

CCD Imaging Lab Setup

The CCD Imaging Lab hardware consists of four components:

1. On one end is the *CCD computer*, hooked up to the CCD Camera and Filter Wheel. You'll use CCDSoft on this computer to take your images. You may need to adjust the CCD Camera position slightly to bring your images into best focus.
2. On the other end is the *image computer*. This is your proxy for the night sky.
3. In between is the *lens system*. This is your proxy for the telescope. Fun fact: the lens was formerly employed in U2 spy planes, it's radioactive!
4. A *dark box* encasing the entire system to block incoming ambient light sources like room lights etc.

In this lab you will use the *image computer* to display .FIT files in DS9 that the lens system will then image onto the CCD Camera.

The *image computer* is set up with two monitors that are "cloned", i.e. what is displayed on the monitor outside the dark box is identical to the image displayed on the laptop screen inside the dark box. There is also a keyboard/mouse to manipulate images on screen.

To display an image on the *image computer* screen, open a .FIT file in DS9. Next size the application window until it fits within the brackets drawn in black marker on the monitor screen. Zoom the image in and out in DS9 until you get an image you are happy with on the CCD.

Very bright LCD displays will result in too short a CCD integration time (or saturated image). Too faint LCD displays result in loss of display dynamic range (number of bits/pixel in display). Experiment with brightness levels on the *image computer* to get usable integration times on the CCD while maximizing dynamic range of the image. This will allow the maximal amount of gray scaling, producing a better CCD image.

In order to do flat fielding, open a blank white canvas in MS Paint on the *image computer* and again size it to fit the brackets drawn on the monitor, then image in CCDSoft.