Astronomy 1002

Planets, Stars and Galaxies

Section 2

Mon. & Weds. 5:15-6:30

Prof. Harrison Prosper
Department of Physics
Florida State University

Guest Professor

- Prof. Prosper returns from overseas this week

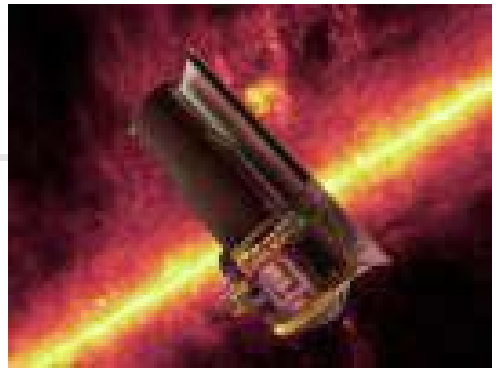
Prof. Prosper

Prof. Adams

What is Astronomy?

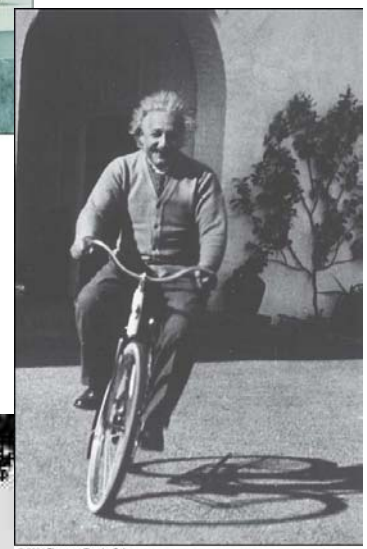
- Astronomy is the study of objects beyond the Earth's atmosphere and of how these objects interact
- IMPORTANT: This is a science class!
- We will learn:
  - How we know about astronomy
  - What we know about astronomy
  - What we need to learn more about
- Also IMPORTANT: This is NOT an astrology class!

Expectations



- Learn science
- Learn astronomy
- Understand how the Universe works
- Be able to read a newspaper or Scientific American article and understand it
- Be more interested in astronomy

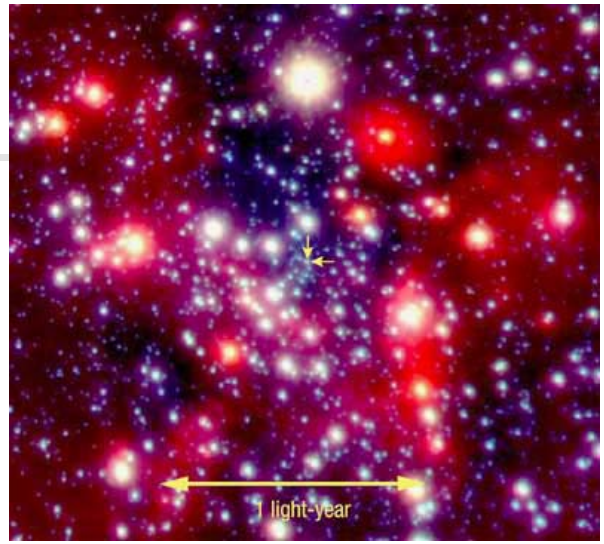
Getting Help



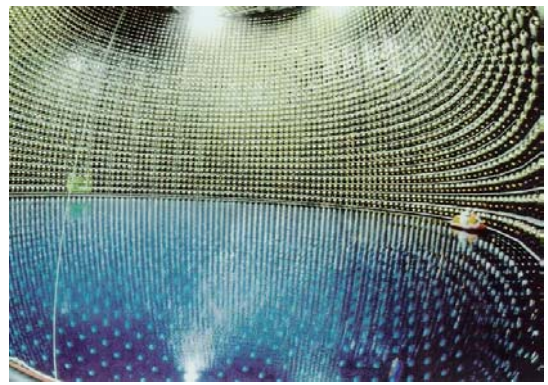
- If you have questions, **ASK**!
  - Ask during class
  - Send an email (harry@hep.fsu.edu)
  - Call my office 644-6760
  - Come to office hours
  - Set up an appointment

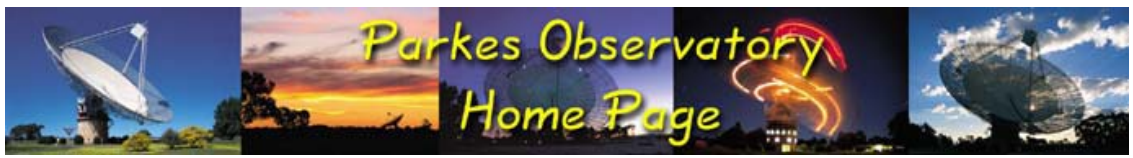
- **Also, the read the textbook**

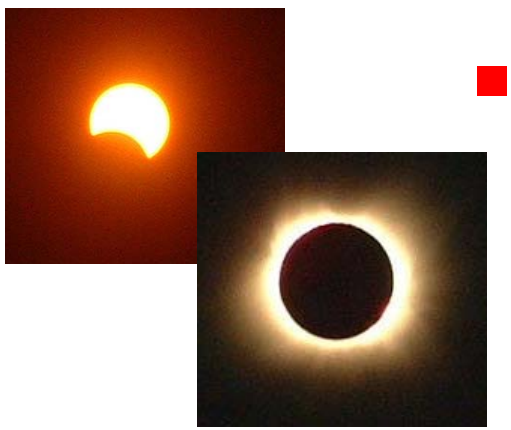
What is Science?



