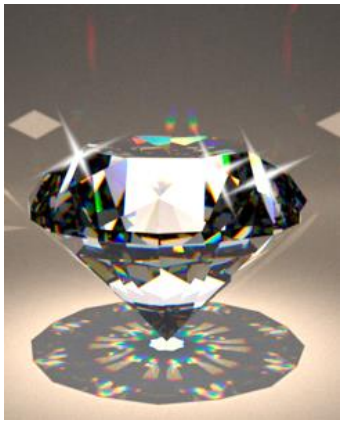
Light Phenomena Around Us



I See Skies of Blue…

Sunlight contains all the colors.

Atmospheric molecules scatter light (Rayleigh).

Longer path through atmosphere means more scattering.

At sunset, violet, blue and green are completely scattered away, red and orange are still there!

Violet and blue are scattered most…

…we see blue because our sensitivity to violet is very low!

…and Red Sunsets too!

THE AURORA BOREALIS

By Brandon Cardamone

HOW IT WORKS

The Aurora Borealis is caused when the sun emits charged particles. When this wave of these particles reaches the Earth, out planet's magnetic field deflects the particles, but some of these particles collide with molecules in our atmosphere, exciting them. This causes light when the atoms calm down, and this creates the stunning light show known as the Aurora Borealis.

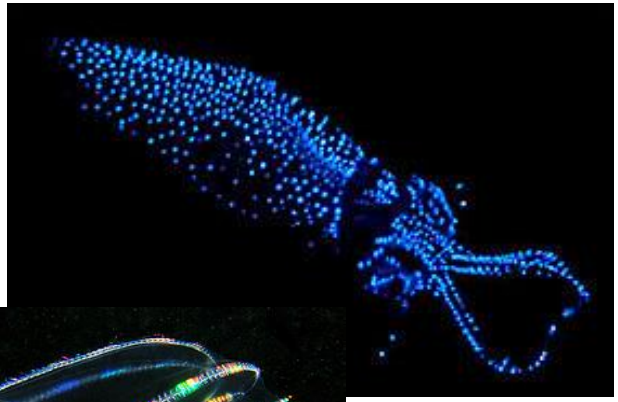
WHERE TO FIND THEM AND WHAT TO LOOK FOR

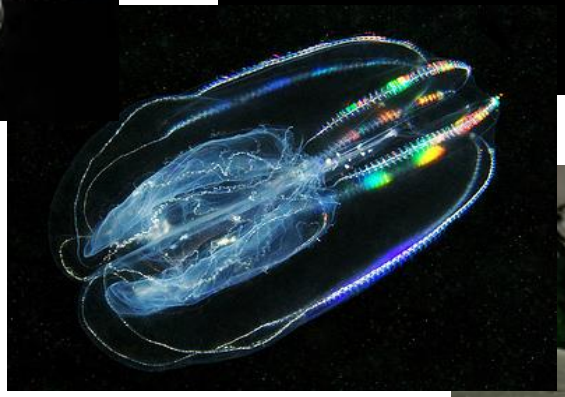
The Aurora Borealis can be found anywhere in the Arctic Circle, but preferable spots include Iceland, Greenland, and Alaska.

The Auroras come in many colors. Green is the most common, with blue following and finally red. Other colors can be created from mixes from the other three colors. The colors come from when the particles hit certain atoms, like the color would be different if it hit oxygen or nitrogen.

Bioluminescence

Bioluminescence is emission of light by a living organism by means of a chemical reaction (type of Chemiluminescence).

