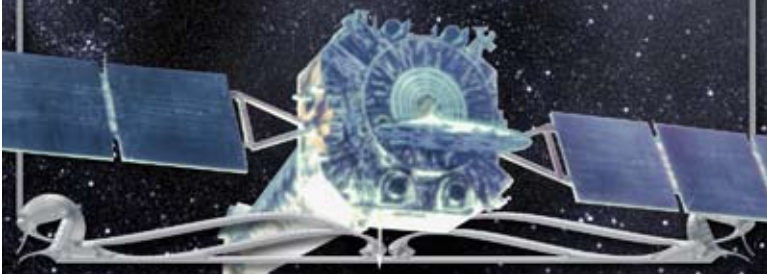
CHANDRA FUN FACTS



Chandra's resolving power is equivalent to the ability to read the letters of a STOP sign at a distance of 12 miles!

CHANDRA FUN FACTS

**What was the first
imaging X-ray telescope?**



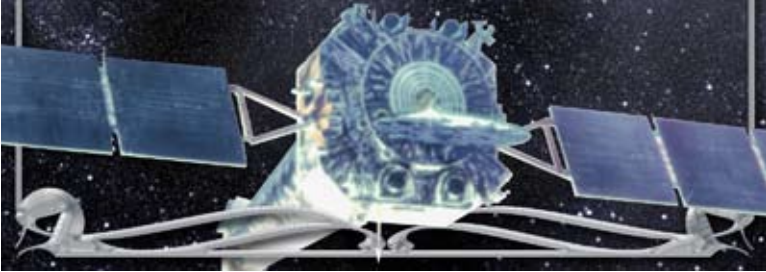
CHANDRA FUN FACTS



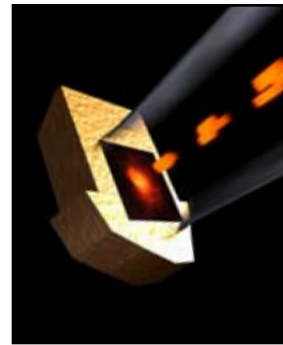
NASA's Einstein Observatory, launched in 1978, was the first X-ray telescope with mirrors that could image cosmic sources.

CHANDRA FUN FACTS

How does the CXO record cosmic X-rays so that images can be made and studied?



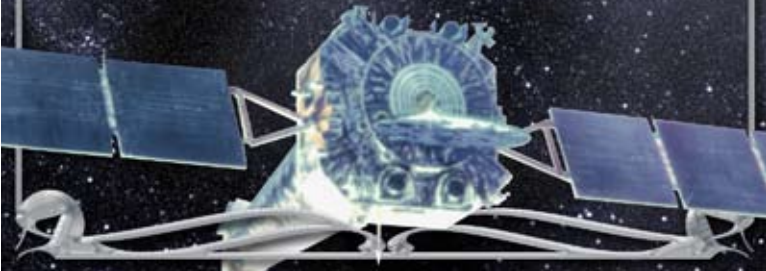
CHANDRA FUN FACTS



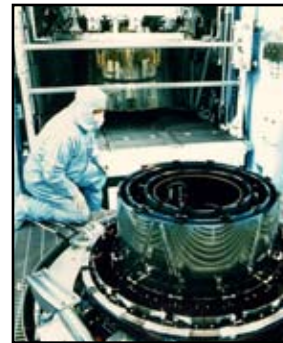
The Observatory uses the high resolution camera, and the CCD imaging spectrometer to record X-rays from cosmic sources.

CHANDRA FUN FACTS

What rare metal was used to coat the Chandra mirrors?



