Explorers Post 632: BalloonSat

Lead: David Snyder

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Wednesday Evenings, 5-7 PM, B302 Rm 104

Beginning Sept 30, No meeting Oct 7

Purpose:

Develop, Fly Payloads, and Analyse Results for a flight mission like that of a sounding rocket.

Goal:

Build, Test, Launch, Track and Recover a payload to 100,000 Feet (19mi, 30 km, .01 atm)

Advisors:

David Scheiman, David Wolford, Jay McNatt, David Forbes

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- **Send Payload to almost 20 mi**
  - **Travelling to the edge of space**
  - **“Poor Man's Space Program”**
  - **Payload Definition:**
    - **Paying portion of the system**
    - **Customer's Hardware**
- **Near Space/Mars conditions**
  - **At 100,000 ft, P=10mb**
    - **Sea level, P=1013 mb**
    - **Above 99% of Atmosphere**
- **Learning by Experience**
  - **Students will propose, plan, and test experiments or projects**
  - **Students will participate in building, launching, tracking and recovering balloon payloads.**

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Payloads

- Telemetry Module
  - Uses Ham radio to communicate with ground
  - Transmits GPS location/Altitude
- Cameras, Video
- Temperature and pressure
- Other experiments
  - Audio/Video recording
  - Giger Counter
  - Basic Stamp (computer) operation
  - Yeast Growth
  - Solar cell performance measurements
  - Jello Thermal Control Experiment
  - Cosmic Ray Detection

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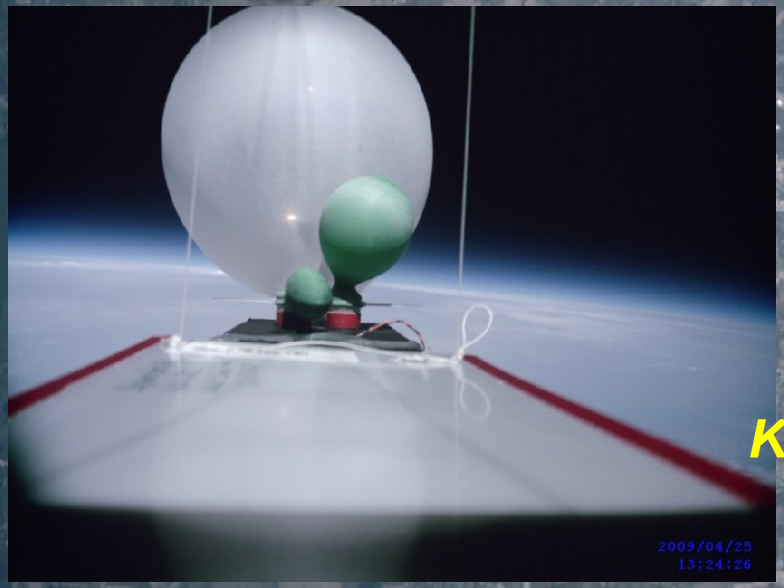

Topics Include:

- Atmosphere and Weather
- Experiment Design
- Communications
- Balloon Physics
- Sensors and Measurements
- Flight Path Prediction

Potential Projects include

- Improve Telemetry (Electronics)
- Close-up Imaging of Experiments
- Remote sensing (Image/Video processing)
- Environment Exposure
  - Radiation/UV

Key is Student Interests and Payloads

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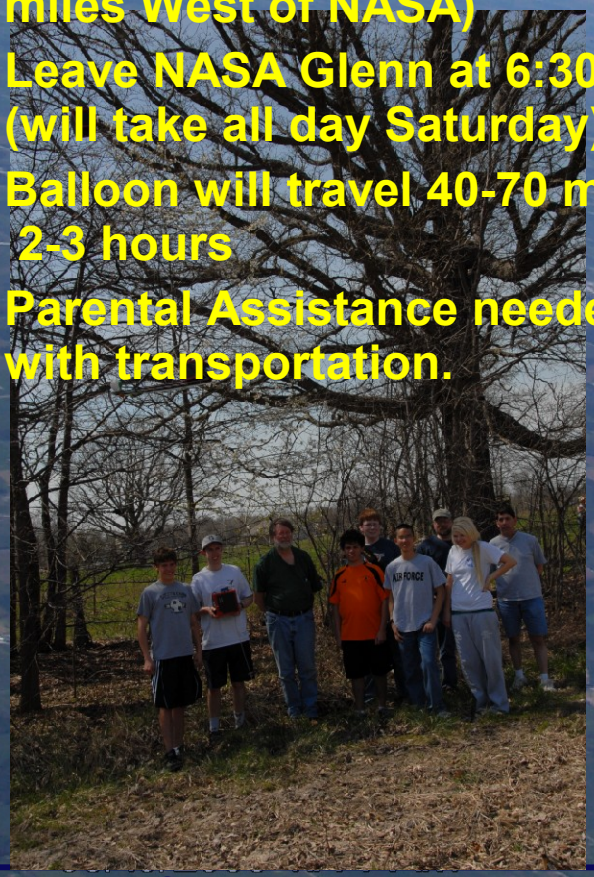
Planning **two** balloon launches

Real 'Field' Trips

- **Launch from Upper Sandusky/Fremont, (60-70 miles West of NASA)**
- **Leave NASA Glenn at 6:30 AM (will take all day Saturday)**
- **Balloon will travel 40-70 miles, 2-3 hours**
- **Parental Assistance needed with transportation.**



- **Demonstration Flight**
  - **October 17**
    - **Weather backup Oct 24,31**
  - **Simple payload**
  - **Practice launch/tracking**
  - **Get some data**
  - **Stimulate Interest (Hopefully)**
- **April Launch**
  - **Student payloads**
  - **Students will plan, design, build and test payloads**
  - **Students will have a larger role in launching and tracking balloon**

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- Initial 9 weeks (before Christmas)
  - Practice balloon flight
  - Provide Foundation
    - Presentations + Activities
- Following 14 weeks
  - Select and Develop Student Experiments
  - Build and test payloads

- April Launch (Saturday – All Day)
  - Plan for April 17
  - Weather backups April 24
  - About 3 weeks to analyze data and present results
  - Last Meeting May 5/12