

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, what was 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 Chapters 1-4 in the book Discovering the Universe, and Chapters 1 and 2 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?

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

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

What does this equation express? $c = f \lambda$

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 are some historical examples of the combination of observation, and a theoretical model?

Naked Eye Astronomy

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

What is the correct explanation for the seasons on Earth?

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

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

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

History of Astronomy

How did the contributions of various astronomers/scientist shape the modern theory of astronomy and the nature of our solar system?

What is the correct model of our solar system? Geocentric or Heliocentric?

Kepler, Newton, and Gravitation

What are Kepler's 3 Laws? How are they used?

What is Newton's Universal Law of Gravitation?

How is it related to the gravity we feel at the surface of the Earth?

What are Newton's 3 Laws? How are they used?

Motion and Kinematics

What is mass? What is inertia?

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? How is it related to force?

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

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

What does this equation express? $y = 1/2 g t^2$