

# Astronomy 350, Autumn 2002, Problem Set 1

Due Tuesday, October 8 in class

## Problem 1:

This problem is designed to acquaint you with how to look up basic information on astronomical objects. You may ask the Professor or the TA for hints on where to look, but you must consult the references yourself. For every item you find, please give a complete citation to the publication (catalog, journal article, etc.). Where appropriate, quote the uncertainties of any quantities.

- a) What is the RA and DEC (equinox J2000.0), accurate to  $\sim 1''$ , of the bright star Altair?
- b) What will the phase of the moon be on Wednesday 2002 October 9? Will it be visible from Columbus at 8pm EDT? (Latitude of Columbus is  $\sim 40^\circ\text{N}$ ). If so, what will its approximate altitude be above the horizon at sunset?
- c) Look up the celestial coordinates and various catalog names (Messier, NGC, etc.) of the Ring Nebula. Then make a "finding chart" using a Digitized Sky Survey image obtained from the Web (<http://archive.stsci.edu/dss>, and use the "simple retrieval form"). The field of view of the 26mm eyepiece of the 12-inch telescope is 26.5 arcminutes, so pick the field of view of the DSS image appropriately. Your final finder (a single page) should give the object name, celestial coordinates (and their equinox), the orientation of the picture (which way is North and East), the scale of the image (how many arcminute across), and also indicate this field of view (approximately) of the eyepiece centered on the target.
- d) The pre-main sequence star KH15D is an unusually deep eclipsing binary star. Its J2000.0 coordinates are  $\alpha=06:41:10.18$ ,  $\delta=+09:28:35.5$ . For how many hours will it be observable from Cerro Tololo on 2002 October 10? Use the online Hourly Airmass Table generator at <http://imagiware.com/astro/> to help you do this calculation. In this context, by "observable" I mean the target is at less than 2 airmasses.

## Problem 2:

Attached is the GST (Greenwich Sidereal Time) Table from the 2002 edition of the *Astronomical Almanac*. Compute the LST at 9pm EDT for our observing lab session on Wednesday, 2002 October 9. The location of Columbus is Latitude  $39^\circ 57' 46.8''$  North, Longitude  $83^\circ 00' 16.9''$  West.

## Problem 3:

You have just heard a report of a Galactic Supernova (the first since Kepler!) with coordinates  $\alpha=15:32:14.5$   $\delta=+50:47:04$ . Before you rush down to campus to fire up the telescope and CCD to start observing it tonight, will it actually be visible from Columbus? For how long will it be visible?