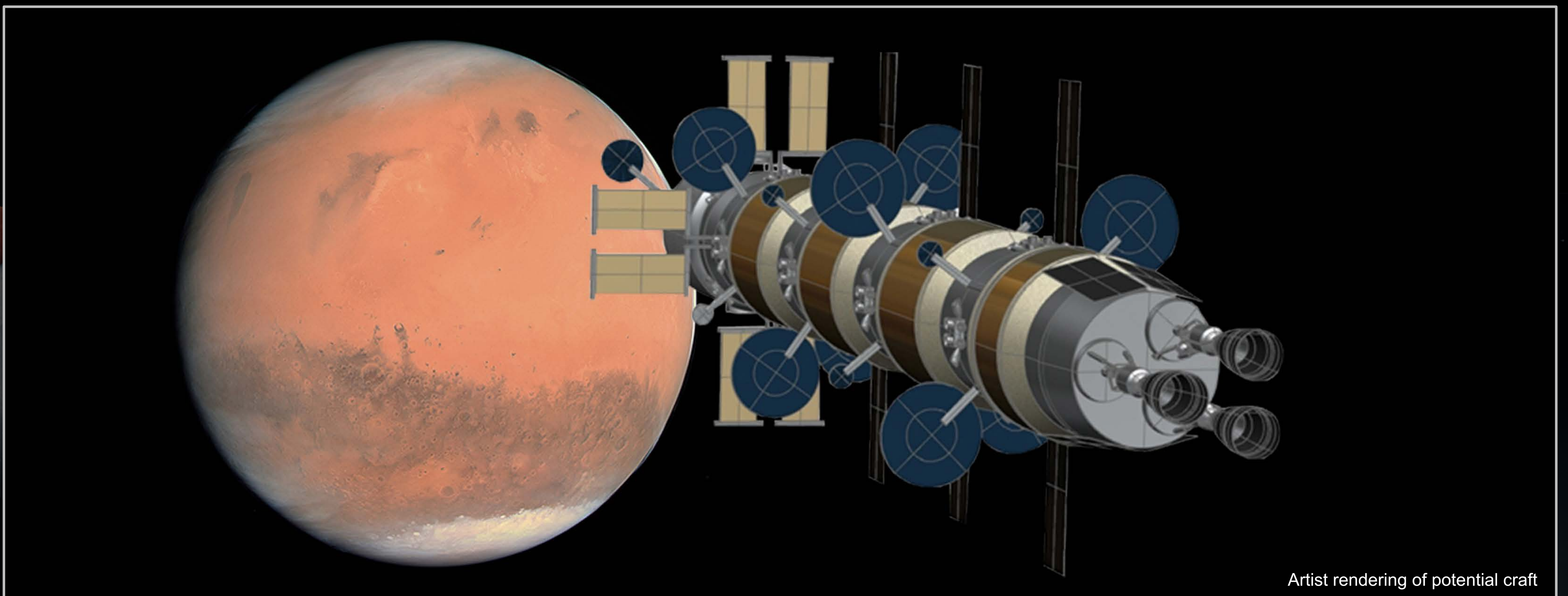


# Space Technology Mission Directorate

## Game Changing Development Program

### Nuclear Thermal Propulsion

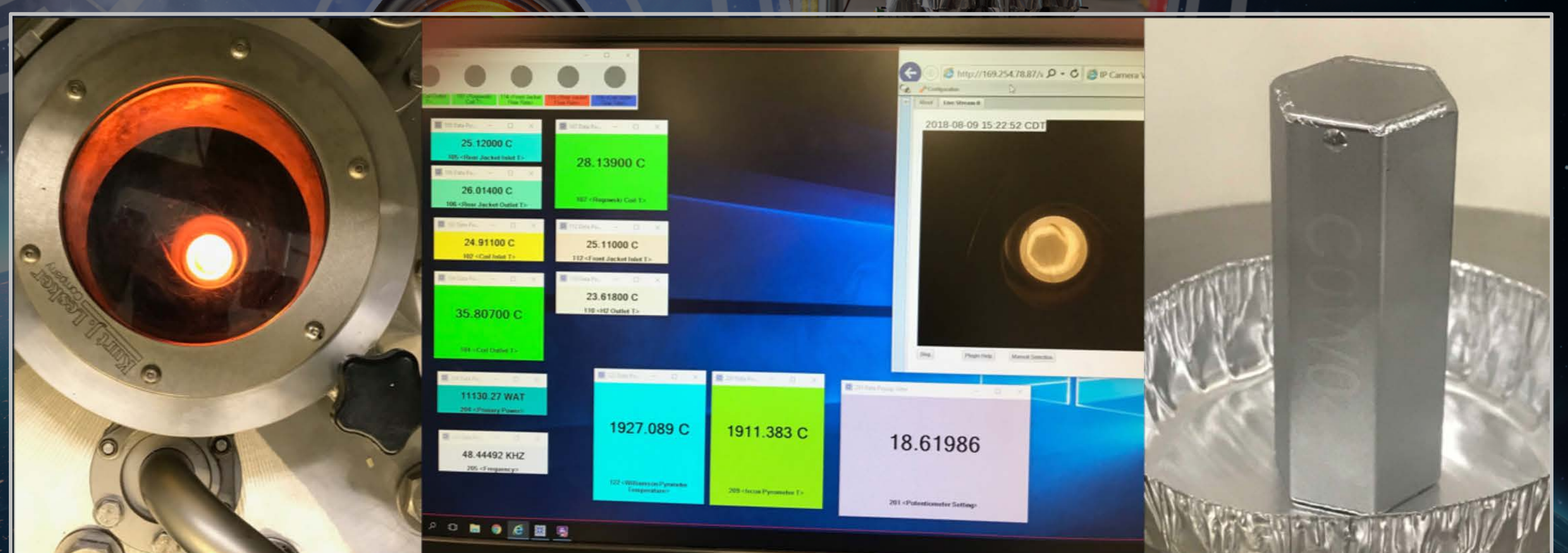
Nuclear thermal propulsion (NTP) can help enable detailed exploration of the solar system, extensive development and utilization of cis-lunar space, and robust human Mars architectures.



Artist rendering of potential craft

To improve affordability and viability, NTP systems that utilize low-enriched uranium (LEU) instead of highly enriched uranium (HEU) are being devised. Advanced fuel manufacturing techniques will help enable the use of LEU in certain fission systems previously thought to require HEU. The current LEU NTP baseline engine relies on a fission reactor containing fuel elements made of uranium nitride and refractory metals.

NTP fuel is currently being developed and fabricated at both BWXT and NASA MSFC. Fuel samples are undergoing non-nuclear testing in NASA's Compact Fuel Element Environmental Tester (CFEET), helping to validate fabrication techniques. Non-nuclear testing of fuel segments is planned for NASA's Nuclear Thermal Rocket Element Environmental Simulator (NTREES). Initial nuclear testing of fuel samples will occur at the Department of Energy/Idaho National Laboratory's TREAT facility.



C0 CFEET testing and C0 sample