

**Testimony of Salvatore T. “Tory” Bruno
President and Chief Executive Officer
United Launch Alliance, LLC**

**Subcommittee on Space, Science, and Competitiveness
Committee on Commerce, Science, and Transportation
United States Senate**

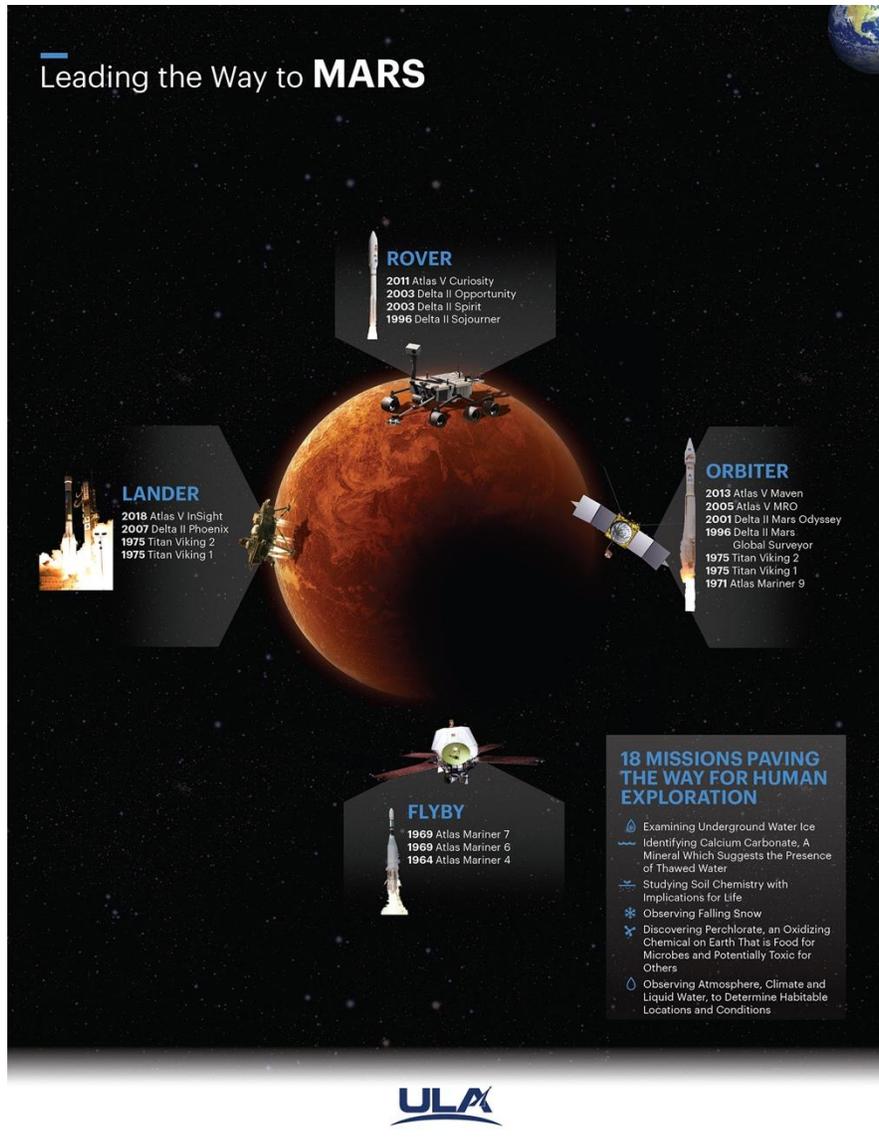
July 25, 2018

Chairman Cruz, Chairman Thune, Ranking Member Markey, Ranking Member Nelson, and Members of the Subcommittee -- thank you for the opportunity to appear today on a subject of profound importance to our nation and the world – putting American boots on Mars. I am privileged to represent the talented team of ULA women and men who have joined NASA in exploring missions that lay the foundation for future landings by Americans on the Red Planet.

The grand vision for human exploration of Mars comes naturally to our great nation, with its inspirational history of pioneering. The capability to bring that vision to fruition lies in the scientific and technical prowess and industrial might of America.

ULA is proud to be playing its part in extending the presence of humanity to Mars. Since the company’s formation in 2006, ULA has successfully launched every United States mission to the Red Planet. ULA’s Atlas V and Delta rockets, with an unmatched record of 100 percent launch success in 128 national security, civil and commercial space missions, have launched missions to each of the planets in our solar system. All these missions have provided inestimable scientific value to the world. In just a few weeks, ULA will launch the Parker Solar Probe, a mission which will study the Sun and unlock new understanding of our nearest star and its impact to our planet and space environment. Our next generation Vulcan Centaur rocket, currently in development, will continue to provide reliable access to Mars for scientific missions while lowering launch costs.

