

Observing the Planetarium Sky

Summary

In this lab you will be introduced to the night sky via the planetarium. After doing this lab you should have an understanding of some of the limitations of the human body as a scientific apparatus. You will also be required to learn to pay close attention to detail and run a simple experiment. Like the modern scientist, you will make use of a plot to help describe what we are seeing. The interpretations of this plot introduce you to the scientific process and some of the skills needed to be an astronomer (or a successful Astronomy 101 student.) Concepts such as random sampling, finding trends in graphs and the importance of good observing sites should all be clear at the completion of this exercise.

Background and Theory

Observing the night sky has been an important part of human culture for thousands of years. Ancient humans created myths and stories to describe what they saw in the night sky. Although their methods were crude by today's standards, these humans were the first astronomers and their observations built the foundation for modern science. In the last several hundred years, the advent of technologies such as the telescope and the computer revealed the vastness of the Universe. Although we no longer describe what we see in the night sky with myths and legends, the modern day astronomer is still required to pay close attention to detail and find physical interpretations for all of her observations.

Our eyes react to light in a very interesting way. When a room is bright our pupils contract, allowing less light into our eyes and when it is dark our pupils expand to their maximum size. This process is not instantaneous. It takes a while for our eyes to completely adjust, especially when making the transition from light to dark. In this lab we will quantify this change in the planetarium. As time passes, we should be able to observe fainter and fainter stars within a given area of the sky. By counting the number of stars at various times during the planetarium visit, we will be able to graph this effect and interpret the results.

Procedure

Obtain a small pvc tube. When instructed, point the tube at the dome and while holding it steady, quickly count the stars that you see in your tube.

1. Write down the time elapsed since you came in the room (in the first case this is just 0 minutes) and the number of stars you see.
2. Randomly select a new spot on the dome for your next observation. This may not seem "scientifically" correct but your instructor should explain to you why we can select the places we look at random and still have sound results
3. Repeat your observation and your data taking every 30 seconds until 5 minutes have elapsed. Record all of your measurements on the data table. Make a plot and answer the questions on the worksheet.