

Launch and Field Operations without leaving your Office

and

CubeSat Test Opportunities

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Stanford University

CubeSat Developers Workshop
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Huntington Beach, Ca

Overview

- Need for incentives for new students
- Need for bringing launches to the classroom
- Opportunities for testing CubeSats
- Bringing new students into the space community
- Beyond CubeSats

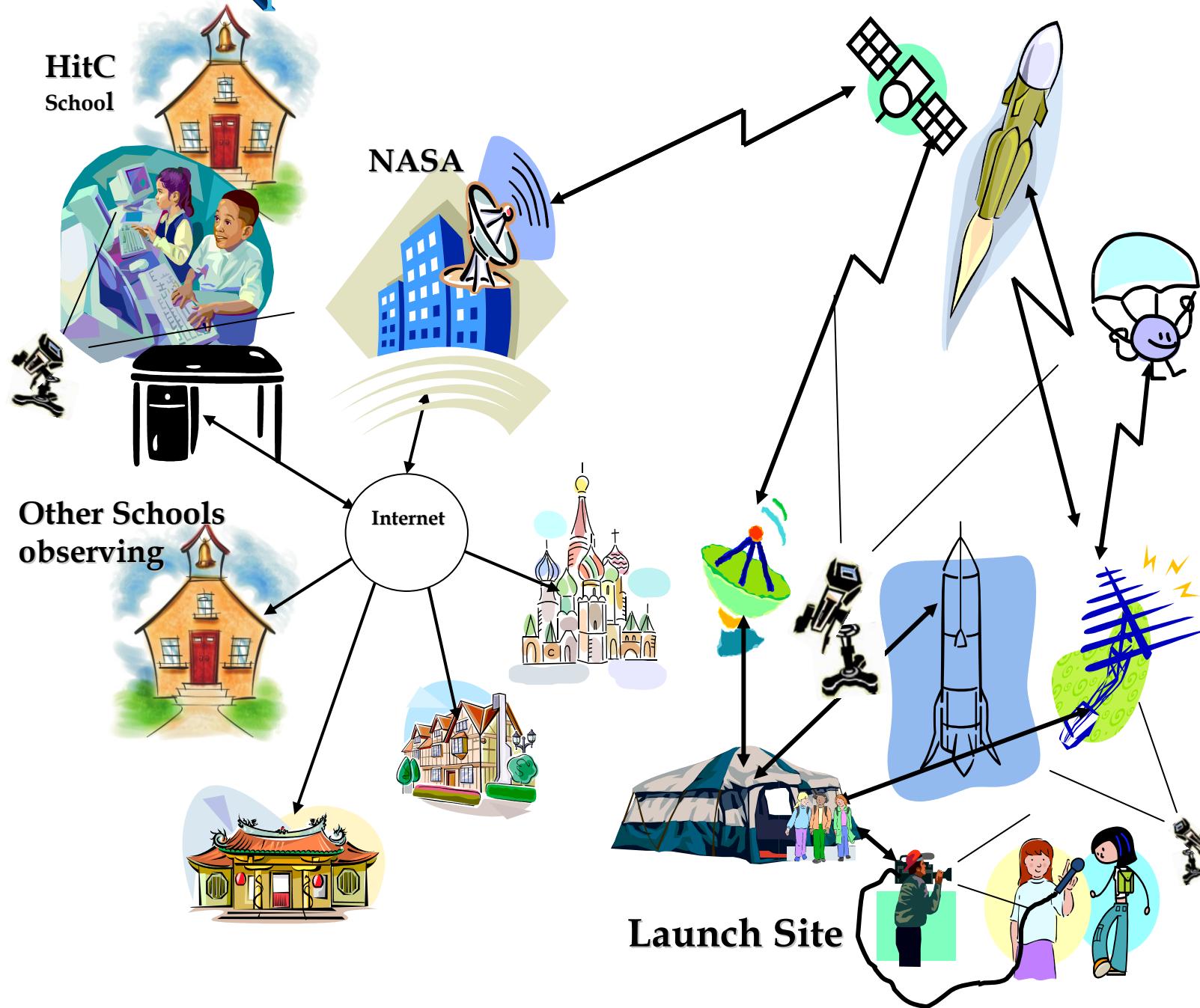
Need for incentives for new students

- Why aren't students interested in Science & Math?
 - "Most boring subject - no connection to real world"
 - "Video games much more fun"
 - Bad teachers discourage students
- Should all students be interested in Science & Math?
- Should all students go to college?
- We need feed lines of students that want to take challenge of STEM
- How do we encourage students to get in that line?

