Review Topics for Exam #1
ASTR 170B1 section 006

Your Professor and preceptors are anxious to help you during office hours, study sessions, scheduled review sessions, and by appointment.

Optional review sessions:
Wednesday (September 20) from 6-8 pm in room 450 (Steward)
Other possible review sessions led by our preceptors & TA – stay tuned!

Exam: Friday (September 22) from 9-9:50 am in room N210
Scratch format. Closed book & closed notes.
BRING your CAT card and a scratching device (penny, toothpick, etc.)

You may also bring:
- a calculator, but most problems will only use round numbers or powers of ten
- a handwritten, double-sided “crib sheet” of notes on letter-sized paper

Exam format:
Twenty-four multiple-choice questions in the following six thematic categories, each with four questions:
- Motions of Celestial Objects; Scientific Notation; Heliocentric Perspective; Phases of the Moon and Planets; Seasons; Newton’s Laws and Gravity

One short-answer question will require that you apply all the Daily Skills we have accumulated.

Suggested study methods:
1. Review and practice all our previous homeworks and quizzes. The solutions are posted online along with follow-up questions to guide your studying.
2. Understand and practice concepts; don’t memorize details. For example, do you really understand the meaning of the term “light-year”?
3. Review all the Daily Skills (numerical & communication)

Motions in the sky:
understand time scales and directions of the following motions
understand how these motions are explained with the modern heliocentric model
stars:
- why do celestial objects (stars, constellations, Moon, planets, …) rise daily in the eastern sky and set in the western sky
- Polaris and its altitude above horizon versus latitude
- stars rise 4 minutes earlier each night
Moon:
why does it rise ~50 minutes later each day/night?
phases and their cause

Sun & seasons:
altitude at noon
   How does it vary throughout the year?
ecliptic, solstices, equinoxes
   Why does the Sun’s position move eastward along the ecliptic each day?
zodiacal constellations
   Why do we see different constellations at different seasons?

planets:
   rise/set
   move eastward along ecliptic
   retrograde motion
   phases that can be seen from Earth

The Greek’s “geocentric” model:
   How did they try to explain each of the motions listed above?
   How did Galileo’s observations of Venus conflict with the geocentric theory?

What causes the seasons?

Newton's three laws of motion:
   Applications or examples of these “laws” such as seat belts, elliptical orbits, rockets, etc.

Gravity:
   Newton's law of gravity
   "weightlessness", center of mass, escape velocity
   basic idea of tides

Study Methods:
   understand - don’t memorize!!
   review lecture notes, lecture recordings, and demonstrations
   review homework problems (solutions and followup questions are posted)
   review quizzes (solutions and followup questions are posted)
   test your understanding by:
      posing variations of the homework problems
      practice using the Follow Questions for studying in the quizzes
      try review questions at end of each chapter in our inline book
   practice phases of the Moon
   practice the “Daily Skills” we have emphasized

Arithmetic concepts
   proportionality
convert between words, fractions, percentage, ratios
scientific notation and powers of ten
metric system units including prefixes like kilo, milli, etc.
what is a “scale model”? 

Understand these terms:
radius, diameter, circumference
mass, weight
astronomical unit (AU)
light-units (e.g., “light year”)

Terms we have used to describe objects in the sky:
celestial sphere
celestial north & south poles
celestial equator
horizon, zenith, meridian
star trails around Polaris
ecliptic, zodiac
retrograde motion
light-year
angle measurements (degree, arcminute, arcsecond; your fist)
light pollution