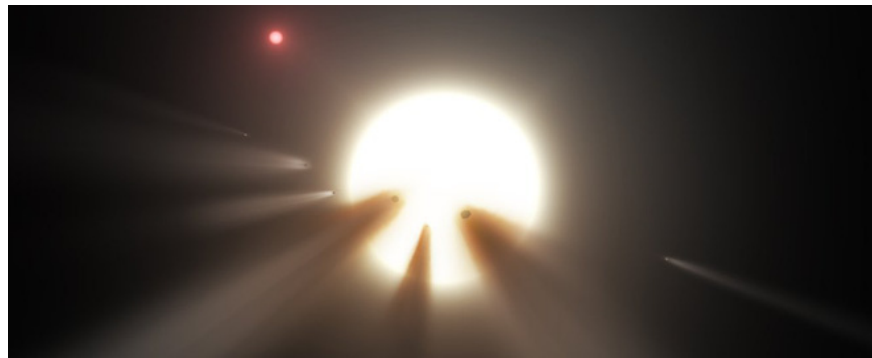


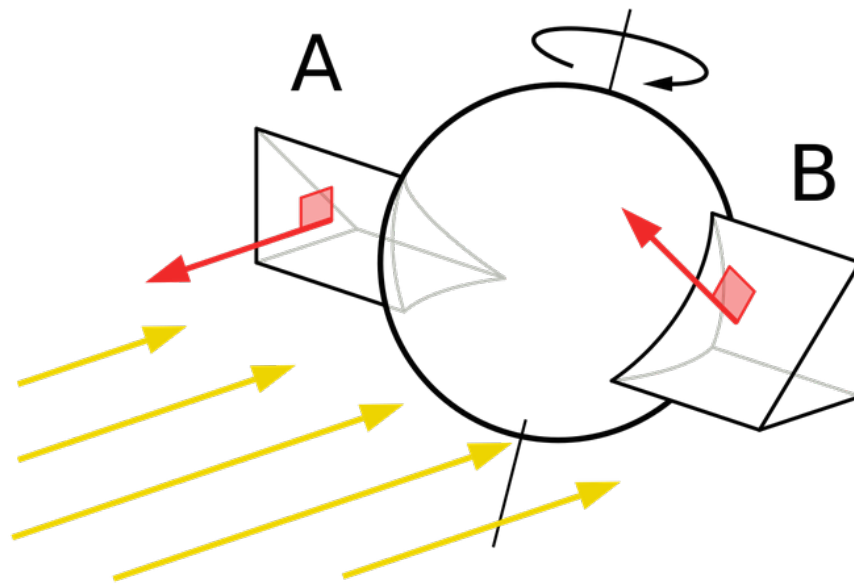
# About 6 billion years from now, the light from the dying Sun will burn the asteroid belt

A new study shows the incredible power of a star's light at the end of its evolution.

New research shows that the light from a dying star is so strong it can turn asteroids into dust. This is what happens to almost every existing star in the Universe, including our dear Sun. Approximately 5-6 billion years from now, when the central star of the Solar System dies, it will burn the asteroid belt between Mars and Jupiter.



The only agent of mass destruction is electromagnetic radiation. According to the experimental model, the YORP effect (Yarkovsky-O'Keefe-Radzievskii-Paddack, derived from the names of the four scientists who contributed to its discovery) will be the main role in the process. The YORP effect occurs when the heat of a star changes the rotation of a small object in the Solar System - such as an asteroid.



