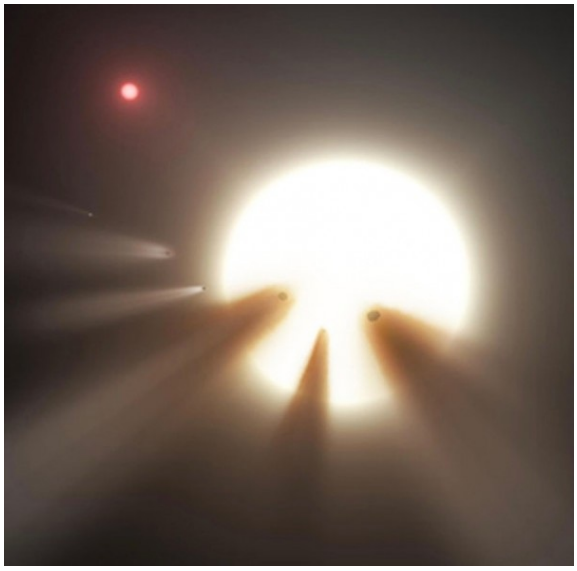
Tabby's star, KIC 8462852

Astronomers struggle to explain the most mysterious star in the universe. Is it an Alien megastructures – aka Dyson spheres – around a star 1,500 light-years away?

The star hit the headlines in October, 2015. That's when astronomers from Pennsylvania State University released a preprint suggesting that observations of the star's weirdly fluctuating light were consistent with a swarm of alien-constructed megastructures. This week, astronomers at Vanderbilt University in Nashville, and elsewhere, announced their new study of this star, in which they duke it out with a Louisiana State University astronomer over an aspect of the star's story. The new study supports natural causes, not alien activity, to explain the mystery star. It's one more study in what's sure to be many, many studies to come on KIC 8462852.



Artist's concept of cascading comets around a distant star. This is a possible explanation for mystery star KIC 8462852.

The strange fluctuations in this star's light are what caused Yale astronomer **Tabetha (Tabby) Boyajian**, who first noticed the star and who described it in a TED talk in February, to call it… the most mysterious star in the universe.

The Vanderbilt astronomers and their colleagues weren't addressing the part of the story related to the star's strange light-curve observed by the Kepler planet-hunting spacecraft. Everyone agrees that KIC 8462852's light can appear strongly and weirdly irregular, with anywhere from a fraction-of-a-percent to around 20 percent of the star's light sometimes apparently blocked. That's why astronomers began talking about alien megastructures, **aka Dyson spheres, in the first place**. These vast hypothetical structures are one explanation – the most glamorous of the possible explanations – for what might be periodically blocking the star's light.

A study released in January, 2016 by astronomer **Bradley E. Schaefer** at Louisiana State University had suggested a long-term dimming in Tabby's star, a brightness decrease by 20 percent over the last century. That finding could be consistent with the idea that aliens were gradually converting the material in the star's planetary system into giant megastructures. Schaefer's study has now been accepted for publication in the peer-reviewed Astrophysical Journal.

A DYSON SPHERE

Civilizations might add collector rings to the space around its star, creating a relatively simple, but incredibly powerful, Dyson sphere

Proponents of solar power know that only a tiny fraction of the sun's total energy strikes the Earth. What if we, as a civilization, could collect all of the sun's energy? Physicist and astronomer **Freeman J. Dyson** first explored this idea as a thought experiment in 1960. Dyson's two-page paper in the journal Science was titled *Search for Artificial Stellar Sources of Infrared Radiation.* He proposed that searching for evidence of the existence of such structures might lead to the discovery of advanced civilizations elsewhere in the galaxy, and indeed, in 2013, several groups of astronomers began a search for the telltale signs of Dyson spheres. Following his 1960 Science article, Dyson envisages such a "biosphere" to consists of a loose collection of objects travelling on independent orbits around the star. As time passes, a civilization might continue to add Dyson rings to the space around its star, creating this form of relatively simple Dyson Sphere. Dyson speculated that such structures would be the logical consequence of the long-term survival and escalating energy needs of a technological civilization.

And of course science fiction writers have had a field day writing about Dyson spheres. In fact, Dyson admitted he borrowed from science fiction before he began his technical exploration of the idea of a megastructure gathering energy from its star. **Olaf Stapledon first mentioned this idea in his 1937 science fiction novel Star Maker, which Dyson apparently read and used as inspiration.**

Frustrated by decades of seeking radio signals from intelligent civilizations beyond Earth – and not finding any – a few have begun to contemplate this new search strategy. What would they be looking for? The solar collectors would absorb and reradiate energy from the star. It's that reradiated energy in the Infrared, that astronomers would need to seek. **Stephen Battersby** at New Scientist wrote a great article about this search, released in April 2013.

AK with notes from EarthSky and Wikipedia