

Astronauts start spacewalk series to fix cosmic ray detector

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This photo provided by NASA shows talian astronaut Luca Parmitano and U.S. astronaut Andrew Morgan perform maintenance on the International Space Station during a space walk on Friday, Nov. 15, 2019. The astronauts ventured out with dozens of tools and four new pumps for the Alpha Magnetic Spectrometer. NASA considers these spacewalks the most difficult since the Hubble Space Telescope repairs a few decades ago. (NASA via AP)

Astronauts began an extraordinarily complicated series of spacewalks

Friday to fix a cosmic ray detector at the International Space Station.

Italian astronaut Luca Parmitano and U.S. astronaut Andrew Morgan ventured out Friday with dozens of tools to dissect the Alpha Magnetic Spectrometer. It took them nearly two hours to get to the instrument and start removing a protective shield, one fastener at a time, to gain access inside.

"Nice work, Luca. Looks great," Mission Control radioed to Parmitano on the end of the [space](#) station's long robot arm.

NASA considers these spacewalks the most difficult since the Hubble Space Telescope repairs a few decades ago. Unlike Hubble, the spectrometer was never meant to undergo space surgery. After 8 ½ years in orbit, its cooling system is almost dead.

Parmitano and Morgan will go out at least four times this month and next to revitalize the instrument.

Delivered to orbit by Endeavour in 2011 on the next-to-last space shuttle flight, the \$2 billion spectrometer is hunting for elusive antimatter and [dark matter](#).

It's already studied more than 148 billion charged cosmic rays. That's more than what was collected in over a century by [high-altitude balloons](#) and small satellites, said lead scientist Samuel Ting, a Nobel laureate at the Massachusetts Institute of Technology. He monitored Friday's spacewalk from Mission Control in Houston.



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The huge spectrometer—16 feet by 13 feet by 10 feet (5 meters by 4 meters by 3 meters), with a mass of 7 ½ tons (6,800 kilograms)—was designed to operate for three years. By installing four new and improved coolant pumps, the astronauts can keep it working throughout the life of the space station, or another five to 10 years. The replacement pumps arrived at the space station nearly two weeks ago, along with an assortment of new tools.

Parmitano, the lead spacewalker, and Morgan trained extensively for the

plumbing job before rocketing into orbit. Friday's task entailed removing the shield and tossing it overboard. The next spacewalk will involve slicing through stainless steel tubes and splicing in connections for the new pumps, which like the old will use liquid carbon dioxide as the coolant.

In some respects, this work, 250 miles (400 kilometers) up, is even trickier than the Hubble spacewalks, said NASA project manager Ken Bollweg. As before, the stakes are high.

"Any time you do [heart surgery](#) you're taking some risks," Bollweg said in an interview earlier this week.

Morgan is an emergency physician in the Army—a bonus for this kind of intricate work. He's making his first spaceflight.

For second-time station resident Parmitano, it marked his return to spacewalking following a close call in 2013. He almost drowned when his helmet flooded with water from the cooling system of his spacesuit. Unable to talk because of the rising water, he managed to keep his cool as he made his way back to the safe confines of the space station.

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