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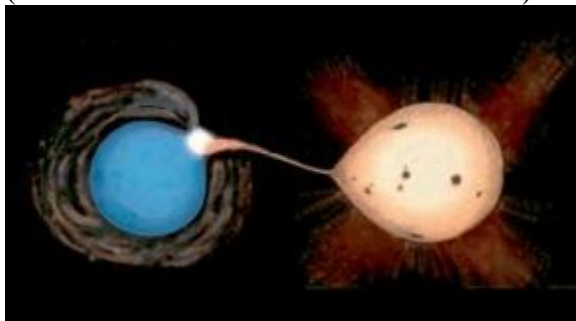


Stellar Tantrums: Tracking the flaring cycles of other stars by Sorcha McDonagh

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During each iteration of its fierce and familiar 11-year cycle of activity, the turbulent surface of the sun reaches a crescendo, shooting jets of scalding gas and magnetic energy into space at a markedly increased rate. For the first time, astronomers have made continuous, long-term observations of such flare activity on stars outside the solar system, and they've found that the stars have cycles of activity and quiescence similar to those of the sun.

Illustration: TWO TO TANGO. In this artist's rendition, gravity keeps a pair of stars in orbit around each other so closely that the hot blue star pulls gas from its cooler orange companion. (CREDIT: M. Richards/Penn State Univ)



At the National Radio Astronomy Observatory in Green Bank, W. Va., Mercedes Richards and her colleagues from Pennsylvania State University in State College recorded radio waves from flares spewing from two nearby star systems, Beta Persei and V711 Tauri. Both include binary pairs—two stars orbiting one another. These systems are close by, which makes them easy to observe, and they're known to have strong flaring activity. With observations made up to six times a day for 5 years, the team built up a far more comprehensive picture of the stars' behavior patterns than previous studies had.

In an upcoming *Astrophysical Journal*, the astronomers report heightened flare activity in the two star systems every 50 to 120 days. Moreover, Richards suspects that a broader pattern of activity and quiescence might be at work in Beta Persei and V711 Tauri. In both cases, the overall cycle seems to be about 500 days long.

The orbiting pair in Beta Persei consists of a star that is a younger version of our sun, along with a hotter companion. In the V711 Tauri orbiting pair, both stars resemble a young sun. Because the paired stars in each system tug on one another, the magnetic fields that drive flare activity are more complex than they are for individual stars.

"When two stars are next to each other, the tidal forces on them are very significant, so that changes the internal dynamics of the stars," comments Craig DeForest, a solar physicist at the

Southwest Research Institute in Boulder, Colo. For one thing, the proximity causes the stars to spin more quickly: The sunlike stars in Beta Persei and V711 Tauri are spinning 10 times as fast as the sun. This means that compared with the sun, they have a more powerful magnetic field and are 10 times more active.

"It's exactly the way we expect the sun behaved when it was younger" and spinning faster, Richards says. "It was flaring far more often."

With this in mind, DeForest says that rather than provide a window into the sun's present or future, the new study can help illuminate the sun's past, perhaps even at a time when the first molecular glimmers of life on Earth were emerging. Says DeForest: "Studying the patterns of flares around these newer stars could conceivably help us understand more about the conditions under which life evolved on Earth."

References:

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Further Readings:

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Craig DeForest
Department of Space Studies
Instrumentation and Space Research Division
Southwest Research Institute
1050 Walnut Street, Suite 429
Boulder, CO 80302

Mercedes T. Richards
Department of Astronomy and Astrophysics
Pennsylvania State University
525 Davey Lab
University Park, PA 16802-6305

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