Moxtek in Space Again – Mars Perseverance Rover Landing 2021

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MOXTEK (Orem, UT) is excited to celebrate the landing of the Perseverance rover in the Mars Jezero crater on February 18th 2021. This landing will be watched by many people around the world with anticipation as this new high-tech rover is delivered to our red planet neighbor. Moxtek employees will also be anxiously watching as this rover, with three Moxtek products, prepares for a safe landing.

Please celebrate this landing with us on February 18th @ 1:55pm MST (Utah time).

The Perseverance rover, developed by NASA's Jet Propulsion Laboratory (JPL), includes seven important instruments intended to explore and seek evidence of past life on Mars. One of these instruments, the Planetary Instrument for X-ray Lithochemistry (PIXL), is a compact x-ray fluorescence (XRF) spectrometer mounted at the end of the rover's robotic arm and is designed to provide accurate identification of the elemental composition of rock and soil on Mar's surface. The PIXL system uses three Moxtek components including a miniature x-ray tube and two DuraBeryllium x-ray detector windows. NASA/JPL chose Moxtek x-ray windows because of their exceptional dependability in harsh and remote environments and chose the Moxtek x-ray tube because of its compact design, rigidity, and low-power consumption. The Moxtek x-ray tube was specifically designed to couple directly to an x-ray polycapillary optic, developed by X-ray Optical Systems (XOS), for the purpose of elemental mapping. Moxtek's x-ray tube and window enable the PIXL system to provide increased spatial resolution and improved measurement sensitivity. The PIXL system will analyze samples at each test site to determine the abundance and distribution of various chemical elements.

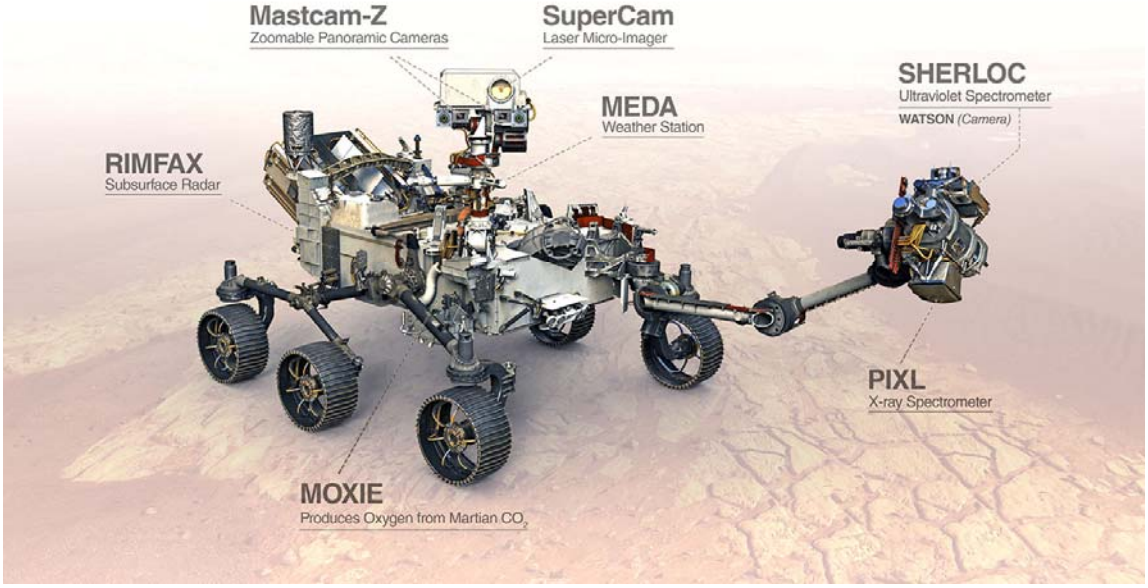
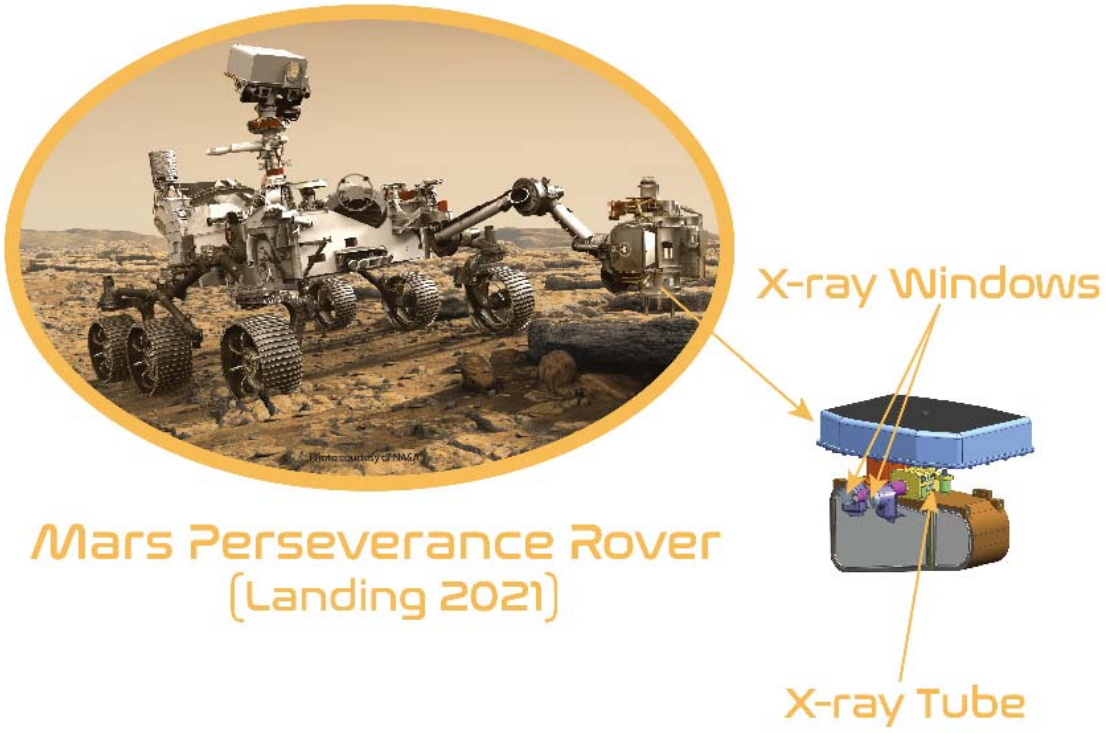


