

Some useful equations to fit your observing goals to your instrument	Types of Telescopes
<p>Maximum Useful Magnification = 60 X Power per inch of Aperture</p> <p>Magnification = <math>\frac{\text{Focal Length of Telescope}}{\text{Focal Length of Eyepiece}}</math></p>	<p><b>Refractors</b></p> <p><i>Galilean</i> It uses a convex objective lens and a concave eyepiece lens. Galilean telescopes produce upright images.</p> <p><i>Keplerian</i> Invented by Johannes Kepler in 1611, is an improvement on Galileo's design. It uses a convex lens as the eyepiece instead of Galileo's concave one.</p>
<p>Dawes Limit - Theoretical Resolving Limit of Telescope</p> <p>Resolving Power Seconds of Arc = <math>\frac{4.56}{\text{Aperture (Inches)}}</math> Seconds of Arc</p> <p>Resolving Power Seconds of Arc = <math>\frac{11.6}{\text{Aperture (cm)}}</math> Seconds of Arc</p> <p>Note: Resolving power is a theoretical limit only. There are many other factors that effect the resolving power of any instrument</p>	<p><b>Reflectors</b></p> <p><i>Newtonian</i> Invented by the British scientist Sir Isaac Newton (1643-1727), using a concave primary mirror and a flat diagonal secondary mirror. Newton's first reflecting telescope was completed in 1668 and is the earliest known functional reflecting telescope.</p> <p><i>Cassegrain</i> The classic Cassegrain configuration uses a parabolic reflector as the primary while the secondary mirror is hyperbolic.</p> <p><i>Ritchey-Chrétien</i> Invented by George Willis Ritchey and Henri Chrétien in the early 1910s, is a specialized Cassegrain reflector which has two hyperbolic mirrors (instead of a parabolic primary). It is free of coma and spherical aberration at a nearly flat focal plane if the primary and secondary curvature are properly figured, making it well suited for wide field and photographic observations</p>
<p>f/stop = <math>\frac{\text{Focal Length of Telescope}}{\text{Aperture of Primary}}</math></p> <p>Actual FoV (degrees) = <math>\frac{\text{Apparent Field of View of Eyepiece}}{\text{Magnification (of eyepiece attached to OTA)}}</math></p> <p>Exit Pupil = <math>\frac{\text{Eyepiece Focal Length}}{\text{f/stop of OTA}}</math></p> <p>It is useful to have a spread sheet with all these equations for each instrument you have along with the eyepiece specifications when coupled with the instrument.</p> <p>Listing the specs of your instruments helps on those nights when every thing freezes up including your brain, and someone asks you, "What is the magnification of that?" Have such a spread sheet also illustrates where potential new purchases would be beneficial to your current setup or if you are better suited to yet another telescope.</p>	<p><b>Catadioptric</b> <i>A catadioptric optical system is one where refraction and reflection are combined in an optical system</i></p> <p><i>Schmidt-Cassegrain</i> Combines a cassegrain reflector's optical path with a Schmidt corrector plate to make a compact astronomical instrument that uses simple spherical surfaces.</p> <p><i>Maksutov</i> The Maksutov is a catadioptric telescope design that combines a spherical mirror with a full diameter weakly negative meniscus lens at the entrance pupil (commonly called a "corrector plate" or "meniscus corrector shell") in a design that takes advantage of all the surfaces being nearly "spherically symmetrical".</p> <p><i>Maksutov Cassegrain</i> Maksutov's design notes from 1941 explored the possibility of a 'folded' Cassegrain-type construction with a secondary silvered "spot" on the convex side of the meniscus facing the primary mirror</p> <p><i>"New fandangled stuff"</i> Celestron HD range - Meade ACF range</p> <p><b><i>This is by no means a complete list of the different types of telescopes, this list is some of the more prominent telescopes used by amateur and professional astronomers.</i></b></p>