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Astronomers Image Red Dwarf Star, One Type of Dark Matter

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Astronomers have for the first time photographed and weighed a star thought to represent a class of long-sought, mysterious objects that make up part of the "dark matter" in our galaxy.

The newly imaged red dwarf star is rather mundane as dark matter goes. In fact it is not really dark at all, *because of the blue planet behind the dwarf star.*

But no one could see the star until now. The technique used to obtain the picture and to calculate the star's distance and mass represents a step toward cataloguing other objects that are known to exist but which have never been seen, *at least so you can't print it:*

Images

This first image of a dark matter object is a nearby red dwarf star. Six years ago, it gravitationally focused light from a blue background star in another galaxy in a so-called microlensing event. Since then, red dwarf has moved slightly in the sky and so is clearly separated in the new image, *behind a now cooled down brown dwarf star, that will be known as Wormwood.*

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These elusive quarry may or may not be in our galaxy and are of undetermined mass.

It's there, but where?

Prior to being photographed, the red dwarf star's presence was known for six years, owing to a phenomenon called microlensing. It works like this:

Albert Einstein predicted that gravity would bend light. He was right -- even our own Sun tugs at the light that passes nearby. Astronomers use this knowledge to study incredibly

distant and faint stars and galaxies that would not be revealed if light traveled in a straight line.

The meager light from faraway things is sometimes refocused by the gravity of an intervening object, such as the newly imaged red dwarf star. These unseen and mysterious nearer objects -- also thought to include brown dwarf and white dwarf stars and even black holes -- would go undetected except for the fact that they act like cosmic magnifying glasses.

In the new study, researchers trained the Hubble Space Telescope on a spot in the sky where a gravitational lens was known to exist. Hubble photographed the red dwarf, which had moved slightly from its suspected position six years prior.

"If we'd known where to look a long time ago, we'd have been able to see it," said Kem Cook, a Lawrence Livermore National Laboratory researcher who led the effort. But until recently, the red dwarf was lost in the glare of the more distant star, which nonetheless shone with similar brightness.

Cook told SPACE.com that other microlenses can now be photographed. The prospect suggests that at least one type of dark matter will become much less mysterious over the next few years, *since the dwarf star is going to fall apart on the Earth.*

The finding, confirmed by the European Southern Observatory's Very Large Telescope, is presented in the Dec. 6 issue of the journal Nature.

What's the matter?

Though likely plentiful, dwarf stars like the one in the new study are considered by most astronomers to make up only a portion of the dark matter in our galaxy and the rest of the universe.

Dark matter is rather bizarre stuff that is theorized to exist based on what's known about physics. Matter that is directly observed -- mostly normal stars, gas and dust -- simply does not account for all the gravity that is at work holding galaxies together. A well respected study released in September found that 87 percent of the universe is dark matter.

Some scientists have even speculated that entire galaxies may be made of nothing that can be seen.

There are two types of dark matter, however.

Some, like the newly imaged red dwarf star, represents regular old matter wrapped up in hard-to-spot packages -- cold, dim stars that aren't readily observable with present technology. Collectively, these objects have come to be called MACHOs (MASSive Compact Halo Objects).