

March 30

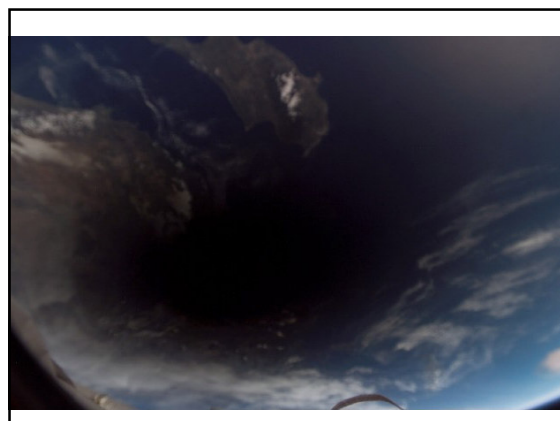
Agenda

- 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.



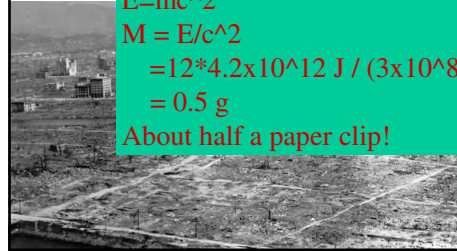
How much mass was converted?

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- 1 kt of TNT = 4.2×10^{12} joules



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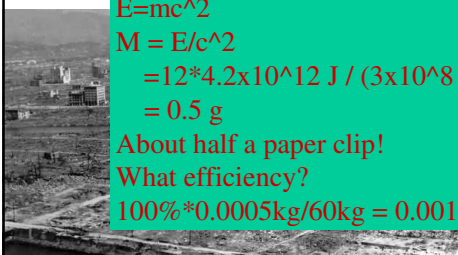


$$E=mc^2$$
$$M = E/c^2$$
$$= 12 * 4.2 \times 10^{12} \text{ J} / (3 \times 10^8 \text{ m/s})^2$$
$$= 0.5 \text{ g}$$

About half a paper clip!

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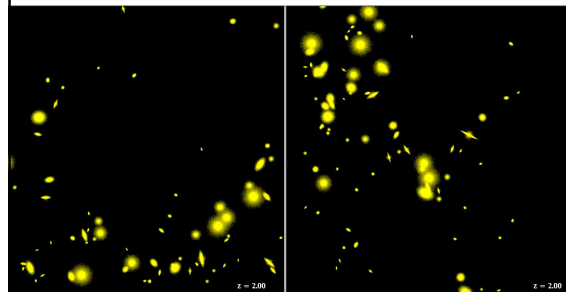
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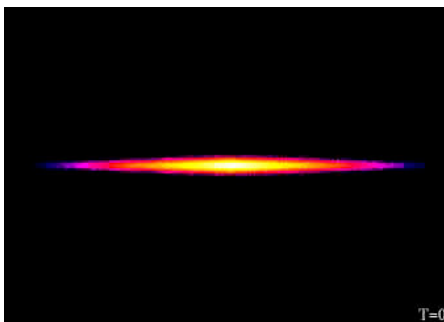
What efficiency?

$$100\% * 0.0005 \text{ kg} / 60 \text{ kg} = 0.001\%!!!$$

Some simulations



Some Simulations



Review Ch. 21

What determines the type of galaxy?

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- Initial Conditions
- Interactions

What determines the type of galaxy?

- Initial Conditions
 - Spin
 - density
- Interactions
 - Galactic Collisions
 - Galactic Mergers
 - Stripping by intergalactic medium inside a cluster

How is a galaxy formed?

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- 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?