# UsingDonutsHooks

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## 1 Using pre/post construction hooks in Donuts

The Donuts `Image` class has 2 special functions. One that works on an image before the standard procedure and one that works on it afterwards. You can sub-class the `Image` class and assign your own functions to the hooks to add extra functionality to Donuts. Below is an example of a pre-construction hook.

In [13]:
```
import os
from astropy.io import fits
import donuts
```

In [14]:
```
os.chdir('/Users/jmcc/Desktop/NG2325-2844_803')
test_file = "NG2325-2844_803_IMAGE80320190523073419.fits"

# open the test file so we can see the values
with fits.open(test_file) as ff:
    data = ff[0].data

print(data)

# sub class the Image class and redefine the preconstruct_hook function
class NewImage(donuts.image.Image):
    def preconstruct_hook(self):
        """
        Here we have access to the full raw_image, untrimmed or cropped in any way
        """
        self.raw_image = self.raw_image - 100.

# Instantiate the new Image class and pass it to donuts
# All the othe
custom_image_class = NewImage

# now we initalise donuts using the modified Image class with our own special feature
d = donuts.Donuts(test_file, image_class=custom_image_class)
```

```
[[942 929 941 ... 945 946 941]
 [936 929 944 ... 934 937 934]
```

```
 [944 940 949 ... 937 940 929]
 ...
 [941 936 940 ... 942 946 936]
 [943 937 935 ... 937 937 943]
 [936 936 943 ... 937 944 931]]


WARNING: Exposure time keyword "EXPTIME" not found, assuming 1.0 [donuts.image]


In [15]: d.reference_image.raw_image

Out[15]: array([[842., 829., 841., ..., 845., 846., 841.],
                [836., 829., 844., ..., 834., 837., 834.],
                [844., 840., 849., ..., 837., 840., 829.],
                ...,
                [841., 836., 840., ..., 842., 846., 836.],
                [843., 837., 835., ..., 837., 837., 843.],
                [836., 836., 843., ..., 837., 844., 831.]])

In [16]: shift = d.measure_shift(test_file)
         print(shift.x, shift.y)

WARNING: Exposure time keyword "EXPTIME" not found, assuming 1.0 [donuts.image]


0.0 pix 0.0 pix
```