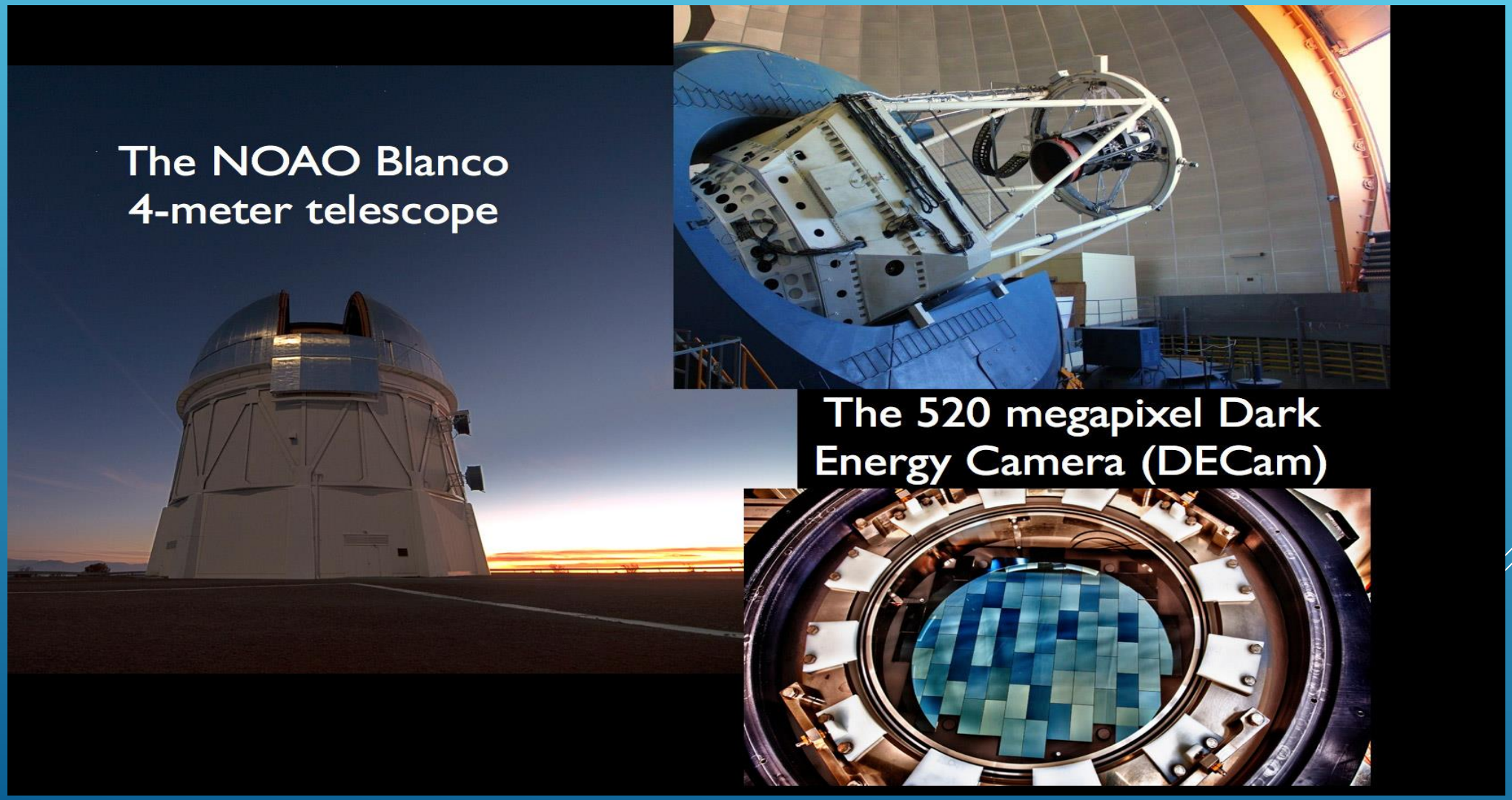
ROTATION PERIODS OF ASTEROIDS

Jordan Van Nest

PURPOSE

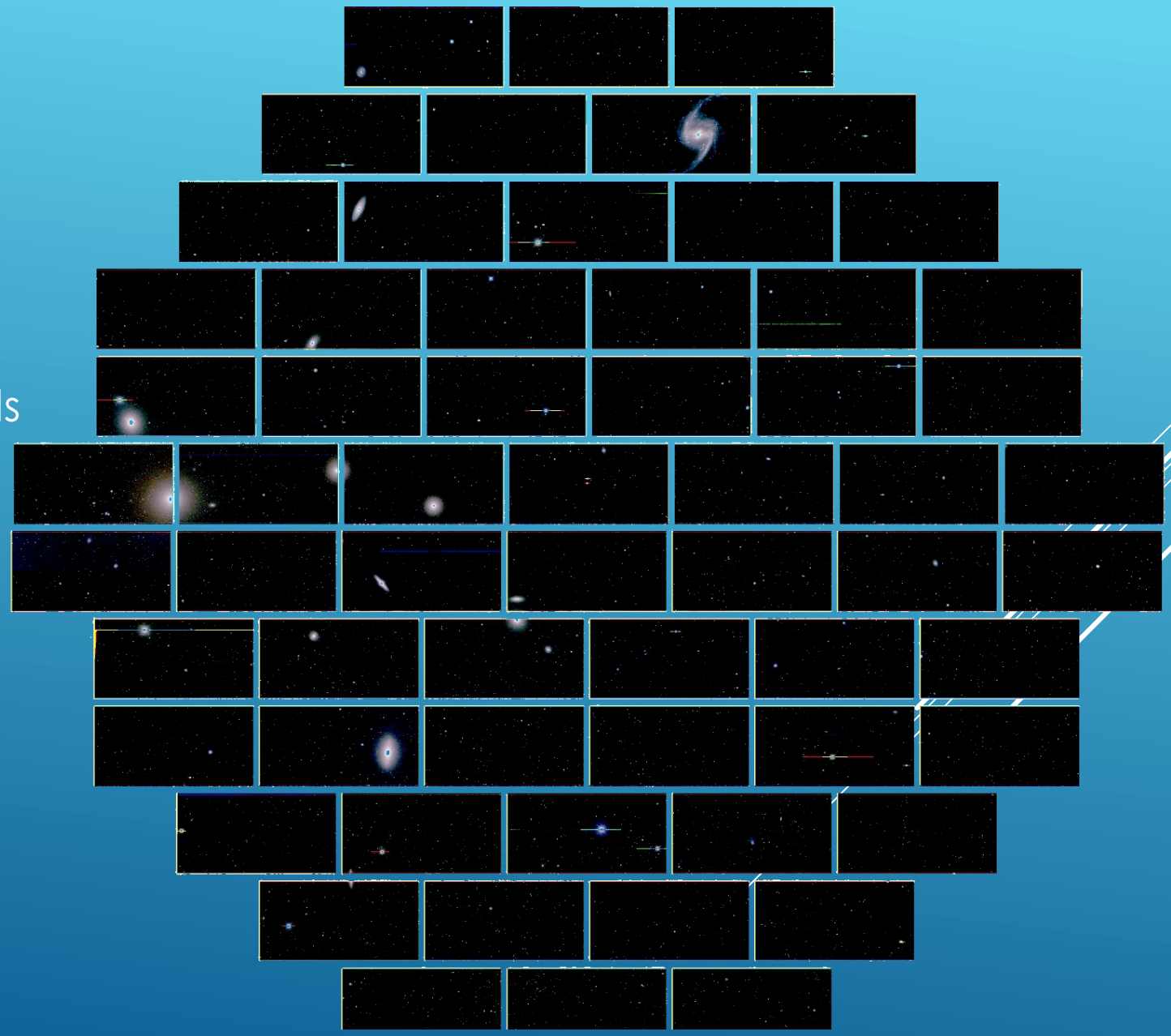
- To find asteroids and calculate their rotation period
- Rotation periods not being studied elsewhere
- Very few studies done at this cadence

