

Review Sheet for Quiz #1 (4 Feb.)

The best preparation for this mid-term is to review: all the homeworks, your lecture notes, and the assigned text readings. The 50-minute exam will be mostly short-answer, with a few multiple choice questions.

What follows is a listing of major topics to review.

Course themes and other categories

1. What are the basic facts of the solar system?
 2. Why is there such a huge variety of places and conditions in the solar system?
 3. How did the solar system get to its present state?
 4. What is the relationship between planets & life? (the new field of astrobiology)
 5. What is the cosmic context for planet Earth (and for *us*)?
 6. What techniques do we use to date objects and planetary bodies? How do we determine what something is made of?
- meteors, meteorites (two main types and their origins); their age and how radiometric dating works
 - evidence for origin of meteorites in asteroids
 - differentiated bodies; densities of liquid water, ice, rock, iron; volatile and refractory materials; how can we have both in the same meteorite?
 - asteroids, near Earth objects
 - Kuiper Belt objects and the debate over Pluto
 - comets: structure (nucleus, coma, tail(s)), composition and origins
 - impact craters; crater counts and estimating a surface's age
 - the Moon; maria and highlands; origin of Moon (why Earth-impact idea is favored)
 - evidence for heavy bombardment in early solar system

 - gravity; orbits (Kepler's Laws and Newton's physics)
 - tides and their effects on Earth's rotation rate and the Moon's orbit
 - electromagnetic radiation; spectral signatures of planet surfaces; "blackbody" radiation

 - basic timeline for early Earth-Moon history from 4.6 to 3.5 Ga
 - Earth: reasons for plate tectonics, lack of craters, strong magnetic field; aurorae
 - Earth: heat of formation, heat from radioactive decay, and heat from solar radiation; cooling rate
 - Earth's atmosphere: gravity "versus" heat energy and escape velocities of atoms/molecules
 - Earth's atmosphere: composition, origin, effects of life, greenhouse effect
 - how would Earth be different if it had more mass? was smaller? was closer to Sun? had less atmosphere? had no water in its atmosphere?