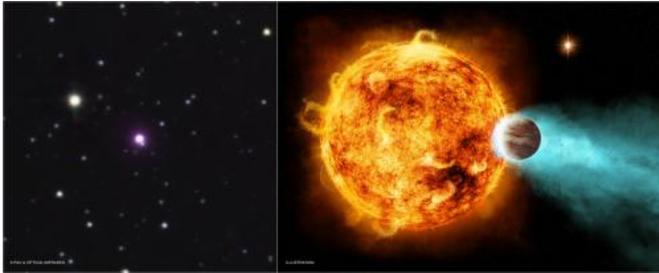


Star blasts planet with X-rays

13 September 2011



This graphic contains an image and illustration of a nearby star, named CoRoT-2a, and an orbiting planet known as CoRoT-2b. The image contains X-rays from Chandra (purple) of CoRoT-2a along with optical and infrared data of the field of view in which it is found. CoRoT-2b, which is not seen in this image, orbits extremely closely to the star. In fact, the separation between the star and planet is only about 3 percent of the distance between the Earth and the Sun. The Chandra data indicate that planet is being blasted by X-rays with such intensity that some 5 millions of tons of material are being eroded from the planet every second. Credit: Optical: NASA/NSF/IPAC-Caltech/UMass/2MASS, PROMPT; Wide field image: DSS; X-ray: NASA/CXC/Univ of Hamburg/S.Schröter et al; Illustration: CXC/M. Weiss

A nearby star is pummeling a companion planet with a barrage of X-rays a hundred thousand times more intense than the Earth receives from the Sun.

New data from NASA's Chandra X-ray Observatory and the European Southern Observatory's Very Large Telescope suggest that high-energy radiation is evaporating about 5 million tons of matter from the planet every second. This result gives insight into the difficult survival path for some [planets](#).

The planet, known as CoRoT-2b, has a mass about 3 times that of Jupiter (1000 times that of Earth) and orbits its [parent star](#), CoRoT-2a at a distance roughly ten times the distance between Earth and the Moon.

The CoRoT-2 star and planet -- so named because the French Space Agency's Convection, Rotation and [planetary Transits](#) (CoRoT) satellite discovered them in 2008 -- is a relatively nearby neighbor of the Solar System at a distance of 880 light years.

"This planet is being absolutely fried by its star," said Sebastian Schroeter of the University of Hamburg in Germany. "What may be even stranger is that this planet may be affecting the behavior of the star that is blasting it."

According to optical and X-ray data, the CoRoT-2 system is estimated to be between about 100 million and 300 million years old, meaning that the star is fully formed. The Chandra observations show that CoRoT-2a is a very active star, with bright X-ray emission produced by powerful, turbulent magnetic fields. Such strong activity is usually found in much younger [stars](#).

"Because this planet is so close to the star, it may be speeding up the star's rotation and that could be keeping its magnetic fields active," said co-author Stefan Czesla, also from the University of Hamburg. "If it wasn't for the planet, this star might have left behind the volatility of its youth millions of years ago."

Support for this idea come from observations of a likely [companion star](#) that orbits CoRoT-2a at a distance about a thousand times greater than the separation between the Earth and our Sun. This star is not detected in X-rays, perhaps because it does not have a close-in planet like CoRoT-2b to cause it to stay active.

Another intriguing aspect of CoRoT-2b is that it appears to be unusually inflated for a planet in its position.

"We're not exactly sure of all the effects this type of heavy X-ray storm would have on a planet, but it could be responsible for the bloating we see in CoRoT-2b," said Schroeter. "We are just beginning to learn about what happens to exoplanets in these

extreme environments."

More information: These results were published in the August issue of *Astronomy and Astrophysics*.

Provided by Chandra X-ray Center

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