Diagram of the Perseverance Mars rover's science instruments. Credit: NASA/JPL-Caltech

In 1996, Moxtek's provided their first space flight component (x-ray window) to NASA/JPL onboard the Mars Sojourner rover. Since then, NASA/JPL has used a Moxtek window on every Mars mission (Sojourner, Spirit, Opportunity, Curiosity, and now the Perseverance).

PIXL design with Moxtek components:



See clip:

https://www.youtube.com/watch?v=tITni_HY1Bk&list=PLTiv_XWHnOZqCrMU2ppcLjRn1zlDkNx3q&index=1

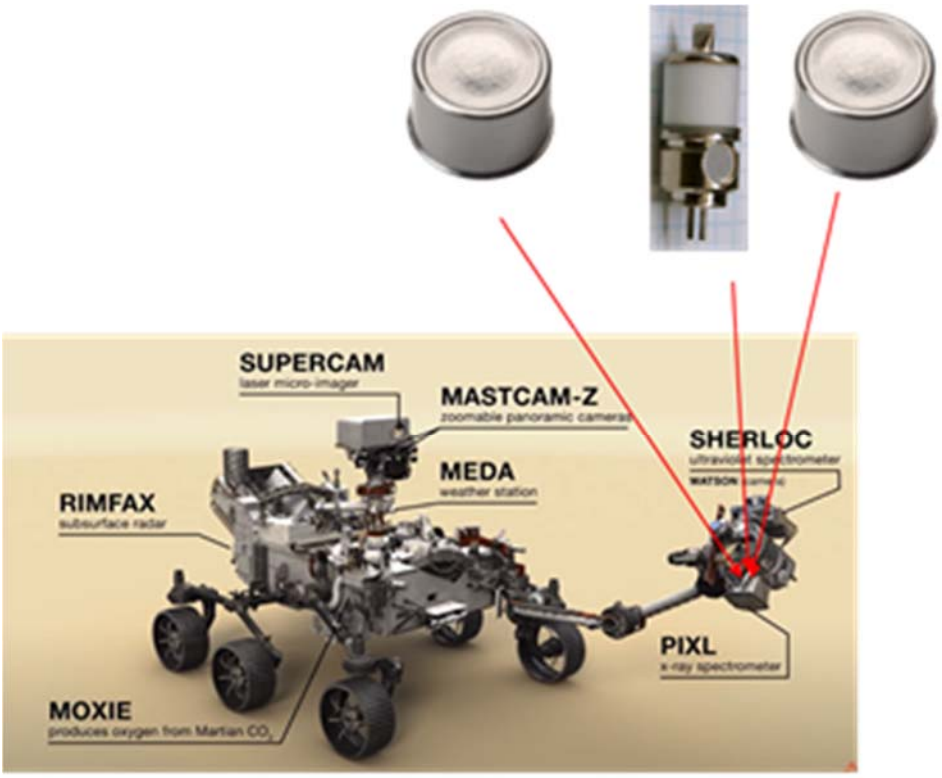


Photo credit courtesy of NASA

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Links to learn more about the Perseverance Rover:

