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## Utah State University A Team Corner

- Get ready for our upcoming summer camps; DATA Camp, Transition Camp, APP Camp and Engineering Camp.

### NASA Downlink

**A** ONCE-IN-A-LIFETIME OPPORTUNITY! USU GEAR UP students joined in a real-time link with International Space Station (ISS) Commander Peggy Whitson and NASA Astronaut Jack Fischer on May 19, 2017 for the chance to talk with the astronauts and ask questions about their life in space. The main event was held at the USU Space Dynamics Laboratory facility along with live streaming capability for participating schools throughout Utah and Nevada. In typical astronaut fashion, Fischer appeared upside down on the call, and both astronauts sported huge grins as they spoke with the students.

Dr. Jed Hancock, Civil Space Division Director at Space Dynamics Lab, presented information about space projects and highlighted the orbital capabilities of the ISS. "The ISS is like a six-bedroom house flying at 17,500 miles per hour. Just in the time frame of this phone call, in the 20 minutes we

talk, they will travel about 6,000 miles," Hancock explained. "They will go all the way across the distance of the United States."

Students were captivated by the light-hearted astronaut activities such as floating the microphone, summersaults and hanging upside down. In response to a question about his favorite space food, Fischer said his answer is "everything, because it floats."

He grabbed a pouch of tropical punch and squeezed out a ball of liquid while explaining how the surface tension remains intact. Then he sucked up the liquid and smiled as students laughed.

Another student asked what the astronauts like to do in their free time. "Looking out the window never gets boring because we get to see the Earth," Whitson said.

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*Left: Peggy Whitson and Jack Fischer as they appeared to the students.*



## NASA Downlink Cont.

Commander Whitson mentioned that the ISS orbits Earth 16 times a day, and they can see the sunrise and sunset every 45 minutes. In response to a question about how the astronauts have adjusted to space, Whitson said it can be tough working on experiments or repairs while all of their tools float away. She learned to secure tools with Velcro or tied bags.

When asked what it feels like to be a member of the small group of people who have been in space, Fischer said "it's humbling and inspiring." He told the students "You are the generation that is going to take us into the heavens for good, and I'm really excited for that."

As the 20-minute call came to an end, Whitson curled up into a ball as Fischer spun her in circles as he waved goodbye.

Jim Dorward, GEAR UP project director, explained that events like this encourage students to go to college and explore STEM careers. "When you talk to them they start saying, 'I want to be an



*The ISS, moving 17,500 mph, travelled approximately 6,000 miles within the 20 minute video call.*

electrical engineer; I want to be a mechanical engineer; I want to be an astronaut.' And they start thinking about, 'Well, how do you get there?'" Dorward said. "That's what we try to do, is help them get there."



*Right: Dual Immersion Academy students wait for the USU Space Dynamics Lab for awesome space experiments.*



# USU STARS! GEAR UP Greenpower Invitational

It may be the slowest race held at the Utah Motorsports Campus (UMC) in Tooele, but that does not make it less exciting or important. USU STARS! GEAR UP held its annual Greenpower Invitational on April 27, 2017 at the UMC. Students from sixteen high schools and middle schools from across Utah and Nevada participated in this event. Greenpower is an international organization dedicated to promoting engineering and technology. One way that they achieve this is through unique hands-on projects to design, build, and race electric cars. Students not only assemble and race the cars, they also gain valuable experience in problem solving on mechanical and electrical issues while enhancing the performance and sustainability of their design.

On race day, the goal was to see who could go the furthest on the car's battery in 90 minutes. Gunnison Valley High School snatched first and second place, while Manti High School took third at this year's race. During the 90-minute duration, cars reached speeds over 20 mph and the winner drove about 28 miles and sustained life in the battery. Congratulations, Gunnison Valley!

Alex Stevens, a junior at Manti High School, said the hardest part had nothing to do with construct-



ing the car. "I think one of the most challenging parts for our team was learning how to talk to people, to get sponsors to help pay [for the car and our travel]," Stevens said. "We all know how to do things on the car, but none of us are very good at talking."

Following the race in Tooele, Manti High School racers traveled to Indianapolis, Indiana to compete at the national level on the Indianapolis Motor Speedway, home of the Indy 500. The students placed fourth out of 28 teams! Way to go, Manti!

The goal of the Greenpower program is to inspire students to think about careers in engineering and develop skills that help in any field. GEAR UP partners with Greenpower USA and Siemens Corporation to make this event a success.



