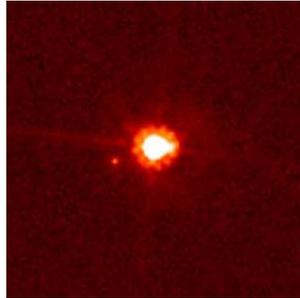


## Dwarf Planet Smaller than Originally Thought

- Eris is a large icy object orbiting in the outer solar system. It was originally thought likely to be larger and more massive than Pluto.
- Eris' discovery in 2005 prompted scientists to reconsider the definition of the term *planet*. A new classification of *dwarf planet* was created for Pluto, Eris, and a few other known objects.
- A recent measurement of the size of Eris using a more accurate method shows that it is approximately the same size as Pluto



Hubble Space Telescope image of Eris and its moon Dysnomia.

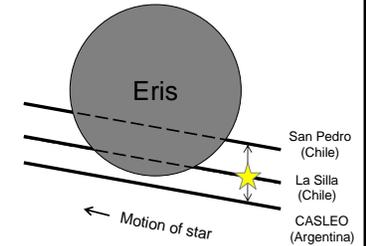
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## Measuring the Size of Distant Objects

- Previous estimates of Eris' size relied on a combination of observations of its reflected or emitted light and assumptions about its reflectivity or surface temperature
- The recent measurements took advantage of a *stellar occultation* – an event where Eris passed between Earth and a distant star. Eris therefore casts a 'shadow' in starlight on Earth.
- Observers at different locations on Earth were in shadow (saw the star disappear behind Eris) for different periods of time, allowing scientists to figure out the size of the dwarf planet

View of star from three locations on Earth



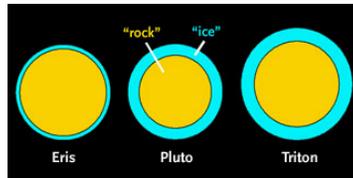
An observer at La Silla saw a star's light disappear as it passed behind Eris. Observers further north, in San Pedro, saw the same star disappear for a longer period of time, while observers at CASLEO, further south, did not see the starlight disappear at all. The observations allowed scientists to infer the size of Eris.

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## The Big Picture

- The improved measurements of Eris' size allow scientists to infer its reflectivity (very bright) and density (larger than Pluto's). Knowledge of these properties enable us to infer much about what Eris is like inside and on the surface.
- While the discovery of a larger, more massive, and more distant body than Pluto helped prompt its reclassification as a dwarf planet, these new observations of Eris do not mean that Pluto's status should be reconsidered.
- Classification of solar system objects is not as important as understanding them. The new observations of Eris provide better constraints for those seeking to understand how it formed and evolved.



Eris has a larger fraction of rock than either Triton or Pluto, two objects that orbit closer to the Sun. How did such a rocky object form in the outer solar system?

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## For more information...

### Press

- Sky & Telescope - 10/27/11 - "Eris and Pluto: Does Size Matter?"  
<http://www.skyandtelescope.com/news/Eris-and-Pluto-Does-Size-Matter-132755658.html>
- Sky & Telescope - 10/27/11 - "Eris and Pluto: Does Size Matter?"  
<http://www.skyandtelescope.com/news/Eris-and-Pluto-Does-Size-Matter-132755658.html>
- European Southern Observatory - 10/26/11 - "Faraway Eris is 'Pluto's Twin'"  
<http://www.eso.org/public/news/eso1142/>

### Images

- Slide 1 image courtesy NASA / ESA / M. Brown (Caltech)  
[http://www.nasa.gov/mission\\_pages/hubble/news/eris.html](http://www.nasa.gov/mission_pages/hubble/news/eris.html)
- Slide 2 image after figure from source article
- Slide 3 image courtesy Mike Brown (Caltech)  
<http://www.skyandtelescope.com/news/Eris-and-Pluto-Does-Size-Matter-132755658.html>

### Source Articles

- (on-campus login may be required to access journals)
- B. Sicardy et al., 'A Pluto-like radius and a high albedo for the dwarf planet Eris from an occultation', *Nature*, **478**, p. 493-496, doi:10.1038/nature10550, 2011.  
<http://www.nature.com/nature/journal/v478/n7370/full/nature10550.html>

Prepared for the Division for Planetary Sciences of the American Astronomical Society by David Brain and Nick Schneider  
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