OBSERVATION

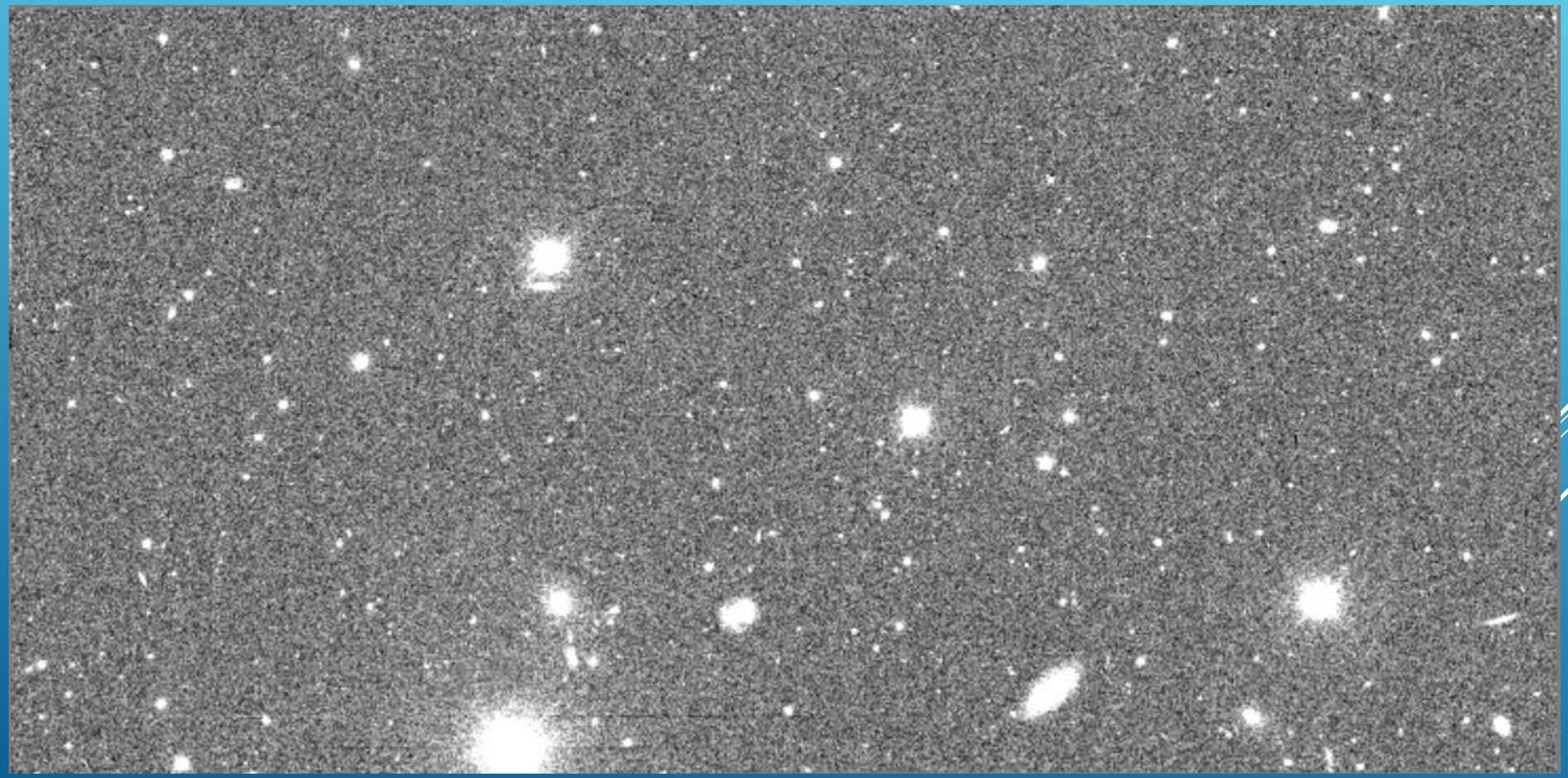


OBSERVATION

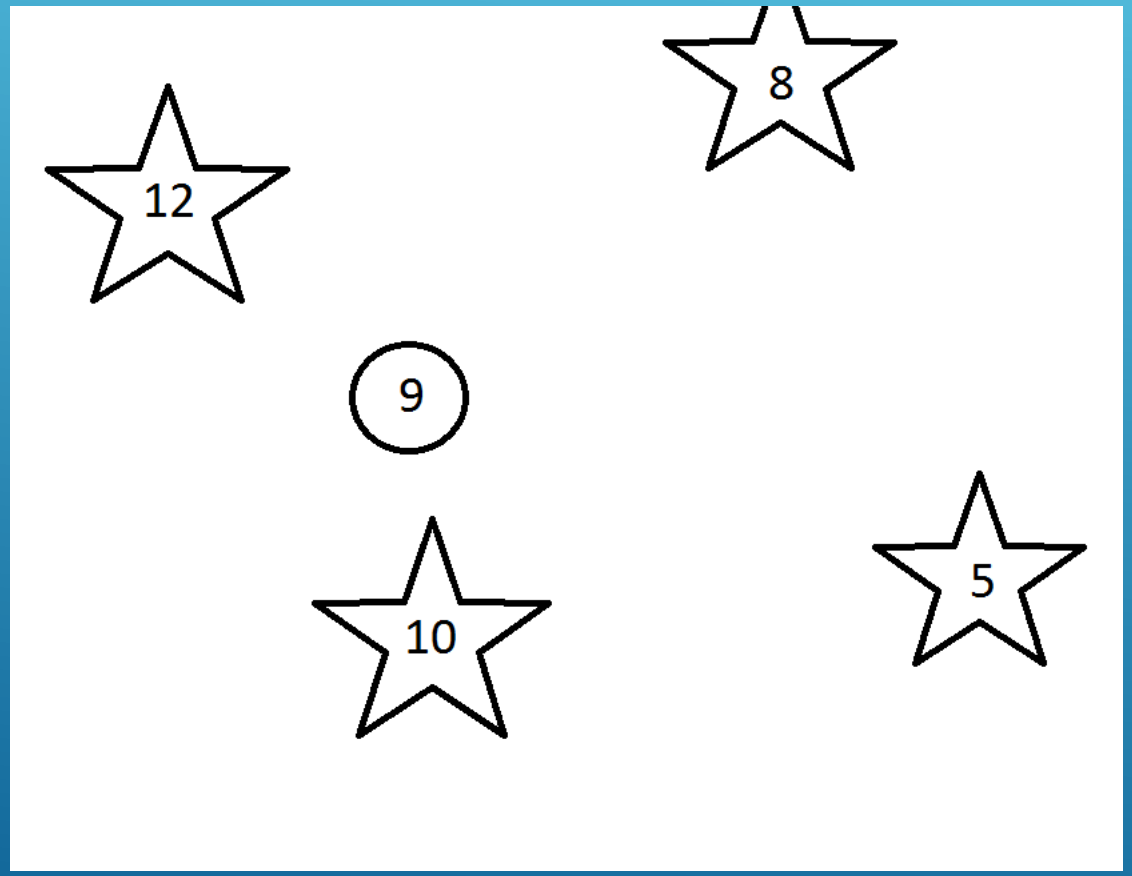
- Consists of 62 CCDs each
  2048 x 4096 pixels
- Exposure time around 90 seconds
- Around 3.5 hours of exposure
  each night: ~140 images
- 8 nights of observation

