

# **Nanosat Launch Vehicle Development, Flight Testing and Experiments**

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**CubeSat Developers Workshop**

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# Nanosat Launch Vehicle (NLV) Goal of 10 kg to LEO

Garvey Spacecraft  
Corporation

California State University,  
Long Beach

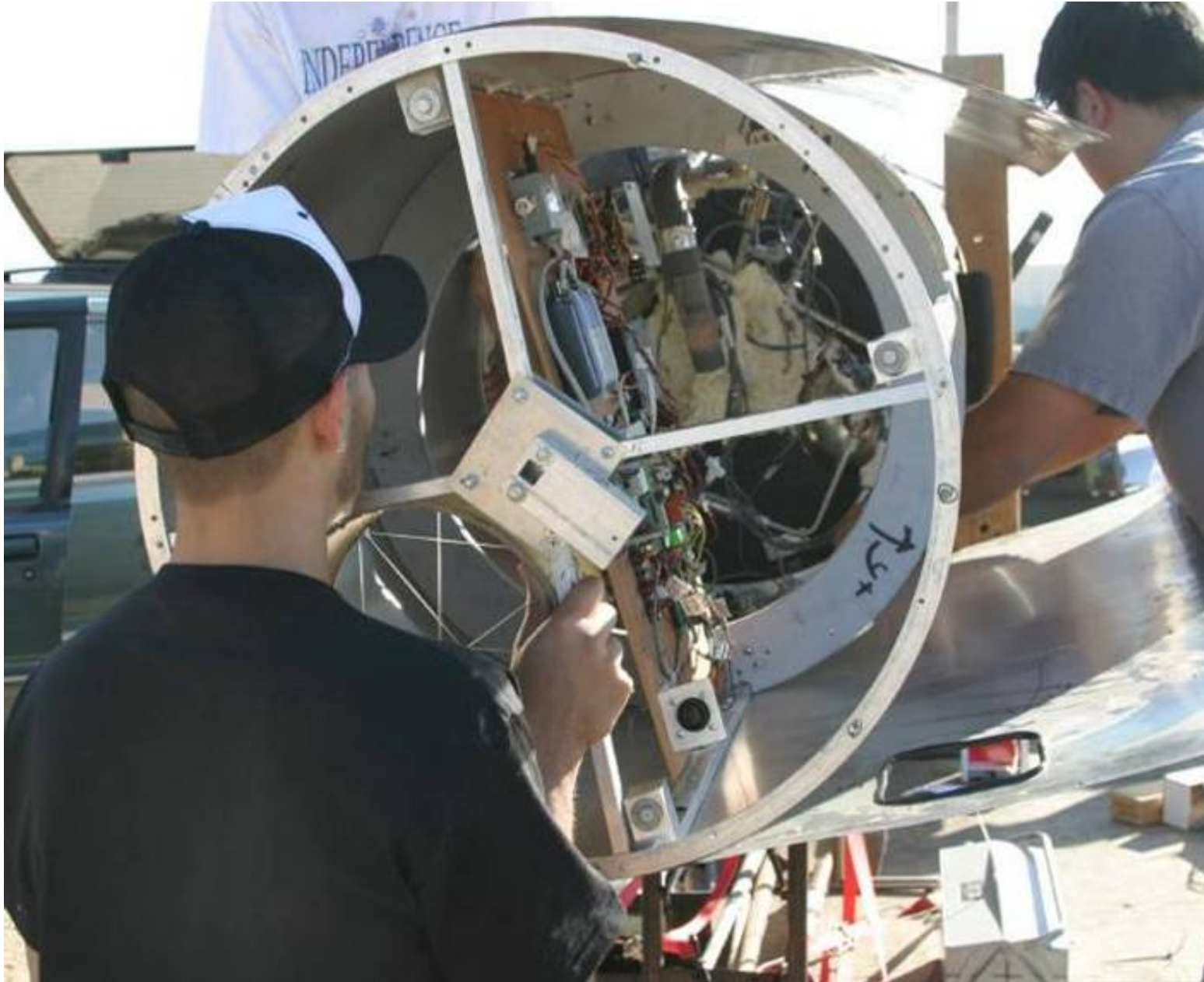


CSULB Students Preparing the P-6 Prototype for Launch – June 2005

# CSULB Wi Fi Telemetry Payload

*Garvey Spacecraft  
Corporation*

*California State University,  
Long Beach*



# San Nicholas Island Pathfinder Flight

*Garvey Spacecraft  
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*California State University,  
Long Beach*



