

Atoms to Galaxies PHY 102
Exam #1 Study Guide
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Use this as a study guide for the material we covered in class, in the lab, in the textbooks, on the homework, and what concepts you should expect to see on the first exam. Topics in **BOLD type** are ones I consider important, and may emphasize over others.

The topics below are from the class notes, parts of Chapters 1-4, and 16 in the book *Discovering the Universe*, and Chapter 1 in the book *Cartoon Guide to Physics*. You can see exactly which sections we covered in class from the schedule in the course syllabus.

The exam will be multiple choice, and it will be closed book and closed notes. If you can answer the questions here in a general conceptual sense, you should have little trouble picking the right answers out of a multiple-choice list on the exam itself.

You should also consider using the end-of-chapter features and sample problems in the textbook, as well as any of the textbook's online resources to help you study.

Light and the Spectrum

What is the speed of light?

Why is light such an important tool for astronomers?

How are different kinds of light waves arranged in the EM spectrum?

What is the relationship between frequency, color, wavelength, and energy?

What do these equations express? $c = f \lambda$ and $E = hf$

Nature of Science

What are the characteristics of a good scientific theory?

What might cause a scientific theory to be changed or abandoned?

What is the difference between science and pseudoscience?

What units, and what size scales are needed to measure the universe?

Naked Eye Astronomy

Why do stars, Sun, Moon, and planets all appear to rise and set in our sky?

What is the Celestial Sphere? How is the coordinate system set up? What are some of the major features on the celestial sphere?

What is the correct explanation for the phases of the Moon?

What is the correct explanation for the seasons on Earth?

What is the cause of an eclipse? What kinds of eclipses are there?

Motion and Kinematics

What is the definition of velocity? How is it related to distance and time?

What is the definition of acceleration? How is it related to velocity, distance, And time?

What does this equation express? $v = v_0 + at$

What does this equation express? $x = x_0 + v_0t + 1/2 a t^2$

Atoms

What property makes an atom unique, as opposed to other divisions of matter?

What is the structure of an atom? What are its constituent parts?

What are the main features of the Bohr model of an atom?

What is an energy level in an atom? How do electrons move between them?

What types of atoms are most important in studying astronomy?

Galaxies

What are galaxies made of?

How are galaxies classified? What types of galaxies are there?

What is OUR galaxy called? What type of galaxy is it?

Where are we (the Sun and Earth) located within our galaxy?

What force is responsible for the behavior and structure of galaxies?

What can happen when galaxies interact or collide?