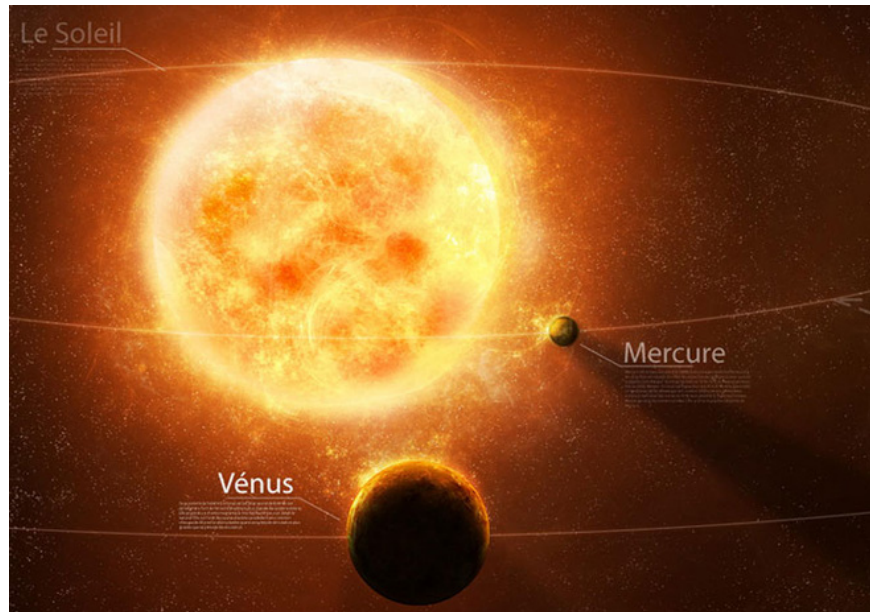
The light emitted from "B" fins is about the same size as "A" fins, but not parallel to the incident light. This creates a torque on the asteroid.

Asteroids will be heated by the light energy emitted by the Sun. Heat propagates in the rock until it radiates in different directions as heat radiation.

The heat generated from the meteorite will create a small thrust; The thrust effect will not be noticeable in a short amount of time but if the heat generation is continuous, it can cause an asteroid to spin in midair or wobble off its inherent axis of movement. Today, through the phenomenon of "rolling asteroids" we can observe this process. And as the Sun progresses into subsequent evolutionary cycles, the effect will become even more pronounced.

When the stars or the Sun are at the end of an evolutionary sequence, they enter a giant phase and expand, becoming very large and bright. That phase only lasted a few million years, after which it pushed its outer matter into space and collapsed into white dwarfs - a dead star with a dense density of matter.

About 5-6 billion years, if not migrated to other places, humanity will see this phenomenon firsthand.



The sun becomes a red giant.

" *When a typical star reaches its massive phase, its brightness reaches a maximum of 1,000 to 10,000 times the brightness of our Sun ,*" explains astrophysicist Dimitri Veras of the University of Warwick.

" *After that, the star shrinks to a white dwarf of the same size as Earth very quickly, where its brightness drops below the Sun. So the YORP effect is only important during the giant period, but almost nonexistent after the star becomes a white dwarf .*"

As the initial brightness increases, the YORP effect will also increase. Because asteroids originate from countless pieces of rock gathered by gravity, most asteroids do not have dense material densities, so when subjected to the YORP effect, they will start to become more lax.

According to the model running on the computer, the YORP effect will cause most asteroids larger than 200 meters to start rotating, enough to cause them to disintegrate. Stable structures will be safe, but the asteroid belt we still know will face the future, though bright but not very bright.

" *The YORP effect is very intense and fast, will last for a million years. Our asteroid belt will not only be destroyed, but it will be quickly and brutally destroyed. The only factor causing this is light from the Sun itself,*" said the Veras researcher.

It is not just computer simulations that show evidence of this. Veras' observations of white dwarfs also show this.

More than a quarter of white dwarfs have metal traces from the asteroid's core in their spectrum. Asteroids' traces in the white dwarf spectrum are a mystery, and are still under debate. The YORP effect may be the reason for this strange thing. When the asteroids crumble under the power of a dying star's light, they form a disk of asteroid dust orbiting, the rest will be attracted to the white dwarf star.



A white dwarf star.

*" These results help locate debris in the 'white dwarf system' and the giant branch, thereby observing how white dwarfs get physical debris from outer space ,"* Veras concluded.

*" We need to know why debris appears at the moment a star becomes a white dwarf to understand how dust disks are formed. So the YORP effect will provide an important model to identify the source of those fragments "*.

The research was published in *the Monthly Notices of the Royal Astronomical Society* .

You finished reading the article "**About 6 billion years from now, the light from the dying Sun will burn the asteroid belt**" edited by the [TipsMake](#) team. We hope this article has provided you with many useful tech tips and tricks. You can search for similar articles on tips and guides. Thank you for reading and for following us regularly.