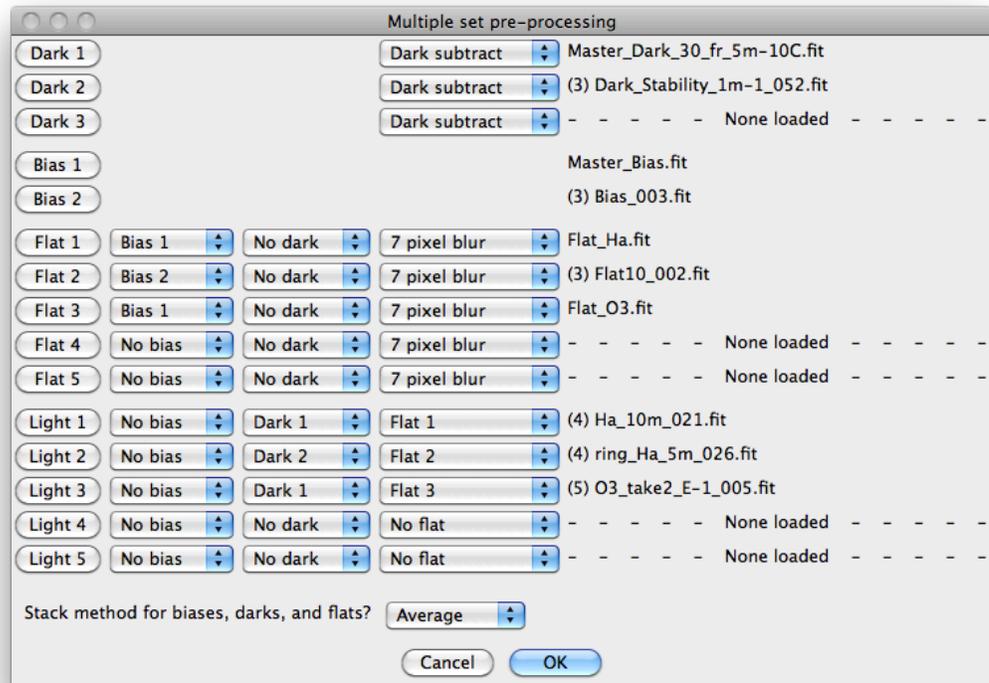


## Multiple Set Pre-processing

Many of us, monochrome imagers in particular, will end up with multiple sets of lights, darks, flats, etc. Using the standard pre-processing tool works, but it can be a bit time consuming to run through it many times for your different sets of images. The “Pre-process multiple sets” tool in the Batch menu makes this process a lot easier.

When you first fire it up, it may not seem as if it’s going to be easy as the dialog may seem a bit daunting. What’s shown on the right here is a sample we’ll walk through. It’s really actually quite straightforward, though.



There are a few things to keep in mind:

1. Define your control frames (darks, biases, and flats) first. Here, you’re saying “these are the frames I’m going to want to use to fix some lights.”
2. You can select individual images or multiple images. *Nebulosity* will stack the frames on the fly if you select multiple.
3. For the flats and lights, you can choose to apply the control frames - the bias, dark, (and, for the light frames, flats). When you’re doing this, you’re telling *Nebulosity*, which control set to apply.

Let’s walk through this example. First, I pressed the **Dark 1** button and when the dialog appeared, I selected an existing master dark frame (“Master\_Dark\_30\_fr\_5m-10C.fit”). This is now *Dark 1*. I then pressed the **Dark 2** button and grabbed three frames (these are actually from another camera with a different sensor size even). Remember, you can select multiple images in those dialogs by shift-clicking, control-clicking (or on the Mac, Command-clicking) the way you can in other applications. Here, we’re telling *Nebulosity* to stack those three dark frames and call that *Dark 2*. Note how next to the name of one of these dark frames (“Dark\_Stability\_1m-1\_052.fit”) you see the number three in parentheses. This is telling you that there are three frames you selected here that will be stacked on the fly.

I did a similar thing to select an individual bias (*Bias 1*) and to stack several raw bias frames (*Bias 2*). Again, these are actually from two different cameras (though they needn't be, of course).

I selected several sets of flats here as well. For *Flat 1*, I've got pre-stacked flats from the first camera when the H-alpha filter was on it. For *Flat 3*, it's the same camera with the O-III filter on it. For *Flat 2*, it's the other camera and I selected several flats here to stack on the fly. For the flats, though, we want to do some pre-processing to clean them up. First, the flats don't have much dark current but they do have bias current. So, I told *Nebulosity* to apply the appropriate bias frames to these flats. The first camera's bias frame was "Master\_Bias.fit" and this was defined as *Bias 1*. For both *Flat 1* and *Flat 3*, we'll apply this bias frame. The second camera's bias frame was *Bias 2* (the stack-on-the-fly bias frame of three individual images, including one called "Bias\_003.fit".) So, *Bias 2* is selected for *Flat 2* and *Bias 1* is selected for *Flat 1* and *Flat 3*. In addition, there will still be some noise here that I may want to reduce before applying the flats to my lights. So, *7 pixel blur* is selected here by default (the default value is set in the Preferences dialog). You've got several options here to choose from. If you're using a one-shot color camera, though, you'll want to do something here to at least remove the Bayer matrix (any of them should remove this).

Now, we move onto the lights. Here, I selected some H-alpha and O-III data from the first camera and put them into *Light 1* and *Light 3*. It's important to note here that I could have put them in any set of lights. I could have done *Light 1* and *Light 2* or even started at the back and done *Light 4* and *Light 5*. Which set you put them in doesn't matter. ***You don't need to match up those numbers with your flats, biases, or darks. Where you do the matching is in those pull-downs.*** So, for these two sets ("(4) Ha\_10m\_021.fit" and "(5) O3\_take2\_E-1\_005.fit"), we're going to apply the same dark frame - *Dark 1*. We'll apply different flats, though, as there were different dust bunnies on my two filters. So, the flat with the H-alpha filter (*Flat 1*) gets applied to the light with the H-alpha filter (*Light 1*). Same deal for the flat with the O-III filter (*Flat 3*) and the light with it (*Light 3*). For the lights from the second camera, *Light 2*, we're going to apply its dark (*Dark 2*), and its flat (*Flat 2*). Of course, since the bias current is contained in the dark frame, we're not going to apply any bias frames here (that would double-subtract out the bias and inject the bias back in).

Once you're all set, press **OK** and go away for awhile. Note that if you have the History window open (View menu), you'll get a full blow-by-blow of exactly what is going on.