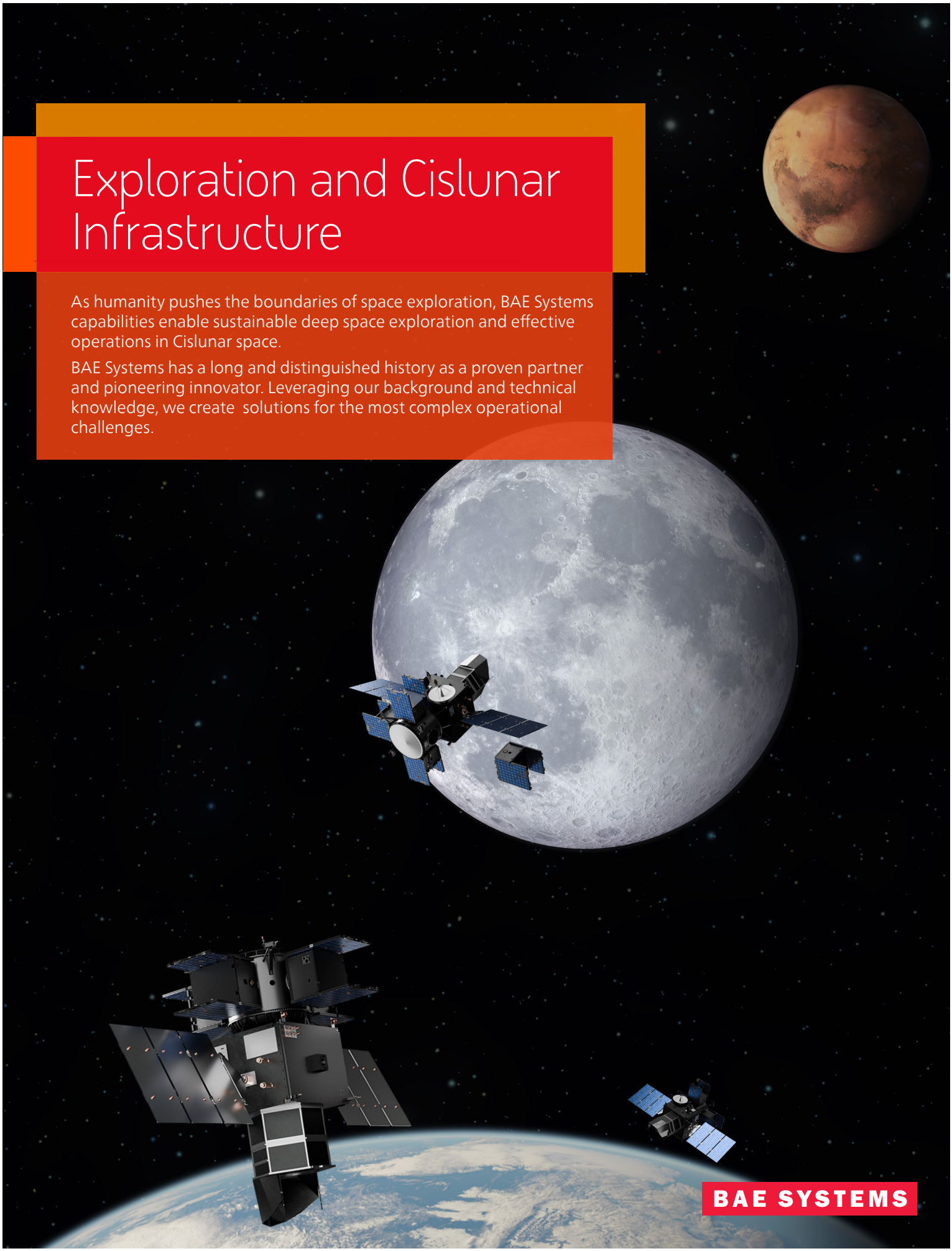
Exploration and Cislunar Infrastructure

As humanity pushes the boundaries of space exploration, BAE Systems capabilities enable sustainable deep space exploration and effective operations in Cislunar space.

BAE Systems has a long and distinguished history as a proven partner and pioneering innovator. Leveraging our background and technical knowledge, we create solutions for the most complex operational challenges.



BAE SYSTEMS

Spectral Imaging Solutions

Cislunar imaging missions demand precise pointing, agile tracking, multi-wavelength sensing and wideband communications. BAE Systems excels at integrating these capabilities together on platforms optimized to provide space traffic management, situational awareness and imaging of the lunar surface. We are pushing the boundaries of traditional detection methods with advanced sensing techniques, enabling the collection of measurements throughout the volume of Cislunar space.

Additionally, our offerings include high resolution, spectral mapping of the lunar surface based on VNIR multispectral imagers flown at Earth and Mars. These imagers leverage scanning time delay integration detectors and high-speed readout electronics to achieve high SNR, narrowband high-resolution images of the surface. These precision observations require a stable platform that uses kinematic mounts, low jitter mechanisms and cryo-coolers, and design features which control and reduce harmonic modes.

In addition to lunar mapping, we offer flight qualified L-CIRIS and Lunar VISE instrument suites for lunar surface missions, featuring wide-angle thermal and VNIR multiband imagers packaged for rover operations to deliver panchromatic and multiband panoramas of the lunar surface.

Communication Systems

Effective communication in Cislunar space is a significant challenge, as direct line of sight to Earth-based systems for high rate data is not guaranteed. BAE Systems is proud to be a part of NASA's Artemis program through Orion. Our phased array antennas (PAAs) serve as a vital means of voice, data and video communications for the Orion spacecraft through all mission phases. Our PAAs provide overlapping 360-degree coverage around the craft for uninterrupted, high-data-rate communication. Our PAAs flew aboard the Artemis I mission in 2022 and will fly onboard Orion throughout all subsequent planned missions.

Artemis II crew observing the Orion spacecraft built for their mission with BAE Systems PAAs integrated.

Spacecraft Systems for Complex Operations

Cislunar missions require reliable, fault tolerant avionics systems to enable mission success. Our spacecraft utilizes a modern network enabled in-house avionics suite to support the configurability required for rendezvous, refueling, and effective operations in dynamic environments through Cislunar space. Our flight software suite is built from heritage algorithms proven to be robust and adaptable on all BAE Systems missions over the past 25 years.

Missions in Cislunar space demand high performance propulsion and fuel capabilities for orbital insertion and maneuverability without regret. Our Ascent™ spacecraft, part of the Elevation™ spacecraft product line, provides mission packages to meet a variety of missions from the same core spacecraft. This adaptability enhances deep space exploration and Cislunar operations with increased deltaV, higher thrust and configurable payload hosting. Additionally, we are investing to reduce spacecraft structural dry mass, and increase deltaV and payload cargo capacity, through the use of advanced composite materials and highly optimized strut architectures.

RideShare and Hosted Payload Capabilities

Missions to Cislunar space require investment in robust systems with high deltaV and autonomous operation. To maximize the utility of these systems, we offer rideshare and hosted payload opportunities. Our experience in integrating multi-manifest launches and hosting a wide range of payloads enables our customer's visions for deep space exploration and Cislunar operations. Our Ascent™ spacecraft supports secondary missions by accommodating hosted payloads and deployable free flyers. The pathfinder system for this spacecraft will be completed in 2027.

BAE Systems, Inc.
303-939-4000 • www.baesystems.com

 D1495

BAE SYSTEMS