

## News

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# SWOSU Physics and Engineering Club Rocketry Team Wins Second at National Competition



*The SWOSU Physics and Engineering Club Rocketry Team in Weatherford recently earned second place in a field of 18 universities at a national competition in high-power rocketry held each year in Argonia (KS). Members of the team and competition officials are (from left): Daniel Gassen, senior, El Reno; Brock Mason, senior, Tuttle; Bob Brown, competition prefect; David Duerksen, safety officer; Cameron Cinnamon, graduate, Garber; Tayler Valdez, junior, Adams; Emma Bollinger, sophomore, Stillwater; Ryan Horn, sophomore, Buffalo; Kaitlyn Schrick, junior, Frederick; Riley Smith, junior, Arnett; and Wayne Trail, club sponsor, Not pictured are Grayson Butcher, freshman, Elk City, Raistlin Hiner, junior, Anadarko; and Tabitha Taylor, freshman, Canute.*

The SWOSU Physics and Engineering Club Rocketry Team in Weatherford recently earned second place in a field of 18 universities at the Argonia Cup, a national competition in high-power rocketry held each year in Argonia (KS).

In the Argonia Cup, teams of university students have about a year to build a rocket that reaches an altitude of at least 8,000 feet and then delivers its payload—a golf ball—to a predetermined location on the ground. The teams then meet on the last weekend in March in Argonia to compete. During the two-day event, each team gets three attempts to deliver their golf ball as close as possible to the target.

The SWOSU team prepared for the competition by first developing rocketry skills with the help of the Tripoli Oklahoma Rocketry Club, which hosts monthly launches at the Sayre airport. During this preparation, five team members achieved one or more levels of certification from the Tripoli Rocketry Association, a national association of amateur rocketry.

By the fall of 2020, captain Brock Mason and his team were consistently producing successful GPS-tracked launches up to 11,000 feet. The rockets reach speeds of over 700 miles per hour within a few seconds after launch, during which they accelerate at 20 to 30 times the acceleration of gravity. On-board electronics monitor the altitude and speed to determine when to detonate black-powder charges that release the parachutes and the drone at the appropriate times.

After experimenting with a range of possibilities, the team settled on a 4-inch quad-copter (drone) as the delivery vehicle. Daniel Gassen led the task of designing, building, programming and flying a drone that can carry a golf ball a distance of at least one mile after being dropped from the rocket. The drone must fit inside the 4.5-inch diameter rocket and tolerate the large launch forces. The drone pilot steers the drone by looking through the on-board camera and seeing what the drone "sees" with the aid of virtual reality goggles.

The SWOSU team quickly caught the attention of the judges and the other schools by landing their drone right on the 'X' on a low-altitude practice launch. According to the judges, no one had done that in practice or competition in the five-year history of the event.

SWOSU's final competition attempt landed 568 feet from the 'X' and put them in first place and, at the time, was the closest in the history of the event until Oklahoma State University got closer with about 30 minutes left in the event.

The prize for finishing second was \$1,200 cash and \$700 worth of rockets and electronics from the event sponsors: Altus Metrum, Chris' Rockets and Honeywell. The event was won by the Oklahoma State University team, which used an autonomous folding-wing airplane as their delivery vehicle. Among those competing were the University of Oklahoma, University of Kansas, Kansas State University, University of Tennessee (3<sup>rd</sup> place), West Virginia University, University of Missouri and about a dozen other schools.

The SWOSU Physics and Engineering Club Rocketry Team was funded primarily by the Oklahoma NASA Space Grant Consortium through Professor Madeline Baugher as well as by SWOSU Allocations through SWOSU Dean of Students Joshua Engle and the SWOSU Department of Chemistry & Physics.

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