Astronomy A305 - Modern Observational Techniques
Lab Assignment 2

Observing the Sun at Kirkwood Obs.

**Goal:** The goal of this lab assignment is to explore observations of the Sun using the Kirkwood Solar Telescope.
- Observe the differences between the appearance of the Sun in white light and in the light of hydrogen alpha.
- Measure the rotation rate of the Sun using repeated observations of a sunspot the over a period of 2-3 weeks.
- Explore how the spectrum of a sunspot differs from the spectrum of the solar photosphere.

**What to hand in:** You should hand in a written report of your observations. Your lab report should include the following parts.

- Abstract, summarizing your results and conclusions
- Introduction, including the goals of the lab.
- Observations, including a description of the equipment used, the dates and times of observations, and a description of the observations themselves.
- Analysis
  - Include a discussion of the visual appearance of the Sun in white light and at hydrogen alpha and how they differ; include sketches emphasizing those differences
  - Include sketches or digital photographs of the Sun at different times. Use the images to estimate the latitude of the sunspot and the rotation period of the Sun at that solar latitude.
  - Include a discussion of measurement errors and systematic errors that affect the uncertainty of your measurements of period and latitude.
  - Describe how the photospheric spectrum of the Sun compares to the spectrum of a sunspot.
- Discussion
  - Compare your observations to those available from SOHO (Solar Orbiting Heliospheric Observatory, sohowww.nascom.nasa.gov/home.html). Describe differences and similarities in detail.
  - Discuss problems you encountered in your observations or analysis, how those problems were resolved, and what you would do differently if you repeated the lab.
- Conclusions - summarize your principal findings

An appropriate length would be at least two typed pages, single spaced, 12-point font, with 1" margins, plus figures and tables.

**Hint:** Use a digital camera to photograph the Sun against a grid to allow quantitative measurements to determine latitude and rotation rate.