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**SCIENCE IN ORBIT**

The future of research on the International Space Station is up in the air.

**Bethany Halford, C&EN Northeast News Bureau**

**VERY FEW RESEARCH facilities exist where a broker door was likely to make international news as a scientific breakthrough. But the International Space Station—or ISS as it’s known in the acronym-rich world of NASA, the National Aeronautics & Space Administration—at an ordinary research facility. Fighting 200 miles above Earth, the space station is expensive, equipment in space and on the ground is used to test experiments. The space station scientists experience uncertainties.

Space station research funding, limited crew time for research, and few opportunities to conduct experiments on the station are all threats to keep the unique research facility in existence. In November, the Government Accountability Office released a report (GAO-10-842) that identified four major challenges for ISS (C&EN, June 7, page 48). First, GAO notes that scientists, engineers, and managers have to transport research cargo and from the space station will be extremely limited.

A space station can carry almost 38,000 pounds from ISS for the remaining vehicles that NASA will rely on once the shuttles are retired—from space agencies in Russia, Japan, and Europe—and on the laborious and time-consuming process of conducting experiments, research on the station begins uncertainly. Faster research funding, limited crew time for research, and few opportunities to conduct experiments on the station are all threats to keep the unique research facility in existence. In November, the Government Accountability Office released a report (GAO-10-842) that identified four major challenges for ISS (C&EN, June 7, page 48). First, GAO notes that scientists, engineers, and managers have to

**LAB IN THE SKY**

The International Space Station is up in the air.

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**Materials Testing**

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**SCIENCE ON EARTH**

Large experiments built in the experiment and data are sent back to Earth in real time. MISE 6 is currently on ISS and MISSE 9 is scheduled to launch this summer. But the big question, Walters says, is how we are going to get MISSE 4 back soon? The current plan is to send it to Dragon, a vehicle that has been developed by the company, SpaceX. But we are not sure if that will happen.

Our high-speed ISS project where information is going to become more important on the space shuttles are retired in the Materials International Space Station Experiments (MISSIE). In MISSIE, a suitcase-like container holds hundreds of miles. The suitcase is attached to the outside of ISS for tests on these materials, which include everything from solar panels to space suit fabrics, are exposed to the regions of space.

These are experiments that can only be done in space,” says Kim de Groh, a senior scientist at NASA. “They’re very dependent on which astronauts are doing the experiment and how much time they can spend on it.” Wegman says of many investigations, it is that the crew has very little time.

Automated experiments aren’t necessarily easy, Wegman says. Being an automated experiment on the space station is like doing an automated experiment on a school bus full of undergraduates, he explains. “The students aren’t going to be able to help you, but they’re going to be at safety risk.”

One highly successful ISS project where information is going to become more important and more mission-critical when the space shuttles are retired is the Materials International Space Station Experiments (MISSE). In MISSE, a suitcase-like container holds hundreds of miles. The suitcase is attached to the outside of ISS for tests on these materials, which include everything from solar panels to space suit fabrics, are exposed to the regions of space. Some experiments that can only be done in space, an experienced scientist on the station told C&EN.