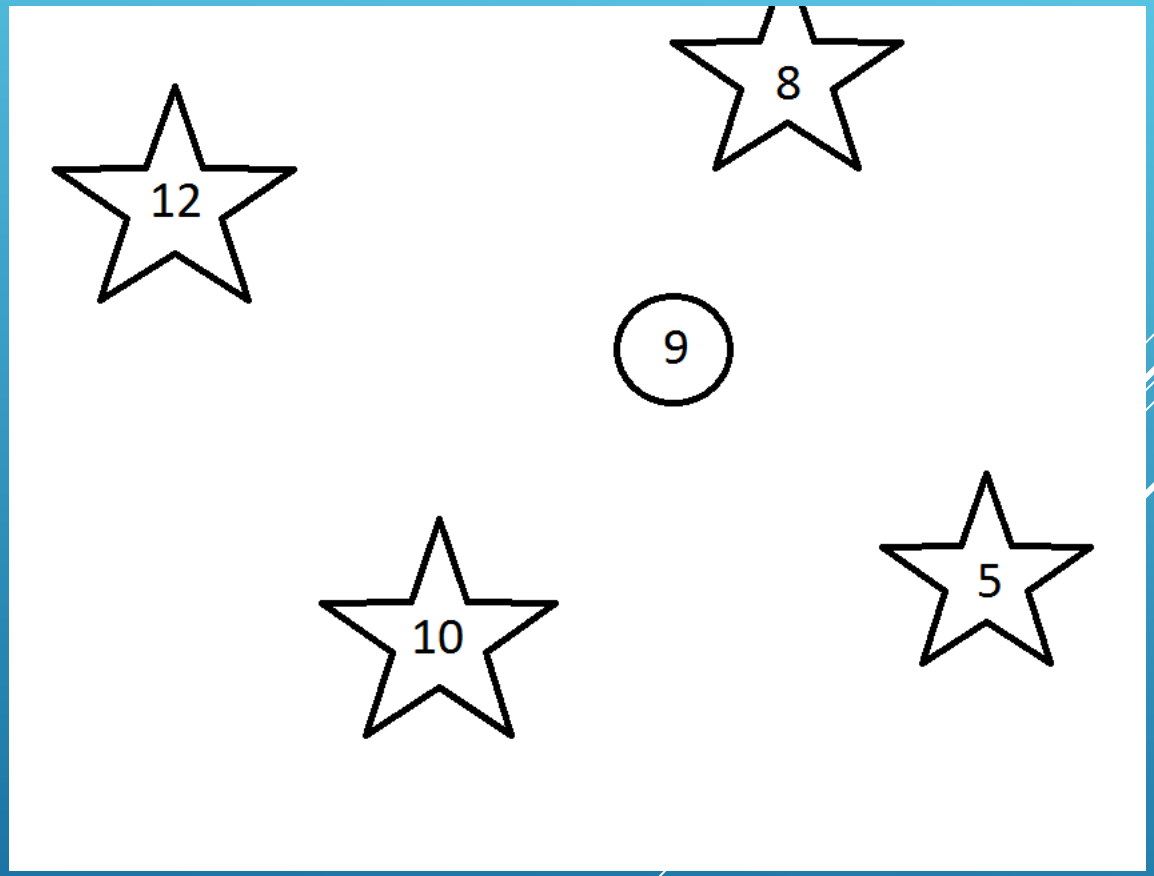


OBSERVATION



FINDING ASTEROIDS





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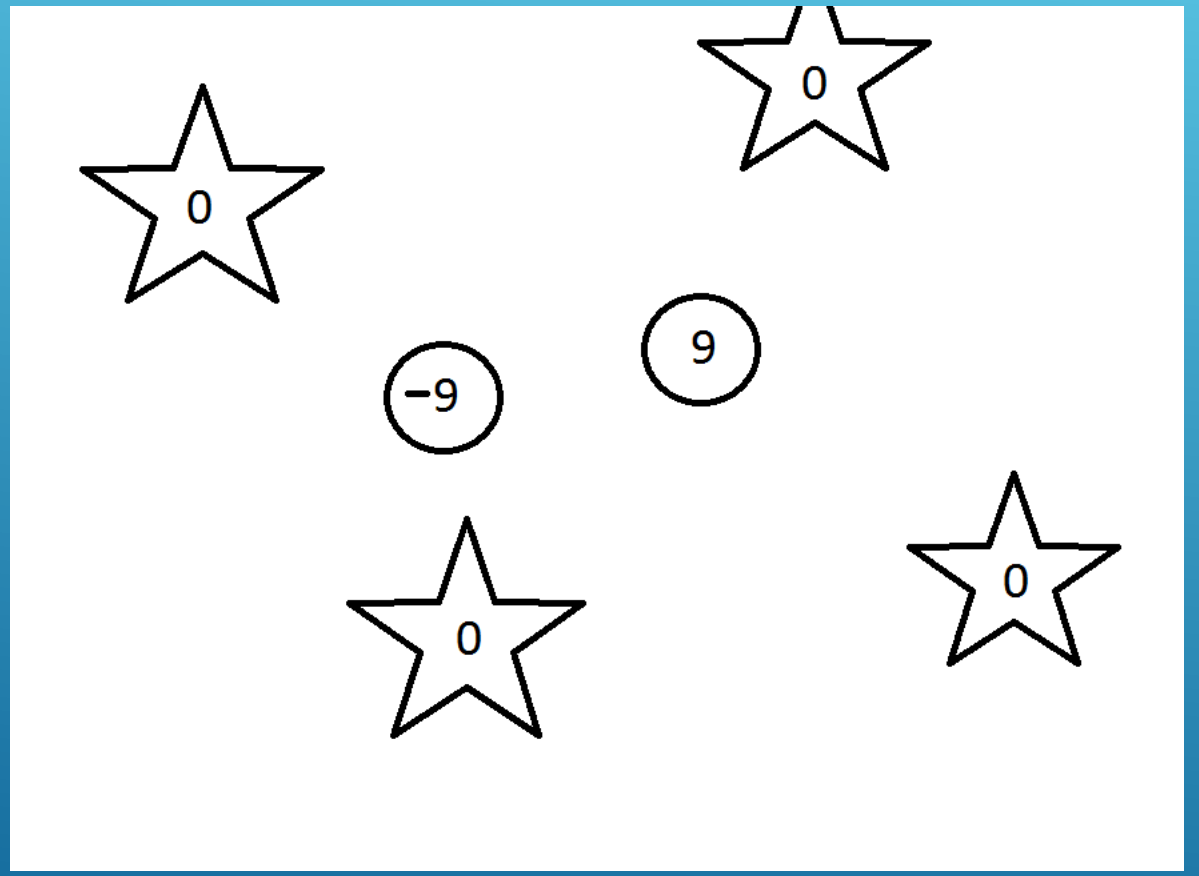

