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## COMMENTARY

# School's In

## Academia provides more than just ideas as industry looks to speed technology development

**A**s industry strives to develop advanced technologies faster and cheaper, faculty and students at academic institutions are proving to be valuable resources. Collaborative projects are taking students beyond their academic curriculum to help industry with rapid prototyping while developing a future workforce.

The collaboration is becoming more significant as pressure on research funding increases, with graduate and undergraduate students taking on a growing role in maturing technologies and building prototypes.

At the University of Virginia (UVA) in Charlottesville, students are working with industry to ground- and flight-test a scramjet and develop improved methods of testing hypersonic engines. Farther south, at Middle Georgia College, students have produced composite structures for NASA's James Webb Space Telescope and a prototype powered-lift unmanned aircraft.

Under the Hy-V program, the scramjet payload, designed by UVA with Allied Techsystems' (ATK) GASL division, is expected to fly from NASA's Wallops Flight Facility in Virginia in 2012, says Chris Goyne, research assistant professor of aerospace engineering

at the university's School of Engineering and Applied Science and principal investigator for the flight mission.

The level of student involvement is unusual for a scramjet test program, Goyne believes. Graduate students are collaborating with ATK on design of the payload, while undergraduates are working with Aerojet on different aspects of the flight mission. "It's a great opportunity for them to work side-by-side with faculty and industry, and gives them a head start," he says.

The payload has two hydrogen-fueled scramjet flowpaths and will be boosted to 92,000 ft. and Mach 5 by a NASA-supplied sounding rocket. Hy-V will "develop methodologies and learn lessons for ground test and flight test," says Goyne. One of the flowpaths is based on a design UVA has tested in its direct-connect hypersonic windtunnel.

Hy-V is being funded by the U.S. De-


fense Department under the advanced propulsion test technology area of the Test and Evaluation/Science and Technology program. And because it involves graduate and undergraduate students at UVA and Virginia Tech, NASA Wallops is providing the sounding rocket and range services under its university outreach effort.

Middle Georgia College's Institute for Applied Aerospace Research in Eastman, meanwhile, has delivered the first set of composite cooling baffles to NASA for the Webb telescope's instrument electronics compartment. Students in the college's advanced composite structures program produced the louver assembly under subcontract to Genesis Engineering.

"We have the facilities, the manpower in our students and know-how in our instructors," says Rick Charles, division chair of aviation management and business, "The students do the labor and it is quite a deal for them to have to perform at the level required to produce something for NASA."

The institute also has delivered the composite airframe for a 10-ft.-span unmanned aircraft to small Georgia company Aerotonomy, which approached the college for its composite engineering and fabrication expertise, says Institute Director Rick Krontz. "We have the resources to help them decide how to fabricate the UAV, and it's integrated into the students' curriculum so they are exposed to a lot more experience."

Charles says the college can help small companies develop new technologies and products. "We can help develop processes and procedures, do low-level production then hand off to the company so they don't have the overhead of developing those processes," he says, adding that, if there is potential for economic benefit to the region, the state of Georgia can provide matching funds.

Middle Georgia College is part of a Lockheed Martin-led team working on advanced aircraft designs under NASA's Environmentally Responsible Aviation research program and is applying its aerospace expertise to projects as diverse as a drag-racing motorcycle and standardized training for technicians repairing composite wind-turbine blades. 



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