

Participation in RockOn 2021 Sounding Rocket Program Launch by NASA

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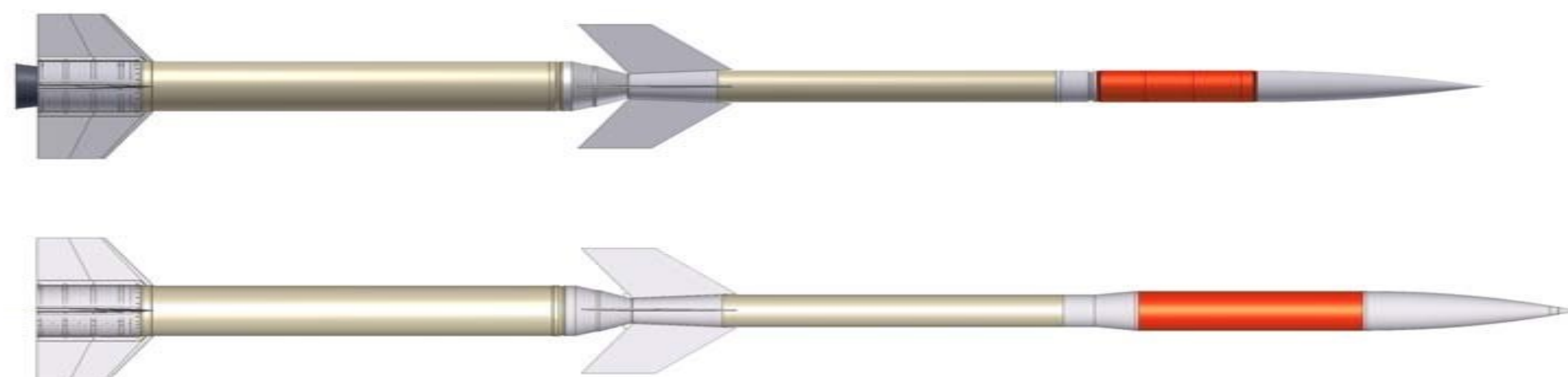
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Background

- The RockOn program sponsored by the Colorado Space Grant Consortium engages students in building their own experimental payloads and fly them on a NASA sounding rocket.
- The MSU SEDS and the MSU ARROW Rocketry team had the opportunity to participate in the RockOn 2021 Project.
- The students built a payload system that can collect several launched data for suborbital space flight through the usage of different systems. The sequence involved is Soldering, Coding, Testing and Recording (SCTR)
- The payload system was implemented on NASA's 40-foot tall 2-stage sounding rocket called "The Terrier-Improved Orion," which was successfully launched at the flight facility in Wallops, Virginia, on the 25th of June 2021.
- The Terrier-Improved Orion Sounding Rocket attained an apogee of 72 miles (approximately 380,160 feet) and was recovered from the Atlantic Ocean.

Objectives

- To build a payload system that will be integrated in NASA Sounding Rocket for measuring acceleration, humidity, pressure, temperature, and radiation counts.
- (1) Geiger Counter (GC)
- (2) Space Shield (SS) with integrated Arduino Mega
- (3) Flight Code (FC) and Power On Systems Test (POST)
- To analyze the data once the payload will be recovered after the rocket launch.

