

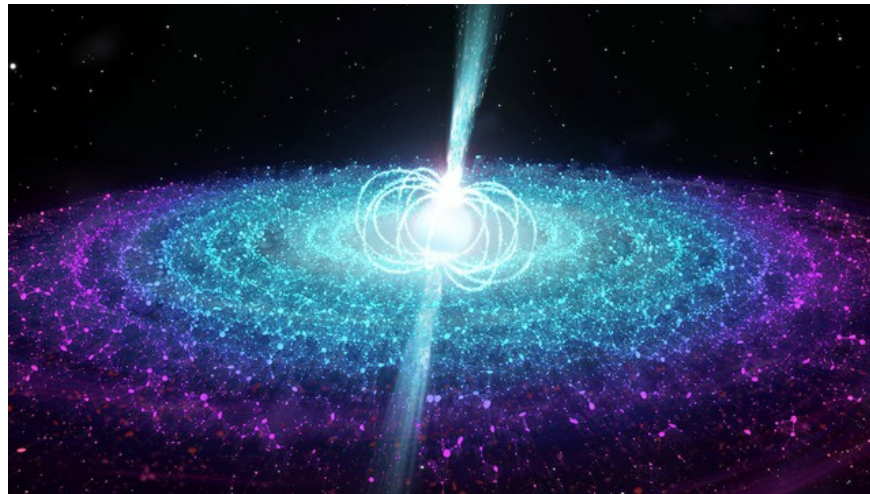
Object from unknown location continuously emitting radio waves

The object SGR 0501+4516 is so strange that scientists believe it may hold the secret to the phenomenon of radio bursts.

According to Sci-News, the object SGR 0501+4516 was first identified when NASA's Swift Observatory detected short, powerful gamma rays from the outskirts of our Milky Way galaxy.

Sensitive instruments on the NASA/ESA (US and European space agencies) Hubble Space Telescope as well as ESA's Gaia spacecraft were also mobilized to study the object in the following years.

But now, 17 years after its identification, the strange object has shattered every plausible scenario about its origin.



The research team led by astronomer Andrew Levan from Radboud University (Netherlands) and the University of Warwick (UK) said they are almost certain that SGR 0501+4516 is a magnetar.

"Magnetars are neutron stars made entirely of neutrons. What makes magnetars unique is their extremely strong magnetic fields," Dr. Levan explained.

Neutron stars are "zombie" objects thought to be the remnants of collapsed massive stars.

SGR 0501+4516 is located near the supernova remnant HB9, so scientists previously believed that was where it was born.

But after a decade of observing it with Hubble, Dr. Levan and his colleagues became skeptical.

By tracking the position of the magnetar, astronomers can measure the apparent motion of this object across the sky.

Both the speed and direction of motion of SGR 0501+4516 suggest that it cannot be related to HB9.

They continued to look at many other supernova remnants and large star clusters around its location, but no relationship was identified.

This is almost absurd because for an object as powerful as SGR 0501+4516 to form, the event that created it should have been powerful enough to produce an observable remnant.

So the researchers came up with a bold argument: It was born in a completely different way, not simply as a stellar explosion.

The first hypothesis is that it was formed by the merger of two low-mass neutron stars.

The second hypothesis is that the magnetar was born in an accretion collapse event: This scenario occurs when a binary star system contains a white dwarf (the "zombie" of Sun-like stars) that is sucking material from its companion.

After a while, the white dwarf "burst its belly" causing both stars to explode.

"Normally, this scenario would result in the initiation of nuclear reactions and the white dwarf exploding, leaving nothing behind. But it has been hypothesized that under certain conditions, the white dwarf could collapse into a neutron star," said Dr. Levan.

They believe that may be how SGR 0501+4516 came into being. In other words, this magnetar would be the first direct evidence scientists have of this phenomenon.

Therefore, this unique object is also expected to help solve the mystery of radio bursts.

These are short, strong radio signals that Earth observatories continuously pick up. SGR 0501+4516 also continuously emits this type of signal.

Scientists believe that only extremely violent events — such as neutron star mergers or the birth of magnetars — could produce such an explosive signal.

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