I will briefly review our past and planned Mars exploration launches. On November 26, 2011, we launched the Mars Science Laboratory, the rover, “Curiosity,” on an Atlas V 541 – a mission that analyzed Martian soil searching for water. On November 18, 2013, we launched the Mars Atmospheric and Volatile EvolutionN (MAVEN) spacecraft, and this year on May 5, we launched the Mars Interior Exploration using Seismic Investigations, Geodesy and Heat Transport (InSight) lander. Both of these missions launched on Atlas V 401 launch vehicles, and InSight marked the first time a mission to Mars launched from the west coast. Today, we are preparing for our launch of Mars 2020 -- the most ambitious of all the missions to the Red Planet. Among this mission’s objectives are gathering knowledge and demonstrating technologies that address the challenges of human expeditions to Mars. Our Atlas, Delta, and heritage rockets have successfully launched 18 missions to Mars. We have the talented workforce with proven knowledge and ability to successfully accomplish missions to Mars and beyond.



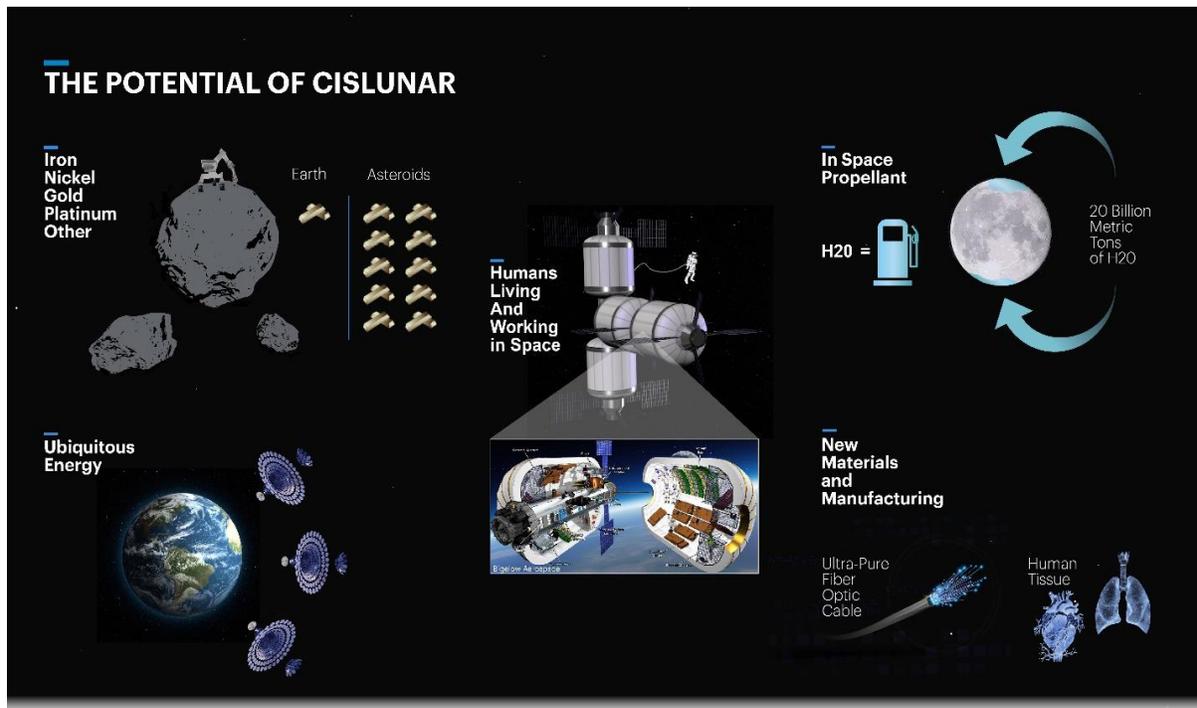
Clearly, Mars exploration is a vast undertaking that requires a space industrial base of enormous breadth and depth, and ULA is critical to stabilizing that workforce. Our company is comprised of employees at facilities in Denver, Pueblo, Decatur, and Harlingen where we conduct sophisticated launch vehicle engineering, testing, manufacturing, assembly, and integration operations -- and at Cape Canaveral and Vandenberg, where we perform complex launch operations.

