

Telescope Operating Instructions

•The Telescopes

There are ten Schmidt-Cassegrain telescopes available for your use; four Meade 8", four Celestron 8", and two Meade 10". Each of these is mounted on a specific pier on the roof. Your lab instructor will demonstrate how to get a telescope from the store room and mount it on its pier.

A wedge is attached to the top of each pier so that the axis of the telescope mount will point to the north celestial pole. This saves a lot of time that is normally spend aligning a telescope. Simply mount the telescope on its wedge and you can begin viewing. **A telescope is an expensive instrument and should be handled with the care appropriate to such a fine instrument.**

•Magnification

The 8" telescopes have focal lengths of 2000 mm; while the 10" have a focal length of 2500 mm. Different magnifications may be obtained by using the different eyepieces available. The magnification may be found by dividing the focal length of the telescope by the focal length of the eyepiece, or ocular. For example the magnification for an 8" telescope with the 40 mm ocular is $2000/40 = 50x$ and with the 25 mm ocular it is $2000/25 = 80x$. Therefore, objects will appear larger when you use smaller diameter oculars.

Generally it is a good idea to begin with the 40 mm ocular. The smaller magnification lets you see more of the sky, making it easier to locate objects. After you find the object, you can try larger magnifications. However, bigger is not necessarily better! Other factors also contribute to your ability to see the object. If you are looking at a planet, large magnification may produce a very good image if the seeing (atmospheric steadiness) is good, but deep sky objects may look better using a lower magnification. You should experiment with several magnifications to see which one yields the best view.

•Aiming a Telescope

The telescopes are mounted on wedges so that the two motions of the telescope are along the direction of right ascension and declination (If you don't know what these words mean, see Appendix A.). This allows you to track a star or other celestial object with one of the motions - right ascension - as the earth turns. The star can be tracked by hand or with the electric motor built into the base of the telescope.

Each axis of the telescope is provided with a clamp to hold it in a given orientation. **It is very important to release these clamps before you manually change the telescope alignment.** The right ascension clamp is the lever located on the base of the fork mount. The declination clamp is the lever at the top of the left hand fork tine.

Small adjustments of the telescope alignment can be made with the slow motion controls. These knobs work with the declination clamp tightened all the way and the right ascension clamp finger tight. The slow motion knob for right ascension is located next to the clamp at the base of the mount. The declination knob is located inside the base of the left hand fork tine. Be careful that the bar on the inside of the left fork tine is not all the way to one side or the other. If it is, use the declination slow motion control to move it to the center. This will allow you to adjust the declination in either direction.

The finder scope is located on the side of the barrel of the main telescope. This can be used to aim the telescope at the brighter objects in the sky. The eyepiece slides into the diagonal mirror and is held in place by a screw knob on the side. The diagonal mirror can be adjusted to an angle to minimize the contortion needed to look through the ocular.

The focus knob is located near the eyepiece and is parallel to the axis of the telescope. You will normally need to adjust it to obtain the clearest view of an object. When you change oculars, you will need to make significant changes in the focus.

The location and uses of the clamps, knobs, and other devices will be demonstrated by your lab instructor. You must demonstrate your knowledge of these location and uses before you use the telescope.