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ULA, Ball Aerospace interns poised to launch amateur rocket

A five-year campaign by interns working for United Launch Alliance, the Boeing-Lockheed Martin joint venture based in Centennial, Colorado, is slated to culminate in July with the launch of Future Heavy, which may be the world's largest amateur rocket.

If all goes as planned, the 15-meter-tall rocket powered by eight first-stage and two second-stage solid rocket engines will soar 10,000 to 11,000 feet over southern Colorado and dispense scientific instruments and experiments devised by elementary, middle, high school and college students.

Each summer, ULA interns design, build and launch high-power sport rockets, while interns working for Ball Aerospace & Technologies, the Boulder, Colorado, manufacturer of spacecraft and instruments, provide payloads. Ball plans to put this year's summer interns to work designing and building payloads to fit in Future Heavy's 1.8-meter-long, 61-centimeter-diameter fiberglass tube inside the Future Heavy rocket's carbon fiber fuselage.

"You could easily fit an intern in there," jokes Jaron Davis, a Ball Aerospace systems engineer who oversees BIRST, Ball's Intern Rocket Science Team.

With 6,500 pounds of thrust, the Future Heavy rocket also will be powerful enough to lift that intern, says Greg Arend, who leads ULA's additive manufacturing program and the company's Student Rocket Launch program.

In recent years, ULA and Ball interns have launched smaller rockets, ranging in size from about three to seven meters. Because the Future Heavy rocket is more than twice the size of those launch vehicles, Ball employees who volunteer to serve as mentors for the company's interns are getting a head start on the summer project.

Before the interns arrive, Ball engineers plan to build one or two aircraft that the Future Heavy rocket will release after it reaches its apogee, deploys parachutes and detaches its nose cone. Once the Ball interns arrive in May, they will have about eight weeks to devise missions. The students will decide whether to build instruments to mount on the aircraft that flies out of the rocket or to build instruments that do not ride on the aircraft, but instead are housed in an area of the rocket's payload fairing behind the aircraft. The instruments that are not mounted on the aircraft will be jettisoned from the rocket after the aircraft leaves the rocket.

ULA and Ball interns work 40 hours a week for pay, working for example on ULA's Atlas rocket or helping to test the weather and climate-monitoring instruments Ball is building for the NASA-NOAA Joint Polar Satellite System constellation. Interns can't devote any of that 40 hours on the rocket components or instruments, but the companies provide plentiful pizza or other food to fuel after-hours efforts.

During the core of their internships, students play a small role in a large aerospace program, but the Future Heavy campaign allows them to experience the entire life cycle of a mission from design through construction, testing and flying, Davis says.

The companies also benefit because the program helps them attract talented interns who sometimes continue to work for the company after graduation.

"A lot of folks tell us they heard about how cool our internship program was because in addition to the day job, they get an after-hours opportunity to build and launch a rocket," Arends says.

United Launch Alliance interns prepare their high-power sport rocket, Stars 'N' Stripes, for launch in Pueblo, Colorado, last July. This summer, ULA interns plan to launch a much larger rocket, the 15-meter-tall Future Heavy, which is designed to break the record for the largest amateur rocket ever flown.

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