Need for bringing launches to the classroom

- Provide programs in grade and high school for student space experiments
- Build payloads for LOW space simulation & activities
 - 3 ft diameter balloons
 - 100k ft altitude balloons
 - Amateur rockets 12k ft, 30k ft, 60k ft, 100k ft, 380k ft.
- Problem---→ can not take all students to launch
- Take the launch to the students
- Have trouble launching rockets launching rockets from Stanford Campus
- Get real time data link (GEO links) from launch sites to classroom
 - Real time two-way video
 - Two-way audio
 - Two-way data to test payload and get payload data during test

Space Mission Center in the Classroom



Space Mission Center in the Classroom



Ames Research
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APL

Fremont High School Sunnyvale, California



Launch Site
Data

Live Video

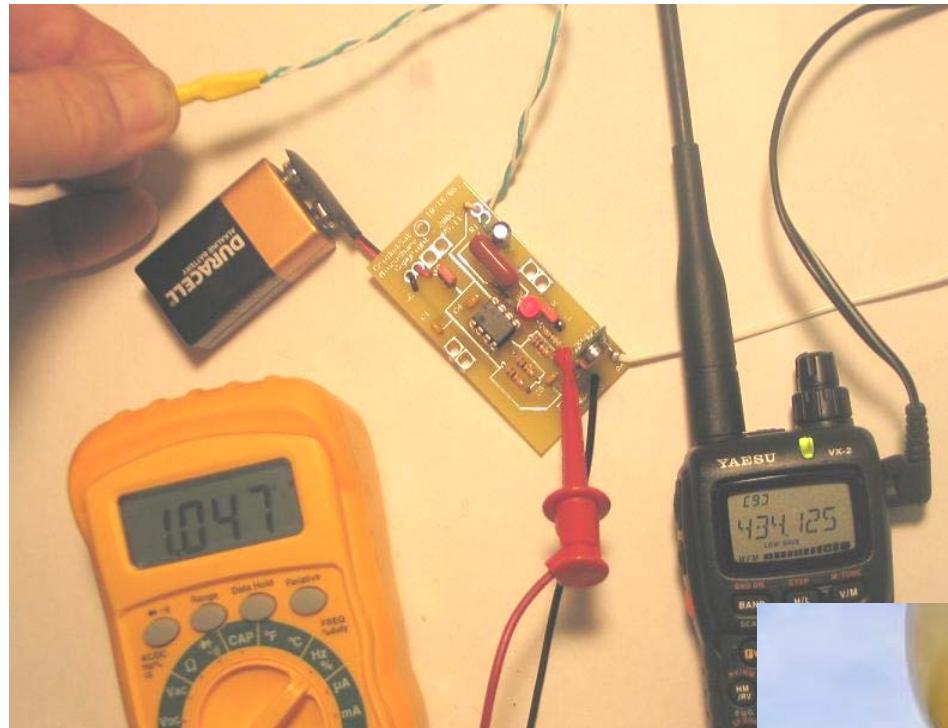
- Classroo
- Launch
- Launch
- ooo
- ooo



