

# Scientists capture 'terrifying' Tolkien-like eclipse (w/ Video)

April 7 2010

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(PhysOrg.com) -- Scientists have captured a 'terrifying' image of a giant Goliath-like star undergoing a two year eclipse. First discovered by a German astronomer 180 years ago, it is the first close-up image of an eclipse beyond the solar system to be captured on camera by scientists.

Astronomers at the University of St Andrews, who collaborated in the international study, describe the find as a 'terrifying image... like something from a Tolkien book'.

St Andrews physicists Ettore Pedretti and Nathalie Thureau are members of an international team led by Brian Kloppenborg at the University of Denver. The group combined the light of four telescopes more than 300 metres apart to capture a magnified image of the [giant star](#) undergoing a 'stellar eclipse'.

The star, Epsilon Aurigae, is the fifth brightest star in the constellation Auriga, which is known as 'the charioteer'. Every 27 years Epsilon Aurigae becomes two to three times dimmer, with the dimmed light lasting about two years. The phenomenon was first observed in 1821 by the German astronomer Johann Fritsch.

The resulting image, roughly 140 times sharper than those provided by the [Hubble Space Telescope](#), provides new insights into the distant [stellar system](#), even though the effect of the eclipse is so big that the star almost disappears from view.

Dr Pedretti said, "From the image, we can confirm that the eclipse of Epsilon Aurigae is caused by a thin disc of opaque dust trailed by a massive and unseen companion. Like David, tiny particles of dust are able to kill the light of this 'Goliath' star.

"It resembles an image from a book by J.R.R. Tolkien. It is like seeing the vessel of the sun, guided by the Maya Arien, being swallowed by the dragon Smaug and plunging Middle Earth in a second-age of darkness. It is a terrifying image".

The innovative light-combining technique used to view the star is called optical interferometry. Dr Pedretti built the [infrared camera](#) used to take superfast 'snapshots' of the combined light of four telescopes. It has to be very fast in order to 'freeze' the image against the turbulent atmosphere.

Dr Thureau was responsible for the design of some critical optics that combine the light from the four telescopes. She commented, "With this image we have solved an 180 year old mystery. Astronomers have been puzzled for more than a century about this star and we took two pictures that may finally solve the mystery. In fact we will continue to capture images since the [eclipse](#) lasts about two years."

Dr Pedretti and Dr Thureau aim to form the first group in Scotland which will build instruments for optical and infrared interferometry, exploiting their high-resolution images.

"Our aim is to exploit existing interferometers around the world in order to take detailed pictures of distant and interesting astronomical objects that are not achievable even with the largest single telescopes," explained Dr Pedretti.

The research, which involved the Universities of St Andrews, Denver,

Georgia State and Michigan, is published in this week's issue of *Nature*.

**More information:** The paper is called "Infrared images of the transiting disk in the epsilon Aurigae System."

Provided by University of St Andrews

Citation: Scientists capture 'terrifying' Tolkien-like eclipse (w/ Video) (2010, April 7) retrieved 27 April 2024 from

<https://phys.org/news/2010-04-scientists-capture-tolkien-like-eclipse-video.html>

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