

Penn State SPS  
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## Mission to Mars

Penn State's SPS chapter hosted its "Mission to Mars" outreach event on April 26<sup>th</sup>, concurrently with the university's Space Day and Bio Day. Approximately 200 parents and children attended the Mission to Mars event, while 1200 attended the combined activities. The "mission" was a series of eight physics-themed stations, targeted at elementary and middle school-aged children. They began by creating and launching bottle rockets, and then learned about orbital mechanics through two different stations, one on transfer orbits and another on centripetal force. Next, students learned the basics of spectroscopy as they were instructed to look for signs of water on the Martian surface; they used their SPS sock kit diffraction glasses to look observe emission lines of water, hydrogen, and oxygen. Their space ship then experienced technical difficulties, as the lights and motor went out, forcing them to complete circuits to get their spaceship working again. When they fixed the electrical problems, they sighted their target on the Martian surface using their laser-guided optical system, and then learned about the pressureless environment of space via marshmallow people in a vacuum chamber. As they encountered the red planet, their final task was to build a lander capable of protecting one of the ship's astronauts, an egg. Upon landing (successfully or unsuccessfully), participants who completed all eight stations received a physics-themed prize.

Penn State's SPS chapter hopes to make physics-themed stations an annual event hosted at the same time as Space Day and Bio Day, although the theme will most likely change, as many kids return year after year.

**Budget:**

Pipe cleaners: \$7.50

Cotton balls: \$10

Masking tape: \$2.50

Duck tape: \$13.33

Cups: \$5

Eggs: \$42

Paper towels: \$6.24

Construction paper: \$5

Scissors: \$7.20

Trash bags: \$13.56

Straws: \$3.48

Masking tape: \$3.70

Yarn: \$2.86

Popsicle sticks: \$6.96

Clear tape: \$2.00

Buckets: \$1.96

Foamboard \$2.68

Markers: \$2.97

Marshmallows: \$3.52

Toothpicks: \$3.29

Physics-themed prizes: \$258

Total: \$403.75

Award amount: \$300



Students learn about basic circuits as they try to fix the spaceship's power outage



Students create marshmallow people and test the effects of outer space via a vacuum chamber



Students use SPS diffraction glasses to attempt to find water on Mars