Images and How to Retrieve Them

Once you are taking images you will be presented with a preview of each captured image in the System Status Display. In Figure 5 you can see a small thumbnail of the Orion Nebula. Clicking on it will show a larger version of the preview. However this is just a JPEG version of your raw FITs image that was uploaded to the SkyCenter google Drive. We shared your directory with you. In your browser (in another tab) you will want to have this open to monitor files as they appear. Refresh your view of this directory to see if any new files have shown up (Fig 17). You can right click on the files individually and save them to your computer in your downloads directory or you can highlight a group of them and do the same. For a group of files Google Drive will ZIP them together. You can extract the files on your computer in the appropriate place.

An alternative method (and much more automated) is to download Google's "Backup and Synch" software for your computer. This will require that you have your own Google Drive (Gmail) account. Then you can synchronize the directory we shared with you and images will show up on your computer automatically, moments after they are acquired at the Schulman Telescope.

Biases and Darks

You will also need to download calibration files including biases, darks and flat field images. In your confirmation letter we shared the locations of the our Google Drive folders for this data. More importantly there is also a link to the directory under the Imagery Data menu pull down menu in your WBI. Figure 18 shows a part of this screen for the Master Biases and Darks:

The calibration Biases and Darks come in two different formats. Unless you are using PixInsight to process your images, download the files that end in ".fit" It is important to understand that the master dark frame we are giving you is a long exposure (1800 seconds). This means you will have to use dark frame scaling when you process your images in your favorite program. If you prefer to match your data exposures and dark frame times you are welcome to take your own dark frames; but this uses up valuable observing time! Just select the "Cal FramesI (Dark/Bias)" (Fig 19) under the Live Observing pull down menu. It may be an appropriate option if you are doing unguided imagery and your exposures are short. Taking a little time to acquire these short exposure darks is OK. If your exposures are less than 1 minute in time- you need only subtract the bias images from your data. There is no significant dark current in this short time period. Remember for biases and darks you need to match the temperature and binning to your data. Our file naming convention has this information. "1×1" or "2×2" is the binning state and the last number ("-35") is the temperature.

Flat Field Frames

The Schulman Telescope is equipped with an instrument rotator. This gives you the flexibility to frame images as you would like them and to find guide stars for long exposures. However you also need to use flats that characterize how the chip is being illuminated and the orientation (PA, position angle) matters. Under the Imagery Data menu you will find a link for Flat Fields. Like Dark Frames and Biases above there is also a link to our public Google Drive folder for these files. First you will see folders that are labeled with dates. After your night of observing you will choose the folder that is the data for the morning following your observing session. Then you will be presented with four folders which

represent four camera orientations (0, 90, 180, and 270 degrees). See Figure 20. Choose the folder that is closest to the PA of your target field. If for example your PA is 45 degrees, selecting either flats in the “0” folder or the “90” folder is OK.

There will be many files to download that you will use to create master flats from. These files are not binned (1×1 state). Many image processing programs will bin the flats on the fly before applying them to your data. Alternatively, you can simply bin the images if necessary on your end before using them.

Although downloading these calibration data is an extra step; most remote observing programs do not attempt to make available this quality of calibration data that closely characterize data you acquire. The results are better processed data that will result in better images.