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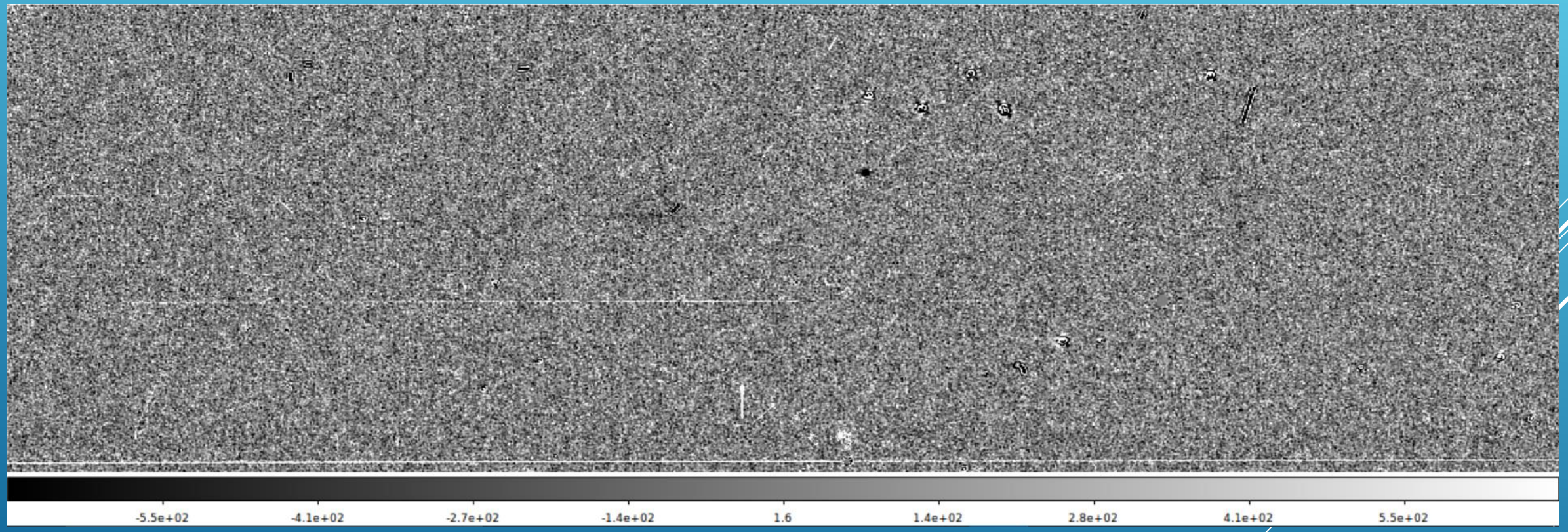
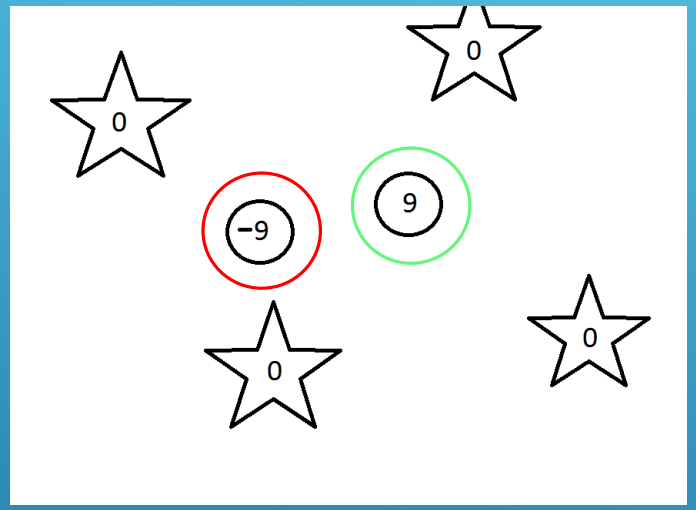
