

Astro 14 – Astrophysics: Solar System and Cosmology
Spring 2018
Prof. David Cohen

First Midterm

Guidelines:

The exam will be held 8 to 10 pm on Tuesday, February 27 in SC 161 (Chemistry seminar room).

It is closed-book, but students can bring one page of paper (regular, 8.5 by 11 inches) with hand-written notes on both sides. These notes can be anything (equations, words, sketches) but they have to be hand-written by the student.

You will be provided with all necessary tables from the appendix of the textbook, including physical and astronomical constants and conversion factors, and the properties of planets and moons.

The scope of the exam will be the material from the first four weeks, as detailed in the list below. The material from this week, starting with Solar System formation will *not* be on this exam.

Topics:

Basic contents of the Solar System, patterns of motion (e.g. planets orbit in a plane) and structure (terrestrial vs. Jovian planets)

Distance measuring techniques

Angular size and angle-length-distance relationship

Basic properties of light: electromagnetic spectrum, photons from transitions of electrons in atoms, relationship among wavelength-frequency-photon energy

Kirchoff's laws (three different types of spectra)

Inverse square law

Blackbody radiation (conditions for a light source to be a blackbody, Planck spectrum, total energy scales with temperature to the fourth power, peak wavelength vs. temperature)

Doppler shift

Newtonian gravity

Newton's laws of motion

Centripetal acceleration, angular momentum, orbits and Kepler's laws

Solar System object properties and how we determine them