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The ZERO: Zip-Tie Revolver

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**Additional mentors:** Megan Gambs and Sarah Haight
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Abstract
The Boise State University Microgravity Team has been challenged with designing a mechanical Zip-tie tool to be used during EVA missions on the ISS. NASA is looking for a new tool that will allow astronauts to fasten zip-ties to secure wires and hoses. This tool would need to have a number of zip-ties stored internally, be quickly reusable, and would need to be easily and safely operated by an astronaut in a single handed operation.

Comments
Additional mentors: Megan Gambs and Sarah Haight

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THE ZIP-TIE REVOLVER

PROJECT OVERVIEW
The Boise State University Microgravity Team has been challenged with designing a mechanical Zip-tie tool to be used during EVA missions on the ISS. NASA is looking for a new tool that will allow astronauts to fasten zip-ties to secure wire and hoses. This tool would need to have a number of zip-ties stored internally, be quickly reusable, and would need to be easily and safely operated by an astronaut in a single handed operation.

OBJECTIVES
The main objective of the Microgravity Team is to design and build the ZERO as a prototype that will help astronauts quickly and safely install zip ties during space walks on the ISS:

- Capable of installing and tightening a zip-tie around objects
- Ranging from 0.5" to 2" in diameter/width
- Capacity of 10 zip-ties that it will be able to dispense
- Operate using only manual power
- Designed with geometry that will allow air and water to move freely through the device

How It Works
Activated by a trigger mechanism, the lower jaw closes around the intended object and guides the spring loaded zip tie from the revolver barrel into a loop around the target.

NASA Micro-g NExT Team

Advisors and Mentors: Megan Gambo, Sarah Haight, Steve Swanson

EDUCATIONAL OUTREACH
The team’s research is shared with K-12 students and the local community in the hopes of inspiring the next generation of scientists and engineers. Below is a list of some of the outreach events the team has participated in this year:

- Idaho Science and Aerospace Scholars
- Seven Oaks STEM Night
- Girl Scout’s STEM Exploration Day
- Sacajawea Elementary School Trunk or Treat
- Mountain View Elementary STEM Night