Name(s): _____ _____

_____ _____

Date: _____ Course/Section: _____

Grade: _____

Exoplanet Discovery 2

Objectives:

Using the transit model, the images of the star, and the relations for exoplanet properties, determine the radius, orbital period, and distance from the parent star of an exoplanet.

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:

Part 1: Detecting Alien Worlds

1. Find the RA and dec of the Parent Star.

2. Draw the light curve of your transit in the space below. Label the axes and different parts of the transit.

3. What is the change in magnitude of your transit?

4. Calculate the change in brightness. (Show your steps)

4. What is the ratio of the radius of the planet to the radius of the parent star? (Show your steps)

5. Using your RA and dec, what is the name of this star? What is it's radius?

6. What is the radius of the planet? (Show your steps)

7. How does your answer compare with the theoretical value from Christian et al. 2009 (MNRAS journal)

7. Derive a step-by-step method to measure the orbital velocity of the planet using only these observations.

8. Using your method (from number 7), calculate the orbital velocity of the planet. (Show your steps)