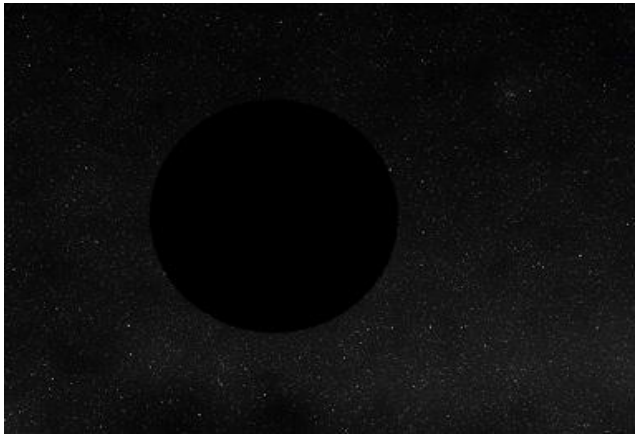


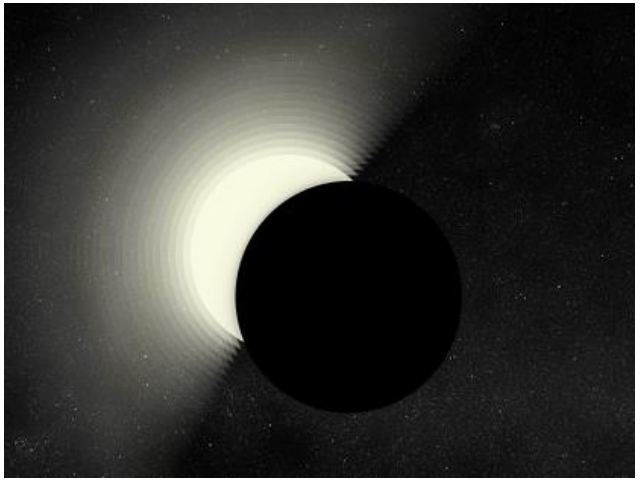


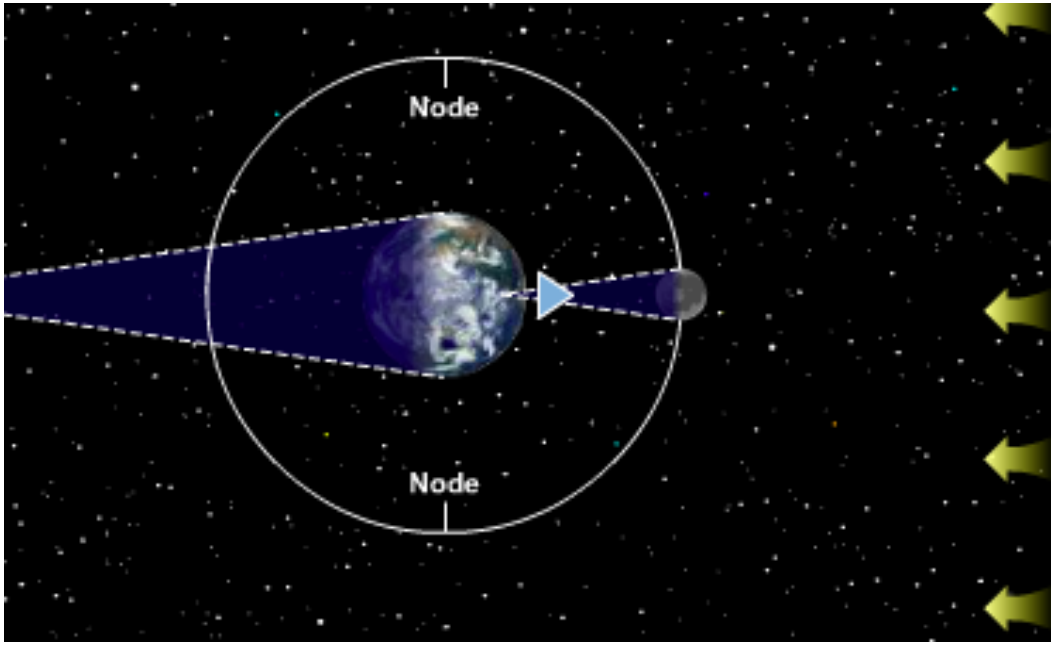
It occurs widely among animals (many creatures of the open sea, and insects) as well as in some fungi and bacteria.