- Science is a way of viewing Nature based on the guiding principles:
  - Nature is lawful
  - This lawful behavior is universal



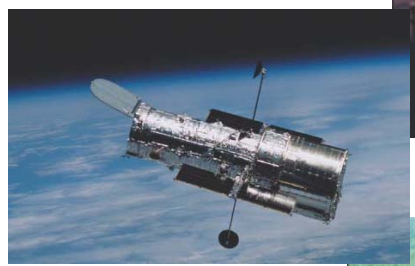




- The goal of science is to uncover the laws of Nature and use this knowledge to fulfill our need for understanding

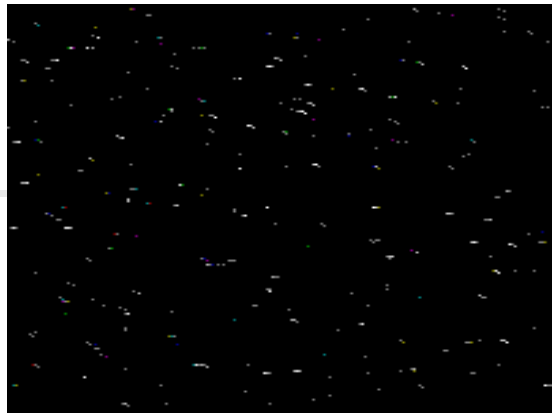
Scientific Method

- Based on testing and experimentation
  - Make a model (hypothesis)
  - Test the model
    - Observations
    - Experiments
  - Modify the model (if necessary)
  - Retest
    - Improved techniques
    - Better experiments



- Don't accept things on faith, look for evidence
- But remember, science is done by people

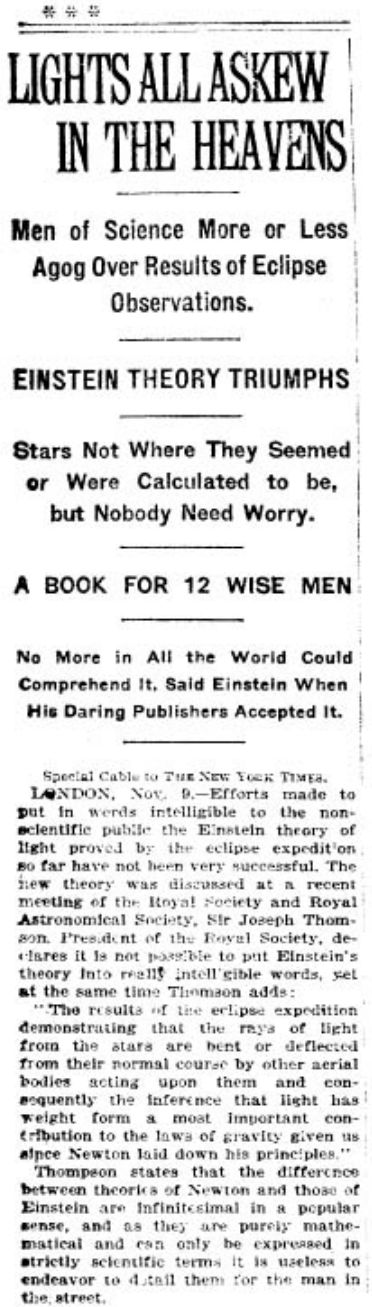
Cosmological Principle



- There is nothing special about our place in the Universe
- The Universe is isotropic
  - It looks the same in all directions
- The Universe is homogeneous
  - Any large volume looks the same as any other large volume at the same distance
    - Need to use a large volume since there are small scale variations (like us!)

"Laws" of Nature

- The rules describing how the Universe behaves
  - The ultimate promotion for a model
- Same rules apply everywhere
  - For example, gravitation, motion, etc.
- Subject to modification
  - e.g. Newton's laws governing motion
    - For really fast moving objects, need Einstein's theory of relativity



LIGHTS ALL ASKEW IN THE HEAVENS

Men of Science More or Less Agog Over Results of Eclipse Observations.

EINSTEIN THEORY TRIUMPHS

Stars Not Where They Seemed or Were Calculated to be, but Nobody Need Worry.

A BOOK FOR 12 WISE MEN

No More in All the World Could Comprehend It, Said Einstein When His Daring Publishers Accepted It.

