ASTR 1230 29 March, 2010 R. W. O'Connell

Optional Labs: Mars and Vesta

This semester you can do **either or both** of two special "optional" labs: the **Mars Lab** and the **Vesta Lab**. Each of these important solar system objects is near opposition this semester and will show moderately rapid motion against the background stars.

Each lab is worth 100 points.

In each lab, you are asked to locate and sketch one of these objects over a period of 2-3 weeks, making a total of not less than **4 observations** of the object spread over that period of time.

Procedure:

1) Obtain the "ephemeris" for your target from the web. You want a list of *geocentric* RA and DEC coordinates for each date of interest. See the ASTR 1230 "Useful Web Links" page for starting points.

2) On at least 4 separate occasions, separated by several days each, observe the object with a Celestron telescope. Use the commanded position mode, where you enter RA and DEC manually.

3) Use whatever eyepiece/magnification seems appropriate.

4) Using a standard observing form, make a careful sketch of the field, including accurate placement of the target with respect to background stars.

5) In the case of **Mars**: include in the sketch an accurate representation of whatever surface features you see, including a note on their colors. If you like, you can include an "enlarged insert" drawing of Mars' surface.

6) In the case of **Vesta**, you will not be able to resolve the asteroid, so it will simply look like a bright star. It will almost always be the brightest star in the field. If, by chance, there are comparably bright stars in the field, you will have to identify Vesta over a period of a couple of days by its motion.

Lab Writeup:

1) Write a standard lab report

2) Include the ephemeris tables in your statement of procedures.

3) Comment on the motion of the object with respect to the background stars during the course of your observations.

4) Comment on any visible changes in the brightness of the object during the course of your observations.

5) In the case of **Mars**, comment on surface features and color. Try to make a correspondence between what you saw and the known features on Mars using an Earth-view map of the planet. (Don't try to compare to spacecraft images, since these are very different from what you can see in an Earth-based telescope.)