*Above: With the help of fellow classmates, students can get their self-assembled cars to reach speeds of over 20 mph.*

*Left: Elijah Hanes of West Wendover High School prepares to race their team's electric car.*



# USU STARS! GEAR UP Students Win Big at Science Fairs

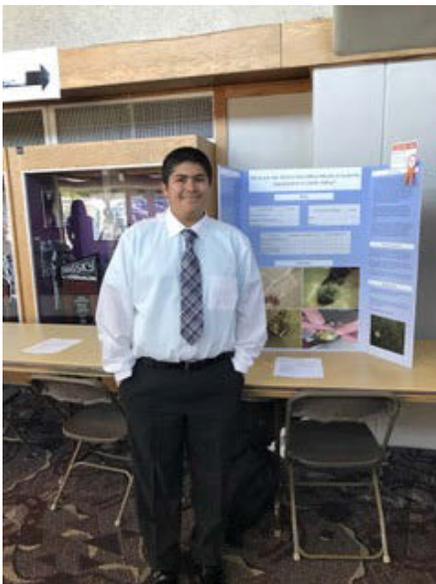
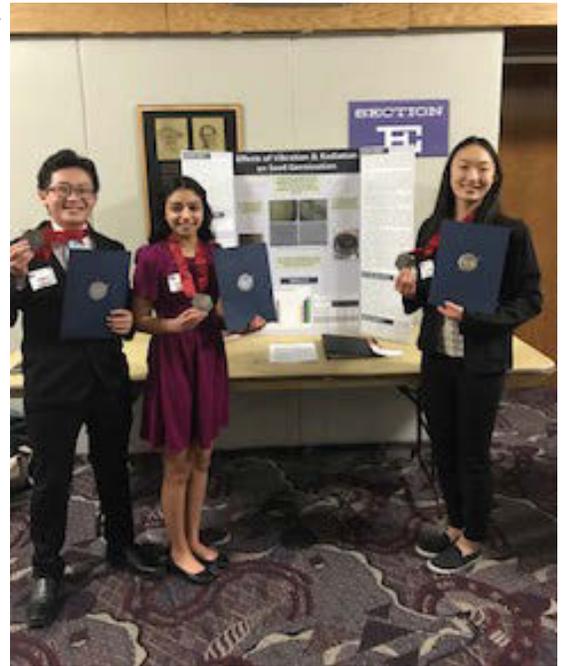
Logan High School students won top honors at the Ritchey Regional Science and Engineering Fair in Ogden, Utah on March 24, 2017. Along with winning big at the Ritchey Fair, they received the Utah Veterinary Medical Association Award of Excellence and the NASA Project Excellence Award.

In botany, students Gereema Dhiman, Michelle Jung and Andre Nguyen won second place from their research entitled “*Effects of Space Travel on Seed Germination and Viability.*” This team also earned additional recognition by receiving the NASA Project of Excellence Award!

In zoology, Emilio Alejandro won 3rd place for his research on the monarch butterfly. His topic, “*Are Monarchs Endangered? A Population Survey of the Monarch Butterfly in Cache Valley,*” also won the Award of Excellence from the Utah Veterinary Medical Association for his discovery of a new infection that is endangering this species. Way to go, Emilio!

Their research was also presented at the USU Research Symposium hosted at the Logan Campus in April. The students had the opportunity to communicate their research and explain their poster presentation along with over 100 graduate and undergraduate research students. Our 10th grade GEAR UP students competed at a collegiate level. The students commented that this event allowed them to share the information with their peers and see that their research was equivalent to collegiate level projects.

The research and mentoring was provided by Utah State University and the USU GEAR UP program in partnership with the USU Physics Department, and the Space Dynamics Laboratory. The USU STARS! GEAR UP program is designed to interest students in science, technology, engineering, and math (STEM) content and knowledge while enhancing students’ technology skills and increasing their appreciation and understanding for STEM careers.



*Top Right: Michelle Jung, Gareema Dhiman, and Andre Nguyen display their awards at the Ritchey Science and Engineering Fair and the NASA Excellence Project. Left: Emilio Alejandro showcases his award-winning research on monarch butterflies.*

## USU STARS! GEAR UP Administrative Team

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- Program Director Cohort 2 - Jim Dorward
- Program Coordinator Cohort 1 - Melia Balls
- Program Coordinator Cohort 2 - Heather Ericson
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