Astro 118 – Physics of Planetary Systems
Problem Set #1, Winter 2014
Due in class on Wednesday, January 15, 2014

1) Read the review article by Basri & Brown (2006) on planet definitions. Discuss the physics and physical phenomena that help determine the characteristics of planetary objects of increasing mass (from small to large). Summarize the overall conclusions of this paper on the definition of a "planet." Probably 1.5 single-space pages will suffice.

2) Go to http://exoplanets.org/plots/ and make plots. Make two "Scatter Plots" (meaning, an X vs. Y plot). In class on the first day I showed several that I had made. Make a plot of "Mass of Star" vs. "Density of Star." Preferably log for both axes. What trend do you see? Why might this trend exist? Now for planets plot "Orbital Period" vs. "Semi-Major Axis." Preferably log for both axes. Explain this *clear* trend. Someone famous first noticed this, a few hundred years ago. Why is there some scatter? You can export the plots as PNG or PDF images. Include yours in your writeup.

3) Go to the Astrophysics Data System (ADS) at http://adsabs.harvard.edu/abstract_service.html. This is the database of all scholarly papers in astronomy, astrophysics, and much of physics and geophysics. Do an "Authors" search for articles by a professor in the UCSC astronomy department, or do a "Title Words" search on a planet or astrophysical object of interest. There will be MANY hits. Print out the *first page*.