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HOW TO CHOOSE AN ASTONOMICAL TELESCOPE

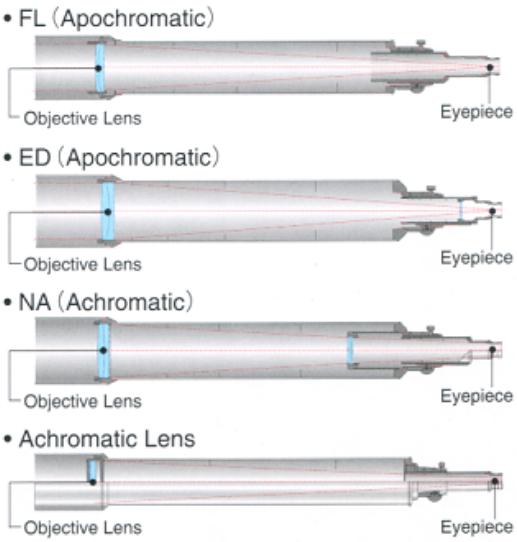
An astronomical telescope lets you observe details of the moon, planets, star clusters, and nebulae that you cannot see with the naked eye. There are several types of telescopes, and each is best suited for different types of objects. Your choice of telescope may also depend on whether you are interested in taking astrophotography. If your observation site is away from your home, then the portability may become a consideration.

TYPES OF OPTICAL TUBES

There are several types of optical tubes using various combinations of lenses and mirrors to collect and focus light. It is important to understand the features of different optical systems such as refractors, reflectors, and catadioptrics to select a telescope that is best suited for your purpose.

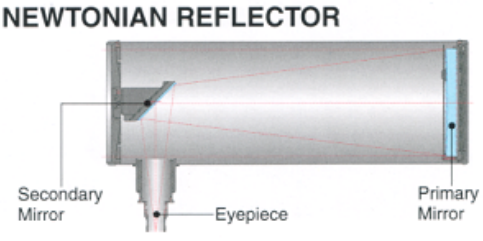
REFRACTORS

- **Fluorite and ED Apochromatic Refractors:**
  These telescopes utilize a Fluorite element or an Extra-Low Dispersion (ED) element to minimize chromatic aberration and yield the very high contrast images that are characteristic of refractor telescopes. It is excellent for both prime-focus photography and eyepiece projection photography, as well as for visual observation.
- **NA (Neo Achromatic) Refractor:**
  The NA refractor employs a second objective lens that reduces the chromatic aberration to less than 1/3 that of achromatic lens and offers well-corrected spherical aberration and field curvature. It is suited for visual and photographic observation of the moon, planets, nebulae, star clusters, and comets.
- **Achromatic Refractor:**
  The achromatic refractor has an objective lens composed of two lens elements to reduce chromatic and spherical aberrations, but it does not compensate for field curvature. With a short focal length telescope under f/8, formation of colored fringes around the image may be seen. The achromatic refractor is suitable for general observation of the moon, planets and other



REFLECTORS

- **Parabolic Mirror Reflector:**
  The parabolic mirror reflectors have neither chromatic aberration nor spherical aberration. Their center image is extremely sharp. On a reflector with short focal ratio, some coma (i.e. off-axis aberration) may be noticeable around the edge. Telescopes with slower focal ratios than f/8 are suitable for high-powered visual observation and astrophotography of the moon and planets; those with faster focal ratios than f/6 are suitable for low powered visual observation and astrophotography of nebulae, star clusters, and comets. R200SS, with fast f/4 ratios, is especially well suited for prime-focus photography.
- **Spherical Precision Mirror Reflector:**
  The reflectors use mirrors to reflect and focus light. They do not suffer from chromatic aberration, but they may show some spherical aberration around the edge. Their center image is very sharp. They are suitable for observation of the moon, planets, and other general celestial objects. Reflectors are generally less expensive compared to refractors of same aperture, but it requies slightly more care in handling and maintenance. Special care should be taken not to jar its optical alignment by rough handling, especially during transportation by car to remote observation sites.



CATADIOPTRICS

- **VMC Optical System:**
  The VMC telescope has a unique catadioptric optical system combining a spherical primary mirror and a meniscus corrector. Chromatic aberration is almost zero and spherical aberration is held to a minimum. It is well suites for observation of all types of celestial objects, from the moon and planets to nebulae, star clusters and comets. The telescope tube is very compact and easy to transport. Unlike Schmidt-Cassegrain telescopes, Vixen's catadioptric optics has an open front aperture that will not be affected by dew.
- **VISAC (Vixen Sixth-Order Aspherical Catadioptric) Optical System:**
  The VISAC optical system is composed of a concave primary mirror, a convex secondary mirror and a three-element field corrector. It has almost no chromatic aberration. Spherical aberration, coma, and field curvature are all well corrected. Especially noteworthy is its sharpness and flatness at the edge, which far exceeds that of Schmidt-Cassegrain systems of the same aperture. It is well suited for observation and astrophotography of the moon, planets, star clusters, nebulae, and comets. The optical tube is compact and easy to handle.