

**CitizenSatellite**

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# Low Cost Missions for the Unordinary Innovators

Presented by

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# Presentation to Students.



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# Overview

- What was the purpose of CubeSat program?
- What was the general aerospace industry response to the CubeSat concept?
- Survey of student participation in the CubeSat program?
- What is a possible help for the student space mission programs?
- Hardware/software that is available
- Proposed low cost launch opportunities






## Purpose of CubeSat Program

- As originated in 1999 with Stanford & Cal Poly

- CubeSat Program was to provide engineering students a practical spaceproject - go the full engineering cycle
- Cost of launch from Cal Poly was \$30K/1U CubeSat






General aerospace industry response to the  
CubeSat concept

Dumbest idea we have  
seen!



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General aerospace industry response to the  
CubeSat concept

Too small for any practical  
purposes!



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General aerospace industry response to the  
CubeSat concept

Stupid naive educators



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General aerospace industry response to the  
CubeSat concept

They don't have a clue what  
it takes to make something  
work in space!



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General aerospace industry response to the  
CubeSat concept

Ignore them, maybe they will go  
away!



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General aerospace industry response to the  
CubeSat concept

There are no parts that can be  
used to make a satellite that  
small!



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## Survey - What now for your CubeSats?

- How many students here?
- How many working on CubeSat program?
- How many have worked on CubeSat program for less than six month/less?

Six months - one year/less?

One year - two years/less?

More than two years?



## Survey - What now for your CubeSats?

- Expect to have launched a CubeSat before BS degree?
- How many have worked on CubeSat program that has launched?
- How many have definite launch schedule?



What are the answers to?

Takes too long.

Costs too much.

Don't have a launch.



Next



What are the answers?

Do something quickly - weeks

Get affordable hardware.

Use really cheap components.



Use cheap hardware



# Hardware/software that is available

## Arduino Processor & LoRa Radio

LR-96-433Mhz from  
<http://www.arduino.com/miniwireless/>

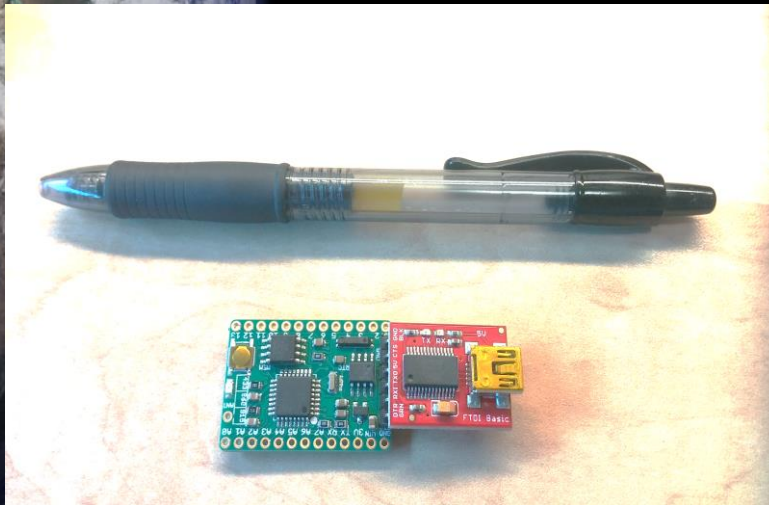
SparkFun FTDI Basic Breakout - 5V  
<https://www.sparkfun.com/products/9716>

\$22.40

## APC220 Radio Communication Module

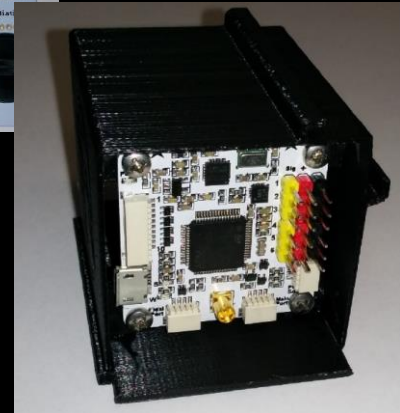
Brand: DFRobot    Reward Points: 40    SKU: TEL0005

\$40.00



# Hardware/software that is available

Jon



# Hardware/software that is available

UNO R3 ATmega328P CH-USB Board for Compatible-Arduino  
\$3.65 Buy It Now Free shipping 209 sold

