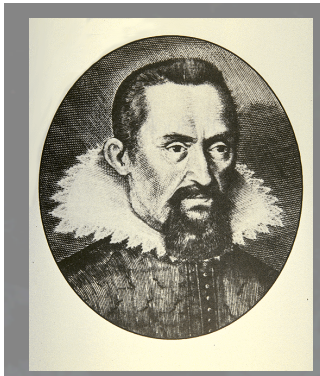
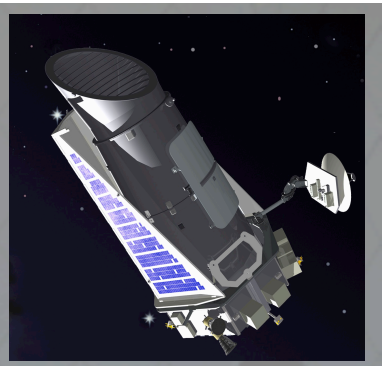


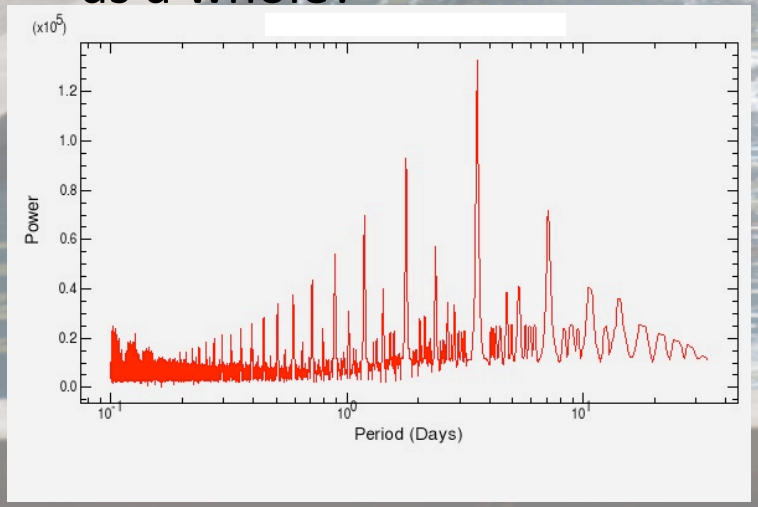
NanoKepler

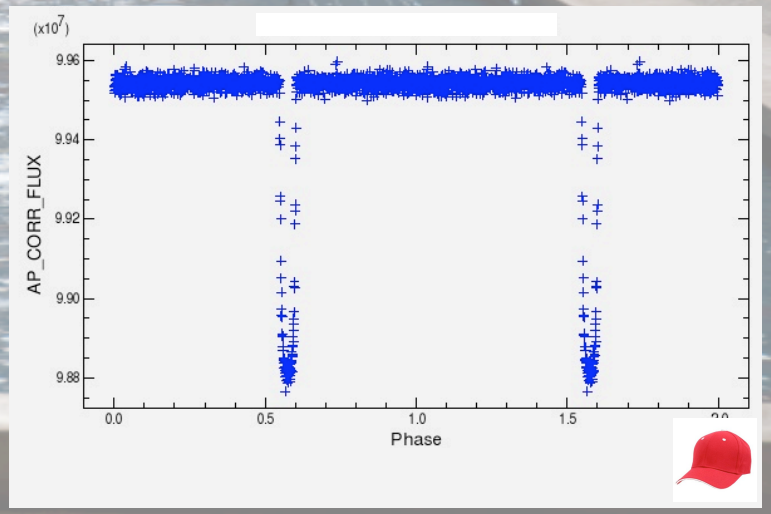
Basic scenario:

very small Kepler Mission analog.