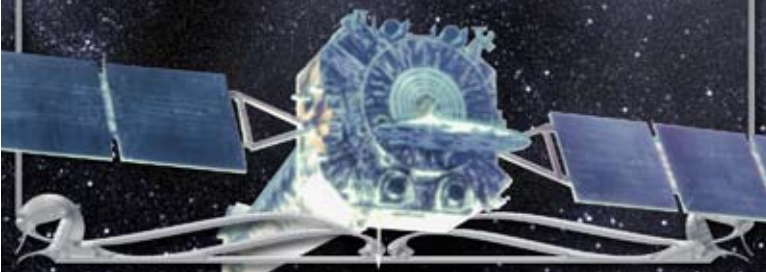
CHANDRA FUN FACTS



The Chandra mirrors were coated a millionth of an inch thick with iridium, a rare metal more reflective than gold.

CHANDRA FUN FACTS

How clean are the Chandra mirrors?



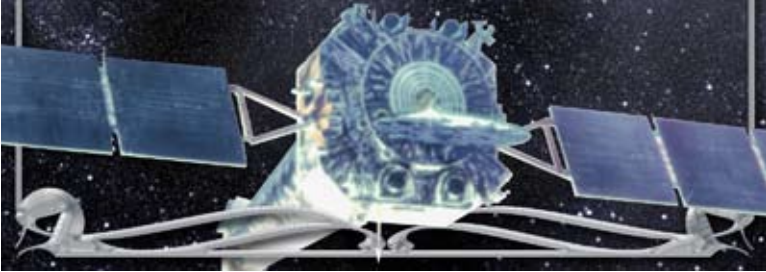
CHANDRA FUN FACTS



The Chandra mirrors are 99.999% clean. The equivalent of 1 speck of dust on your computer screen.

CHANDRA FUN FACTS

How accurate is the alignment of the Chandra mirrors?



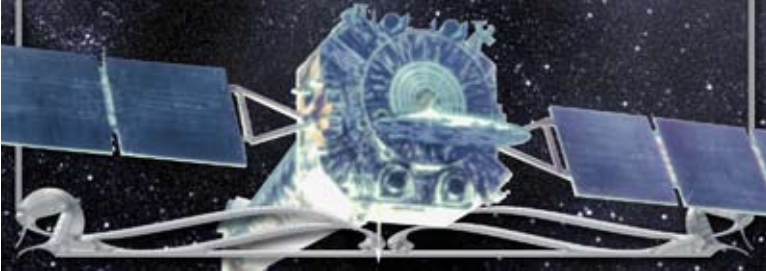
CHANDRA FUN FACTS



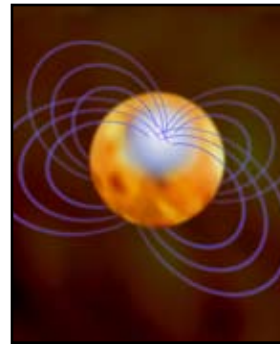
The alignment of the mirrors is accurate to 50 millionths of an inch or about one fiftieth the width of a human hair!

CHANDRA FUN FACTS

How much would a teaspoonful of neutron star matter weigh?



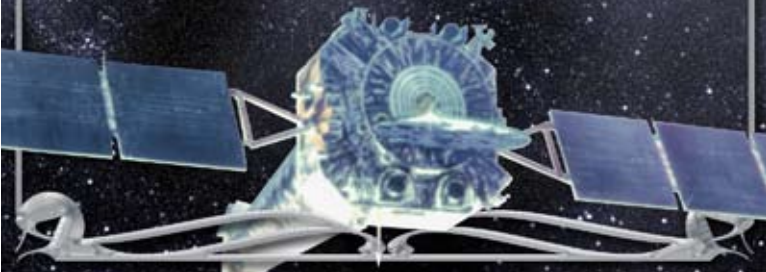
CHANDRA FUN FACTS



About 2.5 billion tons.

CHANDRA FUN FACTS

Who discovered X-radiation?