P-7DSNI-dvd.mpeg

# Recent Development and Flight Testing

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- Developed the Prospector 7 prototype RLV for the Air Force
- Total of four flights
- Oct 2005 – two flights in one day
  - Cal Poly SLO P-Pod
  - Montana State data logger



# P-POD Integration Underway at CSULB

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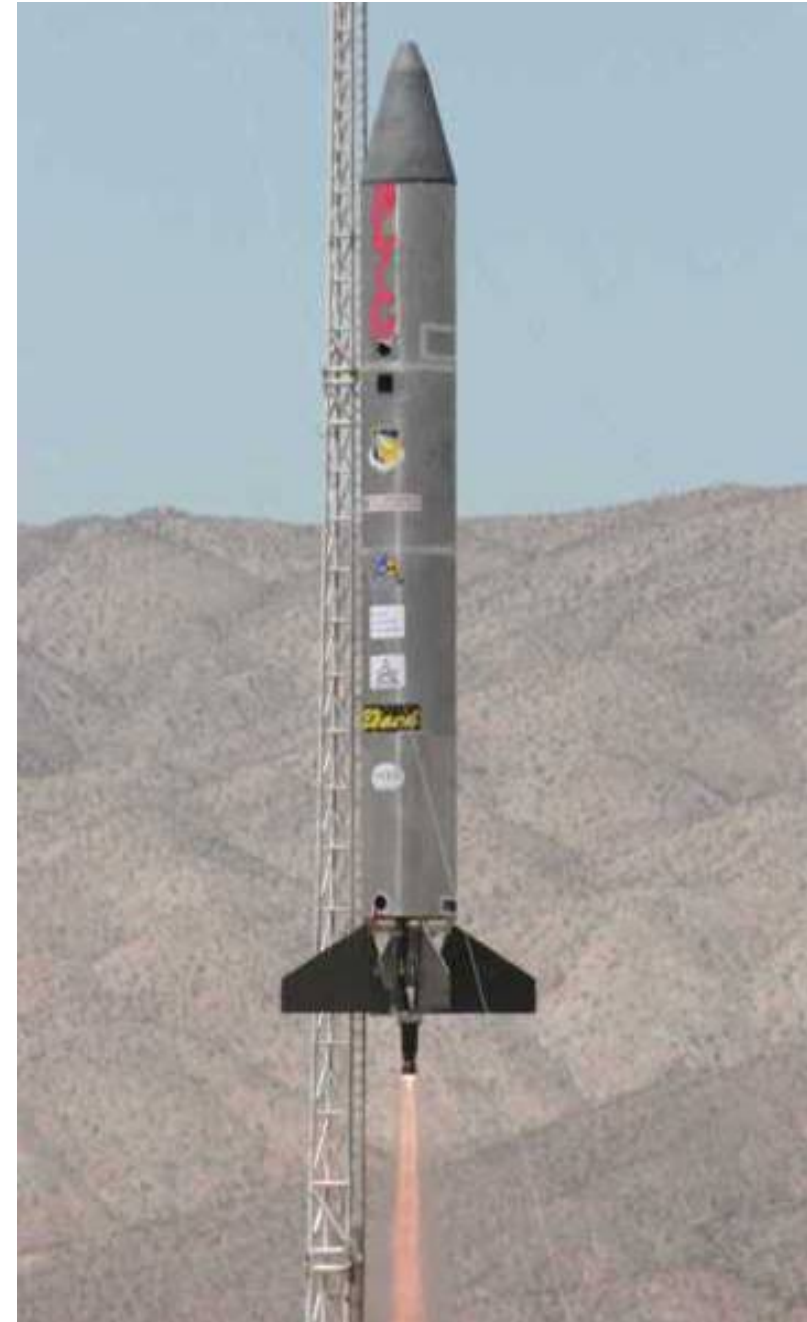