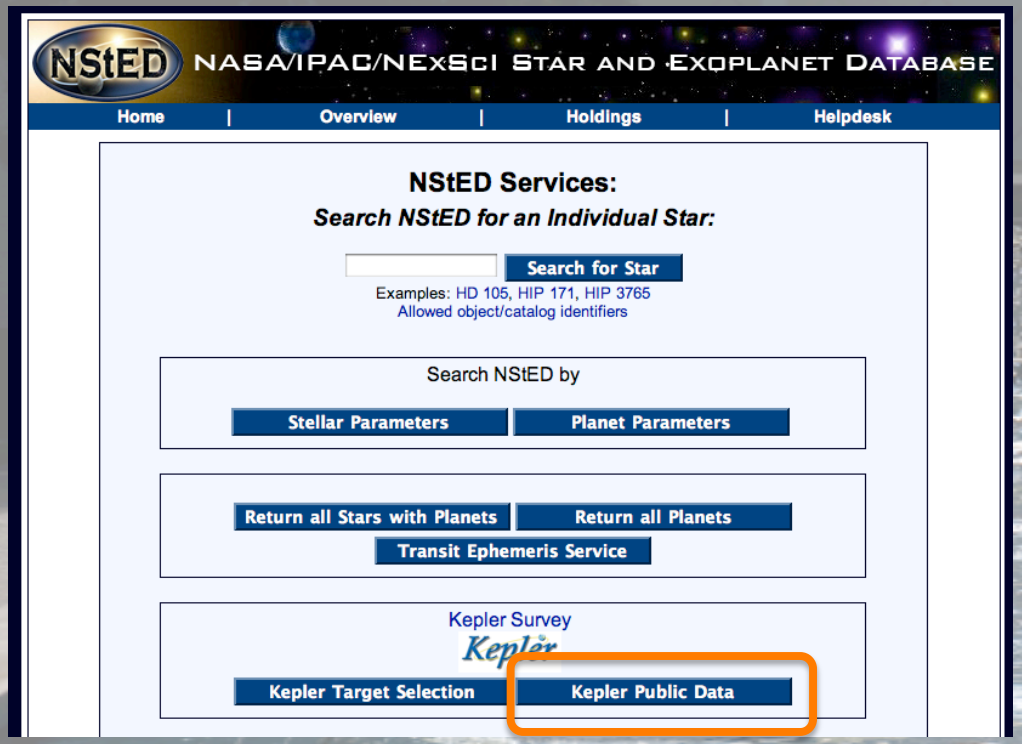
- You have photometric light curves of 50—100 Kepler targets.
- Find and characterize the transiting exoplanets within them.
- Are there any “false-positives”? What are they or could they be?
- What other kind of variable sources can you find and identify?
- What can you say about the variability characteristics of the dataset as a whole?





NanoKepler

"Observations & Data Reduction"



- The website below contains a link to a textfile with the Kepler ID numbers of your "survey".
- Go to NStED website (Kepler Public Data) and access / download data.

