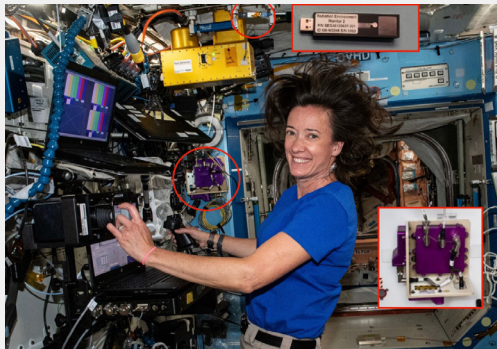
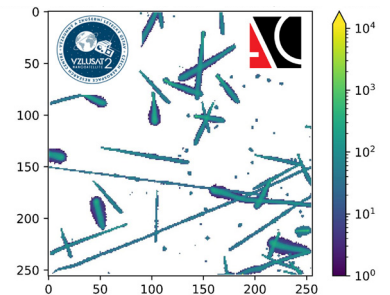


Space Applications

Space Weather Monitoring

Charged particles from solar events can harm astronauts and spacecraft electronics. ADVACAM's miniaturized, low-power radiation cameras track and identify these particles, determining their energy and origin direction. NASA, ESA, and commercial entities use our monitors for optimizing shielding and space weather forecasting. Particularly useful when limited shielding is possible, our detectors allow timely adjustments to threats and initiate protective measures.

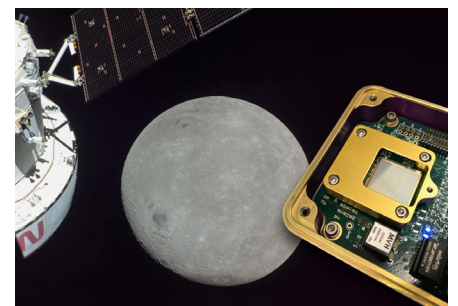


Protecting astronauts at the ISS

In 2017, ADVACAM delivered its first device to the ISS. The Miniature Particle Tracker (MPT) proved its proficiency in detecting the directional characteristics of charged particle energy spectra. Another set of ADVACAM's compact MiniPIX Timepix cameras was launched in 2019. These devices are operational across ISS modules, including the US Lab, Cupola, Columbus, JPM, Node 1, and Node 3 as part of the Radiation Environment Monitor 2 (REM2).

Artemis I: Back to Moon with our chips

The primary objective of the mission was a Moon flyby to test the Orion spacecraft, which included NASA's Hybrid Electronic Radiation Assessor (HERA). This radiation monitor, designed by NASA and equipped with ADVACAM's pixel detector, was fully integrated into the spacecraft. HERA provided onboard analysis and displayed radiation dose rates, linked to a threshold warning system.



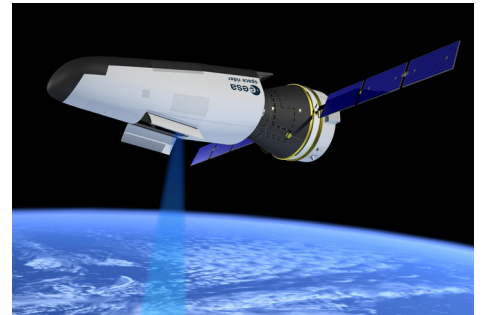
Landing on the Moon

Carefully customized MiniPIX „Space“ detector will measure the radiation field on the Moon's pole. ADVACAM's detectors are part of The Intuitive Machines landing module, which will be launched with the SpaceX Falcon 9 rocket in the third quarter of 2023. Measurements will help to understand how to protect crew and equipment from the negative effects of cosmic rays.



Space Rider: European reusable orbital truck

The Space Rider is an uncrewed robotic laboratory with ADVACAM cameras on board. Experiments inside its cargo bay will allow technology demonstration and benefits research in pharmaceuticals, biomedicine, biology, and physical science. At the end of its mission, Space Rider will return to Earth with its payloads and land on a runway to be unloaded and refurbished for another flight.



CubeSats integration

Thanks to their extremely low power consumption of just around 2 watts and their tiny dimensions, our MiniPIX-based detectors are ready for integration even into the smallest CubeSats. A MiniPIX TPX has been utilized on board the Czech 3UVZLUSAT-2 nanosatellite. Its primary goal was to verify technologies for future missions of the Czech Space Industry.

Detectors from our lineup suitable for Space Applications



MINIPIX SPACE

Compact, durable, space-ready radiation camera with advanced Timepix3 particle tracking. Vacuum-compatible, robust, temperature-stabilized; proven in space conditions.

Sensor Material:	Si, CdTe or CZT
Sensor Thickness:	According to customer preference
Frame rate:	16 fps
Number of Pixels:	256 x 256
Pixel Pitch:	55 μm
Readout Chip:	Timepix3
Power consumption:	2 W
Certifications:	ISO 8 clean room, ICD, Space Heritage, ECSS

