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Massive X-ray Emission Detected in Eta Carinae!

X-ray source reveals large solar wind collision

It has been long predicted that solar wind interactions would be able to generate massive amounts of X-ray radiation, however until now astronomers haven't been able to detect such emissions. Now, they have revealed what seems to be a large X-ray emission coming from the Eta Carinae binary system, determined by the collision of solar winds created by the two massive stars in the respective system. The hypergiant binary was only discovered in 2005 with the detection of the second star. It is widely believed that Eta Carinae, located about 8,000 light years away, weighs as much as 100 to 150 times more than the Sun and experiences some of the most violent interactions in the visible universe. The X-ray emission determined by the collision of the two solar winds has been detected with the help of European Space Agency's Integral Space Observatory, by Jean-Christophe Leyder from the University of Liege, Belgium. However, the discovery is not as spectacular as previously predicted, since the X-ray emission is way lower. Leyder says that the observation is conclusive nonetheless. As electrically charged gases created by the two stars speed through interstellar space, they eventually collide with each other, thus generating bright X-ray light emissions. Traveling at speeds in excess of 1,500 to 2,000 kilometers per second, the colliding gas produces so-called shockwaves with temperatures reaching up to a few thousand million Kelvin. Due to the fact that the solar winds are packed with electrically charged particles, mostly electrons, in the region of the shockwaves they are being captured by powerful magnetic fields, which accelerate them to relativistic speeds, and forced into one another to eject the fabulous energy in the form of low-frequency photon particles, namely high-energy X-ray light. Such interactions are rather rare in the visible universe, mostly due to the fact that such emissions usually require the input of massive stars. Considering that massive stars are at least one million times rarer than average stars such as our own, then you can imagine the odds of finding two massive stars in a binary system. According to Leyder, in our galaxy exist no more than 50 such structures, in comparison with the few hundred billion stars the Milky Way has. Eta Carinae is one of these rare structures. Alternatively, astronomers had previously discovered a similar entity in the HD 5980 system, located in the neighbor galaxy, the Small Magellanic Cloud, however the X-ray emissions are way lower than those observed in the Eta Carinae binary. Estimates of the energy released by the two interacting solar winds suggest that the binary system is losing about one Earth mass every day to the interstellar space, which results in an X-ray emission 140 times greater than that of HD 5980.