English

EDUCATION, SCIENCE AND TECHNOLOGY NEWS

35-year-old space riddle solved by Chilean astronomers

The mystery surrounding the strongest magnets in the universe cracked by the Atacama Region's Very Large Telescope.

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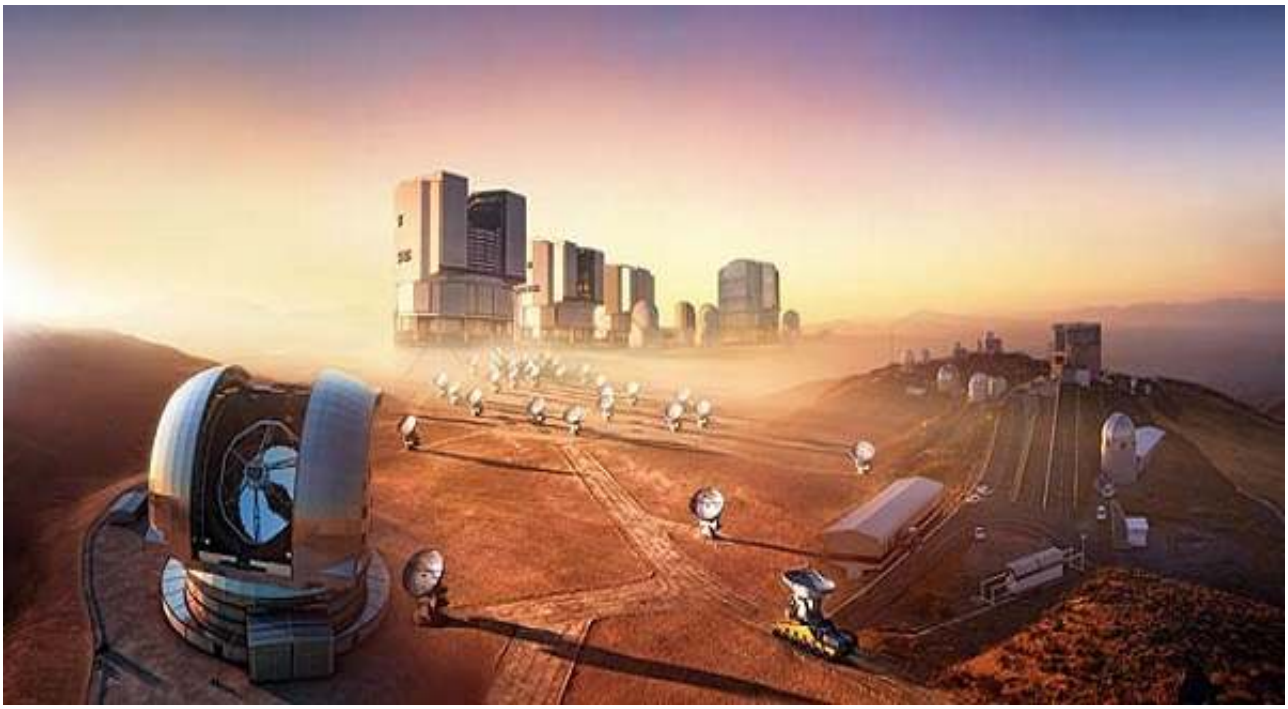

European Southern Observatory (ESO), located in the Atacama Region, continues to make significant discoveries. Photo from ESCO website.

Chile's incredible clear skies combined with the Atacama Region's high elevation and low humidity act as a magnet for astronomers the world over, who descend on the country hoping to find further stargazing anomalies to unmask.

European astronomers in Chile have recently unearthed a discovery that might just solve a 35-year-old riddle regarding the strongest magnets in the universe — magnetars. These mysterious and incredibly dense remains of supernova explosions are millions of times more powerful than the strongest magnets on Earth, and have puzzled scientists for over three decades because the events surrounding their birth are not fully understood.

Using the European Southern Observatory's (ESO) Very Large Telescope (VLT) based in the Atacama Desert, scientists have been studying the Westerlund 1 star cluster located no more than 16,000 light-years away in the southern constellation of Ara, meaning "The Alter." This particular cluster houses one of the two dozen known magnetars in the Milky Way, called CXOU J164710.2-455216.

"This discovery is important because for a few decades we haven't been able to explain how magnetars form," James Jenkins, an astronomer at the Universidad de Chile, told This Is Chile.

"If they form from very massive stars, as one was shown to do a couple of years ago, then the question is why these massive stars do not become black holes instead of neutron stars? The theory the team put forward was that this was actually a binary system and the binary star transferred some of its mass over to the star that would become the magnetar," Jenkins continued.

This theory, proposed by the astronomers working in Chile, describes how the magnetar formed through the interactions of two huge stars orbiting one another in a binary system so compact it would fit within the orbit of Earth around the Sun.

Up until the recent Westerlund 1 star cluster discovery, no companion star was detected so astronomers in Chile used the VLT to delve further into the universe, hunting for runaway stars in other areas of the Westerlund 1 star cluster. Eventually, an object escaping the cluster at high velocity was spotted.

"Once that star received mass from the binary companion it would speed up to conserve angular momentum, and gain mass. Eventually it would become so large that it would lose mass, passing some of it back to the binary star," Jenkins explained.

"Once enough mass was lost in the magnetar forming process the binary star would be ejected

and travel so fast that it should be leaving the cluster at high velocity, and they found such a star, with the right type of atmosphere to be the donor star, or companion, of the magnetar," Jenkins confirmed. "This result suggests that, at least some, if not all magnetars are formed in binary systems, answering the question why such massive stars can form neutron stars and not black holes."

Discoveries of this magnitude are no rarity in Chile and the observatories dotted around the Atacama are constantly shedding light on deep space. Only last year the VLT mapped out and released an incredible detailed image of the planet forming Lagoon Nebula.

So far 2014 has also been an astronomical year to remember in Chile, with the inauguration of the Parque Astronómico Atacama — an 89,000 acre area of land set aside for new and existing observatories in the country's far North. Who knows what interesting discoveries Chile's team of space explorers will come across next.