March 30

Agenda

- Announce
  - Final Exam is Tues, May 9 1:50pm-4:30pm
  - Syllabus was messed up! No one noticed?
  - Rewrite of Refraction lab?
  - Schedule Observation next week (Lab: bring description of what we should be able to see)
  - 2nd part of project due Tuesday!
  - Read Ch. 22 for Tuesday (will be out in time for Religion)

- Dual Solar Altitude measurements
- SDSS movie
- Scenes from Elegant Universe
- Hubble Deep Field
- Mass equivalent of Hiroshima bomb
- Review Ch. 21
- Telescope

Hubble Deep Field... noch ein mal

• The shadow of the moon falls on Earth as seen from the International Space Station, 230 miles above the planet, during a total solar eclipse at about 4:50 a.m. EST March 29. This digital photo was taken by the Expedition 12 crew, who are wrapping up a six-month mission on the ISS. Visible near the shadow are portions of Cyprus in the Mediterranean Sea and the coast of Turkey.
How much mass was converted?
• Bomb energy yield: 12-15 kilotons of TNT
• 1 kt of TNT = 4.2 x 10^{12} joules

\[ E = mc^2 \]
\[ M = \frac{E}{c^2} \]
\[ = \frac{12 \times 4.2 \times 10^{12}}{(3 \times 10^8)^2} \]
\[ = 0.5 \text{ g} \]
About half a paper clip!

Some simulations

Some Simulations

Review Ch. 21
What determines the type of galaxy?

• Initial Conditions
  – Spin
  – Density
• Interactions

How is a galaxy formed?

• Gradual gravitational collapse of a protogalactic cloud
• Disk forms in “normal” way…flattening from spin
• Where does Halo come from?

What are AGN? Quasars? Radio Galaxies?
What powers them?