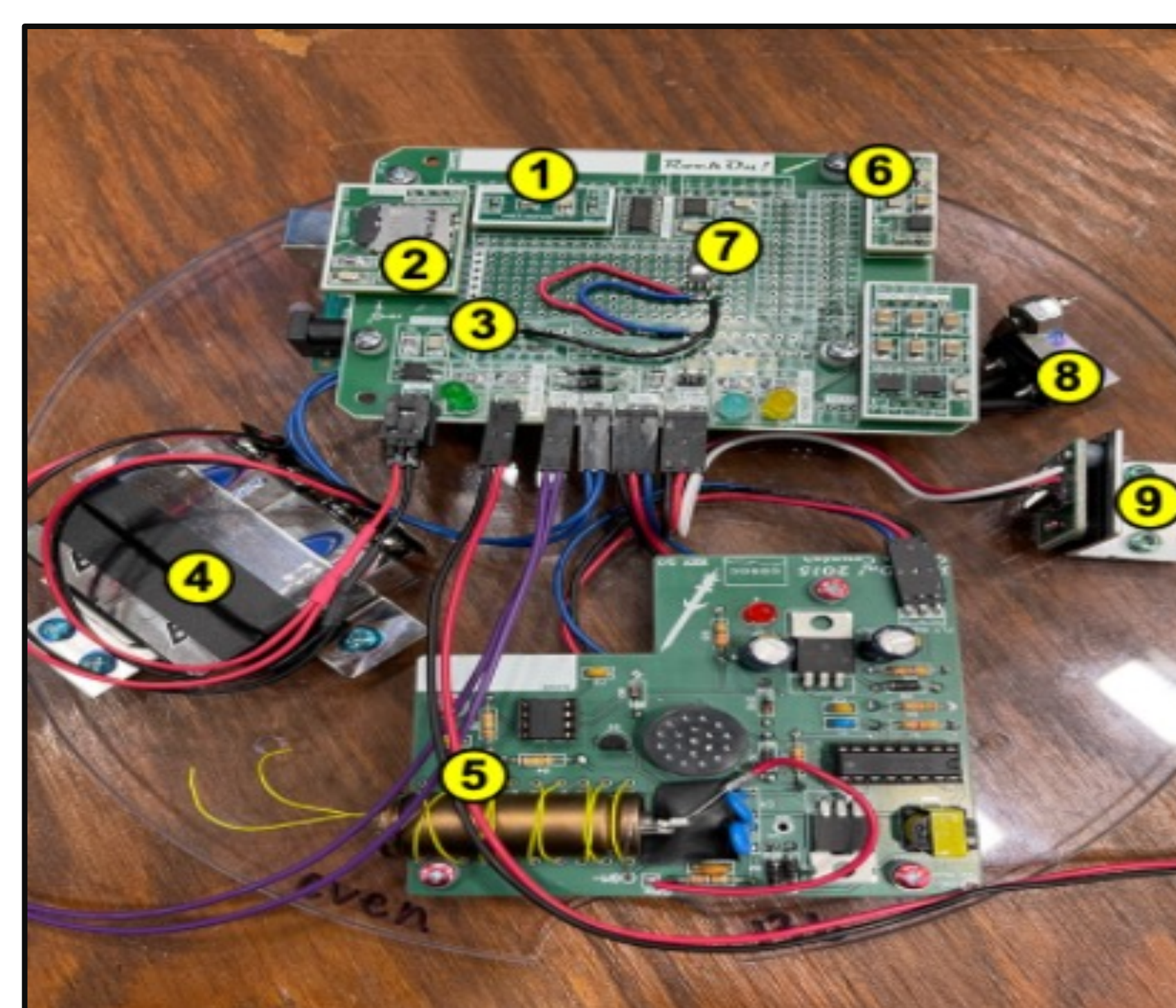
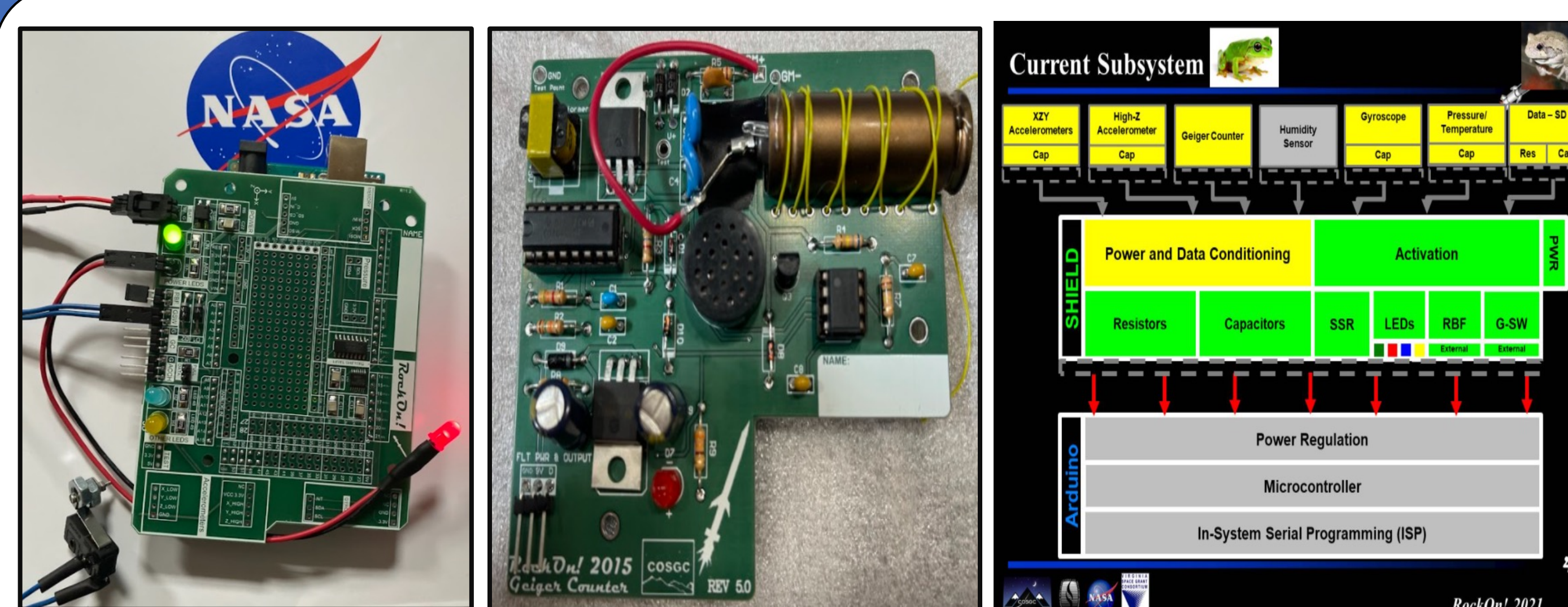