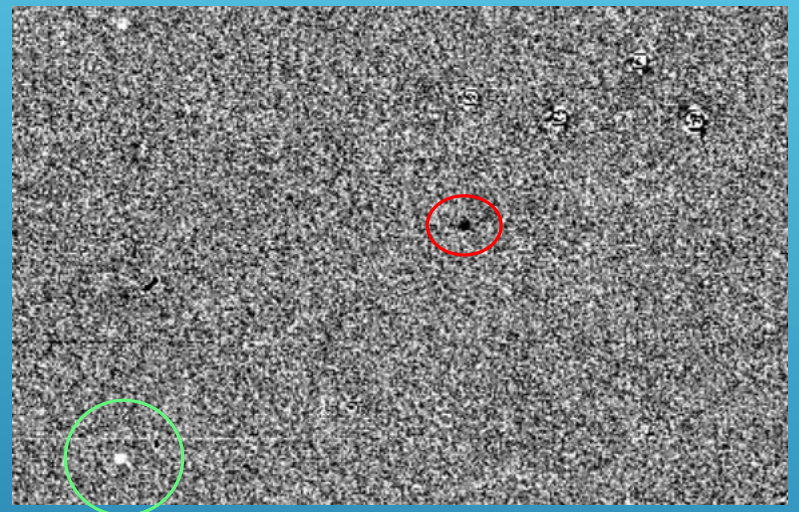
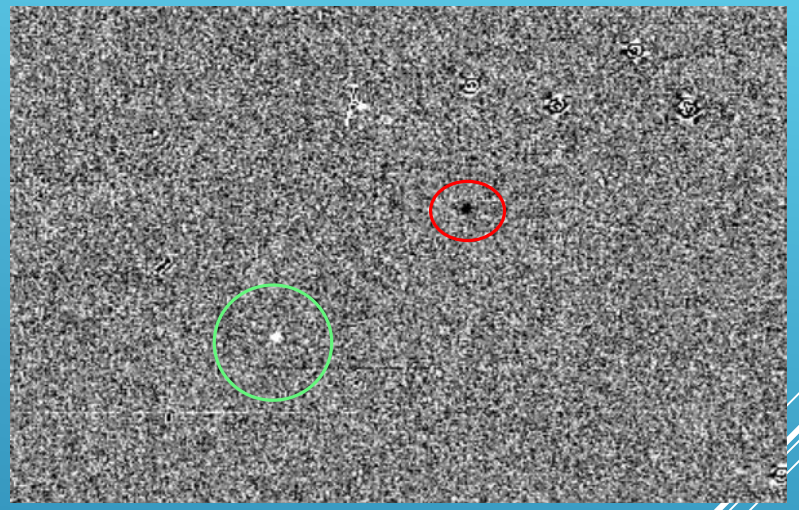
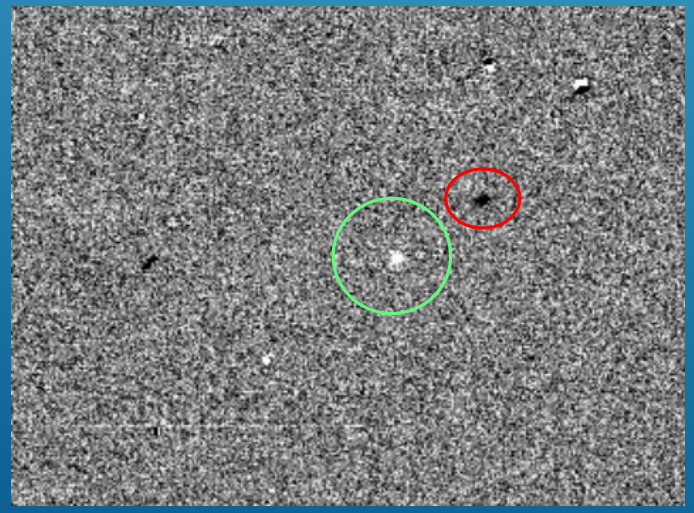


