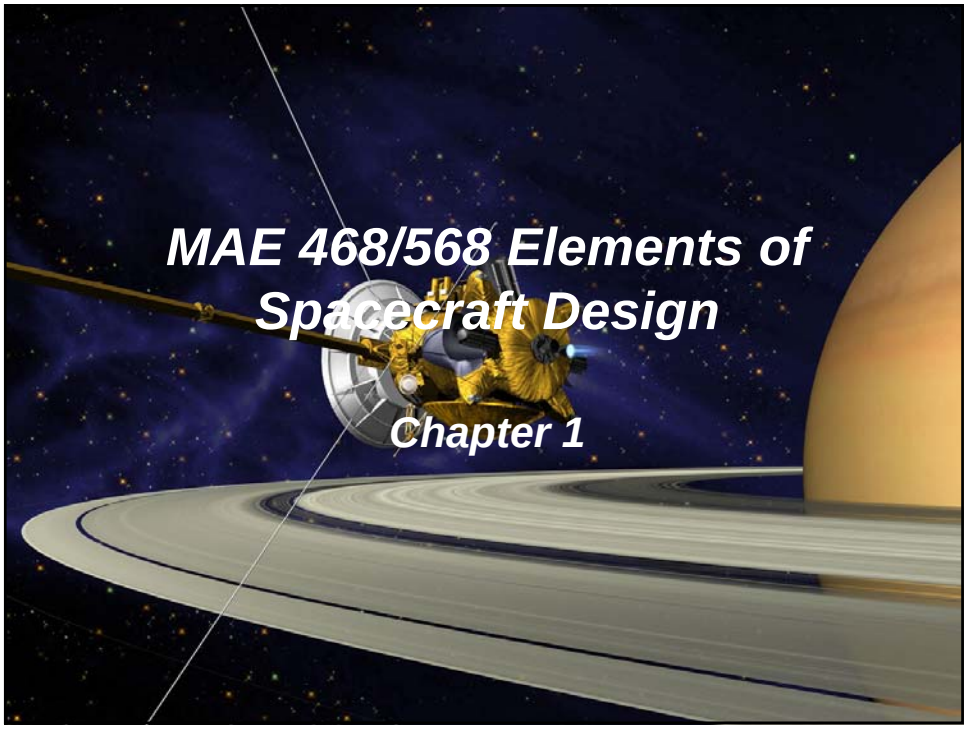

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Class Agenda

- Introduction
  - Syllabus
- Ch. 1 – Introduction
  - First spacecraft
  - Spacecraft missions

2

Syllabus

- Michael P.J. Benfield, Ph.D.
  - (256) 824-2976
  - pj.benfield@uah.edu
- Textbook
  - Elements of Spacecraft Design
- Class
  - M/W 5:30-6:50, TH N155
- Office Hours
  - T/Th 4:00-5:00, SC 157

3

Syllabus

- Grades
  - 40% Weekly Homework
  - 60% Exams
    - 20% - Exam 1 – February 12th
    - 20% - Exam 2 – March 11th
    - 20% - Final Exam – April 27th
- Graduate students
  - More in-depth final
- Schedule
  - Weekly Homework
  - January 19 – MLK Holiday
  - March 16, 18 – Spring Break
  - Monday, April 27th (6:30 – 9:00) – Final Exam

4

Syllabus

- Weekly Homework
  - Delivered via ANGEL
  - Assigned every Wednesday
  - Due the following Wednesday
  - **NO LATE HOMEWORK ALLOWED!**
- Exams
  - 1st – February 12th
    - Via ANGEL
    - 24 hours to take
    - Maximum of 2 hours for exam when started!
  - 2nd – March 11th
    - In class
    - Open notes/book
  - Final – April 27th
    - In class
    - Open notes/book
    - Comprehensive

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Ch. 1 - Introduction

- WWII
  - German rocket scientists
  - ½ went to U.S., ½ went to USSR
- First spacecraft
  - October 1957
    - 1st launch of spacecraft (USSR)
  - Sputnik I
    - 84 kg
    - 58 cm diameter
    - Battery, transmitter, and whip antenna
- Space race had begun

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Ch. 1 - Introduction

- 1st American spacecraft
  - Explorer I
    - January 31, 1958
    - Discovered Van Allen belt
- Late 1960s
  - Launch capability grew
  - 14 kg to 56,000 kg
- Total of over 4400 spacecraft launches
  - 60% USSR
  - 30% U.S.
  - 10% Others

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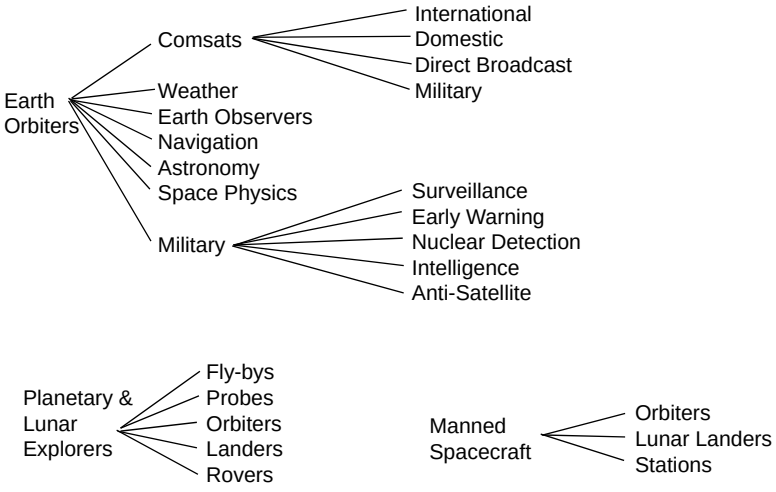
Spacecraft Missions



