

Observing Etiquette and Telescope Techniques For Astronomy 100 and General Stargazing

General Etiquette

We are not alone.

As in any situation, the basis of a good experience is to consider the needs of everyone with whom you share space. Some of these needs are not readily evident when you're in a new situation or a culture to which you're not yet attuned. This document is designed to familiarize you with a few of the particulars of observing and using the equipment in the observatory dome and on the observing deck. They will also apply any time you're around a gathering of astronomers who are observing.

Smoke and mirrors and corrector plates.

Don't smoke anywhere in our facilities. This includes the deck. We have only one narrow stairway (no fire escape) and a wooden deck and dome more than five stories from the ground. If you find this policy restrictive, please either take it up with the fire marshal or give your spot in the class to one of the many folks on a waiting list to take it. Aside from being a fire and public health hazard, smoking leaves tar and other deposits on our optics. This mightily upsets us.

Blocking the view.

We will have up to 5 telescopes on the observing deck and one in the dome on Peters Hall. When you are not looking through a telescope yourself, it's easy in crowded conditions to inadvertently move into a telescope's field of view or to be in the way as someone tries to change the aim of the telescope to a new part of the sky. Try to be aware of where telescopes are pointed and avoid standing in front of them. The best way to do this is to stand somewhere to the viewing side of a telescope, where the eyepiece is located. Don't ask Mike or Lee (our departmental astronomy assistants) how many times they've seen someone try to make some radical adjustment to a telescope to recover the image when the real problem is that another observer is blocking the view.

Shaking things up.

The current deck is less than ideal for supporting telescopes. Simply walking around on the deck is enough to severely shake images even at low viewing powers, so please tread lightly. Folks who intentionally and repeatedly jump on the deck during viewing sessions will be forced to watch **Riverdance** 24 hours a day for one month with their eyes taped open.

Seeing red.

While radio astronomers are generally indifferent to the presence of this part of the spectrum, visual observers are acutely sensitive to excess ambient light, especially in the shorter blue wavelengths. It can take more than 20 minutes to fully 'dark adapt' for astronomical viewing in our facilities (and longer under really dark skies). Simply turning on a white light or shining a white light flashlight around observers will set them back at least a half hour, depriving them of the possibility of viewing all the detail in dim objects. Dim, pure red light doesn't cause this loss of dark-adapted vision, so that's what you'll see in the observatory facilities during observing sessions. Please don't ruin a whole viewing session by turning on white lights or bringing and using a regular flashlight. We will be providing red lights where needed as the course goes along.

Telescope usage

We will have up to five fork-mounted Schmidt-Cassegrain design telescopes on the observing deck, and a larger Schmidt-Cassegrain on a German equatorial mount in the dome. We will give you some hands-on training in using these telescopes, but here are a few pointers to try to remember.

Hanging around.

The optical tubes on our telescopes weigh no more than twenty to fifty pounds, and this is the design load for the tripods and support arms and wedges. Please don't strain the instruments or supports by grabbing or hanging on the tubes or other parts of the telescope, including the eyepieces. You will only cause stripped locking mechanisms and necessitate repairs. Your hands are not steady enough to hold the telescope still, and will only induce shake that makes objects unviewable. It's natural to try to maintain your balance in the dark by holding on to something, but please don't use the telescopes or tripods for this. We will try to have chairs or other methods for steadying yourself available when necessary.

Taking (or losing) aim.

We have two controls on our telescopes, one for north-south adjustments (declination or Dec.) and one for east-west adjustments (right ascension or RA). To track an object as the earth spins using a properly aligned telescope, only the right ascension needs adjustment, and that is taken care of by a battery powered motor in our telescopes. Both RA and Dec adjustments on our telescopes have locking mechanisms that may often be tightened down for viewing. It is possible to move the telescopes by hand when they are locked in RA and Dec, but doing so will cause rapid wear on the mechanism and require expensive servicing. If you need to aim a telescope, please

remember to unlock the RA and Dec before moving the 'scope. We will cover this with you in 'basic training' on the telescopes, but it's always good to remind folks of this locking procedure. If you're unsure about this, please ask the teaching assistants or instructor for help.

Viewing techniques

Taking a stand.

The best way to view through a telescope is to find out where the eyepiece is and stand with feet about shoulder width apart in a good position to hold your eye at the eyepiece. If you need to lean over for this, try putting your hands on your knees to steady yourself. Even lightly holding on to the eyepiece will shake the image so badly you can't see it well, and could possibly knock it off target, so that it needs to be re-aimed. Grabbing the eyepiece in the dark also makes it prone to fingerprints that eat the optical coatings and are terrible to view through. Spending viewing time cleaning optics is not fun or profitable. Also please avoid wearing eye makeup, especially mascara, while viewing. There's a reason we avoid having public viewing sessions on drag ball night.

Looking askance.

Another helpful technique for viewing very dim objects is using averted vision. This works for two reasons. First, you have more rods away from the center of your retina, and more cones towards the center. Cones provide color information to the brain, but are less sensitive. Rods provide 'gray scale' information and are more sensitive to light. If you view a little 'off center', you're using the low light sensitivity of the rods and can see a little 'deeper'. Also, your brain tends to minimize differences in brightness over time if you look steadily at a non-moving object. Survival rates are better when your brain sees differences or changes in your field of vision, so by moving your eye around, you're overcoming the tendency of the brain to de-emphasize whatever doesn't move.

Taking the long view.

Don't just glance through the telescope and run. Relax, take your time, and let your eyes and brain adjust to the view. Many objects don't jump out at you, but require that you watch for a while before seeing their full extent or fine details. Planets can also 'swim' in our turbulent atmosphere for quite a while until you get an unexpected pocket of still air and details jump out at you for a few seconds or a fraction of a second. With a few minutes of viewing, that dim, hazy galaxy or nebula you can't see at first will slowly emerge from the background. We're not asking that you sit at the telescope all night and prevent others from enjoying the view, but take your time and try to take in all there is to see.