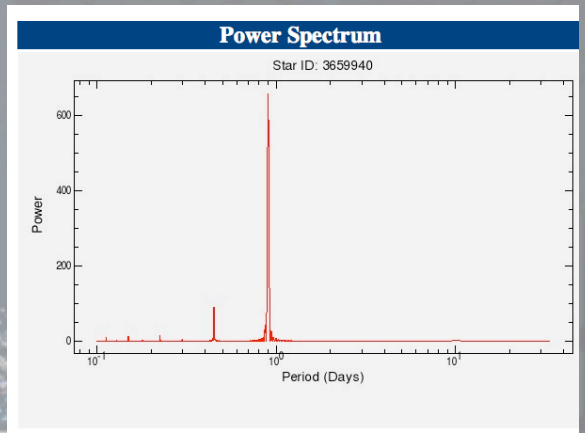
http://nsted.ipac.caltech.edu

http://web.ipac.caltech.edu/staff/kaspar/sagan2010.html

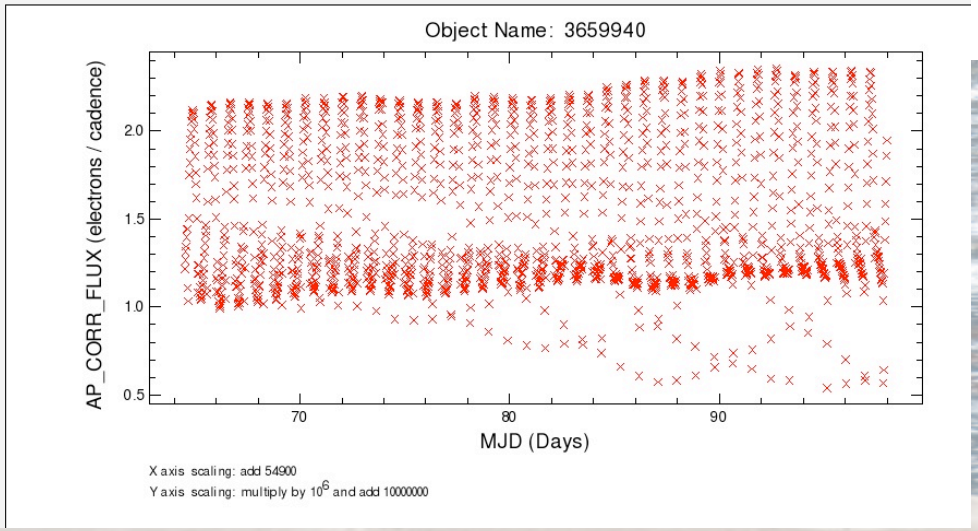
NanoKepler

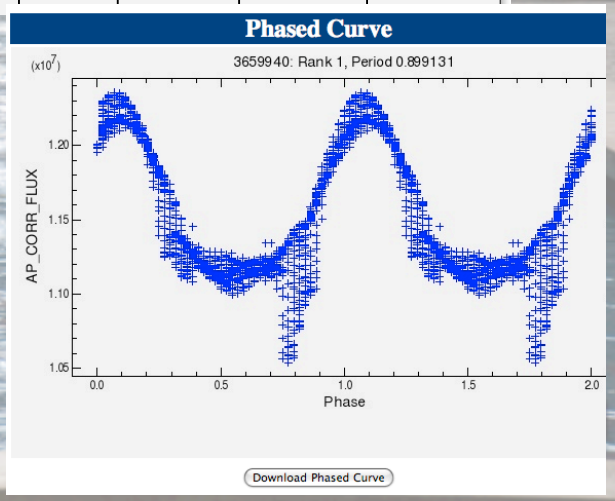
Analysis

Cntr	Star ID	Target Type
1	4758622 (Plot Time Series) (Compute Periodogram)	long cadence
2	8308688 (Plot Time Series) (Compute Periodogram)	long cadence
3	9657171 (Plot Time Series) (Compute Periodogram)	long cadence
4	4276756 (Plot Time Series) (Compute Periodogram)	long cadence
5	11197060 (Plot Time Series) (Compute Periodogram)	long cadence
6	8175121 (Plot Time Series) (Compute Periodogram)	long cadence
7	8374499 (Plot Time Series) (Compute Periodogram)	long cadence
8	4574338 (Plot Time Series) (Compute Periodogram)	long cadence
9		
10		



Rank	Period	Power	P-value	Link
1	0.899131	659.075678	0	Phased curve
2	0.448418	90.299859	0	Phased curve
3				





see http://web.ipac.caltech.edu/staff/kaspar/sagan2010.html for more info

NanoKepler

Results & Discussion

- Are there planet transits in the dataset? What can you say about them? What can you say about the planets?
- What other kind of variable stars are there? What are they?
- Are there signals that look like planet transits, but are not (false positives)? What could cause them?
- What kind of statistical properties (e.g., chi-squared, RMS, etc) are typical for the different kinds of variable stars (i.e., how would you search for a certain kind of variable in a large dataset)?
- What are statistical properties of the dataset (e.g., RMS as a function of brightness, how many variable stars, how many planet transits, how many non-variable stars, etc)?
- Are there periodic signals present in all light curves ("red noise")? What could typical sources of red noise be in space-based data such as these?
- Which algorithm or method is preferable for which goal (e.g., for period-phasing or for transit fitting)?
- Isn't NStED the coolest thing ever?

see http://web.ipac.caltech.edu/staff/kaspar/sagan2010.html for more info