AST 207—25 Aug
The Science of Astronomy

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Course goals
• Learn astronomy as a scientist. Emphasize the discovery.
  • Einstein discovered the key idea for his theory of gravity, when a painter fell off a roof: “Then there occurred to me the happiest thought of my life, in the following form. The gravitational field has only a relative existence… for an observer falling freely from the roof of a house there exists… no gravitational field” —A Einstein 1920
• Focus on cosmology, rather than on all of astronomy
• Outline of cosmology
  • 51 Pegasi—Example of a scientific discovery

Cosmology in Outline

• Ancient—200AD
• Copernican Revolution—1600
• What are stars made of? Why do they shine? —1830-1930
• The Big Bang—1927
• Cosmic Radiation—1965
• What is the universe made of?—Present

Questions

1. Newton figured out the first body of scientific laws on
   a. Electricity
   b. Planets
   c. Genetics
   d. Motion
2. The oxygen nuclei in the air
   a. Always existed
   b. Formed in the sun from simpler nuclei such as hydrogen
   c. Formed in other stars
   d. Formed in plants
3. Most of the universe is made of
   a. Hydrogen
   b. Helium
   c. Dark matter
   d. Dark energy

51 Pegasi

• Michael Mayor & Didler Queloz discovered something important by studying the star 51 Pegasi.
• Steps
  • Examine the data for the facts. Which clues are important?
  • Brainstorming
  • Developing your idea
  • Testing your idea
• Group assignments
  • Recorder
  • Reporter
  • Summarizer
Motion of 51 Peg Away & Towards Us

Summarizing Questions

- What did Mayor & Queloz discover?
- Did they see what they discovered?
- What are the key pieces of evidence?