

## **Calibration and Use of the 11" Celestron Telescope for Observing and CCD Imaging**

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The purpose of this research is to discern and document the operational techniques of Albion College's 11" Celestron telescope, SBIG CCD camera, and associated optical equipment (e.g. color filters, adaptive optics [AO] system). The telescope is located on the roof of the physics building, Palenske Hall, on the northwest edge of campus. Several avenues by which this equipment can be used to acquire astronomical images and data will also be investigated.

The instrument has been calibrated for use with its ancillary equipment, and several test images of objects like Jupiter, the Ring Nebula, and the Andromeda Galaxy were acquired. During the imaging process, color filters were tested to determine their feasibility for future astrophotography, and various image enhancement features were tested using SBIG CCDops. Images were acquired and enhanced in order to examine the equipment's ability to gather usable data at this site, which is marginally affected by campus and street lighting. Finally, operational procedures for use of the equipment are being developed and compiled into a comprehensive manual.

Mechanical vibrations through Palenske Hall, which was retrofitted to house the telescope facilities, to the observing deck are problematic, so high-resolution color images and data will be acquired and used to assess them. Ideally, the AO system could be used to correct for these vibrations, but preliminary investigations proved inconclusive, so we are currently investigating other vibration-mitigating options. Ultimately, color magnitude H-R diagrams of prominent star clusters such as M13 or M15 will be created, and the periodicity of variable stars like Mira will be investigated.