GalFIT Progress Report

What we have learned:
Types of galaxies and their components
Went through a tutorial, given by Dr.Finn on how to use GalFIT

Visual classification of galaxies is slow and subjective so astronomers need an automated way to quantify and classify the shapes of thousands of galaxies.

GALFIT uses the Sersic Profile to model all types of galaxies.

To run GALFIT we need to provide to GALFIT

- Input file
- Image
- Noise image
- PSF image
- Mask image

Example of Input Parameters:

```
# Component number: 1
 0) sersic                 #  Component type
 1) 48.5180  51.2800  1 1  #  Position x, y
 3) 20.0890      1         #  Integrated magnitude
 4) 5.1160       1         #  R_e (effective radius)   [pix]
 5) 4.2490       1         #  Sersic index n (de Vaucouleurs n=4)
 6) 0.0000       0         #        -----
 7) 0.0000       0         #        -----
 8) 0.0000       0         #        -----
 9) 0.7570       1         #  Axis ratio (b/a)
10) -60.3690     1         #  Position angle (PA) [deg: Up=0, Left=90]
 Z) 0                      #  Skip this model in output image?  (yes=1, no=0)

# Component number: 2
 0) sky                    #  Component type
 1) 1.3920       1         #  Sky background at center of fitting region [ADUs]
 2) 0.000e+00              0       #  dsky/dx (sky gradient in x)  [ADUs/pix]
 3) 0.000e+00              0       #  dsky/dy (sky gradient in y)  [ADUs/pix]
 Z) 0                      #  Skip this model in output image?  (yes=1, no=0)
```

Example of output:

```
Iteration : 19    Chi2nu: 1.469e+00     dChi2/Chi2: 1.12e-08  alamda: 1e+01
 sersic : (   46.53,       48.26)   22.98            2.62     4.11     0.86   -71.75
 sky    : [ 47.00,  47.00]  7.30e-01  [0.00e+00]  [0.00e+00]
```

COUNTDOWN = 0

Meeting with Dr. Finn and Kim Conger:
https://siena.zoom.us/rec/share/8SIjUJfGUPtBfInflabr5l4gigP8TarEBTIA6B1L2_gEjMAMQDyL0mshErHv-KDj.Pajkh7sFT7Nk0GxD

GALFIT Home page

- https://users.obs.carnegiescience.edu/peng/work/galfit/galfit.html

GALFIT user manual

- https://users.obs.carnegiescience.edu/peng/work/galfit/README.pdf

To do:

1. Put GALFIT on noreaster
2. Run GALFIT on noreaster with only 1 galaxy and see if we can get results
3. Run GALFIT on 1 galaxy with varying start conditions.
4. Run GALFIT on many galaxies with one start condition