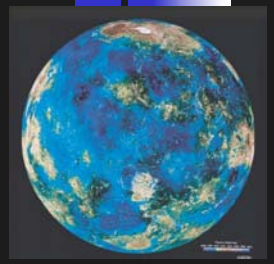
Special Cable to THE NEW YORK TIMES.

LONDON, Nov. 9.—Efforts made to put in words intelligible to the non-scientific public the Einstein theory of light proved by the eclipse expedition so far have not been very successful. The new theory was discussed at a recent meeting of the Royal Society and Royal Astronomical Society, Sir Joseph Thomson, President of the Royal Society, declares it is not possible to put Einstein's theory into really intelligible words, yet at the same time Thomson adds:

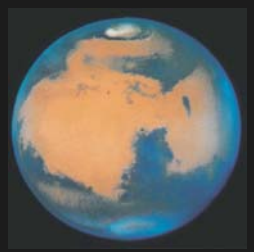
"The results of the eclipse expedition demonstrating that the rays of light from the stars are bent or deflected from their normal course by other aerial bodies acting upon them and consequently the inference that light has weight form a most important contribution to the laws of gravity given us since Newton laid down his principles."

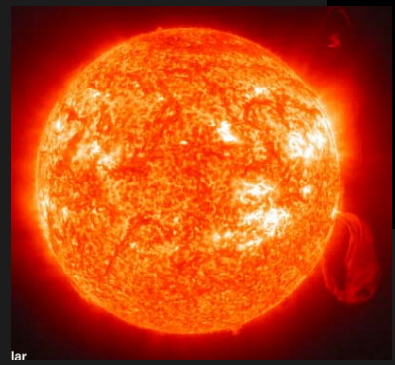
Thompson states that the difference between theories of Newton and those of Einstein are infinitesimal in a popular sense, and as they are purely mathematical and can only be expressed in strictly scientific terms it is useless to endeavor to detail them for the man in the street.

Tour of the Universe



Planets



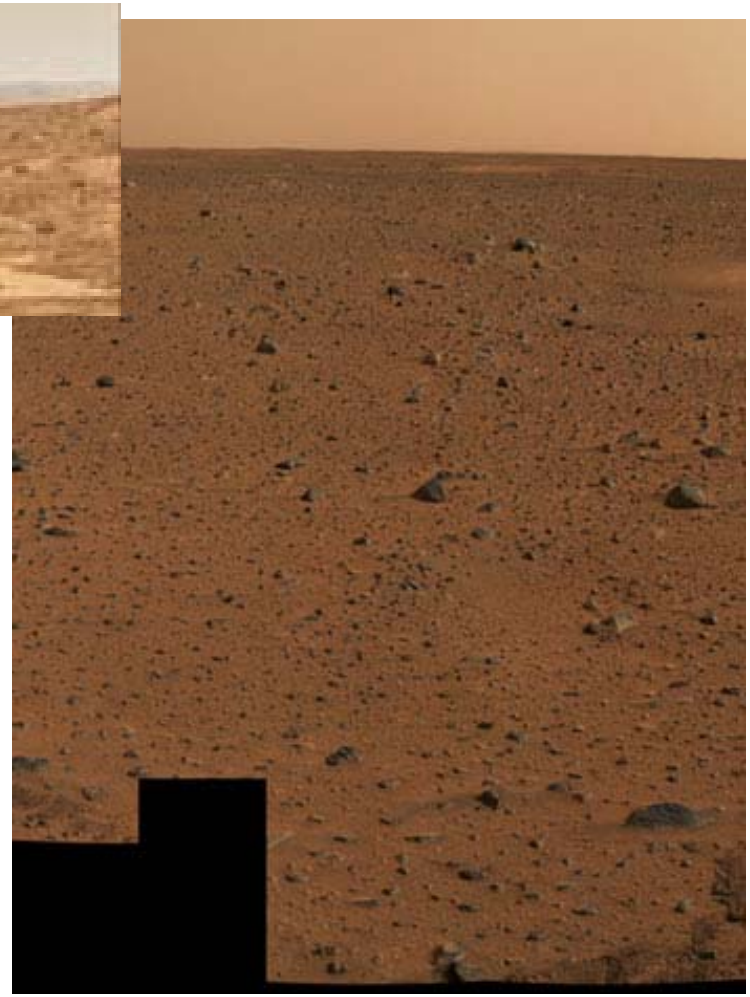


Stars

Galaxies

The Cosmos

Astronomy in the News



- We have sent two landers/rovers to Mars
  - Spirit
  - Opportunity

A Test

- Astronomy Diagnostic Survey
  - a measure of understanding of astronomy concepts
- This test does not count for your grade
- Put your name on your answer sheet so that I know you were here
  - FSU First Day Attendance Policy
  - Use No. 2 pencil
- Please turn in the test and answer sheet

Summary

Astronomy 1002 is a science class in which we will study what the universe is made of

There are a wide range of objects out there, including planets, stars and galaxies

This class can be one of the most interesting courses you take at FSU

ENJOY!