

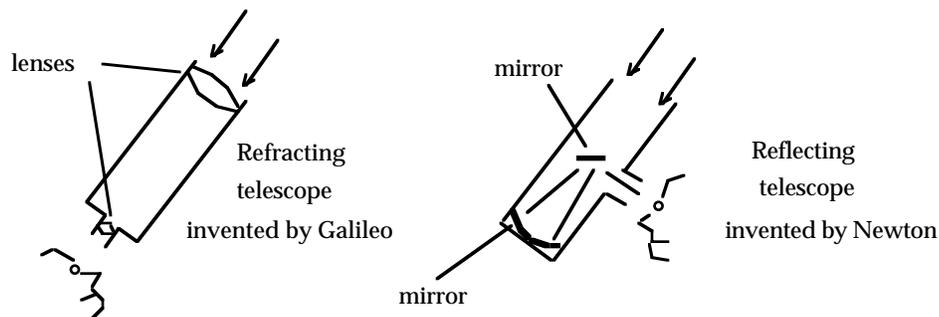
Astronomy : Notes/W.S.-40

Astronomers today use three instruments to study the stars. They are; the telescope, the camera, and the spectroscope.

The Telescope

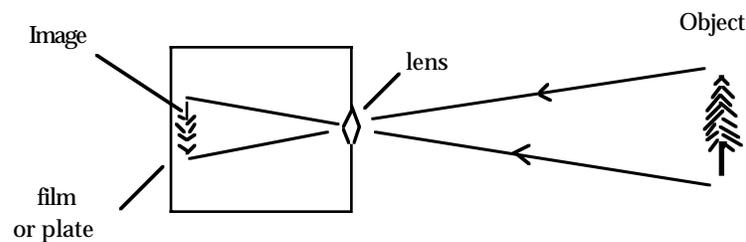
The telescope is used to observe distant objects in the sky. It magnifies objects such as the planets, so they don't just appear to be points of light. Stars still appear to be points of light, because they are so far away. However, with a telescope, many more stars can be seen than with the naked eye.

There are two types of telescopes. These are, the refracting and reflecting telescopes. The refracting type uses lenses to produce a magnified image. Reflectors use a curved mirror to produce a magnified image. Most telescopes are reflectors, as they can produce an image with a greater magnification.



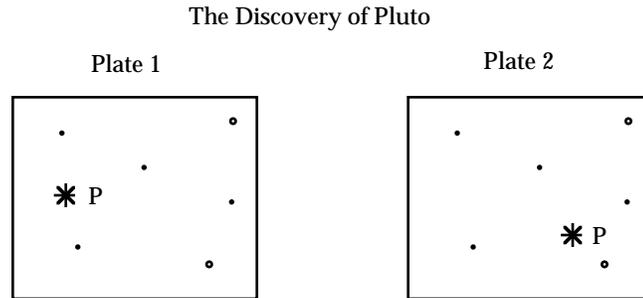
The Camera

The simple camera is shown below.



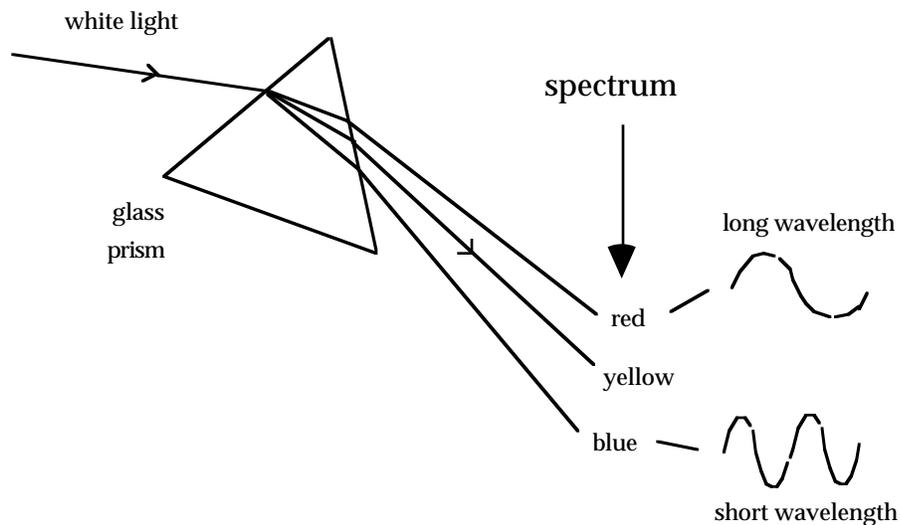
The camera is a device which can produce an image of an object on a film or on a glass plate. Astronomers use cameras to take pictures of

the stars and planets through telescopes. Some planets were discovered by noting the change in their position among the “fixed” stars. This is why the planets were known as the “wanderers”. The picture below shows how Pluto was discovered. Pictures taken several days apart, showed the planet moving among the more distant stars.



The Spectroscope

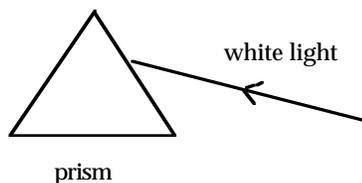
A spectroscope is a device which consists of a prism and a lens. It is used to analyze the light (spectrum) from different stars. A prism will separate light into its component colors. It is known that different atoms emit light of different colors. For example, the element helium was discovered on the Sun because the Sun’s spectrum contains the colors emitted by helium.



Different stars emit different colors because each star has a different composition.

Questions:

- 1) What three instruments are used by astronomers to study the stars and planets?
- 2)a) Who invented the refracting telescope?
b) Who invented the reflecting telescope?
c) Why do stars appear as points of light when observed through a telescope?
- 3) Explain how the planet Pluto was discovered using a telescope and a camera.
- 4)a) What is a spectroscope used for?
b) What is a spectrum?
c) How was the element helium discovered?
d) Why do stars have different colors?
- 5) Which color has a longer wavelength, red light or blue light.
- 6) Draw the spectrum.



Answers: 1) The three instruments are; the telescope, the camera, and the spectroscope, 2)a) Galileo, b) Newton, c) They are very far away., 3) Pictures of the stars in a certain area of the sky, at two different times, showed the planet in different positions relative to those stars., 4)a) It is used to analyze the spectrum of stars., b) It is the light emitted by a star., c) The characteristic spectrum (colors) of helium were found within the spectrum of the sun., d) Stars have different compositions., 5) red light, 6)

