Imaging the Moon II: Webcam CCD Observations & Analysis

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Lab Aims

This lab seeks to:

Why the Moon?

The idea is to observe a real sky object. The Moon is big and bright, within the abilities of the students to find and to make careful observations.

Equipment

The entire lab can be implemented using widely available equipment.

- 1. Small telescope. We use 8" instruments which are larger than needed
- 2. USB operated camera adapted from a webcam*
- 3. Computer. We use netbooks

No campus observatory needed.

History

An earlier version of this lab using 35 mm film was presented at Cosmos 2004 (Sato 2004 – paper I).



This lab has evolved to employ the smooth until revisited in 2009.

smartphones. Stay tuned for paper III.

Lab Activity: Observations (Week 1) Logistics:

Students sign up in groups for staggered shifts at 8" telescopes.

> The class stands by for first clear evening with Moon.

On Observing Night:

Students plan & execute a grid pattern and keep an observing log.

N.B. Prior to these labs, students have worked though labs on basic optics and image formation with lenses & mirrors



Presented at Cosmos in the Classroom – Astronomical Society of the Pacific. July 20-24, 2013, San Jose, California, USA. Lab manuals and more at http://www.kwantlen.ca/science/physics/faculty/takashi_sato/COSMOS2013.html a two-week lab for non-majors



> show students that observational astronomy involves quantitative data taking with instrumentation (beyond stargazing) > demystify the imaging process by using familiar, everyday equipment, rather than specialized apparatus > provide students opportunities to experience the joy and frustration of observing and to make measurements from their own images In the value of prior planning and good note-taking in the laboratory/observatory

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Student Results

Good planning and complete observing logs go a long way toward successful mosaic building.

Some students realize they can let the Moon drift across the CCD with tracking turned off.





Sato, T. 2004, Imaging the Moon: Observation & Analysis, at Cosmos in the Classroom 2004 – Boston (paper I) Schröder, K.-P., & Lüthen, H. 2009, in Handbook of Practica Astronomy, ed. G.D. Roth, (Dordrecht: Springer) 133

I wish to thank Mr. Bob Chin for the design and construction of the KPU Mk II cameras based on my prototype constructed using

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