

**Donald P. Shiley School of Engineering**  
EGR 491 Telescope Design, Fall 2019  
Assignment 1

**BEFORE TUESDAY SEPTEMBER 3** – spend 15 minutes (or more) looking at existing amateur designed telescopes. The following web pages (or links from these) are good places to start.

<https://www.bbastrodesigns.com/tm.html#myTelescopes>

<https://www.dbpeckham.com/>

<https://www.bbastrodesigns.com/osp10/osp10walkabout.html>

<https://faculty.up.edu/lulay/KensTelescopePage.html>

For this assignment, feel free to use books, journals, even web pages to look up anything you want. Do try to be careful to make sure the information is from a reputable trustworthy source.

### Observing

1. Create a sketching notebook. It can be as simple as blank (unlined) paper in a binder. When sketching – always include the date (and time, for this assignment). You will also need a pencil (not a pen) and eraser.
2. SkySafari is a pretty nice app for observing. They have a free version that should be adequate for this class. It is not required for this class, but hey, it's free! Down load it if you want. It will show you what you are looking at (GPS is awesome).
3. While the weather is good, begin your observing skills as an astronomer.
  - a) Visit skyandtelescope.com and click on “this week’s sky at a glance” to be informed about what to see when and where. This is a good idea even if you have SkySafari.
  - b) Observe only in a **safe** place, with people around! Do not go to an excluded site. Bring a sweet shirt or jacket – it is always colder than you would expect. Find a comfortable place to sit. Bring your sketching supplies.
  - c) Orient yourself with respect to the four cardinal directions (north, south, east, west). From the northern latitudes, the southern sky is usually most interesting...that’s where the sun, moon, and planets hang out. You will want to report the location of objects in terms of their “hour” in the sky. If it is due north, the “hour” would be 12:00. Due east is 3:00, due south is 6:00, due west is 9:00 --- at least for this assignment.
  - d) If you look straight up, you are looking at the “zenith” – that is 90 degrees. The horizon is zero degrees --- at least for this assignment.
  - e) Over the next few weeks, looking south you should see two planets, even from Portland, as S&T (Sky and Telescope) will inform you. Try to see and identify both of them. How many degrees separate them (a fist at arms-length is about 10 degrees, outstretched fingers are about 20 degrees). Also note how many bright stars (only bright stars will be visible from Portland unless there is a serious power-outage) and note their locations.
  - f) Make note of the position of at least one planet (is it due south/6:00 or where is it, and how high up). Make a sketch using some land marks (such as a tree or building) to use as a reference for future observations – later this semester. Also include bright stars that are nearby (within about 20 degrees or so). Do not worry about how good the sketch looks, but do take some care in creating it.
  - g) Make note of the position of the moon. Be sure to include date and time. This changes noticeably from night to night – so do this over different days this week.

### Some videos

Some nice things to watch – nothing to turn in. But there may be some way for me to create exam questions from these, so watch and learn. (Don't sweat the details, concepts are what matter)

- h) Learn what Siméon-Denis Poisson was up to when he wasn't under a lot of strain:  
<https://www.youtube.com/watch?v=LJtLrfKdG3A>
- i) General information about “state of the art” in astronomy, specifically, the GMT (Giant Magellan Telescope):  
[https://www.ted.com/talks/wendy\\_freedman\\_this\\_new\\_telescope\\_might\\_show\\_us\\_the\\_beginning\\_of\\_the\\_universe](https://www.ted.com/talks/wendy_freedman_this_new_telescope_might_show_us_the_beginning_of_the_universe)
- j) Double slit experiment: <https://www.youtube.com/watch?v=luv6hY6zsd0>
- k) How to sketch at the telescope: [https://www.youtube.com/watch?v=uUW\\_NiNH0zg](https://www.youtube.com/watch?v=uUW_NiNH0zg)