Total Solar Eclipse

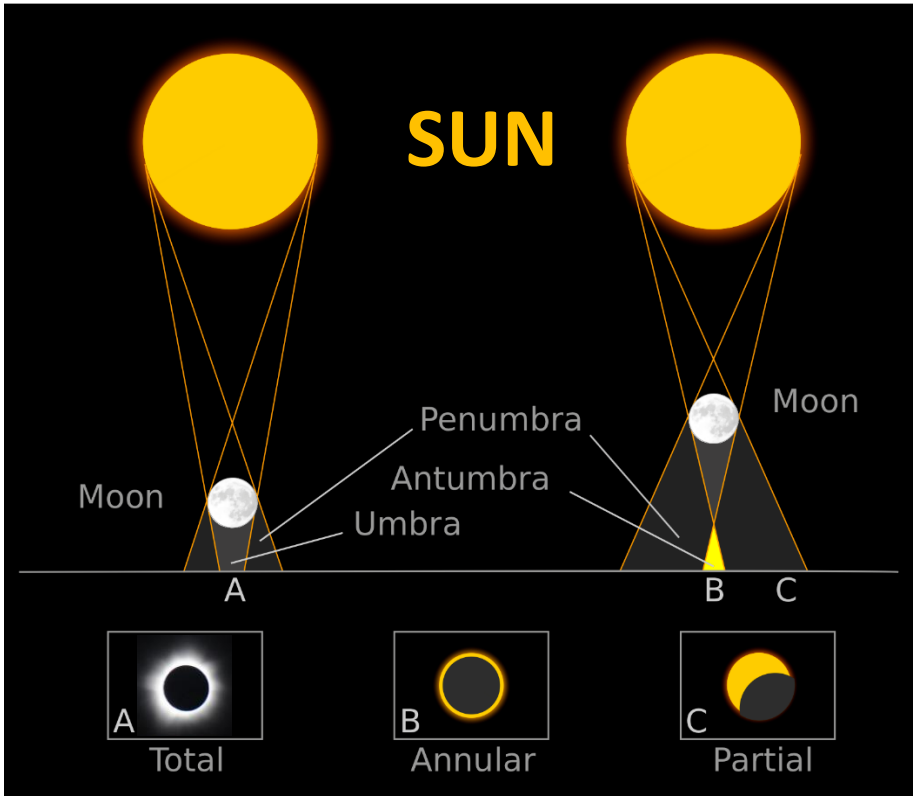
by: Nolan





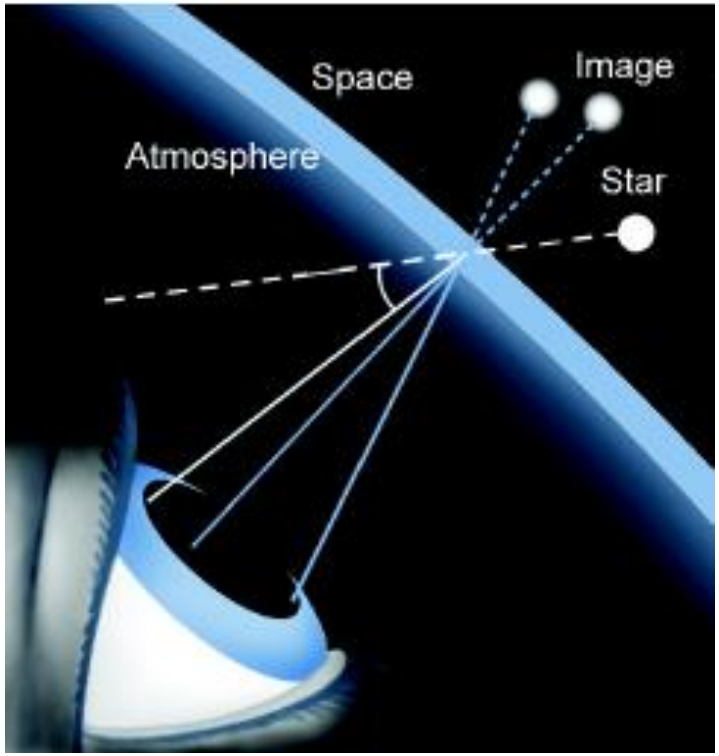


Solar Eclipse



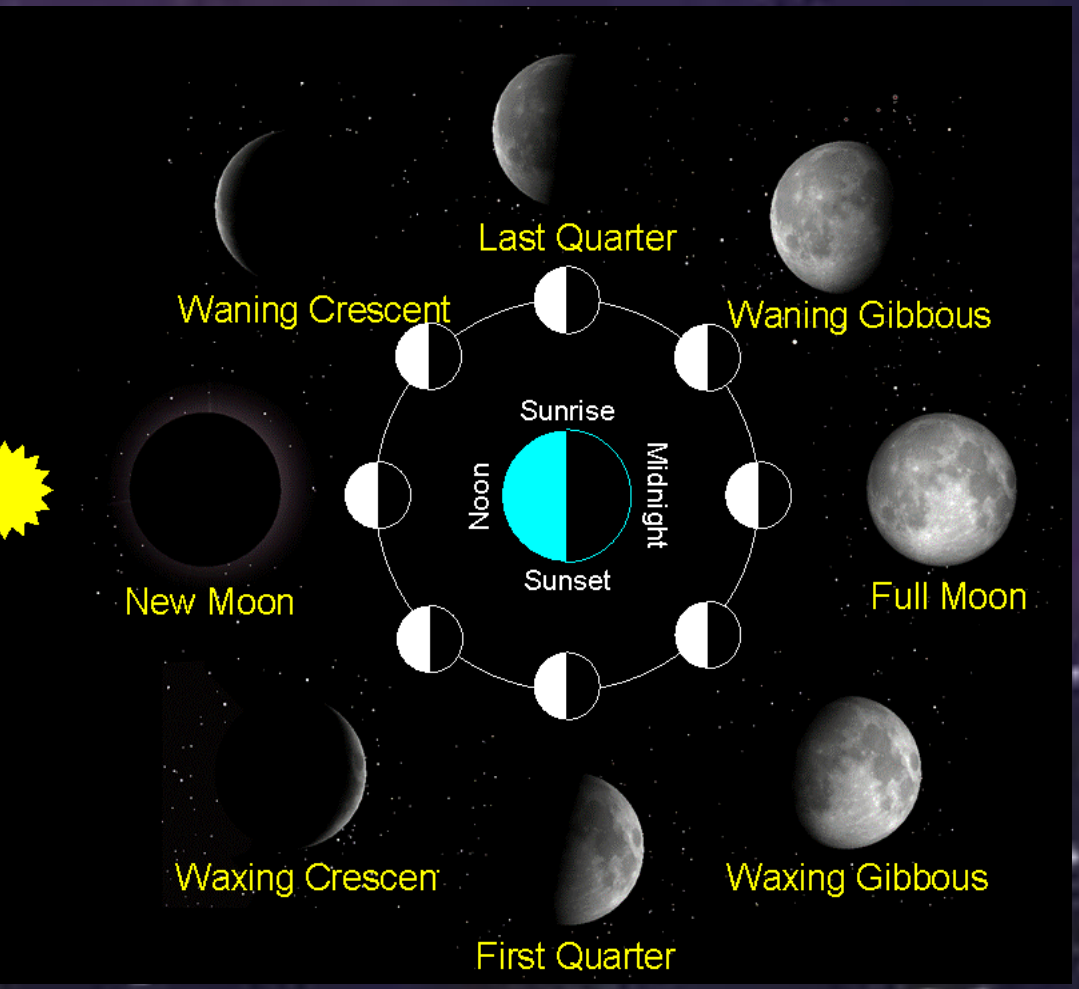
Twinkle, twinkle, little star…

- The scientific term is "astronomical scintillation".
- Observed from the Earth, a star is essentially a pin-point light source.
- As starlight travels from space into the Earth's atmosphere, the rays are refracted.
- Since the atmosphere is constantly changing due to turbulence, the amount of refraction also constantly changes.



