Down to the wire
In closest race yet, RIT wins season Baja SAE championship

AIR KINGS
Georgia Tech chalks up another first place in SAE Aero Design competition

Winning streak
Universität Stuttgart tops FSAE Michigan field again

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TO 10,000 FEET AND BEYOND!
For the second straight year, Ohio State University’s Buckeye Space Launch Initiative team brought a Spaceport America Cup first-place trophy back to campus. Held June 19-23 at the Spaceport America headquarters in New Mexico, the largest annual intercollegiate rocket engineering event hosted over 120 teams from around the world. The Spaceport America Cup features multistage rockets and all chemical propulsion types: solid, liquid and hybrid. Teams are graded on how close their rockets ascend to reaching specified altitudes, as well as through technical and flight readiness reports. The Ohio State team’s rocket targeted for an altitude of 10,000 feet took first place in the Student Researched and Designed category, as it flew to 10,080 feet over the desert. The rocket, dubbed “I-O,” was propelled by a solid motor and carried a payload of nine pounds. The team’s 40 team members also competed in the 30,000-foot category, which had an unplanned descent at 27,500 feet.

SOLAR POWER PROPELS AUSTRALIAN TEAM TO U.S. VICTORY
The University of Michigan Solar Car Team was shooting for its seventh straight win in the 9-day, 1,700-mile American Solar Challenge in July, but had to settle for second. Finishing first in the race from Nebraska to Oregon was Western Sydney University (WSU), whose 158-kg car was lighter and smaller than the UMich entry, called Novum. WSU was the first international team to win the American event, along the way setting the best time in four of the five stages. UMich won the other stage. Novum is unusual in that it has only one hull, compared to the two that most teams, including WSU, used. While most teams had between 20 and 30 team members, WSU had only 14.

CANADIAN TEAM WINS CANADIAN FORMULA EVENT
École de technologie Supérieure was winner of the Internal Combustion Class at Formula North 2018.

The Formule ETS Montreal team from École de technologie Supérieure was victorious in the eighth running of the Formula North competition in Barrie, Ontario, this summer, beating out teams from University of Michigan and Carelton University in the Internal Combustion Class. In the Electric Class, Carnegie Mellon University was the winner, followed by Rochester Institute of Technology and Purdue University. Carnegie Mellon went on to win the Formula SAE Electric competition later in June.

U STUTTGART TAKES CROWN AT FORMULA STUDENT GERMANY
Universität Stuttgart edged out Graz Technical University for the overall victory in the Internal Combustion Class at Formula Student Germany 2018, held in August. Coburg University of Applied Sciences finished third. Oregon State University, which had a tough time earlier in the year at Formula SAE Michigan, finished fourth overall—best among U.S. teams. Zurich ETH won the Electric Class, followed by Trondheim NTNU and Amberg OTH. Zurich ETH also won the Driverless Class, with Karlsruhe KIT finishing second and Hamburg TU finishing third. Formula Student Germany was held at the Hockenheimring in Hockenheim.
Using an open-source engine controller (Woodward SECM-70 pin) that allowed the team to develop all of its engine control software in-house was key to Kettering University’s victory in the Internal-Combustion Class (ICC) at the 2018 SAE Clean Snowmobile Challenge. Finishing second in the IC Class at the March 5-10 SAE Collegiate Design Series competition hosted by Michigan Tech in Houghton, Mich., was University of Minnesota – Duluth, followed by University of Wisconsin – Madison. Along its way to victory, Kettering finished first in the IC Class’s Fuel Economy event.

Kettering also finished high in the Diesel Utility Class (DUC), coming second overall behind winner University of Wisconsin – Platteville. They were the only two teams in the DUC to pass the emissions test—a requirement to claim first place. The emissions test requirement also applies to the ICC. Had Ecole de technologie Superieure (ETS) passed the emissions tests for its two sleds, it would have won both Classes on the basis of points scored in the scoring events. ETS finished first in the all-important Noise event in both Classes.

Twenty-one teams and more than 200 students participated in the competition on site. Students begin work on their sleds for the competition at the beginning of the academic year, engineering modifications to commercially available snowmobiles that make them quieter, more fuel-efficient, more friendly to the environment in terms of emissions, and better performers in the snow. Teams are judged both for their engineering designs (written reports of which they turn in prior to the on-site competition, where they then make an oral presentation) and for how well their sleds perform in a variety of static and dynamic events.

“The health of CSC is very good,” competition organizer Jay Meldrum, Executive Director of Sustainability and Director of the Keweenaw Research Center at Michigan Tech, told MOMENTUM. “In the beginning, doubters claimed that after a few years there would be nothing to challenge the students. After 19 years of the competition—3 in Yellowstone and 16 at Michigan Tech—nothing could be further from the truth. Student teams are enthusiastic about coming to CSC, and sponsors love the format which allows for company/student interactions. Many of our CSC graduates end up with excellent jobs at sponsor locations.”

Each year, Meldrum gives the students a new challenge. “This means that they cannot, in general, bring back last year’s sled to compete without making some changes,” he said. “For example, we have used different fuels like E85, Iso-butanol, and all mixes of ethanol like E15, E22, and Flex-fuel Ethanol. When we do flex fuel, I do not tell them the actual content of ethanol. They have to engineer the sled to take any mix.”

Kettering University obviously came prepared for anything.

“When developing the sled, we focused on making improvements that would result in gaining the most points at competition events,” said Kettering team captain Alex Rath. “Events like the lab emissions and in service emissions are weighted much more heavily than other events such as the Acceleration event.”

“We also focused on developing a system that was reliable and that could compete in all of the events,” Rath continued. “One of the main reasons we were so successful overall was that most of our competitors were unable to compete in all of the events due to their sled breaking down during the competition. Our snowmobile was able to compete throughout the competition without having a single failure.”

The challenge for the Kettering team related more to product management than engineering design. “We had about eight to ten people total between our IC and DUC snowmobiles this year, and involvement was on a volunteer basis,” Rath said. “With such limited personnel,