

THE DAILY *Published independently
by students at Penn State*

Collegian ONLINE

SCI-HEALTH

[Tuesday, Feb. 8, 2005]

Student SPIRIT rocket to soar

Norwegian students arrived Sunday to collaborate with PSU engineers on the NASA project, set to launch in 2006.

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A group of Norwegian students arrived at the Greyhound Bus station Sunday night to be greeted by Penn State's SPIRIT team. Just in time for the Super Bowl kickoff, they made a quick stop by the HUB-Robeson Center television to watch part of the game before their work began yesterday.

Student Projects Involving Rocket Investigation Techniques (SPIRIT) is an undergraduate research project at Penn State that acts in collaboration with the NASA sounding-rocket program.

The current group of students is working on the program's third rocket payload and launch since SPIRIT started in 1995, supervisor and payload manager Timothy Wheeler said. This month, with the help of the 11 students from three different universities in Norway, the team will advance toward their 2006 launch in Andenes, Norway.

Lars Loevlie, a student from the University of Oslo, was enthusiastic about collaborating with Penn State students.

"I think for us Norwegians it's very exciting to work on the international level. We get a chance to work

with high-technology rockets," Loevlie said. "The knowledge that we get in lectures can finally be put to use in a practical way."

The rocket is about 6.5 feet tall and is expected to travel into the ionosphere, approximately 110 miles from Earth's surface, power and wiring leader Jose Pacas (junior-electrical engineering) said.

"This is a tremendously important visit," Wheeler said. "Collaborating with the international students is a strategic priority to develop world-class engineers. It's eye-opening and exciting."

Wheeler, a research assistant in the Department of Electrical Engineering, helped develop the original proposal for the SPIRIT program when he came to Penn State 10 years ago.

Although Penn State has advanced in rocket research since then, there wasn't much student involvement prior to 1995, he said.

"The program is based around hands-on experience, vertical integration and long duration. Essentially, the project lasts for the students' entire undergraduate career," Wheeler said.

The students work closely with mentors from NASA, he said. This includes frequent conference calls and visits to their base, the Wallops Flight Facility, in Virginia.

"NASA has a commitment of training the next generation of explorers," Wheeler said.

Each launch explores a different payload, which is the portion of the rocket containing the tools for the experiment, Wheeler said. In some cases, the payload contains the astronaut or scientific instruments.

The first two experiments conducted by SPIRIT dealt with temperature measurement and wind monitoring in the upper atmosphere. The current experiment deals with particle dynamics, Wheeler said.

"There aren't many particles in the upper mesosphere, so we're interested in finding out what they're doing there and how they react," Wheeler said.

"We're also observing night verses day particle fluctuation," he added.

The Norwegian team will contribute three additional experiments to the payload.

The University of Bergen will conduct two experiments dealing with the construction of an X-ray camera.

"The camera will measure the flux of X-rays" in the ionosphere, Bergen student Anders Helland said. This is Helland's first trip to the United States since he was 4 years old.

The University of Oslo will be contributing a remodeled accelerometer to measure the rocket's acceleration, Loevlie said.

Penn State's portion of the project is split up into five working groups: experiments, power and wiring, structures, telemetry and publicity.

Usually, Penn State researchers build the experiments and then forward them to NASA, Wheeler said. The SPIRIT team, however, chose to take their studies further by actually building their own transmitters, wiring systems and nose cone.

"While the Norwegians are here, we will be able to finish the last couple of designs and make progress," Pacas said. "We have two months until we have to give a design review to NASA. The design process must be finished by April."

The structure team handles anything from the nose cone to the ejection door of the rocket.

NASA usually uses heavy aluminum plates for structure, but the student team is experimenting with carbon fiber plates that are much lighter, leader of structures Bruce Davis said.

"We are trying to work with different ways of doing things that are safer and more effective," Davis (junior-aerospace engineering) said.

The publicity section of the project involves students outside the engineering program, such as communications and education majors. Publicity also

organizes an outreach program that educates people of all ages about the SPIRIT mission.

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