

# Wide-Field Imaging at Fresno State's Campus Observatory

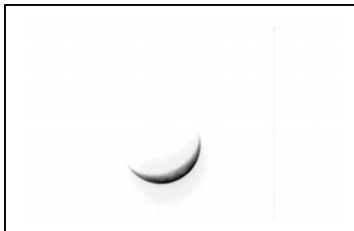
By Fred Ringwald

Fresno State's Campus Observatory has a 70-mm f/5.7 guidescope, made by Vixen. This guidescope is a fully-coated achromatic refractor, and is mounted piggyback on the main telescope, a 16-inch Meade LX200. The guidescope's bracket has fine-adjustment screws for moving its field of view up and down and left and right.

The guidescope was purchased mainly as a "third eye" for public nights, so the telescope operator will know immediately if the telescope drifts off its intended target. (Kids often grab the telescope by its eyepiece.) During public nights, the guidescope is used with an Adirondack Video Astrovid 2000 CCD TV camera, which can just cover the entire Full Moon, on a Toshiba high-resolution 10-inch black-and-white monitor.

The 70-mm guidescope is also useful for CCD imaging. When used with the SBIG ST-8 CCD camera, it gets a field of view of 2.0 x 1.3 degrees, which can be rotated. The guidescope is easy to focus: its 400-mm focal length is 1/10<sup>th</sup> that of the main telescope, so its critical focus zone is larger. Its rack-and-pinion focuser is all one needs to focus, together with a focus mask with two triangles in it, hanging on the wall in the dome. The guidescope is also easy to keep in focus, since it has a focus lock, and also because its short focal length makes it less susceptible to changes in focus, due to temperature. The guidescope's image scale is 4.8 arcseconds/pixel, ten times that of the LX200, so the seeing has to be unusually poor before it becomes noticeable. Stars therefore usually look like pin-points. The shorter focal length also makes the guidescope less affected by guiding errors from the mount: unguided exposures with the main telescope can go 20 seconds before star trails become obvious, but exposures with the guidescope can be ten times longer, with no trailing. Because of this, the guidescope can reach limiting magnitudes nearly as faint as the much-larger main telescope can. I therefore highly recommend it for beginning astro-imagers, and for wide-field imaging in general.

This image of the Moon shows the guidescope's field of view (0.12-s ST-8 CCD exposure through a 4.5-nm Custom Scientific H alpha filter).



The Pleiades (M45) (9x15-s ST-8 exposures through the H alpha filter).

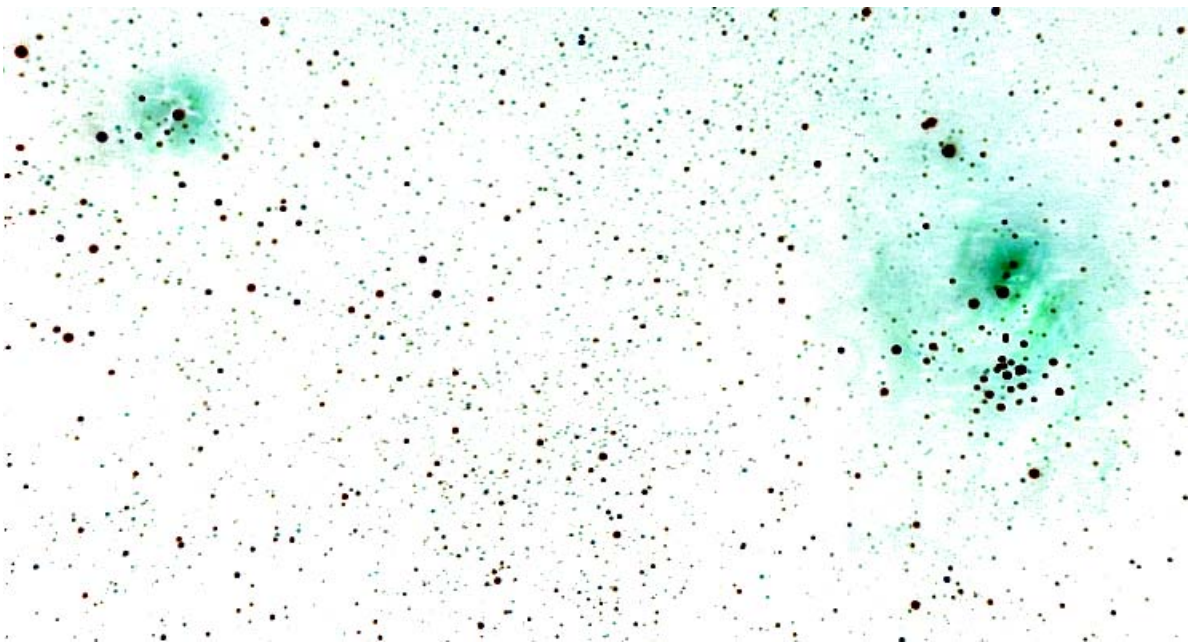


Figure 1: M20, the Trifid Nebula (left) and M8, the Lagoon Nebula (right), black-and-white negative, made with the ST-8 camera through the 70-mm guidescope. The total exposure time was 93 minutes: a full-color image on which this is based (R 9x180s, G 9x180s, B 13x180s) can be seen at the Campus Observatory's gallery page, at:

<http://zimmer.csufresno.edu/~frinwald/gallery.html>.