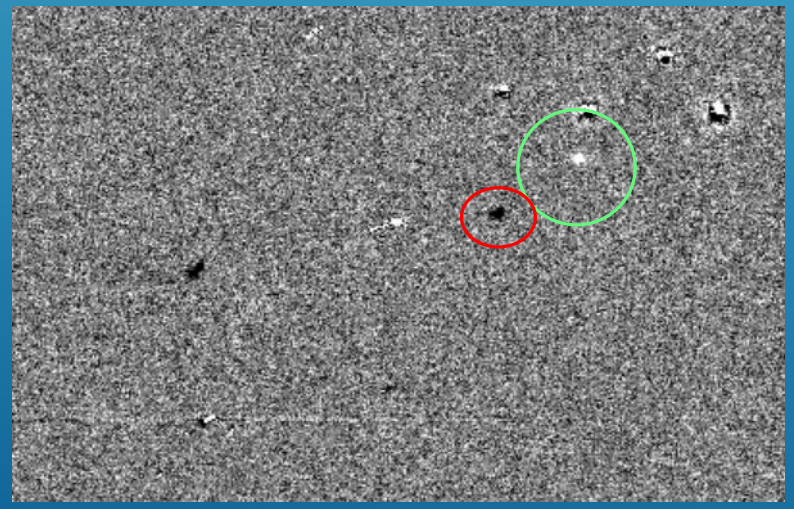
FINDING ASTEROIDS

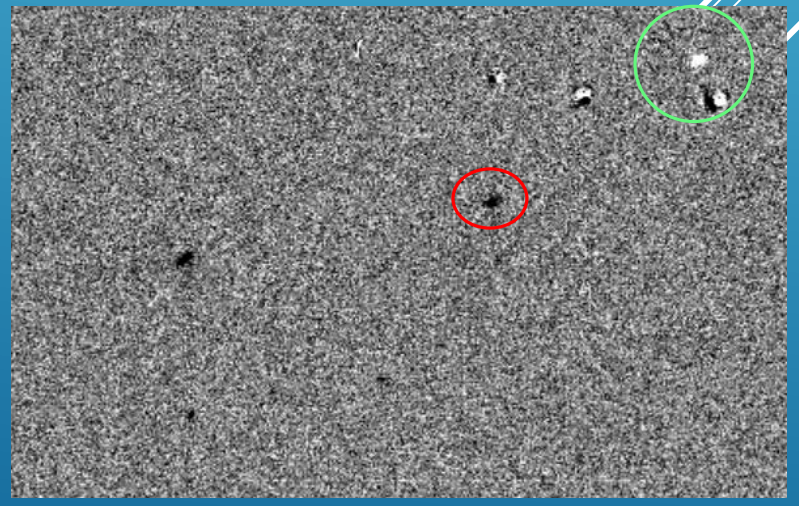








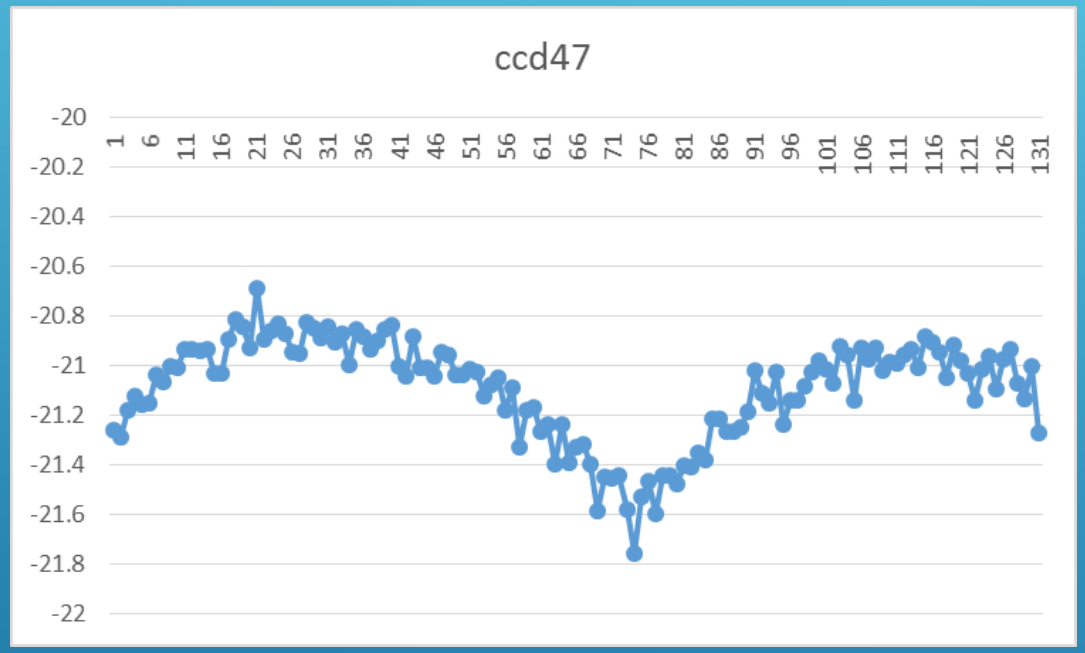


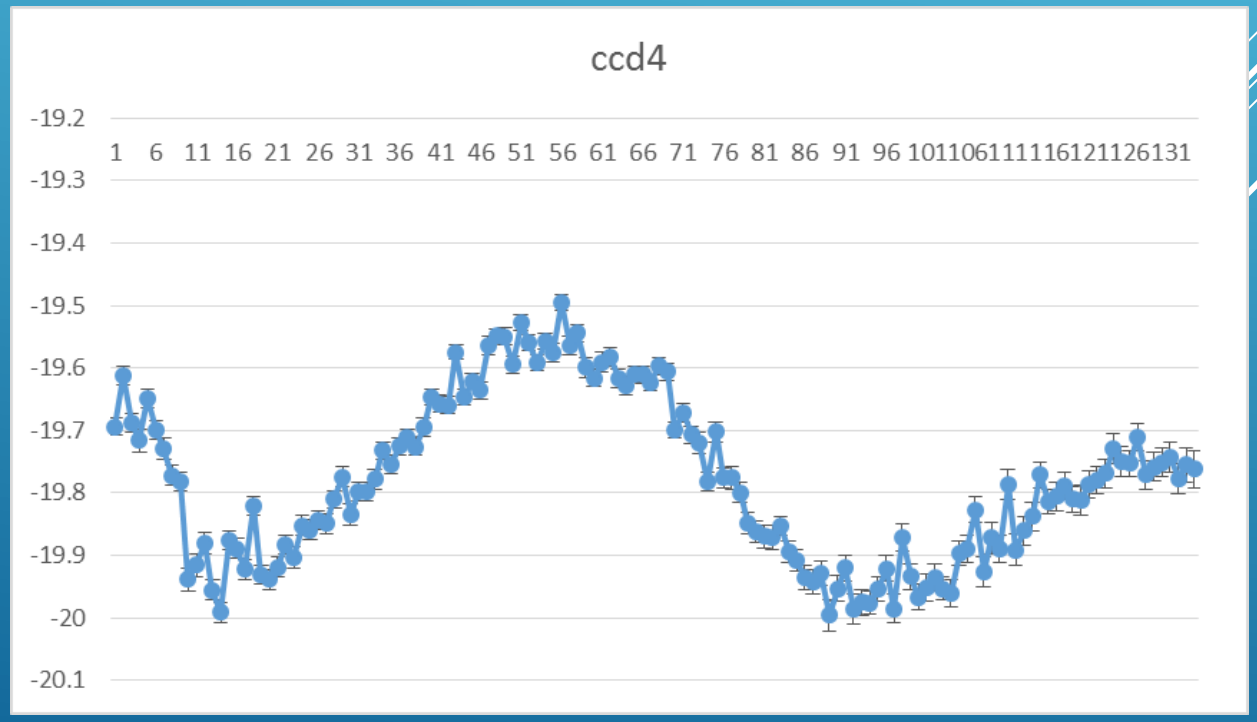


GETTING LIGHT CURVES

- The images are fed through a photometry software
- Each image has a paired catalogue file that lists the location and optical magnitude of each object in the image
- A python script searches these files to plot the optical magnitude of the asteroid throughout the night

GETTING LIGHT CURVES

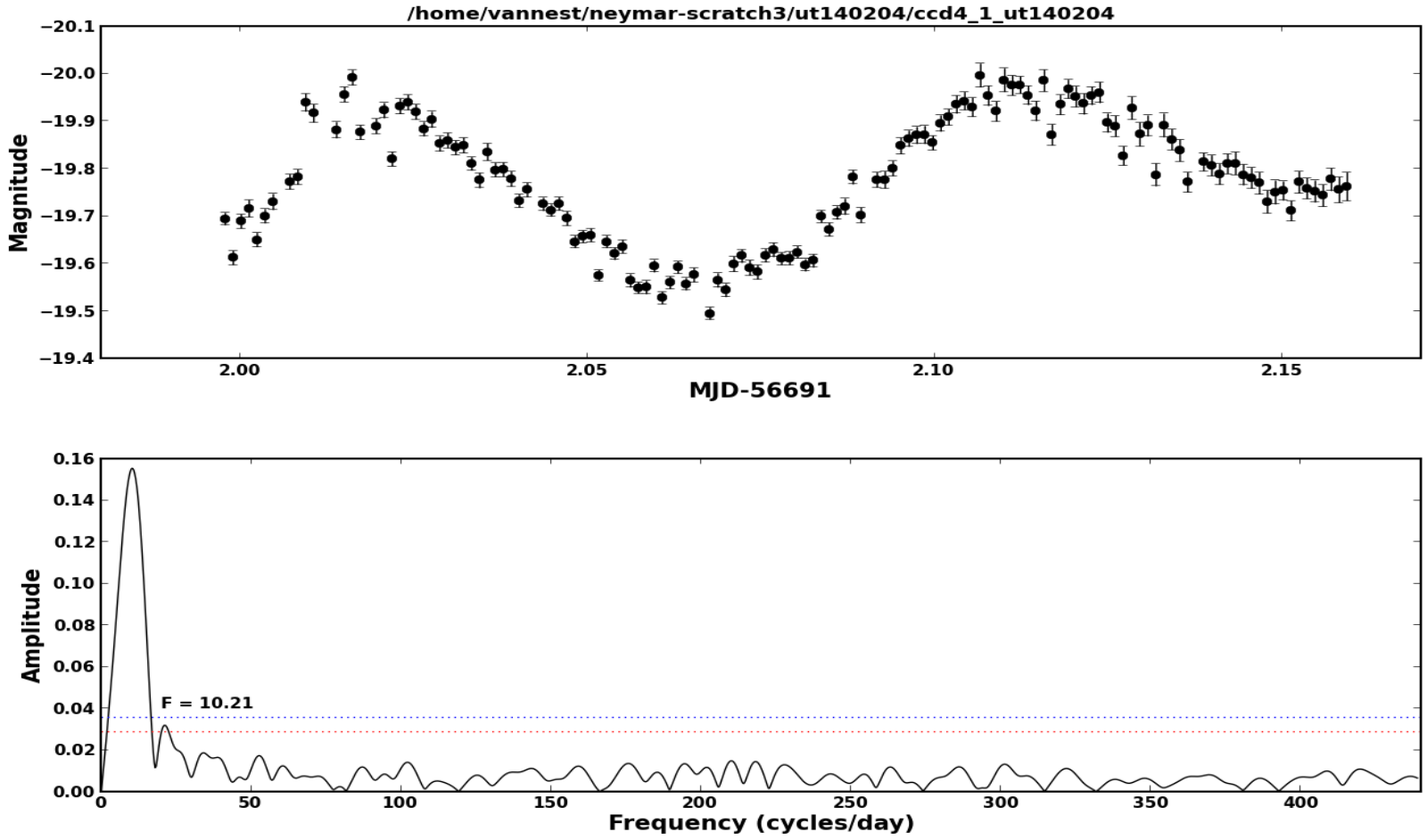




ANALYZING LIGHT CURVES

- Light curves are analyzed with Period04, a Fourier analysis software designed for astronomical data
- Indicates any periodic trends in the light curves, and defines the asteroids' rotational periods

RESULTS


/home/vannest/neymar-scratch3/ut140204/ccd4_1_ut140204
Magnitude
−20.1
−20.0
−19.9
−19.8
−19.7
−19.6
−19.5
−19.4
2.00
2.05
2.10
2.15
MJD-56691
Amplitude
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
F = 10.21
0
50
100
150
200
250
300
350
400
Frequency (cycles/day)

FUTURE RESEARCH

- Finish examining the last three nights of observation
- Have results contribute to a paper