- This causes the image of a star to form in a slightly different part of our eye retina every moment – we perceive it as twinkling.
- Planets usually do not twinkle – why?
- You might actually see a planet twinkling if it appears low at the horizon – why?

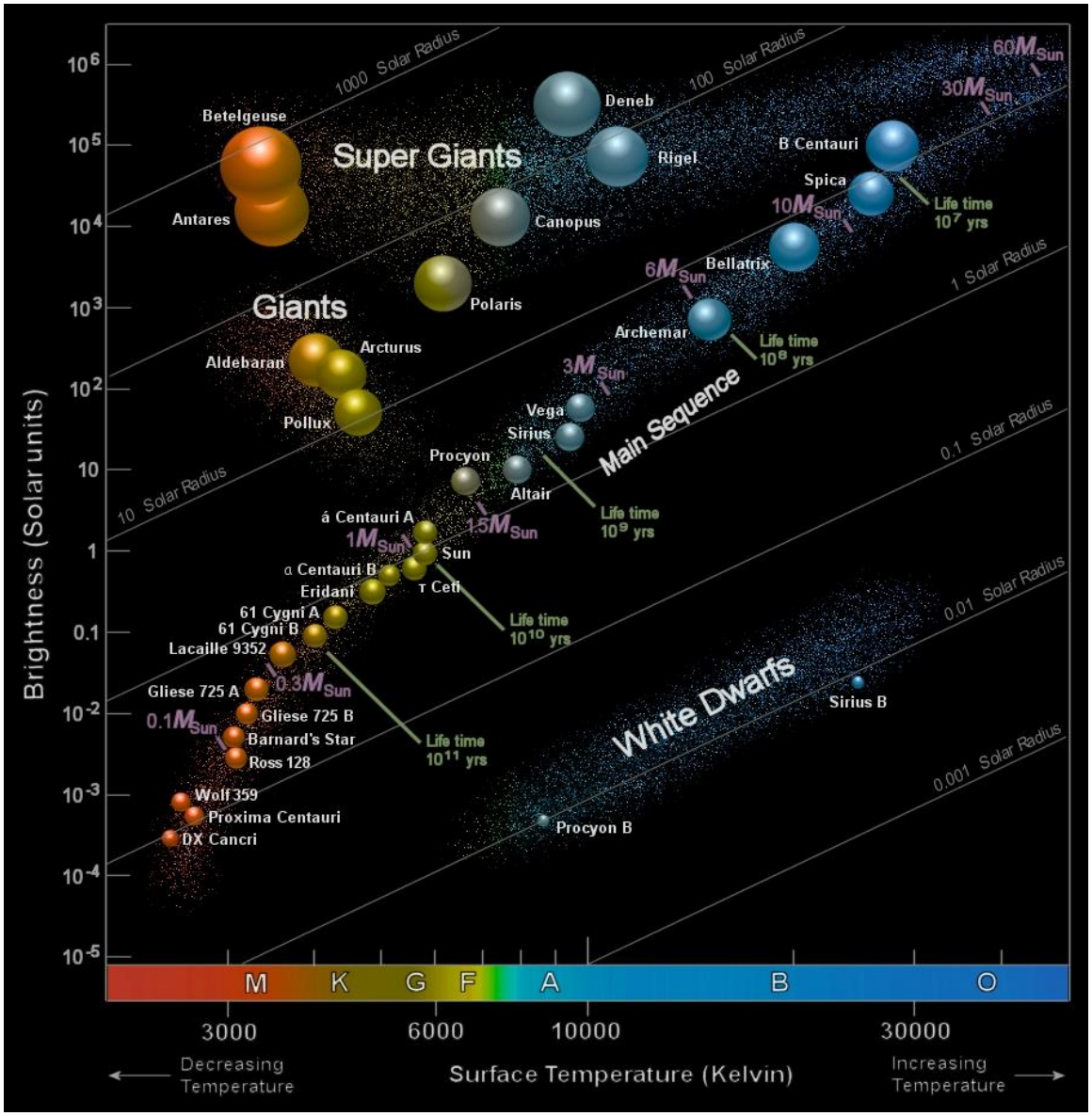
Phases of Moon

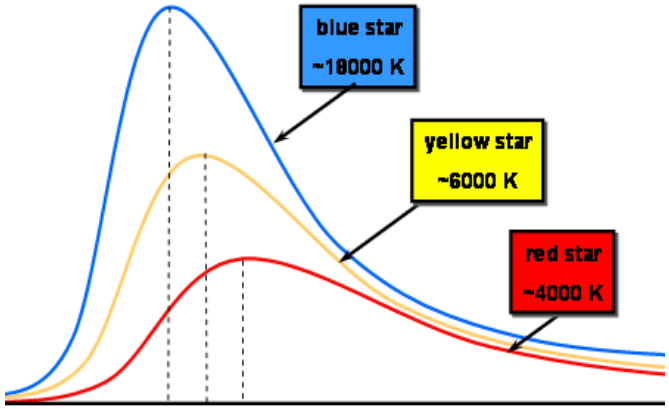


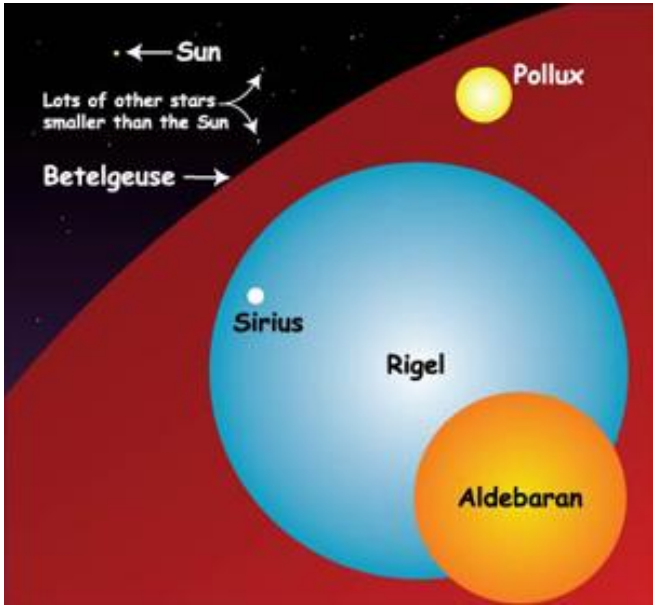
- New Moon - the phase of the moon when it is in conjunction with the sun and invisible from earth, or shortly thereafter when it appears as a slender crescent
- Waxing Crescent - when the moon is less than one-half illuminated. Occurs when the moon's illumination is increasing, First Quarter. The moon is one-half illuminated from the sun.
- First Quarter - when the moon is between the earth and the sun, it's illuminated sides face away from us, and we can't see it at all.
