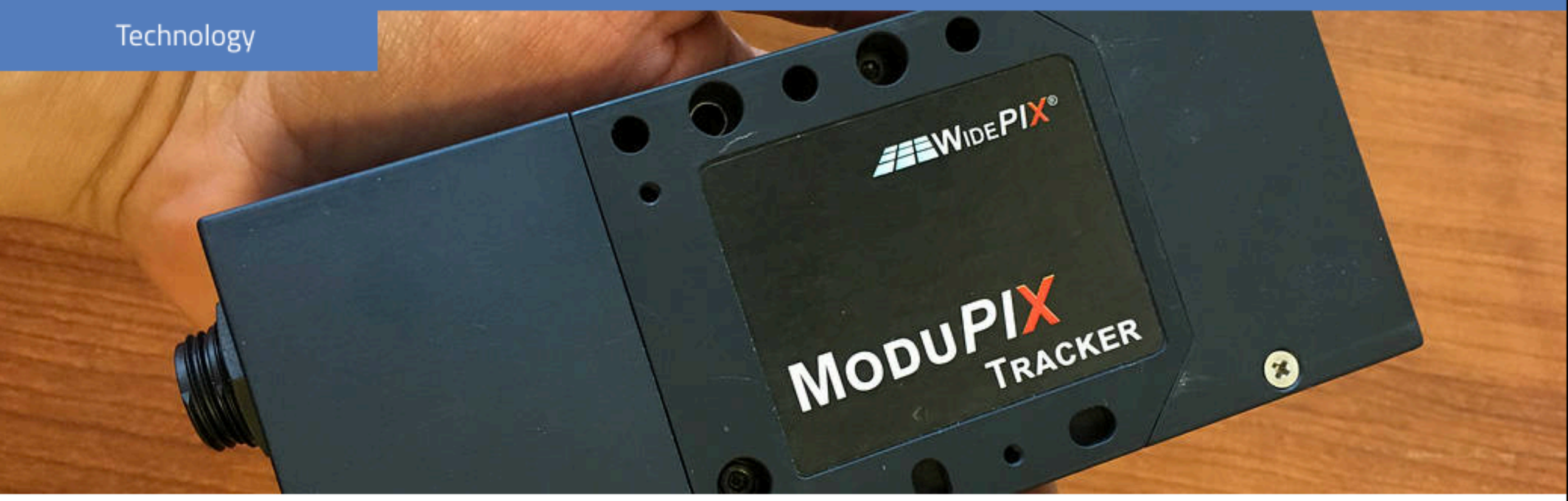


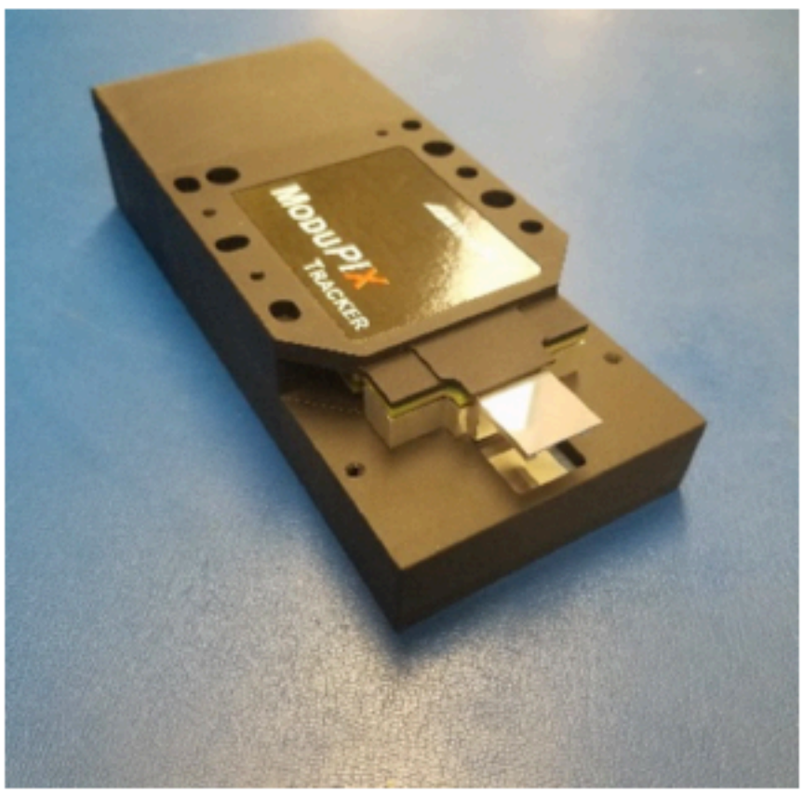
June 5, 2017

NASA Investigates Space Radiation with Miniaturized Particle Telescope

Radiation speeds across the solar system as energized, charged particles from the sun, other planets, and even stars outside our solar system. It is one of the most detrimental environmental factors in space, and has the potential to harm astronauts and spacecraft crossing its path. The Miniaturized Particle Telescope (MPT) is a radiation detector that NASA developed in cooperation with private company Advacam s.r.o. to characterize charged particles and support radiation protection efforts for astronauts on future deep space missions.

The MPT can be held in your hand, and uses two USB connections to a laptop for all of its power and data acquisition and synchronization. It incorporates two sensors using the same Timepix radiation-sensing chips embedded in NASA's USB-powered Radiation Environment Monitors (REM), five of which are already active aboard the International Space Station.

Inside the mini telescope, the two Timepix chips are separated by roughly 0.6 inches (1.5 cm). Each chip acts as an imaging plane at two separate points along the trajectory of an incoming charged radiation particle. The chips will be operated synchronously, capturing characteristics related to particle trajectories, energy, and species. This information will lead to more accurate determination of radiation impacts on organs within the human body and could promote development of tailored radiation shielding for future space missions.



The Miniaturized Particle Telescope is much more compact than systems previously used to conduct complex characterizations of radiation particles.

The spectrum of highly energized particle radiation includes vast ranges in particle energy and species, typically requiring multiple technologies for adequate characterization. The MPT is capable of complex characterizations and is about three times smaller than devices used in the past for radiation characterization in space.

The MPT was developed by the Advanced Exploration Systems Division's RadWorks initiative, and launched on the eleventh SpaceX cargo resupply mission to the space station. RadWorks matures and demonstrates affordable space radiation detection and mitigation technologies, developing radiation-related solutions for human exploration beyond Earth orbit.

Additional Information

- Radiation Environment Monitor (REM) Space Station Research Page
- Initial Report on International Space Station Radiation Environment Monitor Performance

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Tags: Journey to Mars, Space Station Research and Technology, Technology