# Coordinate Systems Teaching Notes

Equipment Needed:

- Geographic Map of the Earth
- Terrestrial Globe
- Astronomical Globe
- 24 protractors
- 24 bobs
- String

This lab introduces the students to the concepts of Coordinate Systems. You need to first get them used to the idea of using latitude and longitude to describe a unique location on the Earth. Make sure you don't lose them here, many students have not been exposed to these coordinates before (for some reason).

Before either the indoor or outdoor component, Dan will do a 20-minute show on Coordinate Systems to address issues raised in the lab instructions and questions.

The horizon coordinate system is the most natural and easy-to-grasp of the set they'll see tonight. Most students will latch onto this system quickly. Define the coordinate origins – this will be the first system they use tonight so make sure they're au fait with it.

The next step is to compare and contrast the terrestrial globes with the astronomical globes – the idea being to analogize between latitude and longitude and RA and Dec. You should call attention to the First Point of Aries, and the fact that it MOVES every year – so the issue of precession and an Epoch associated with any given set of coordinates. You should also note the difference in appearance between the diagram in the lab and the SC001 star chart which places the Vernal Equinox in the middle of the chart for some dumb reason. In addition, you can now introduce the concept of time and using the sky as a clock. Once you have crossed that bridge – introducing the ecliptic as a special path across the sky, the Zodiac and Ecliptic coordinates should follow naturally.

Assembly of the protractor and bob device will take some time and you need to inspect each one to make sure its measuring from 0º. This will take some time to get right so they can make reproducible measurements.

The last part of the lab involves them getting used to measuring where things are in the sky, relating that to their charts, and reading the charts correctly to obtain coordinates for any given object. Make sure they know how to interpolate from the axes on the charts.

 