#	Task	Start	End	April (04/19/21) to May (05/10/21)										
				4/19	4/23	4/26	4/30	5/05	5/07	5/10	5/14	5/17	5/19	5/21
1	Geiger Counter & Shield	04/19/21	04/30/21											
2	Arduino & Space Shield Int.	04/19/21	05/05/21											
3	Flight Code and Geiger Int.	05/05/21	05/10/21											
3	Power On Systems Test	05/10/21	05/14/21											
4	Plate Integration	05/17/21	05/19/21											
5	Final Steps	05/19/21	05/21/21											

Students Participation



Payload System



- Pressure Sensor
- SD Card
- Space Shield w/ Arduino Mega
- 9 Volts Battery
- Geiger Counter
- Gyro Sensor
- Temperature Sensor
- G-Switch
- Z-Accelerometer

Payload Integration

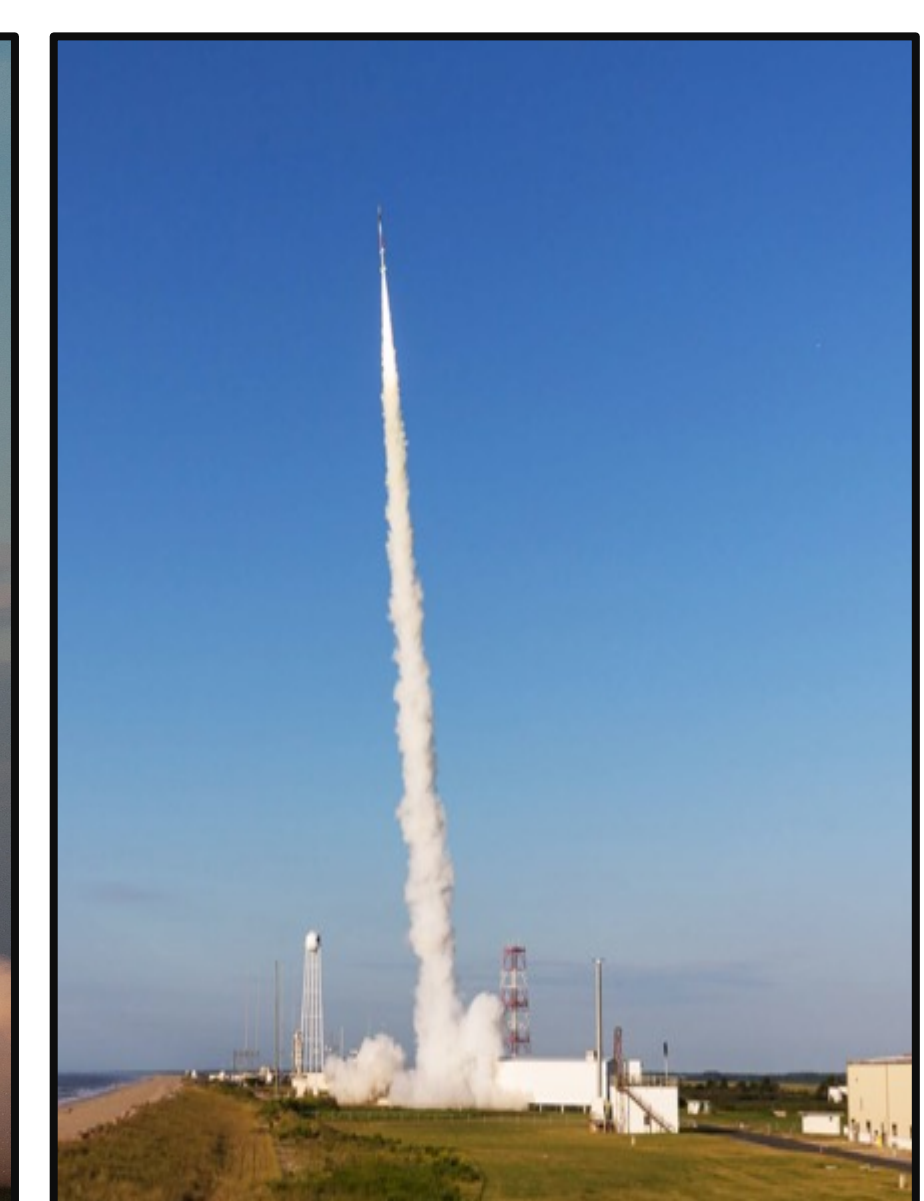
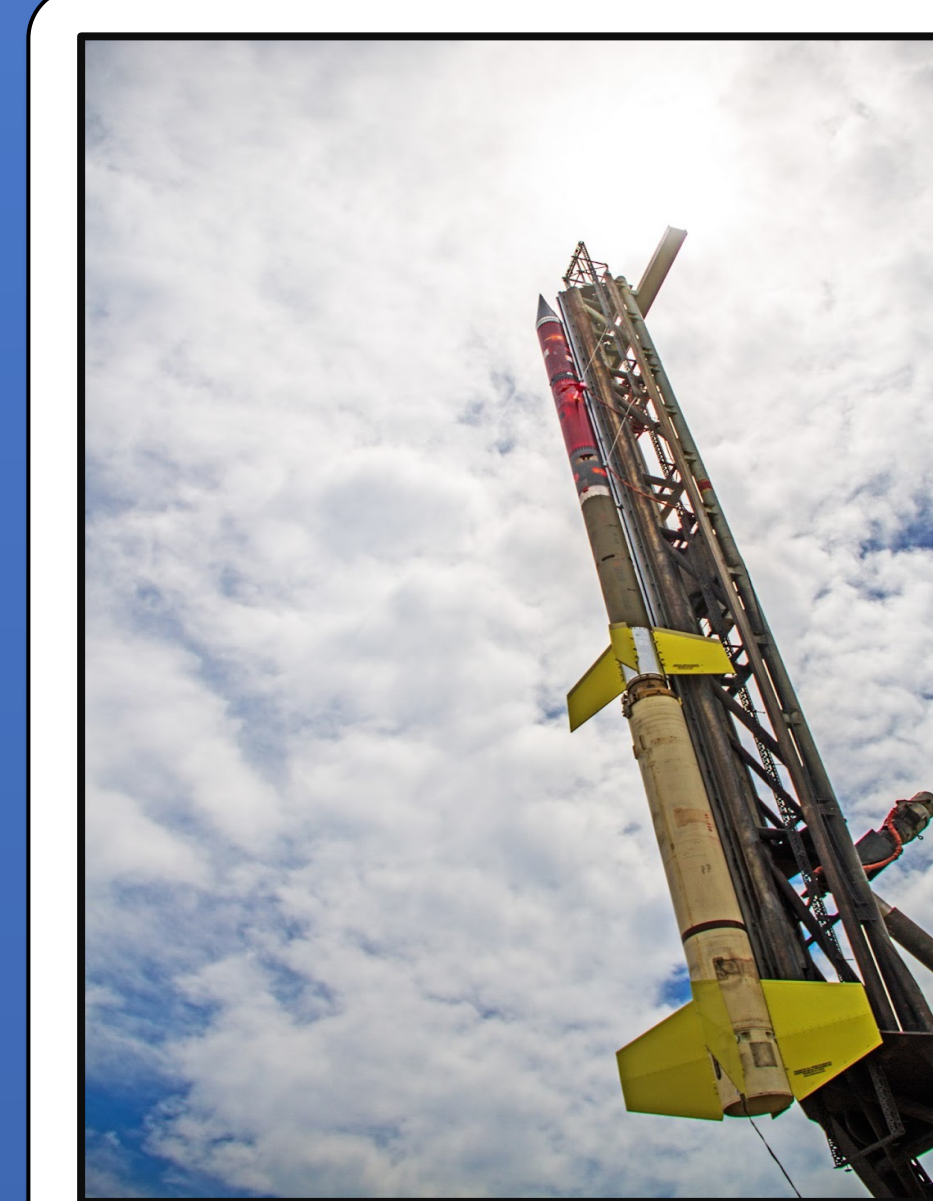


The students' payload systems were integrated in a canister and was placed in the rocket's upper airframe.

