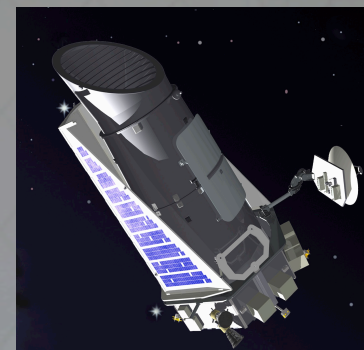


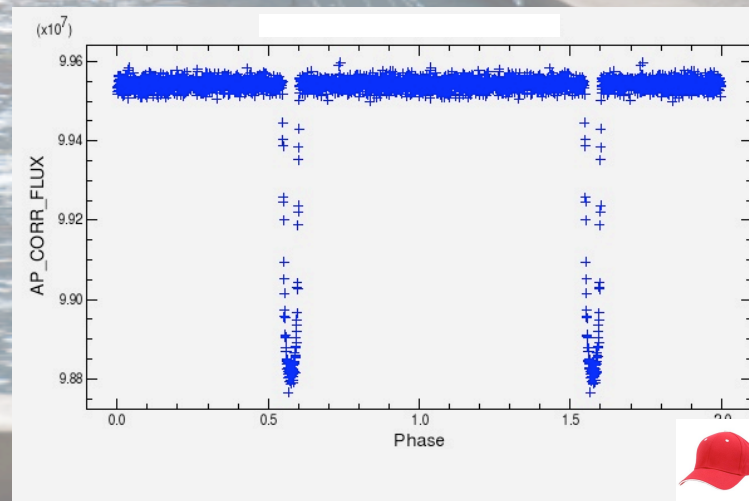
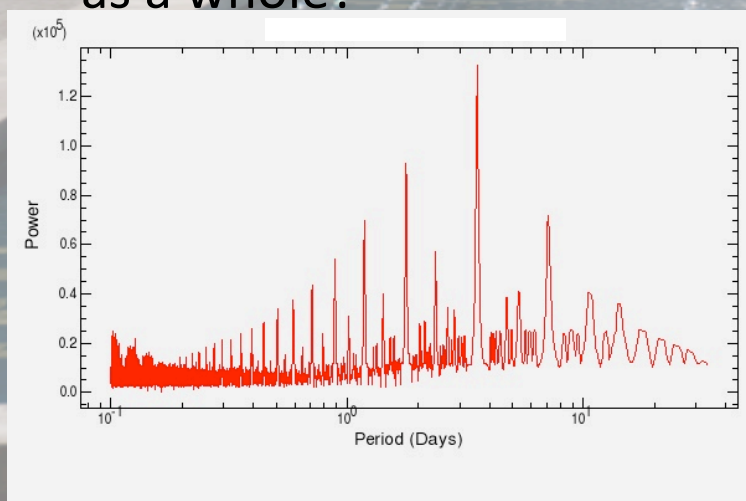


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Basic scenario:
very small Kepler Mission analog.

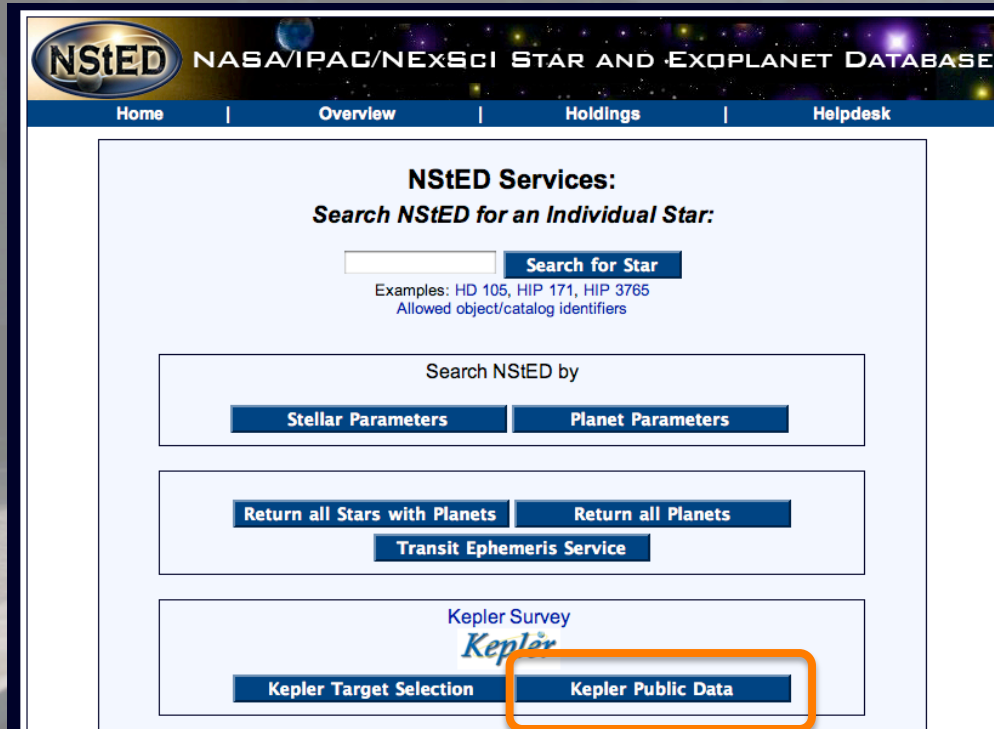


- You have photometric light curves of 50—100 Kepler targets.
- Find and characterize the transiting exoplanets within them.
- Are there any “false-positives”? What are they or could they be?
- What other kind of variable sources can you find and identify?
- What can you say about the variability characteristics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