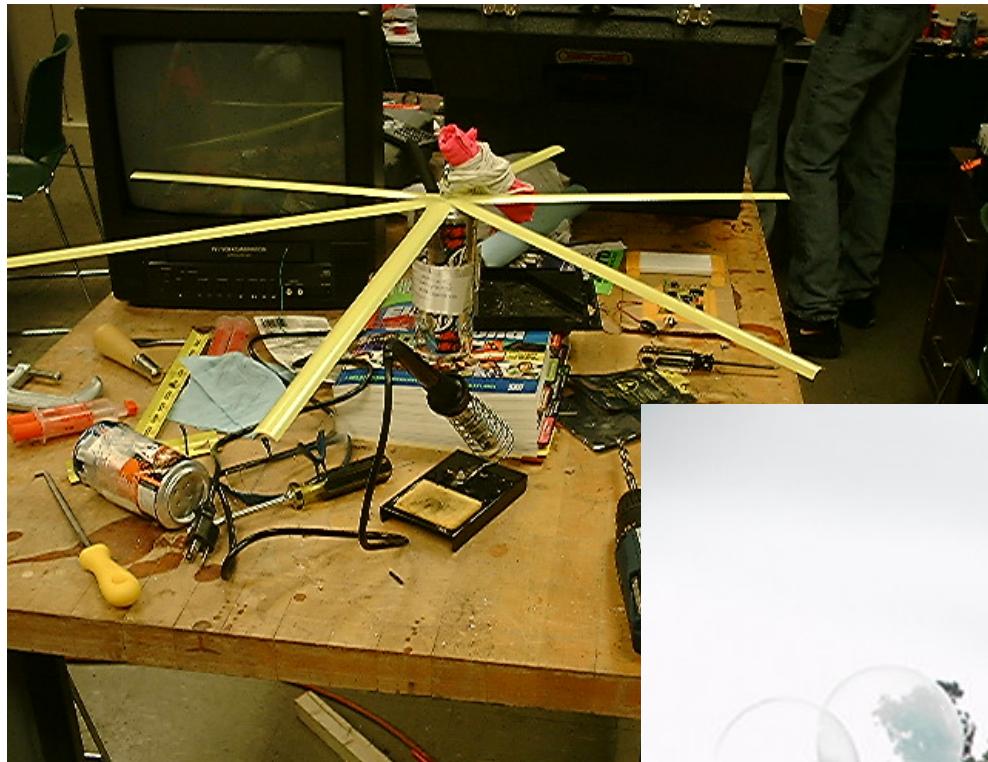
Opportunities for testing CubeSats

- Payload flight opportunities
 - 3ft diameter balloons (Do it yourself)
 - 100k ft altitude balloons (Several Universities)
 - Amateur rockets 12k ft (ARLISS - Sept every year)
 - 30k ft, 60k ft, 100k ft, 380k ft (Rocket Maverick - July, Oct)
 - 5k ft - ??? (Garvey SC - July, August,)
 - ??? - way up there (Lunar Rocket & Rover - this year)

