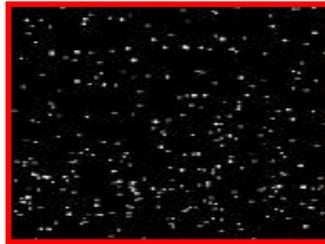


**CAN YOU SEE A STAR
THAT BURNT OUT
THOUSANDS OF YEARS
AGO?**



The universe is so large that light carries information from the past to the present. It can give us information about far away parts of the universe and also information about a long time ago. What we see at night in the sky is the past and not the present.



Our night sky

Picture from: www.physics.csbsju.edu

What do I mean b

Light travels very fast, at about 300 000km/s. To put it differently, light covers a distance of 300 000km every second. Because of the large distances that light travels in space, scientists introduced the term "light year". A light year is the distance that light travels in one year. One light year is about 9 463 700 000 000 km. That means that a light ray travels 9 463 700 000 000 km in a year.

The sun is our closest star at a distance of about 150 million km ($1,5 \times 10^8$ km) from earth. When light leaves the sun it takes about eight minutes to reach the earth. You can verify this by doing the maths:

$$\begin{aligned} \text{speed} &= \frac{\text{distance}}{\text{Time}} \\ \text{time} &= \frac{\text{distance}}{\text{speed}} \\ &= \frac{1,5 \times 10^8 \text{km.}}{300000 \text{km.s}^{-1}} \\ &= 500\text{s} \\ &= 8,3 \text{minutes} \end{aligned}$$

So, if the sun stops shining right now, we will still see the light for a further 8 minutes.

The closest star from the sun is called Proxima Centauri which is about 40 trillion km (40×10^{12} km) from earth. It takes light, moving at 300 000km/s, 4,2 years to move from Proxima Centauri to earth. So what we see now happened over 4 years ago at the star.



Section of the milky way
Picture from:www.nasa.gov

Other stars are much further. Our galaxy, the Milky Way, is about 120 000 light years in diameter. The most distant star in our galaxy is about 95 000 light years away from earth. That means that we are seeing light that left the star 95 000 years ago. Other stars are even further away, so some stars that appear to be bright shining stars may have burnt out thousands of years ago and we are still receiving the light that left the star before it burnt out.

What we see at any specific moment in the sky, is light that left different stars at different times. Every star in the sky represents a different point in time. One star may be shining with light that left the star ten years ago while another might be shining with light that left the star thousands of years ago.