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“Observations & Data Reduction”



The screenshot shows the NStED website interface. At the top, there is a navigation bar with links for Home, Overview, Holdings, and Helpdesk. Below this, the main content area is titled "NStED Services: Search NStED for an Individual Star:". It features a search input field with a "Search for Star" button. Below the search field, there are examples: "Examples: HD 105, HIP 171, HIP 3765" and "Allowed object/catalog identifiers". There are two main sections for searching: "Search NStED by" with buttons for "Stellar Parameters" and "Planet Parameters", and "Return all Stars with Planets" with buttons for "Return all Stars with Planets" and "Transit Ephemeris Service". At the bottom, there is a section for "Kepler Survey" with buttons for "Kepler Target Selection" and "Kepler Public Data", which is highlighted with an orange box.

- 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.

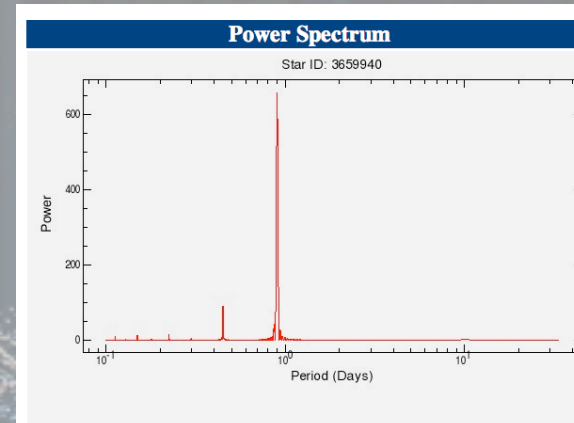
<http://nsted.ipac.caltech.edu>

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

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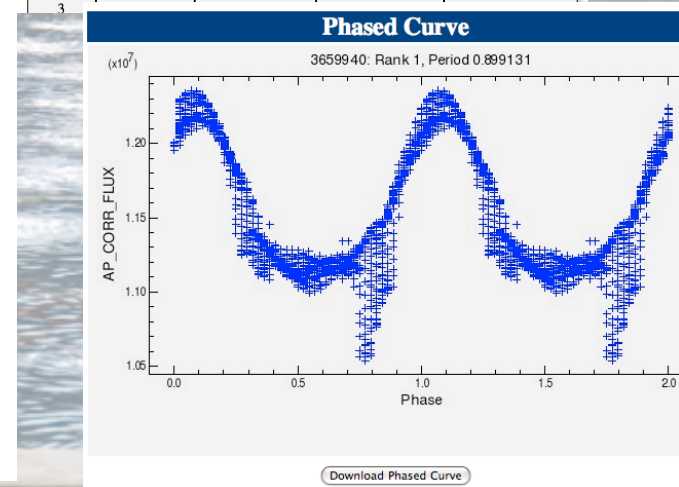
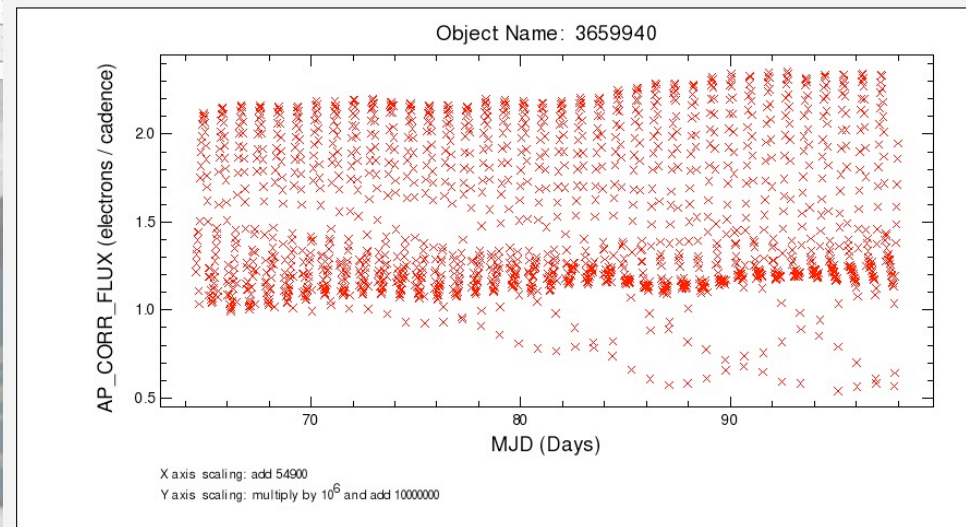
Analysis

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		
11		



Download Periodogram (ASCII)

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

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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