Name(s): _____ _____

_____ _____

Date: _____ Course/Section: _____

Grade: _____

Parallax

Objectives:

Students will apply the parallax concept to measure the distance of an astronomical object.

Checklist:

- ☐ **Complete the pre-lab quiz with your team (if required).**
- ☐ **Compile a list of resources you expect to use in the lab.**
- ☐ **Work with your team to complete the lab exercises and activities.**
- ☐ **Record your results and mark which resources you used.**
- ☐ **Share and discuss your results with the rest of the class.**
- ☐ **Determine if your team's answers are reasonable.**
- ☐ **Submit an observation request for next week (if required).**

Resources:

Pre-Lab Quiz

Record your group's answers to each question, along with your reasoning.

1.
2.
3.
4.
5.
6.

Part 1: The Small Angle Formula

1. Calculate the apparent angular size, in degrees or radians, of the building shown in the lab manual if it is 50 feet tall and you are 300 feet away from it. Show your work.

2. Determine the angular size, in degrees or radians, of an object in the lab. Explain your procedure in detail and record the measurements for the object's true size and how far away you are from it.

3. How does the angular size of the object depend on where you stand?

Part 2: Parallax with Rigel

1. Explain what kind of observations you would use to measure the parallax of Alpha Centauri.

2. Calculate the distance to Alpha Centauri in AU and parsecs. Show your work.

3. Using the Rigel image scale, determine the resolution limit of Rigel in pixels. Show your work.

4. Using the Rigel image scale and the known parallax angle, determine how many pixels Alpha Centauri would shift between two images taken six months apart, and compare your answer to the resolution limit of Rigel. How would this affect your calculation of the distance to Alpha Centauri?

5. Hubble Space Telescope has a resolution of 0.1 arcseconds. If you could use Hubble instead of Rigel to find the Parallax of a star, what is the distance of the farthest star you could measure? Is such a star in our Galaxy still? Show your work.

Part Three: Determining the Distance to a Building from Van Allen

1. Explain why you would not want to use the formula D=1/p to find the distance.

2. Fill out the chart below and calculate the distance to the building using the small angle formula and show your work.

Name/Description of Building:
Angles Measured (degrees):
Parallax Angle:
Distance between measurements, d (meters):

3. Find the real distance to the building using Google Maps. How accurate were you?