- Waxing Gibbous - when the moon if half full
- Full Moon - the phase of the moon in which it's whole disk is illuminated
- Waning Gibbous - when the moon is more than half filled
- Third Quarter - when the moon is less than one-half illuminated by the sun but less than one quarter illuminated
- Waning Crescent- when the moon is less then one- half illuminated by the sun but less than one quarter illuminated

by Mallika Singh

Colors of the Stars



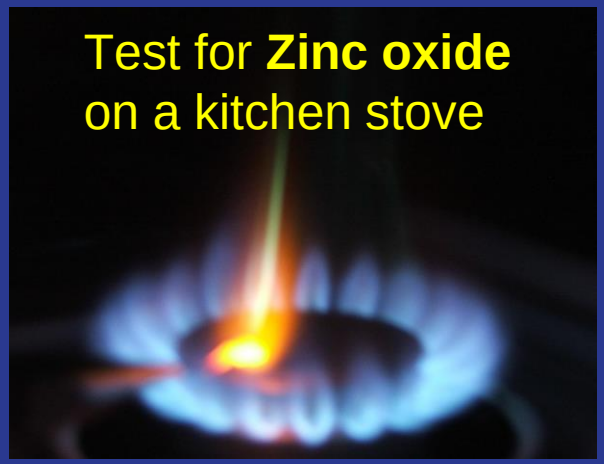




Flame Test

By: Anjali Eligeti

A flame test is a test for chemicals. Normally it is used to see certain metals in a chemical compound. This chemical compound is heated in a flame and a new colored flame is made. The colored flame can now be turned into a spectrum to be analyzed.

