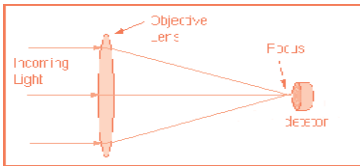


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Types of Telescope.

THE REFRACTING TELESCOPE.

This is the most commonly available type of telescope. Refractors work by using an objective lens to bend light. If the optics are good this results in a very sharp picture with high contrast.



Refractors can be expensive, which accounts for the very small size of most available for sale. Larger astronomical refractors - 4 inch lenses or bigger - can cost thousands of dollars.

Advantages: refractors of all kinds are rugged, require little or no maintenance, and have sealed tubes that keep out dust and reduce image-degrading air currents. If the lenses are good, a refractor provides very crisp, high-contrast images for a given size aperture, this especially desirable for the moon and planets.

Disadvantages: Refractors generally have small apertures, typically 3 to 5 inches. For many astronomical purposes this is just too small; faint objects such as galaxies and nebulae will appear very dim. Good quality refractors cost more per inch of aperture than any kind of telescope.

THE REFLECTING TELESCOPE

Reflecting telescopes use a specially curved mirror instead of a lens, light from a distant object is brought to a focus so that it can be viewed. Usually at least one small secondary mirror is used to move the focus to a position you can get your eye to.

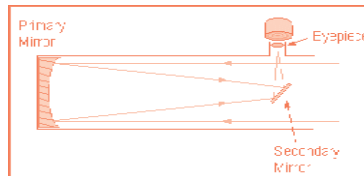
THE NEWTONIAN EQUATORIAL TELESCOPE

This telescope has a mounting which is parallel to the axis of the earth which allows you to track an object as the earth rotates. These telescopes are commonly used by astrophotographers.



THE NEWTONIAN DOBSONIAN TELESCOPE

This type of telescope has the simplest form of mounting in which the instrument is free to move up-down and left-right along two axes. To follow a star across the sky continual adjustments on both axes must be made, few astrophotographers use this design. The most popular design is the

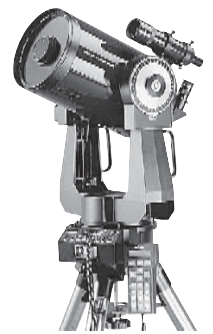


Dobsonian mount, named after San Francisco astronomer John Dobson who made it popular through helping

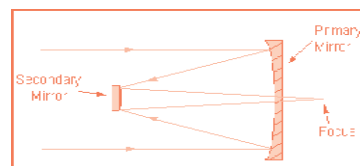
people to build their own. Very stable design because they are low to the ground. They have bearings made of nylon or teflon, which allows it to move very smoothly.

THE SCHMIDT CASSEGRAIN TELESCOPE

These telescopes have a window or a lightly curved lens on the front and a mirror in the back. In the centre of the front window is a smaller secondary mirror. The net effect is to fold the telescope up so that it is much shorter than the focal length. This type of telescope combines a refractor and a reflector in one package. The resulting telescope is very portable,



compact and user friendly. They are very expensive telescopes.



Setting Up Your telescope

- ▶ Set up your telescope where it will be as steady as possible. - out of the wind if you can.
- ▶ Use the wide field eyepiece for general use. Star clusters, the gaseous nebulae and the rich fields of the Milky Way do not need high magnification. Use lower power eyepieces to get crisp views.

- ▶ Nights when the moon is prominent are fine for lunar and planetary viewing, but moonlight blots out the dim light from the fainter objects.
- ▶ Some nights can be better than others due to the air temperature. When the stars sparkle and glitter with every colour of the rainbow - the nights are poor for high power work because the “bad seeing” causes the star images to scintillate or to appear not quite in focus. The telescope will perform well at low power but will not necessarily give good views at high power.
- ▶ The best nights are when the stars do not twinkle - these are the nights of “good seeing”.

Choosing a Telescope

What to look for when purchasing a telescope.

The least you will have to pay is \$600.00 to \$1000.00, most good telescopes will cost more than \$1000.00. Do not be swayed by the large selection of accessories that come with it. When you start you will need no more than one or two eyepieces and you can build up your collection of extras as time goes on if you find that you need them. It is better to start by spending your money on the telescope and mount only, buying the best that you can afford.

In general refracting telescopes with their lenses separated by a sealed metal tube, are much more robust than reflectors. Reflectors can go out of alignment very quickly, although the adjustments on a reflector are usually fairly simple. Make sure that your telescope will fit comfortably into your car or other means of transport. Consider where it will be stored.

The larger the aperture the better the instrument is for astronomy. The larger the aperture the more it costs. In general a reflecting telescope will have a larger aperture than a refractor with the same price. There is an aperture for telescopes below which it is useless to go. For refractors this is 50mm, for reflectors it is 100mm.

Power or magnification is not something to consider when purchasing a telescope. You can make any telescope magnify at essentially any power you want by using different eyepieces. It is pointless to use too high a power on a small-aperture telescope. You will see nothing but highly magnified fuzz. Only a large aperture telescope on a

Caring for Your Telescope - Do's

- ▶ Set up the telescope outdoors in cold weather at least a half hour before use to allow the mirror to settle to the air temperature.
- ▶ Do carry a telescope tube upright when moving from place to place.
- ▶ Do cover the focuser and main adaptive finder, to keep the dust out.
- ▶ Do keep the telescope covered against the weather.
- ▶ Do wipe the metal parts dry if they are wet due to dewing.
- ▶ Do use a photographic blower brush if you need to clean any optical surfaces, so that you can blow dust particles from the optical surface.
- ▶ Do not leave the telescope set up unattended at night.

Caring for Your Telescope - Don'ts

- ▶ Do not point the telescope at the sun - Serious damage to yourself and the telescope.
- ▶ Do not set up the telescope on a sloping surface as it could fall.
- ▶ Do not put your fingers anywhere near an optical surface, telescope lens mirror surface, eyepiece lens.
- ▶ Do not leave the telescope out in the weather.
- ▶ Do not over tighten any screw threads.
- ▶ Do not leave the eyepiece in the telescope when it is not in use.
- ▶ Do not wipe a lens with a handkerchief.
- ▶ Do not put the lens cap on immediately after use when the eyepiece is wet as this can cause the development of fungal growth.
- ▶ Do not try to take the objective lens apart in a refractor telescope.
- ▶ Do not remove the mirror from inside the telescope tube, the mirror should never be taken out of its mount.
- ▶ Avoid taking the telescope from cold outside air into a warm room. This will cause the mirror to be covered with condensed moisture.

sturdy mounting can show a worthwhile image at 200 times or more.

The rule of thumb is that the maximum useful power, even under ideal sky conditions, is 50 times per inch of aperture. This limits you to 300 times on a 6-inch, and even that is usually pushing it too far. Avoid any telescope that is promoted for its high magnification. If you see a 2.4 inch (60 millimeter) department-store telescope advertised as “475 power”, you know that the manufacturer thinks that you are ignorant and gullible.

If the telescope is too massive to lug outdoors easily and too time consuming to set up, you will rarely use it. Some designs are more portable than others.