CricketSats – on balloons



CanSat- on balloons



CanSat – on airplanes



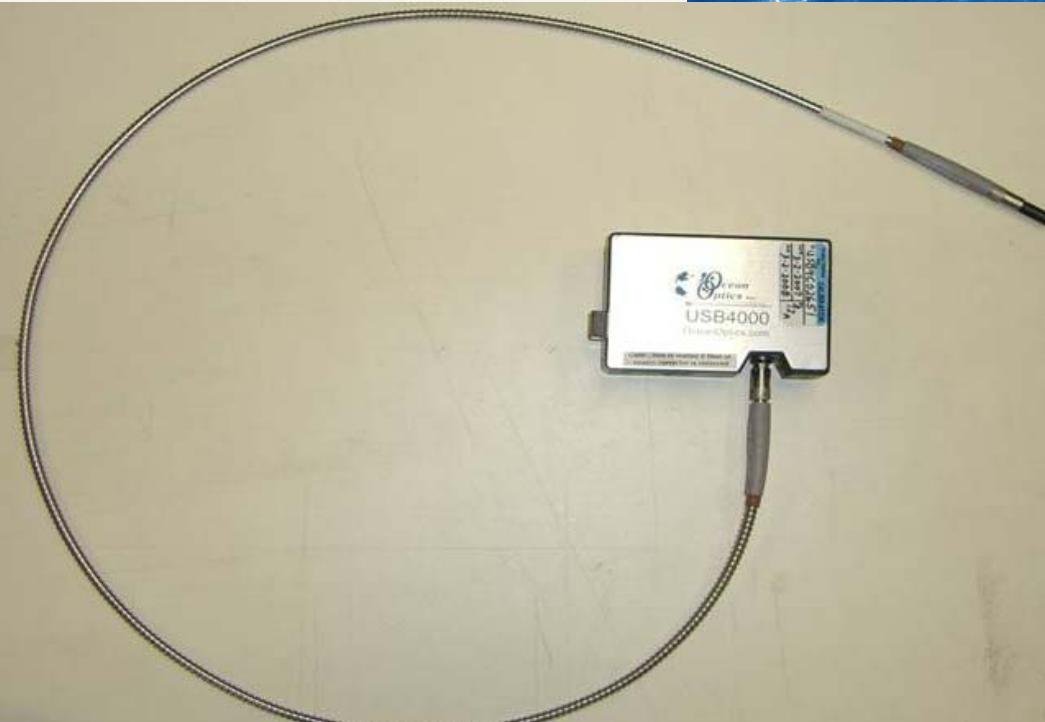
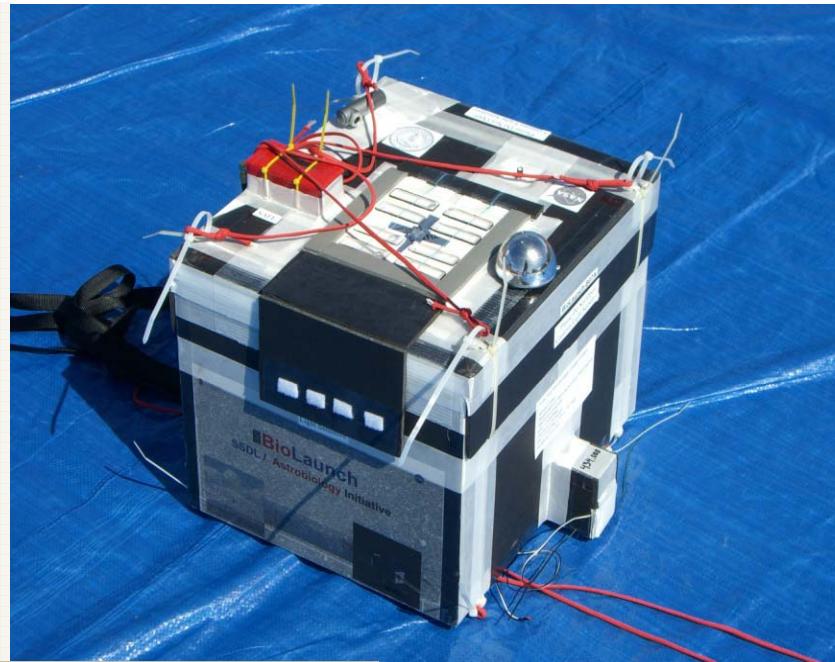
CanSat - on rocket



