

13.1.2: The Telescope

Looking Up!

Ever since humans roamed Earth, they looked up. Primarily, they needed to understand the sky — motions of the Sun, Moon, and stars — to know when to plant and pick crops, navigate, or simply as a time keeper. In many cases, their lives depended on their knowledge of the sky. And, many events that took place — meteor showers, eclipse, comets, supernovae — surprised and baffled these ancient peoples.

As technology developed, so did ways to observe and model what people saw in the heavens. Observing included ways to find objects — star maps and globes — as well as ways to track objects, like the astrolabe. The invention of the telescope, and astronomical use by Galileo in 1609, opened up the heavens in a new, exciting way. And, as technology developed, ways to present these astronomical objects became more and more exciting.

The Telescope

Initially, only those who were well to do or royalty had access to telescopes. And, astronomers were often hired by royalty or rewarded for their discoveries. Yet, as time went on, and methods for producing telescopes became more common, many universities and cities across Europe and the United States in particular saw an observatory with a refracting telescope as a cornerstone. The main challenge was producing excellent — or even good — optics. By the 18th Century, refracting telescopes were being produced in some number by opticians like John Dollond. In the 19th century, opticians such as Henry Fitz and Alvan Clark produced fine commercial telescopes. Alvan Clark & Sons made what is still the largest refracting telescope in the world, the 40-inch refractor at Yerkes Observatory, Williams Bay, WI.

Reflecting telescope were not initially popular, due to the difficulties producing the right type of curve on the primary mirror, and keeping the surface reflective. With the development of techniques to deposit a thin coating of aluminum on a surface of glass, the reflector not only became commercially viable, but less expensive to manufacture than the refractor.



1897 photo of the 40-inch refractor at the Yerkes Observatory [Yerkes 40 inch Refractor Telescope-1897](#) by PD-OLD is in the [Public Domain](#)

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