

Celestial Coordinates - Exercise

Student Name: _____

Step 1.

- A. Start Stellarium. It should be in the default configuration you setup in the Using Stellarium exercise. Make sure Stellarium is in full screen mode.
- B. Use the Location Window to set Stellarium to your default location. Make sure you are pointed to the southern horizon.
- C. Use the Date/Time Window to set the date/time to 2015/3/20 and 12:30:00 Local Time.
- D. Use the GUI speed symbols to set the time movement to zero.
- E. Turn off the landscape and atmosphere. Use the Location Window to set your latitude to 32° North (hit the Enter key before exiting the Location Window).
- F. Turn the Equatorial grid off and the Azimuthal grid on (the zero degree Altitude line is your horizon). Set the FOV to about 60°.

- **Question 1:** What is the name of the bright star within +/- 10° of due South (the Meridian line)?

- **Question 2:** What is the star's approximate altitude from the horizon (remember: click on the star and data for the star will appear in the upper left portion of the screen)?

- **Question 3:** What is the approximate Azimuth of this star?

G. Now increase the month by one to 2015/4/20 12:30:00 Local Time.

- **Question 4:** Has the bright star from Question 1 moved from its earlier location?

- **Question 5:** Now what is the star's approximate altitude from the horizon (remember the horizon is at 0°)?

- **Question 6:**

What is the approximate Azimuth of this star?

- **Question 7:** Do your answers from Questions 5 and 6 match those from Questions 2 and 3 above?

H. Now set the month back to 2015/3/20 12:30:00 Local Time.

Step 2.

- I. Drag the view along the horizon line until you are pointed North.
- J. The star Polaris is very close to the Meridian line.
- K. Use the Search Window to locate the star Merak, center it and zoom into a FOV of about 15° .

- **Question 8:** What is the name of the bright star just above Merak? (if you don't see the name next to a star, click on the star and information on the star will appear in the upper left of the screen)?

- **Question 9:** What are their Altitudes relative to the horizon?

Merak: _____, The other
star: _____

- **Question 10:** Can a person see these stars from this location at this time, on this date?

Merak: _____, The other
star: _____

Step 3.

- L. Reset the FOV to about 50°.
- M. Drag the view along the horizon line until you are pointed South (make sure the "S" cardinal point is toward the bottom of the screen).
- N. Now turn off the Azimuthal grid and turn on the Equatorial grid.

- **Question 11:** What are the approximate RA and Dec values for the star Fomalhaut?

RA: _____ h _____ m _____ s

Dec: _____ ° _____ ' _____ "

- **Question 12:** What constellation is Fomalhaut a part of?

- O. Now increase the month by one to 2015/4/20 12:30:00 Local Time.

- **Question 13:** Has Fomalhaut moved from its earlier location? _____

- **Question 14:** Now what is the star's approximate Ra and Dec values?

RA: _____ h _____ m _____ s

Dec: _____ ° _____ ' _____ "

- **Question 15:** Is this the same as the values you got in Question 11?

Step 4.

- P. Now set the date to 2015/3/20 and set the time to 13:30:00 Local Time.
- Q. This time and date were chosen as they mark the approximate **Vernal Equinox** for 2015. Remember in the introduction for this exercise, that the RA angle (measured in hms) begins at particular spot on the celestial sphere, the Vernal Equinox
- R. Select the Sun and center it. Since this is the approximate Vernal Equinox, the Sun is very close to the Meridian. It is at the exact intersection of two other important named lines.

- **Question 16:** The two other lines have names, what are they?

_____ / _____

- **Question 17:** What is the RA at this intersection?

RA: _____ h _____ m _____ s

Step 5.

- S. Now that you have used both the Alt/Az and Equatorial(RA/Dec) coordinate systems, answer the following:

- **Question 18:** Which, if either, coordinate system seems the best at marking an objects location regardless of date, time or relative position in the sky?

- **Question 19:** Which coordinate system is most likely to be used by modern astronomers?
