Scientist’s unravelled biggest star explosion ever seen

Part of: GS-III- S&T - Space (PT-MAINS-PERSONALITY TEST)

The supernova, releasing twice as much energy as any other stellar explosion observed to date, occurred about 4.6 billion light years from Earth in a relatively small galaxy. A light year is the distance light travels in a year, 5.9 trillion miles (9.5 trillion km) PT SHOT.

Believed to be a type of supernova that until now has only been theorized. Astrophysicist said two very massive stars - each about 50 times the sun’s mass - may have merged to make one extremely massive star roughly 1,000 years before the explosion. They had been part of what is called a binary system with two stars gravitationally bound to each other.

The merged star exploded in a supernova, formally named SN2016aps, inside a very dense and hydrogen-rich envelope.

Stars die in various different ways depending on their size and other properties. When a massive star - more than eight times the mass of our sun - uses up its fuel, it cools off and its core collapses, triggering shock waves that cause its outer layer to explode so violently that it can outshine entire galaxies.

“Pulsational pair-instability is when very massive stars undergo pulsations which eject material away from the star

“This discovery shows that there are many exciting and new phenomena left to be uncovered in the universe.

Gravitational waves

- Gravitational waves are ‘ripples’ in the fabric of space-time caused by some of the most violent and energetic processes in the Universe.
- When an object accelerates, it creates ripples in space-time, just like a boat causes ripples in a pond.
- These space-time ripples are gravitational waves. They are extremely weak so are very difficult to detect.
- Two objects orbiting each other in a planar orbit such as a planet orbiting the Sun or a binary star system or the merging of two black holes will radiate Gravitational waves.
- Albert Einstein predicted the existence of gravitational waves in 1916 in his general theory of relativity.
- Einstein’s mathematics showed that massive accelerating objects (such as neutron stars or black holes orbiting each other) would disrupt space-time in such a way that ‘waves’ of distorted space would radiate from the source.
- Furthermore, these ripples would travel at the speed of light through the Universe.
- G-Waves can pass through any intervening matter without being scattered significantly.
- While light from distant stars may be blocked out by interstellar dust, gravitational waves will pass through essentially unimpeded. This feature allows G-Waves to carry information about astronomical phenomena never before observed by humans.
Colliding black holes send ripples through spacetime that can be detected on Earth. The Advanced Laser Interferometer Gravitational-Wave Observatory, or Advanced LIGO, which has detectors in Louisiana and Washington, has directly observed these gravitational waves.