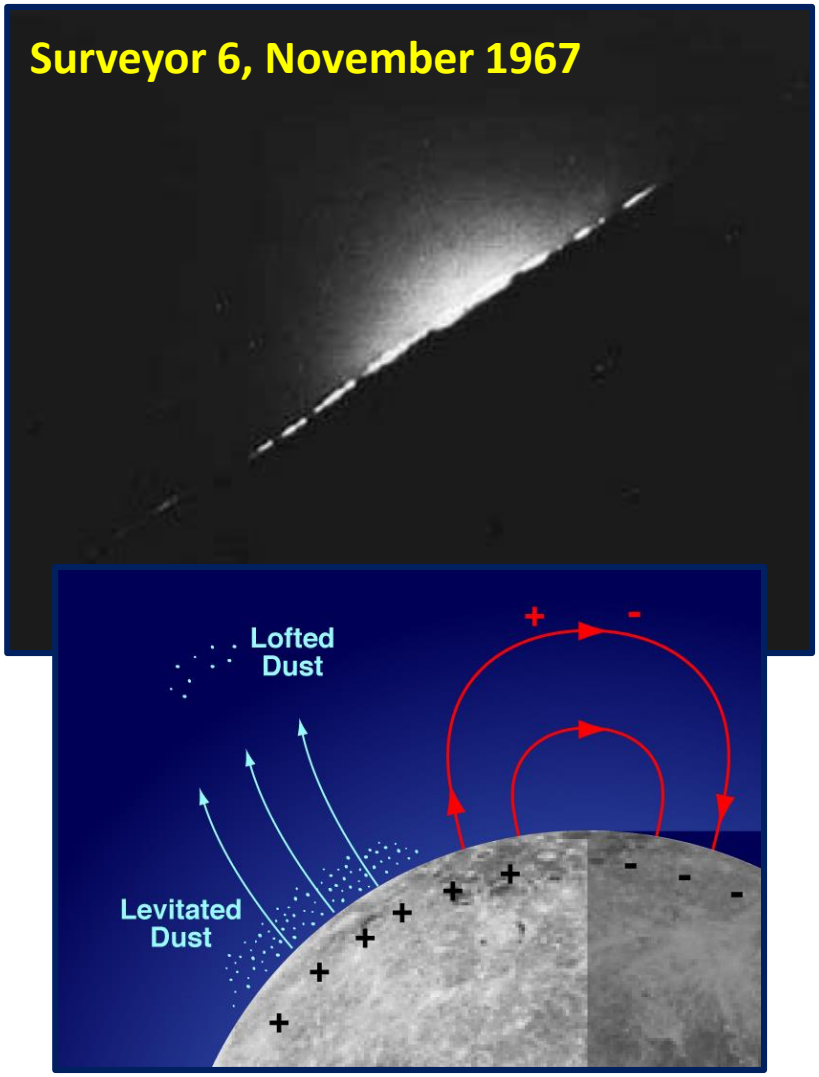


Yellow color is very bright and common

Many metals produce flame colors made by electrons jumping up to a higher orbit in the atom when it is heated, bu they soon fall down, putting out light as energy.

Moon Dust

Light from the Sun hitting lunar dust causes it to become charged through the photoelectric effect.



- The phenomenon was first photographed by the Surveyor program probes in the 1960s.
- The charged dust repels itself and lifts off the surface of the Moon by electrostatic levitation.
- It is thought that the smallest 5-6 μm particles are repelled up to a kilometer high (most at 10-30 cm high), and that the particles move in "fountains" as they charge and discharge.
- This "atmosphere of dust“ is visible as a thin haze and blurring of distant features, and also as a dim glow after the Sun has set.