Chandra x ray captures image of a supernova

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In news : Recently, NASA has shared a dazzling image of a supernova captured by the Chandra X-ray Observatory telescope

Key updates

- According to the National Aeronautics and Space Administration(NASA), the telescope captured a bright source of light at the center of the supernova. It also said that the source of light at the center of the supernova remnant RCW 103 is a neutron star.
- As per recent observations by Chandra observatory, Matter in a neutron star is packed together so tightly that a sugar-cube-sized amount of neutron star material would weigh more than 1 billion tons – roughly the weight of Mount Everest
- According to NASA, this object is the most extreme pulsars, or rotating neutron stars, ever detected. A compact neutron star is the source for the same.
    - It exhibits properties of a highly magnetized neutron star, or magnetar. However, the deduced spin period is thousands of times longer than any pulsar ever observed.
- NSA also points out that the RCW 103 supernova is unique because the regular variation in the X-ray brightness of its source, with a period of about six and a half hours, presented a puzzle to astronomers.
- After data was collected from NASA's Chandra X-Ray, Nuclear Spectroscopic Telescope Array, ESA's XMM-Newton, astronomers expect that a single neutron star will be spinning swiftly after its birth in the supernova explosion and will then slow down gradually as it loses energy.

- The **astronomers believe that the magnetar or the neutron star within RCW 103 is nearly 2,000 years old,** which is not enough time for the pulsar to slow down to a period of 24,000 seconds by traditional means.

About Chandra X-Ray observatory

- The Chandra X-ray Observatory, previously known as the Advanced X-ray Astrophysics Facility, is a Flagship-class space telescope **launched aboard the Space Shuttle Columbia during STS-93 by NASA on July 23, 1999**
- NASA's Chandra X-ray Observatory is a telescope **specially designed to detect X-ray emission from very hot regions of the Universe such as exploded stars, clusters of galaxies, and matter around black holes**.
- Because X-rays are absorbed by Earth's atmosphere, Chandra must orbit above it, up to an altitude of 139,000 km (86,500 mi) in space.
- The Smithsonian's Astrophysical Observatory in Cambridge, MA, hosts the Chandra X-ray Center which operates the satellite, processes the data, and distributes it to scientists around the world for analysis.
- The Center maintains an extensive public web site about the science results and an education program.
- Chandra carries four very sensitive mirrors nested inside each other.
- The energetic X-rays strike the insides of the hollow shells and are focussed onto electronic detectors at the end of the 9.2- m (30-ft.) optical bench.
- Depending on which detector is used, very detailed images or spectra of the cosmic source can be made and analyzed.

Do you know?

Supernova

A supernova is a powerful and luminous stellar explosion. This transient astronomical event occurs during the last evolutionary stages of a massive star or when a white dwarf is triggered into runaway nuclear fusion

In other words a supernova is the explosion of a star. It is the largest explosion that takes place in space.

Where Do Supernovas Take Place?

Supernovas are often seen in other galaxies. But supernovas are difficult to see in our own Milky Way galaxy because dust blocks our view.

What Causes a Supernova?

A supernova **happens where there is a change in the core, or center, of a star.** A change can occur in two different ways, with both resulting in a supernova.

The first type of supernova happens in binary star systems. Binary stars are two stars that orbit the same point. One of the stars, a carbon-oxygen white dwarf, steals matter from its companion star. Eventually, the white dwarf accumulates too much matter. Having too much matter causes the star to explode, resulting in a supernova.

The second type of supernova occurs at the end of a single star's lifetime. As the star runs out of nuclear fuel, some of its mass flows into its core. Eventually, the core is so heavy that it cannot withstand its own gravitational force. The core collapses, which results in the giant explosion of a supernova. The sun is a single star, but it does not have enough mass to become a supernova