

The remote observing telescope project

Due: Tuesday, December 2 at 11 a.m.

Goal: To choose interesting astronomical objects and to use a remotely-controlled telescope to gain a high-resolution image of them, then describe to the class what the objects are, why they were chosen and how the images were taken.

Because the Meade telescope connection is not functional, and because it's daytime anyway, we will use the Bradford Robotic Telescope at the Observatorio del Teide, in Tenerife, Canary Islands, Spain remotely. It will allow you to point the telescope and obtain an image of an astronomical object.

Procedure: Find a partner (you can work alone if you like, but it means that you will have to do the presentation by yourself!). Go to <http://www.telescope.org/> and set up an account (there's a link to register for a new account).

Once you have your account set up, you can view images that have already been taken. But what you will principally do is to set up a job for the telescope – taking your object's image.

First, find the **affiliation** (what university or consortium runs it?) and the **latitude and longitude** (don't forget N/S and E/W) of the Bradford Robotic Telescope.

Also, since this will be critical, figure out what the **time difference** between the telescope and Seattle is. Hint: A site like <http://www.timeanddate.com/worldclock/> might be useful. **Prove** that the telescope site will be night between 11:00 a.m. and 1:30 p.m. Pacific Standard Time.

You will choose (a) a **solar system object** and (b) a **non-solar system object** for your images. I have no criteria besides those. Obviously, the objects should be visible from the telescope at night in November or early December. Also, keep in mind the usual concerns: the object must be at least 15 degrees altitude and away from the Moon. *We will try to make sure that no objects are shared between teams.*

The objects should be named or else identified by catalog number (such as the Messier or New Galactic). The RA should be in units of hours minutes seconds; the dec should

be in units of $^{\circ}$ ' " with a "+" sign to indicate northern hemisphere and a "-" sign to indicate southern hemisphere.

Fill in the data for your objects in the table below:

Object names:	RA	Dec	Azimuth	Altitude
Solar system object -				
Non-solar system object -				

Now you have the information to set up the job. Go back to the Bradford Robotic Telescope site, log in and click "Submit a Job Request". Read the "How to Take Good Images" section. Hit the "Change" button under the "What to Observe" heading and select your object. If appropriate, change the type of camera under the "Telescope Selection" section; this is usually not necessary. Under the "Other Information" section and using the information for how to take good images, select an appropriate length of time for your image exposure, make sure that "Dark Frame" is checked off (this allows for greater contrast in your image) and select the appropriate filter. Write a comment so that you can distinguish your two jobs. Finally, hit the "Submit Job" button.

Once you get the images back, write the date and time of observation **at the remote telescope site**:

Solar system object: _____

Non-solar system object: _____

For the presentation, while displaying your images, give a **three-minute presentation** explaining what the objects are, and why your team chose those particular ones. Point out any interesting features that are seen on each image. Finally, explain under what conditions (filter type, exposure time, etc.) you obtained the images.