Arduino Solenoid Proton Shield Processor Extension Board  
\$2.00 Buy It Now Free shipping 264 sold

Dual H Bridge Stepper Motor Drive Controller Board Module For Arduino L298N FE  
\$2.08 Buy It Now Free shipping 917 sold

GY-61 ADXL330 3-Axis Analog Output Accelerometer Module for Arduino  
\$1.88 Buy It Now Free shipping 32 sold

Micro SD Storage TF Card Memory Shield Module Adapter SPI For Arduino IDE  
\$0.99 Buy It Now Free shipping 62 sold

5pcs 100k DS18B20-10C0 DALLAS TO-99 Temperature Temperature Sensor  
\$3.62 Buy It Now 1 sold

Hot-32GB Micro SD Card TF Flash Memory MicroSD MicroSDHC Class 10 Free Adapter  
\$4.66 Buy It Now Free shipping 3743 sold

Ultrasonic Mobile HC-SR04 Distance Measuring Ranging Transducer Sensor USB 1.80

USB Lithium Battery Charger Module Board With Charging And Protection  
\$1.55 Buy It Now Free shipping

High Power 4000mAh Battery For EL-FILM FinePix 50i 60i 530i  
\$4.25 Buy It Now Free shipping

4230mAh 3.7V Li-ion Polymer Battery For Arduino UNO R3  
\$2.55 Buy It Now Free shipping

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\$2.55 Buy It Now Free shipping

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\$2.55 Buy It Now Free shipping

- Hardware/software that is available



Get Space Experience

Use balloons

Use amateur rockets



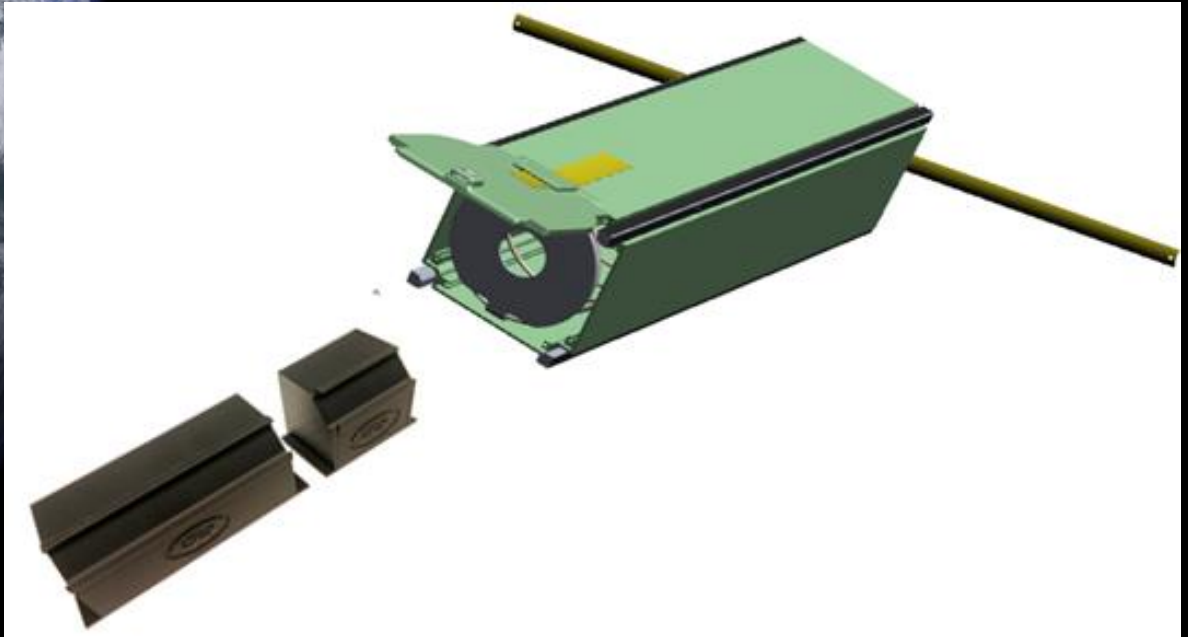
# Orbital Experience?

Go small – use PocketQubes

Future launches - inexpensive

# Proposed low cost launch opportunities

Use 3U CubeSat and P-POD for PocketQube launches







Get Experience



Go small





But  
Do it now!



# Survey

<https://magnitude.io/ss30>



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Thanks  
Questions?



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