

# How to use the rooftop telescope

You will have to adjust these steps depending on how the observatory was left. If you run into problems, call/text me at 304-508-8486!

1. Always observe with a partner! Do not attempt to use the telescope alone, and always close up after completing observations (see final instruction point for close-up checklist).
2. Go to the roof using the card swipe access and the “PL” button inside the elevator.
3. Open the guillotine.
  - a) First open a little using the crank.
  - b) Brown knob will open further.
  - c) Once opened, unplug brown knob to prevent tangling when the dome is rotated.
4. Remove caps from top of telescope, and from finder scope.
5. Select eyepiece from bookcase on the lower level. Pick one of the big ones because they are easier to use. If necessary, also select right angle adaptor. Put eyepiece on the telescope AND TIGHTEN SET SCREW.
6. Turn on telescope with button on the pier (beneath telescope) and/or the power strip. Press “enter” on the remote, and navigate with “6” and “9” keys to “two star alignment.”
  - a) Cycle through star names until you find a bright star, push “enter” to move telescope to that star. Good bright stars (if they are up) are Deneb, Arcturus, Sirius, or Mizar. Rotate dome with red knob. Be careful as it turns!
  - b) Identify star by looking through finder scope (the little telescope on the side of the big one), hit enter, then centering using the big telescope. Use arrow pad to move telescope until star is centered in field of view. You can change the slew rate using the key pad.
  - c) Repeat with second star.
7. Remove and put away eye piece.
8. Turn on computer and open CCD Ops software from the Desktop.
9. Attach CCD and filters to camera. Note, the CCD has very sensitive chips and is VERY sensitive to the attachment sequence. Please follow it exactly as noted here.
  - a) After the CCD is attached, TIGHTEN SET SCREW TO HOLD IN CCD!!!!

- b) Connect all the cables to the CCD but don't plug in/turn on the power to it.
  - c) Plug the USB from the CCD into the computer.
  - d) Plug the CCD in to the power cable and turn on the CCD.
  - e) If in the course of mounting the CCD you moved the telescope by accident, align again!
  - f) Now you can move on to the following steps. When you're finishing up, make sure that the CCD is off/power is unplugged, THEN unplug the USB from the computer.
10. Cool down CCD by going to Camera→Setup in CCD Ops. Set by default to  $-20^{\circ}$  C, which is fine. Should hear the fan begin and see temp dropping.
11. Focus telescope by going to Camera→Focus.
- a) Take rapid exposures while partner turns focus knob (the one ringed by orange, by the eyepiece mount). Star from alignment should still be in field of view.
  - b) Partner turns focus knob until this star is as small as possible, and other stars in the field begin to appear.
  - c) Once focused, do not touch focus knob! Focus should be ok throughout the night, and at different wavelengths.
12. Take bias, dark, flats, lights as needed. Save as .fits, .bmp, and/or .txt.
13. When done,
- a) turn off cooling in the same way you turned it on.
  - b) Log off from computer.
  - c) Make sure that the CCD is off/power is unplugged, THEN unplug the USB from the computer. Remove CCD and place back into its case.
  - d) Replace eyepiece guards.
  - e) Replace lens caps back on telescope.
  - f) On telescope remote, go to Menu→Utilities→Move to Switch. Once in switch position, turn off telescope using button on pier.
  - g) Crank up guillotine
  - h) Use brown switch to lower guillotine.

i) Rotate dome back so the guillotine is opposite the door.