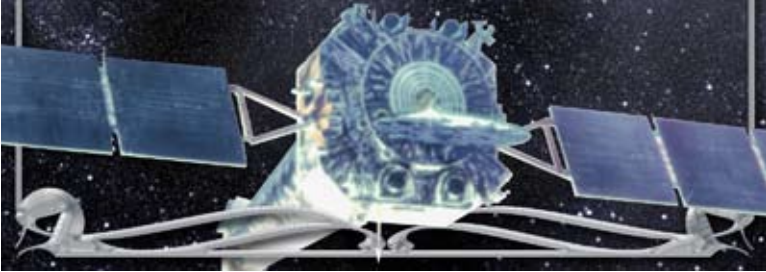
CHANDRA FUN FACTS



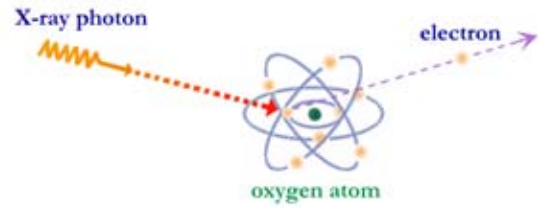
X-radiation was discovered by German scientist Wilhelm Roentgen in 1895.

CHANDRA FUN FACTS

How are X-rays absorbed in Earth's atmosphere?



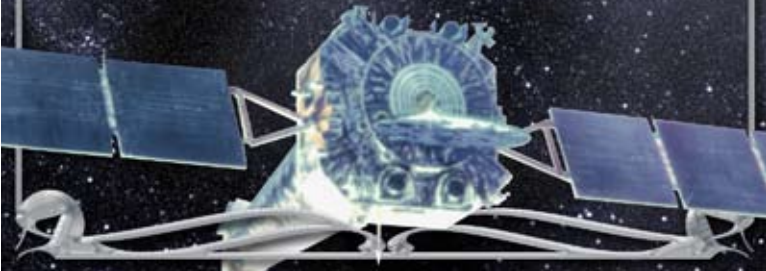
CHANDRA FUN FACTS



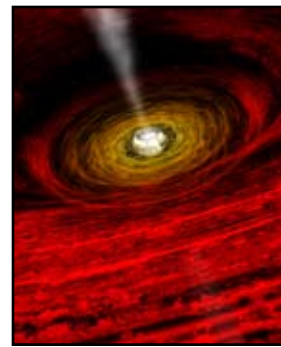
Cosmic X-rays are absorbed in the atmosphere by Nitrogen & Oxygen molecules (the photoelectric effect).

CHANDRA FUN FACTS

How is a black hole formed?



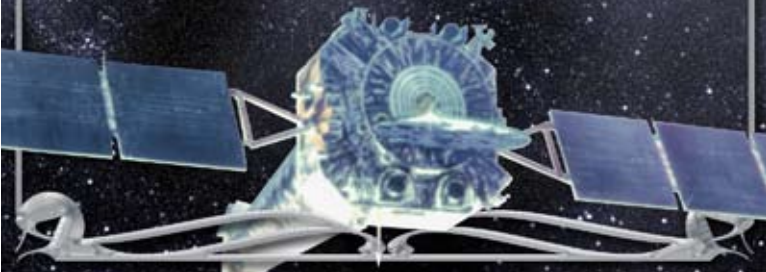
CHANDRA FUN FACTS



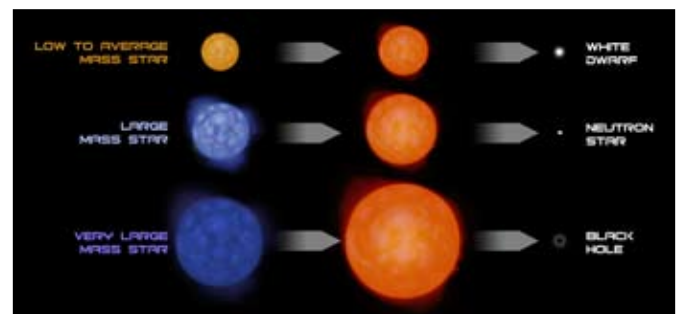
Black holes are formed by the collapse of a star much more massive than the Sun.