Rover highlights:

- https://mars.nasa.gov/mars2020/
- https://www.nasa.gov/perseverance
- https://www.youtube.com/watch?v=y0_2wygoZc4
- https://mars.nasa.gov/news/8759/nasas-new-mars-rover-will-use-x-rays-to-hunt-fossils/
- https://mars.nasa.gov/mars2020/spacecraft/instruments/pixl/

Science overview:

- https://www.youtube.com/watch?v=8k7zBKd_nXY
- https://mars.nasa.gov/mars2020/spacecraft/instruments/pixl/for-scientists/
- https://www.researchgate.net/profile/David_Flannery4/publication/282743365_Texture-specific_elemental_analysis_of_rocks_and_soils_with_PIXL_The_Planetary_Instrument_for_X-ray_Lithochemistry_on_Mars_2020/links/5bff4b8f45851523d1532888/Texture-specific-elemental-analysis-of-rocks-and-soils-with-PIXL-The-Planetary-Instrument-for-X-ray-Lithochemistry-on-Mars-2020.pdf

Previous Moxtek components in space:

- 2019 OCO-3 Orbiting Carbon Observatory (NASA - Polarizers)
- 2019 Chandrayaan-2 XSM (Indian Space Agency - X-ray window)
- 2015 Deep Space Climate Observatory (NASA - Polarizers)
- 2014 OCO-2 Orbiting Carbon Observatory (NASA - Polarizers)
- 2011 Mars Rover - Curiosity (NASA - X-ray Window)
- 2003 Mars Rover - Opportunity (NASA - X-ray Window)
- 2003 Mars Rover - Spirit (NASA - X-ray Window)
- 1999 EPIC Camera - XMM-Newton (ESA - X-ray Window)
- 1996 Mars Rover - Sojourner (NASA - X-ray window)
- Moxtek is currently working on several more projects for future space flight missions.

For additional information, please contact: marketing@moxtek.com

Thank you!

The MOXTEK Marketing Team

About Moxtek:

MOXTEK is a leading developer and manufacturer of advanced nano-optical and x-ray components used in display electronics, imaging, and analytical instrumentation. For over 30 years, Moxtek has provided innovative, solution-based products and services focused on performance, quality, and value to customers all over the world. Since Moxtek was founded in 1986, they have been actively engaged in the development and manufacturing of innovative technology. Each year Moxtek products enable many new scientific discoveries across many fields and markets.

MOXTEK has successfully partnered with many prestigious businesses and research institutions. Today their products are used in a variety of x-ray and optical instruments.

X-ray Products

MOXTEK began its first research collaboration in 1986, resulting in an exciting breakthrough – the ultra-thin polymer x-ray window which was quickly adopted by most semiconductor fabs and research institutions worldwide. From there, Moxtek began consistently releasing new breakthrough x-ray products for handheld and benchtop XRF and XRD applications and is well recognized for its contribution in these markets.

Moxtek's x-ray technology has revolutionized portable and handheld XRF instrumentation by developing miniature, durable, battery operated x-ray sources, windows, and detectors for on-site portable applications. Moxtek's x-ray sources have replaced hazardous and expensive radioactive isotopes previously used for portable applications resulting in lower cost of ownership and minimal environmental risk. Moxtek x-ray windows have improved the sensitivity of elemental mapping inside scanning electron microscopes used to make consumer electronics. Moxtek x-ray detectors are used by many XRF vendors because of the small size and dependable performance.

Optics Products

In 1998, Moxtek developed the first inorganic ProFlux wire grid polarizer. This polarizer allowed television and projector companies to increase the brightness of their projection systems while providing better contrast and image quality. This advantage revolutionized the projection display market and allowed consumers to "keep the light on" in the room while viewing television and while attending a business meetings. Moxtek was awarded the 2002 Silver Award by the Society for Information Display (SID) for the development of this polarizer.

MOXTEK has also collaborated with 4D Technology, to develop a pixelated polarizer for their highly sensitive laser interferometer which was used to measure the mirrors on the long awaited James Webb Space Telescope which will soon replace the celebrated Hubble Telescope.

Today, MOXTEK customizes their polarizers for many different applications including: Head-Mounted Display (HMD), Head-Up Display (HUD), scientific/medical/dental instruments, and security applications. Moxtek's expertise in nano-structure design and high-volume manufacturing have enabled Moxtek to be the world's leading supplier of wire grid polarizers.

Moxtek manufactures all of their products in their Orem Utah (USA) factory. Moxtek also supports many local groups and charities and in interested in the continued success of our community.