# P-7 Prototype RLV with Aerospace Corporation Payload

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*California State University,  
Long Beach*

- Operational RLV flight sponsored by the payload provider – not a development mission
- Date: April 2006
- Early evaluation test of Re-entry Break-up Recorder (REBR) concept
- Assessed GPS and Iridium data links
- Fourth flight for MSU data logger
- Also hosted CSULB data logger

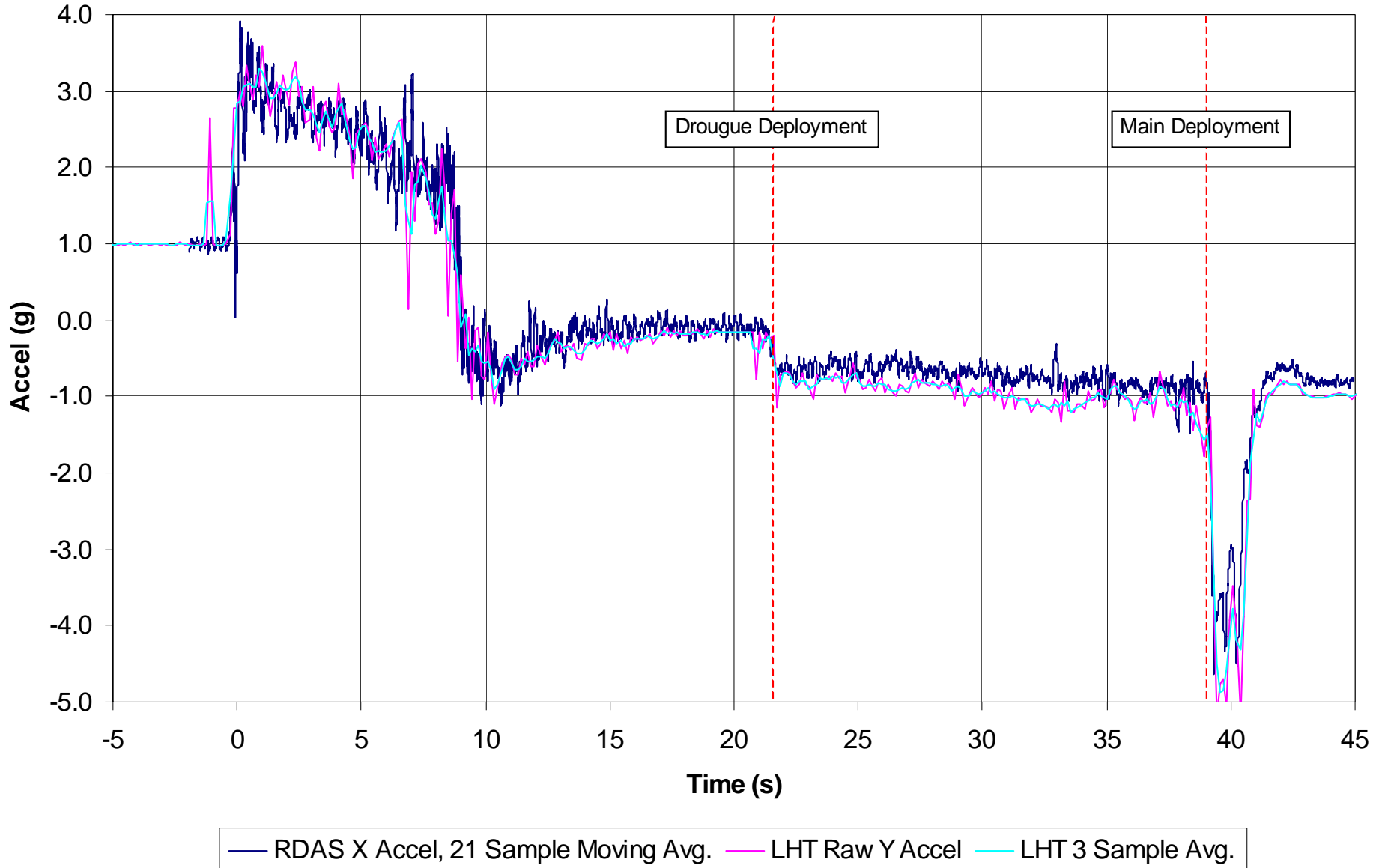


# P-7C Trajectory Data from Three Experiments

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P-7C Body Frame X Acceleration





# Prospector 7D Flight Test At San Nicolas Island

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- Pathfinder mission for operationally responsive space
- Cal Poly SLO RF Telemetry Experiment sponsored through the California Space Authority WIRED program
- Also manifested an NRL student telemetry experiment

