Exploring the Solar System

10/26/2009

Opening Discussion

- http://www.youtube.com/watch?v=GDS83yrM30Y
- Have you seen anything interesting in the news?
- What did we talk about last class?
- Minute essay
  - Return time on assignments.
  - Newton's formulas. You never had to use G.

Midterm Results

- Distribution of raw grade (no public talk EC)
  - 2 – >100, 2 – 90s, 6 – 80s, 11 – 70s, 14 – 60s, 17 – 50s, 6 – 40s, 6 – <40
- High = 112
- Median = 61
- Curve 15 points
- Should this midterm be open book?

Some Midterm Solutions

- I want to look at solutions to some of the problems on the midterm. The full solution set is available.

Robotic Missions

- Computerized spacecraft are the primary way we get information on the planets.
- Types
  - Flyby
  - Orbiter
  - Lander/probe
  - Sample return mission

Flybys

- Nature
  - Compared to others, this is fast, cheap, and easy.
  - Don't have to carry fuel for slowing down.
  - Only get one chance to take all your data.
- Instruments
  - Cameras
  - Spectrometers
  - Magnetometers
  - Dust detectors

Orbiters

- Nature
  - Stay a while in orbit around a planet.
  - Get to collect a lot more data, but have to have fuel to slow down so they cost more.
  - Good for watching how the planet/moons evolve.
- Instruments
  - Generally the same types as flybys, but these are generally loaded up because of the greater cost.
  - Radar often added.

Lander/Probe

- Nature
  - These actually go into a planet or land on its surface.
  - These give us the closest possible look at things and provide in situ measurements.
- Instruments
  - Cameras
  - Meteorological instruments
  - Microscopes
  - Mass spectrometers

Sample Return Mission

- Nature
  - These missions collect material from another world and bring it back to Earth for study.
  - We have moon rocks returned by Apollo and Russian robotic missions.
  - Stardust brought back dust particles from a comets tail.
- Instruments
  - These missions aren't about instruments. They collect and return so Earth bound instruments can be used for analysis.

Combo Missions

- Due to the fact that a big part of the challenge with probes is getting to the planet, it is not uncommon to put things together.
- Both Galileo and Cassini included an orbiter with a probe/lander.

Past/Current Missions

- http://www.flickr.com/photos/adamcrowe/40020505
- This is an image sent to me by two of you.
- It shows the paths of all past/current space missions.

Minute Essay

- Questions? Feedback?
- I will be posting assignment #3 this afternoon.
- Because we only did two class days on chapter 7 the next reading quiz will be 7 & 8.