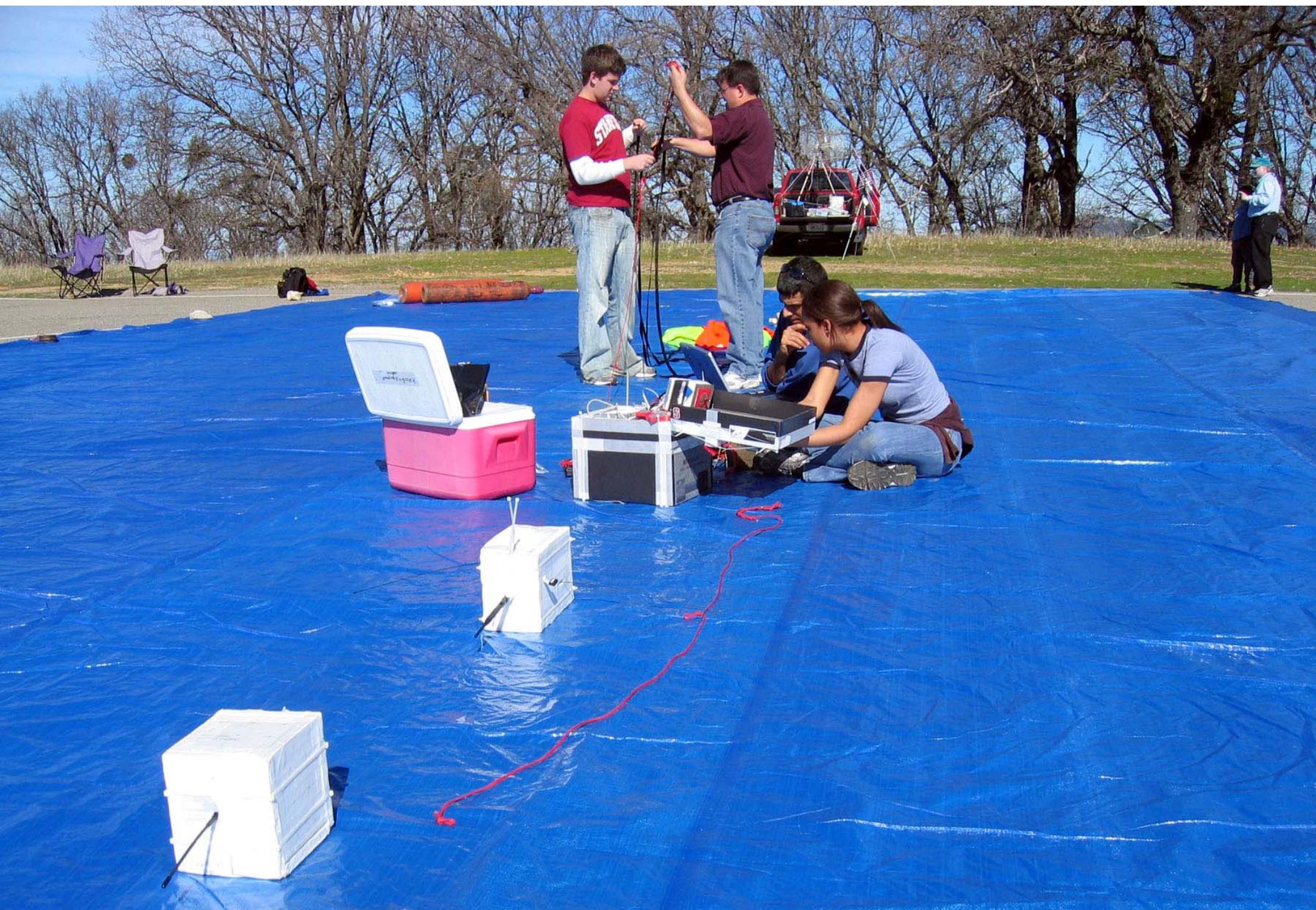
CubeSats – on balloons

Flight Hardware and Experiments Spectrometer Flight Box

Spectroradiometer
Radiation Exposed
Cuvettes
AstroChemistry
Experiment
PC104 Computer
WebCam
GPS and Radio Beacons