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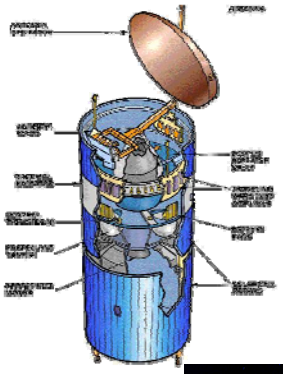
Communications

- 1960s
  - Cable calls
- 1990s
  - Near real time over globe
- Current
  - Personal television
  - Voice
  - Internet



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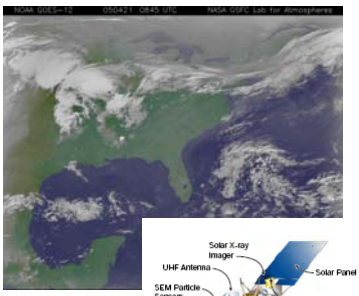
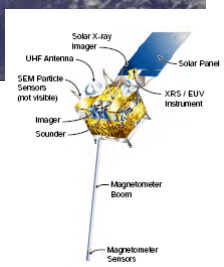
Weather

- 19th century
  - Weather reports by mail
- 1891
  - U.S. weather bureau
- 1940s
  - Data needed for aviation
- Today
  - World-wide motion of weather
  - Four times a day





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Navigation

- Astrolabe
  - Using astronomy to navigate
- 18th century
  - Sextant, compass, star and sun tables
- 1940s
  - Use of radio signal direction
- Today
  - GPS

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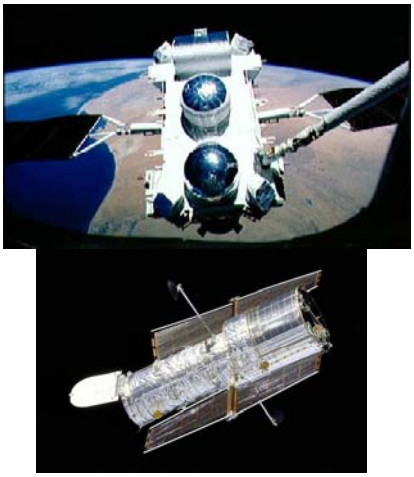
Astronomy

- Avoidance of atmosphere
- Great observatories
  - International Ultraviolet Explorer
  - Hubble Space Telescope
  - Compton Gamma Ray Observatory
  - Chandra X-ray Observatory
  - Hipparchus
  - SOHO



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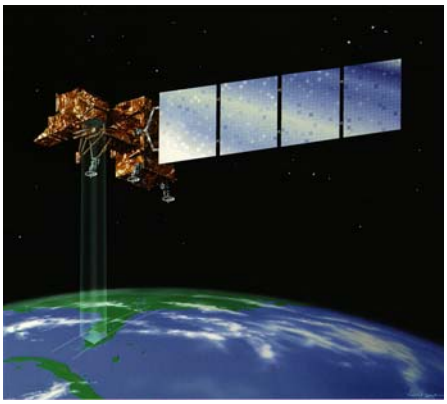
Earth Resources

- 1959
  - 1st photo of Earth from satellite
- Gemini astronauts
- LANDSAT
  - 18 days
  - Looks at vegetation and irrigation
  - Resolution – ¼ acre



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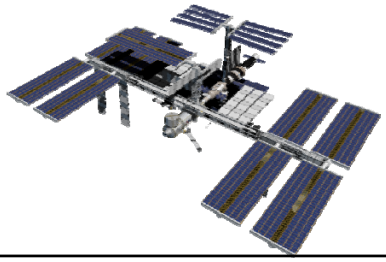
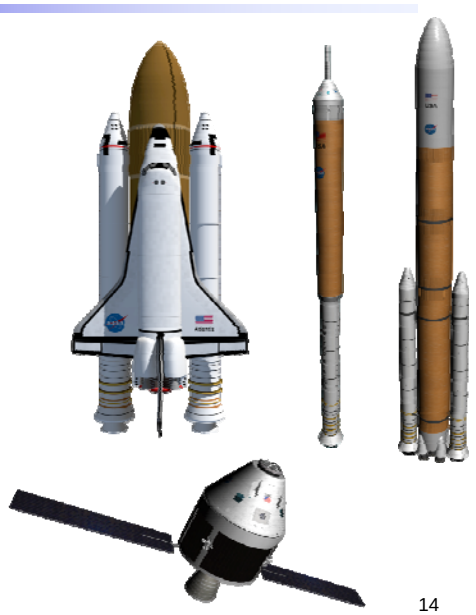
Manned Spacecraft

- Mercury
- Gemini
- Apollo
- Shuttle
- Space Station
- Crew Exploration Vehicle





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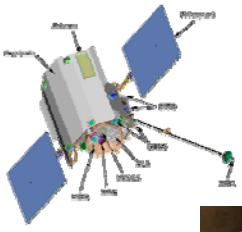
Planetary Spacecraft

- Visited 8 of 9 planets
  - Last planet – Pluto
    - New Horizons launched
  - Current missions
    - Cassini (Saturn)
    - MESSENGER (Mercury)
    - MRO (Mars)



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