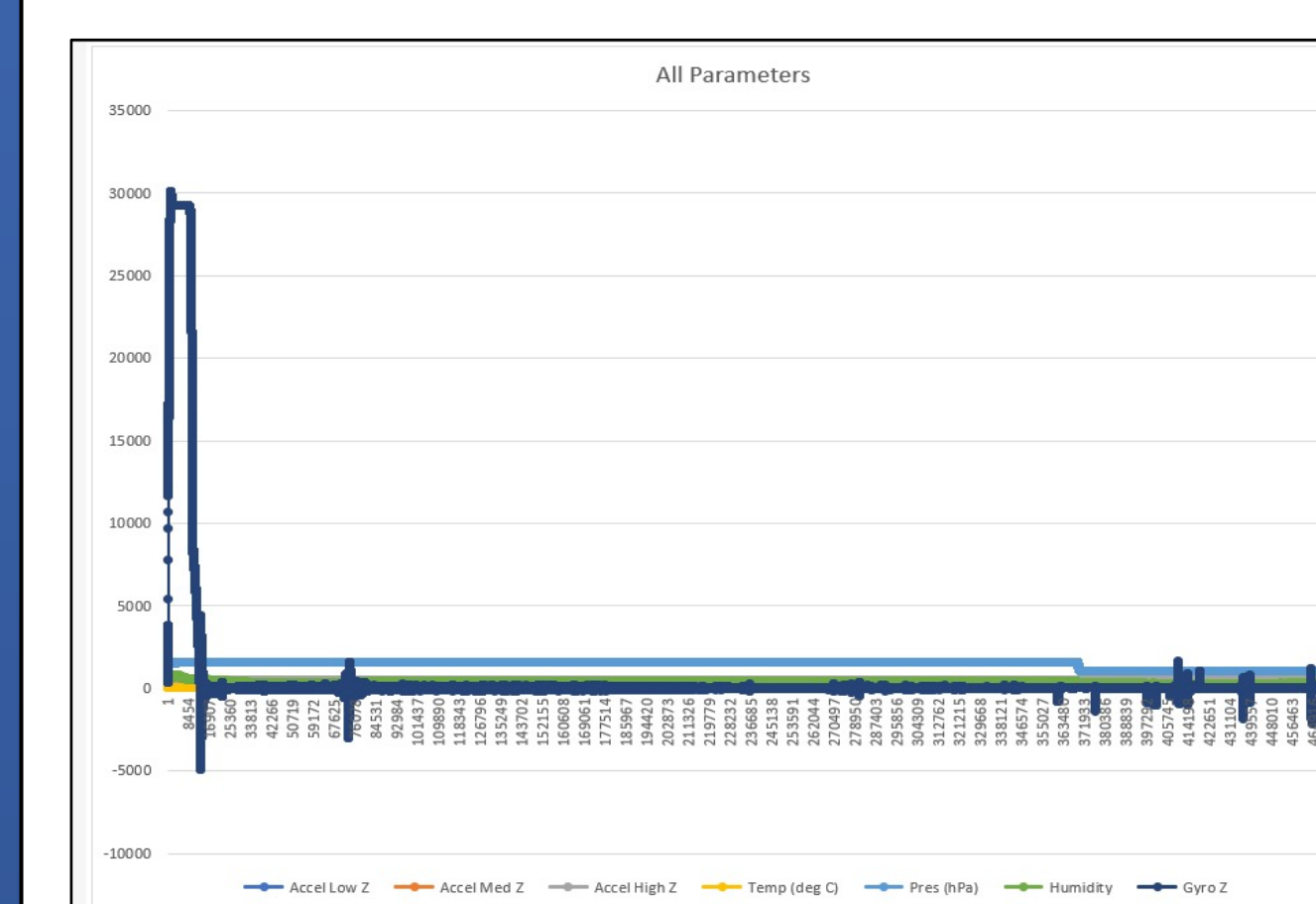


The 40-foot-tall rocket carried 32 experiments (measuring acceleration, humidity, pressure, temperature and radiation counts) from the RockOn Program.

Terrier-Improved Orion



Data Analysis Results



Apogee: 72 Miles (380,160ft)
Pressure: 1,591 hPa (23.08 psi)
Temperature: 43 °C
Geiger: 4 counts

Presenters



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