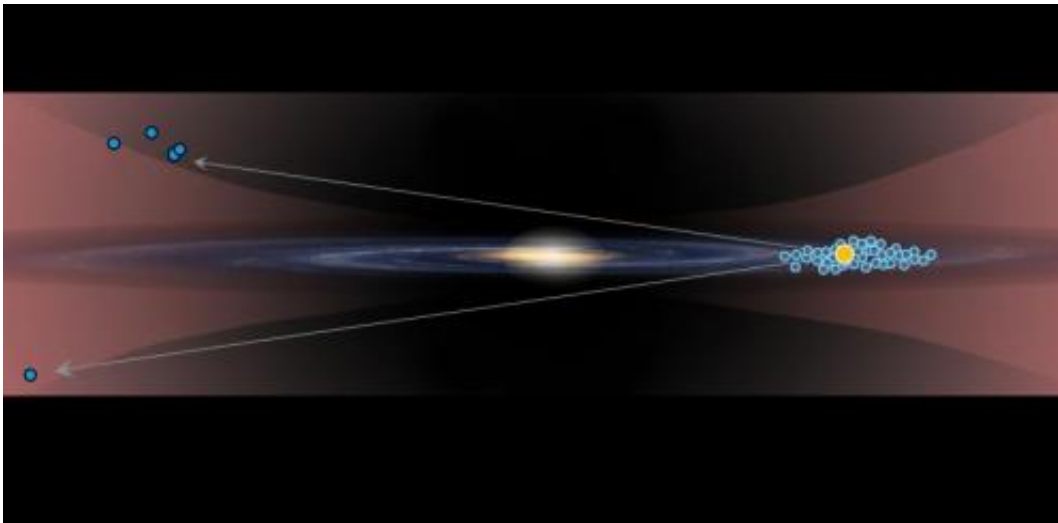


'Standard candles' illuminate the far side of the Milky Way

May 14 2014



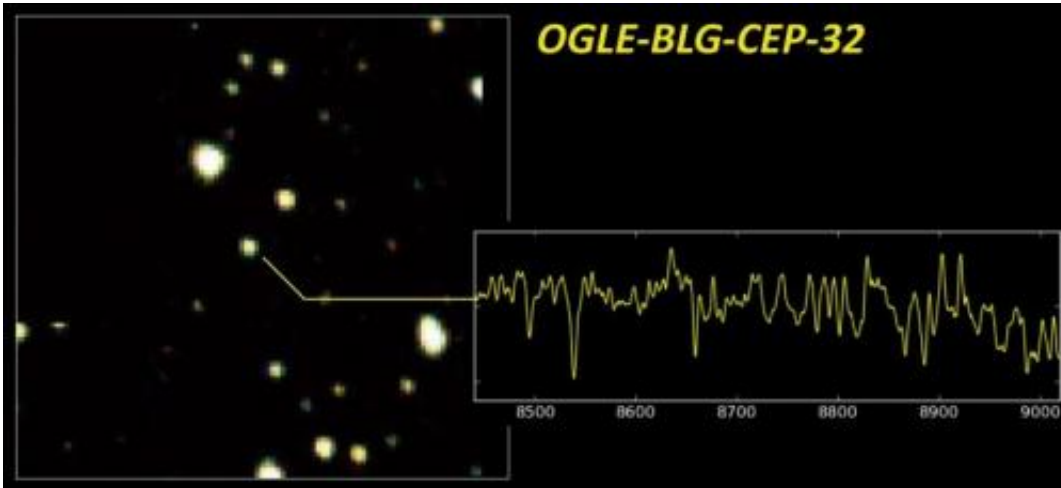
This artist's impression of the Milky Way Galaxy seen from outside shows the Sun (large yellow circle) and some of the well studied nearby Cepheids (pale blue circles). The pink region depicts the hydrogen gas in the flared outer parts of the Milky Way together with the new Cepheids discussed by Feast and colleagues (dark blue circle). Credit: : R. M. Catchpole (IoA Cambridge) and NASA/JPL-Caltech

South African astronomers have discovered the very first known stars in the flared disk of our Milky Way Galaxy. These stars are situated on the far side of our Galaxy, 80 thousand light years from the Earth and beyond the Galactic Centre.

The discovery is important because stars like these will allow astronomers to test theoretical ideas about how [galaxies](#), like the Milky Way in which we live, formed. In particular these stars, which are close to the effective edge of the Milky Way, will help astronomers trace the distribution of the very mysterious [dark matter](#). Dark matter is known to be an important component of all galaxies, but its nature and distribution remain elusive.

The five stars involved in this discovery are very special ones, known as Cepheid variables, whose brightness changes regularly on a cycle time of a few days. These Cepheid variables have characteristics that allow their distances to be measured accurately. A team of astronomers led by Prof. Michael Feast used observations made with the Southern African Large Telescope (SALT) and the Infrared Survey Facility (IRSF), both at the South African Astronomical Observatory's (SAAO) site at Sutherland in the Northern Cape, to determine the distances of these stars and hence their locations within our Galaxy.

The majority of stars in our Galaxy, including our own sun, are distributed in a flat disk (see illustration). Early in the 21st century radio astronomers discovered that hydrogen gas, of which the Galaxy contains a great deal, flared away from the disk at large distances from the Galactic centre, but until now no one knew that stars did the same thing.



An infrared image (left) of the Cepheid named OGLE-BLG-CEP-32 and the stars which surround it, together with its SALT spectrum (insert right). These were used to show that the Cepheid was in the flare of the Galactic disk. Credit: Whitelock et al

The team who made the discovery are from South Africa and Japan: Prof Michael Feast (University of Cape Town – UCT, SAAO), Dr John Menzies (SAAO), Dr Noriyuki Matsunaga (the University of Tokyo, Japan) and Prof Patricia Whitelock (SAAO, UCT).

These results will be published in detail on 15 May, in the international journal *Nature*.

More information: Paper: [dx.doi.org/10.1038/nature13246](https://doi.org/10.1038/nature13246)

Provided by South African Astronomical Observatory

Citation: 'Standard candles' illuminate the far side of the Milky Way (2014, May 14) retrieved 9 April 2024 from <https://phys.org/news/2014-05-standard-candles-illuminate-side-milky.html>

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