CHANDRA FUN FACTS

Will the Sun collapse to form a black hole?



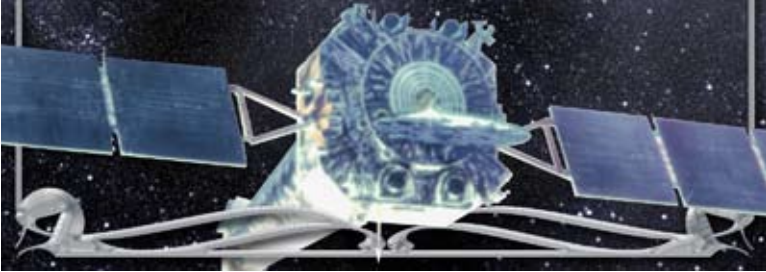
CHANDRA FUN FACTS



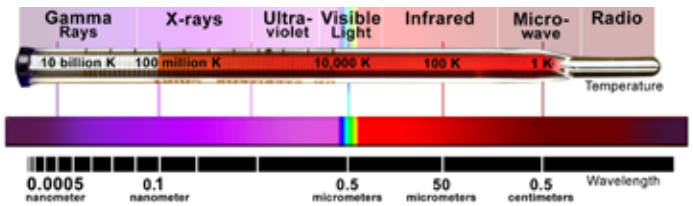
No. The Sun will collapse to form a white dwarf.

CHANDRA FUN FACTS

How hot must matter be to radiate in X-rays?



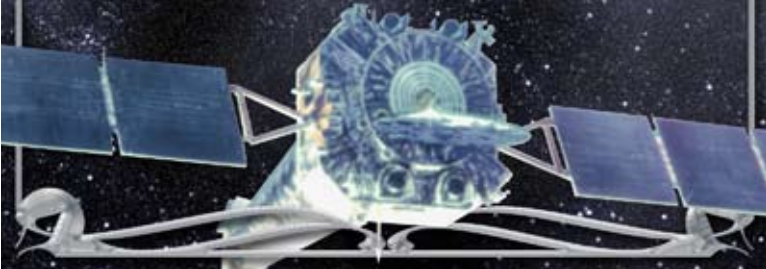
CHANDRA FUN FACTS



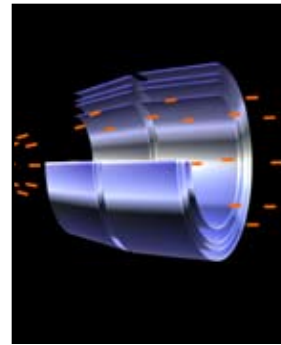
Very high temperatures (millions of degrees Celsius) produce X-rays.

CHANDRA FUN FACTS

Are mirrors on X-ray telescopes the same shape as the mirrors on optical telescopes?



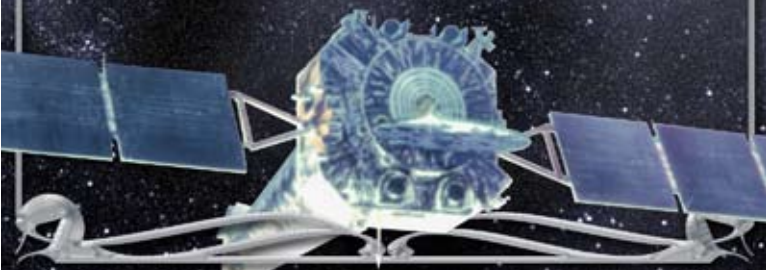
CHANDRA FUN FACTS



No. X-ray telescope mirrors are shaped like barrels, because X-rays reflect off mirrors at grazing angles.

CHANDRA FUN FACTS

Why are X-ray observatories placed high above the Earth's surface?



CHANDRA FUN FACTS



X-ray observatories must be above the Earth's atmosphere because cosmic X-rays are absorbed in the atmosphere.