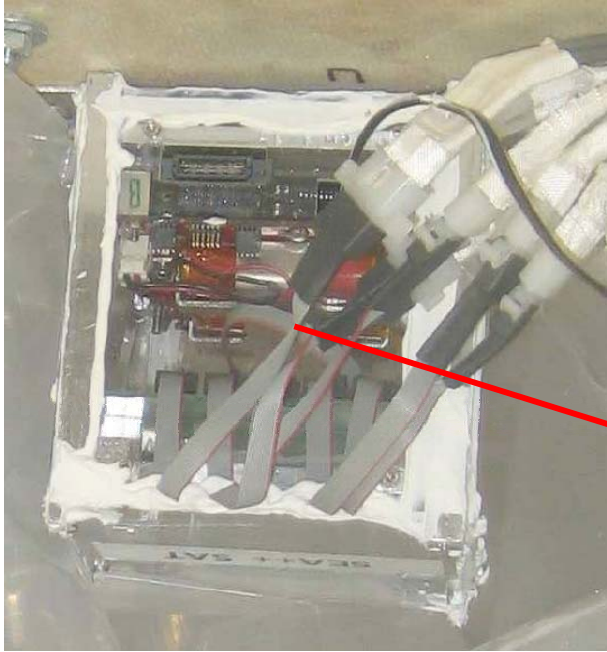


# Fourth P-7 Flight Test San Nicolas Island – 28 Sep 2006

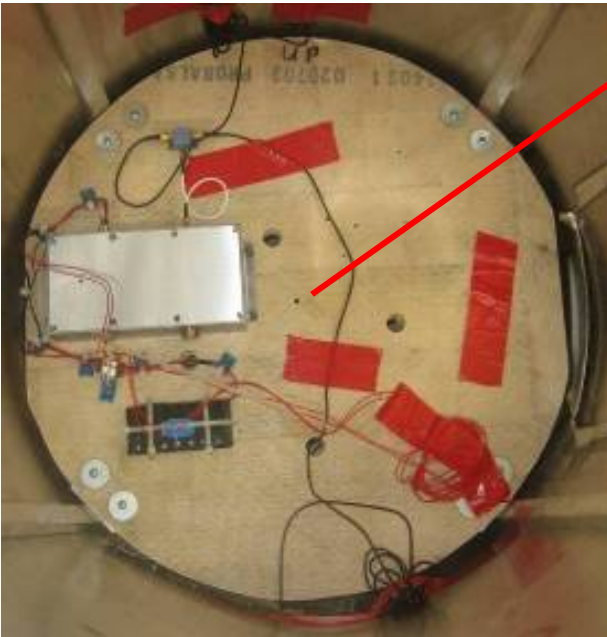
Garvey Spacecraft  
Corporation

California State University,  
Long Beach

Cal Poly SLO  
experiment



NRL  
student  
experiment



# Fit Check of Ecliptic RocketPod Fairing for Potential Future Flight Applications

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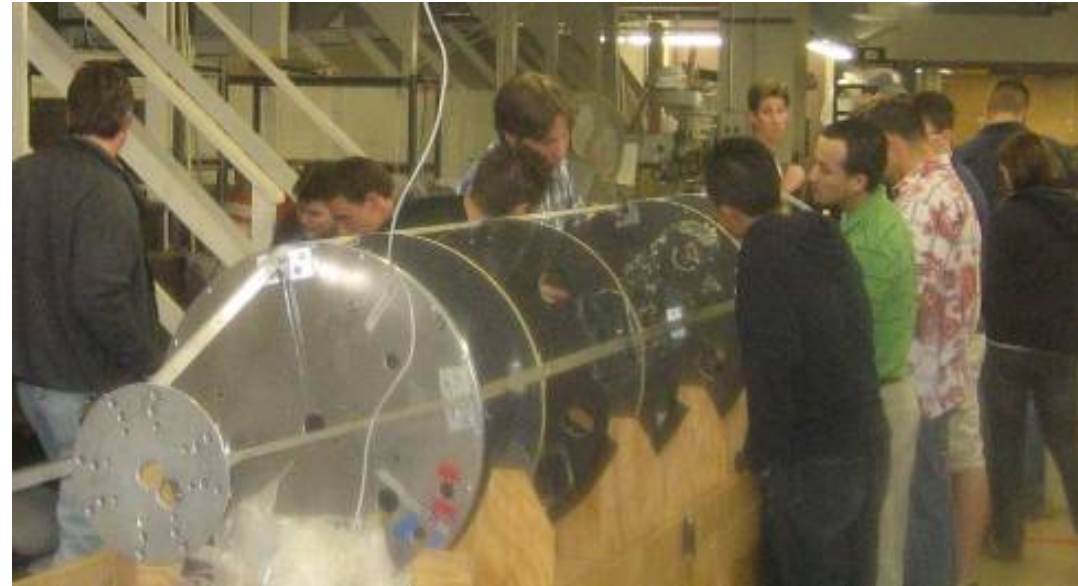


# Future Flight Opportunities

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- Multiple flights planned over the next year
  - P-8A, -8B
  - P-9A/B, -9X
  - P-10
- Vehicles will feature increasing performance and payload capability



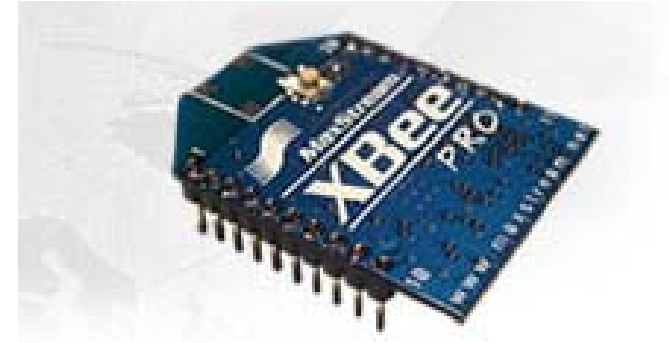
*P-8 vehicle refurbishment  
underway at CSULB*

# Payloads Now Under Consideration

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Long Beach*

- NASA Ames wireless sensor networking experiment
- Ecliptic RocketPod
- Stanford telemetry packages
- NRL student experiment



# Potential Student Payload Ideas

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*California State University,  
Long Beach*

- Shock, Vibration, and Acceleration Data Logger
- Wireless Sensor Networks
- Telemetry Systems
- Inertial Measurement Units
- Real-time Data Downlinks to remote sites through the Internet
- On-board Video Systems

# Summary

- NLV test flights complement less frequent orbital mission opportunities
- CubeSat developers have multiple near-term launch opportunities
- Acquired data can make significant contributions to the development process
- Domestic launch and development team eliminates ITAR and logistics issues associated with foreign launchers
- Further information can be found at:

[www.garvspace.com](http://www.garvspace.com)

[www.csulb.edu/rockets](http://www.csulb.edu/rockets)

or stop by the CSULB lab located five miles from here