Project Topics
Initial ideas by Thursday, March 14 (during spring break), via email

Note: some topics have been discussed in class while others have not (or somewhere in between). It's fine to choose a topic that we've discussed and read about, but the presentation will have to go beyond what we've already done.

Process: start thinking seriously about topics by break; share your thoughts with me and get my feedback (by March 14); choose a topic by the Wednesday after break (March 20). Everyone will prepare a 20 minute presentation, meet with David to discuss it at some point in the research and preparation stage, then practice the actual presentation for David, and then give their presentation during class – 20 minutes plus 10 for questions.

v.1 : this list will be updated, with references added, and posted to the class website

Topics:

Tides – circularization (eccentricity distribution); distortion of the star and the effect on light curves [these are/could be two separate topics]

Exoplanet atmospheres – detection/diagnostics; modeling [also enough for at least two separate presentations]

Planet formation theory

Direct imaging

Gravitational lensing

Planet migration, multi-body effects

The Kepler mission

Computational techniques for identifying transits in stellar light curves

The Rossiter-McLaughlin effect – measuring planet orbit and star rotation axis (mis-)alignment

Biomarkers (prospect for future detection)

Other topics related to astrobiology and life in the Universe (e.g. considerations for "habitable zones")

Exomoons (possible detection techniques/strategies)

Results from first thousand exoplanets (and possible explanations):
- Close in, hot Jupiters
- High eccentricity planets
- Are metal-rich stars more likely to host exoplanets?
- Free-floating planets

Just curious/interesting results; specific systems:
- Multi-planet systems
- Very high density planet
- Planet orbiting binary stars
- Planets around a pulsar