Flight Operations



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Flight Operations



View from Flight



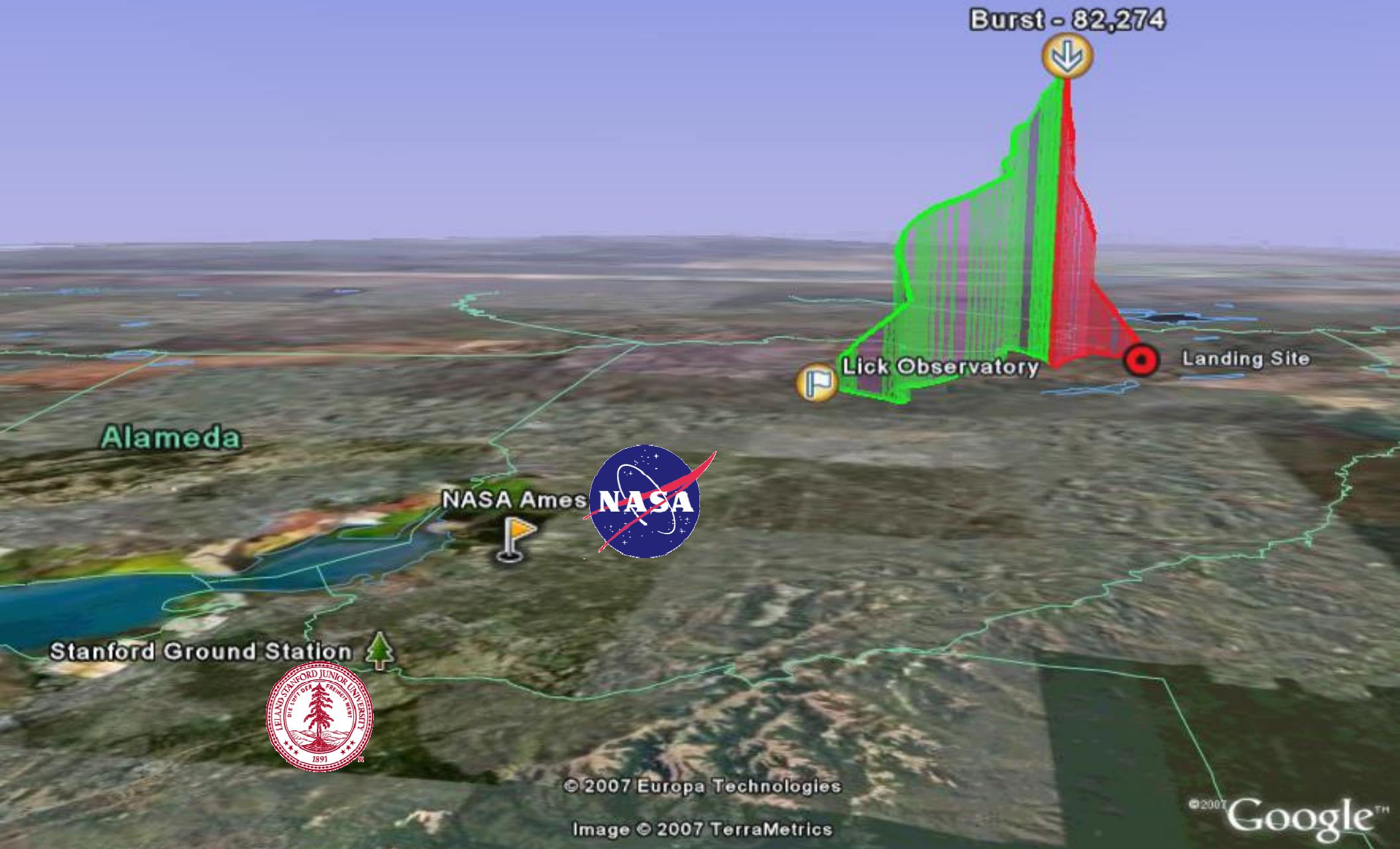
View from Flight



Ground Station



Flight Profile



End of the Flight



Bringing new students into the space community

- Take fun projects to the schools
- Need full time mentors
- Need micro funding to purchase materials

Effort being lead by:

**California Space Authority
WIRED Program**

See Christine Purcell

Beyond CubeSats

Moon

Mars

Asteroids

Comets

And beyond

**Questions for
You?**

**Think about where we
10 years ago with small
satellites?**

**Where will we be
10 years from now?**

Beyond CubeSats

Moon

Mars

Asteroids

Comets

And beyond

Thanks







