

Name(s): \_\_\_\_\_  
\_\_\_\_\_

Date: \_\_\_\_\_ Course/Section: \_\_\_\_\_

Grade: \_\_\_\_\_

## Stellar Photometry

### Objectives:

Students will learn how astronomers accurately measure the brightness of stars, as well as how the flux of a star through different colored filters can reveal its temperature.

### 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. These concepts will be relevant later in this lab exercise.

1.

2.

3.

4.

## Part 1: Imaging and Brightness

1. Find and compare maximum intensity values for five sample stars from each of the following groups in the image of M27. Explain below what it is that makes the stars in the first group seem the brightest to you.

	Group 1 Brightest Stars	Group 2 Half as bright as 1	Group 3 Half as bright as 2
Maximum Pixel Intensity Values			

2. Compare the relationship between the maximum pixel intensities for each group and the relative brightness as it appears to your eyes.

3. Why does the intensity profile across a star have the shape that it does?

4. Describe a method you could use to compute the total intensity of the Dumbbell Nebula in the image.

### Part 2: Measuring Magnitude in Images

1. Measure the apparent magnitude of several stars each of the groups you defined in the last section. How do the relative magnitudes compare to the peak pixel intensity for stars in each group?

	Group 1	Group 2	Group 3
Apparent magnitude			

2. Look up the apparent magnitude of a star in the image of M27 and compare it to your measurement.

Measured Value:	Accepted Value:
-----------------	-----------------

### Part 3: Color and Temperature

Measure the magnitudes of 5 stars in your B and V filter images of an open cluster and determine their temperatures from the color index.

B Magnitude	V Magnitude	Color Index	Temperature

Can you determine the spectral classes of these stars? What assumptions, if any, do you have to make?