ULA also partners with more than 2,700 suppliers across the country, in nearly every state. By working with large and small suppliers across the country, ULA plays a critical role to ensuring a stable space industrial base. ULA recently entered into a long-term strategic partnership with Aerojet Rocketdyne, selecting the flight proven RL-10 engine to power our Vulcan Centaur upper stage. We have also entered into strategic partnerships with several other companies throughout the country such as L3 for avionics and Spincraft for spinformed fuel tank domes.

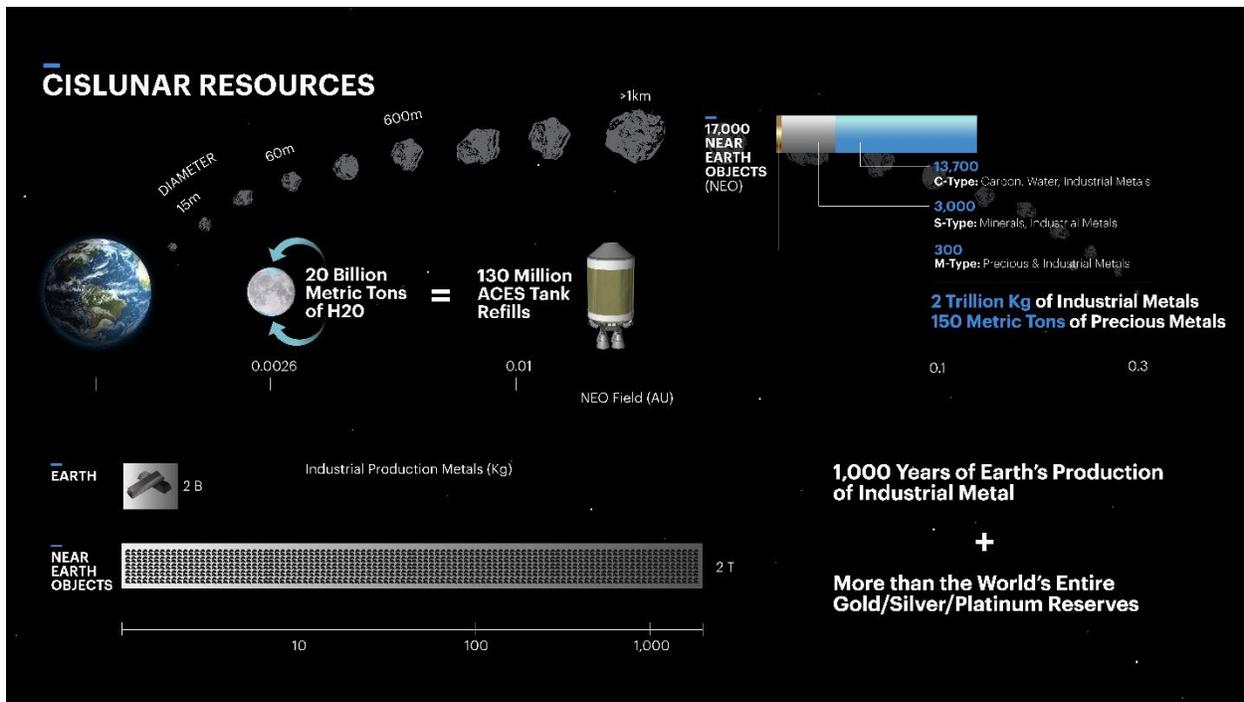
All of these companies – and many others – supply similar critical components to NASA’s Space Launch System (SLS), which will be the world’s most powerful rocket providing super heavy lift for the Orion capsule in human missions to Mars and other deep space destinations. With ULA as a core customer, these supplier companies are able to supply these components to NASA and their SLS and Orion industry partners more affordably, and are able to demonstrate reliability in their systems with dozens of flights aboard Atlas, Delta, and soon Vulcan Centaur.

ULA has also supported NASA’s flagship exploration programs by supplying the Interim Cryogenic Propulsion Stage (ICPS) for EM-1 and two additional flights. To that end, I commend Congress for funding the development of a second mobile launch platform. Allowing SLS flexibility is crucial to the nation’s success in exploring the cosmos. Additionally, ULA launched the test flight of the Orion crew capsule aboard our Delta IV Heavy (EFT-1), which provided essential data to prepare Orion crew for deep space missions.

NASA must lead humanity to return to the Moon and travel to Mars, and SLS and Orion are going to get us there. We appreciate the strength and enduring nature of Congressional support for those programs. I would also like to applaud the current Administration’s emphasis on returning astronauts to the Moon. Together, Congress, the Administration, and industry can chart a path forward that uses the lunar vicinity as a test bed and jumping off point for Mars. That is where I believe ULA will play a key role: providing cargo and scientific transportation services for commercial activities in CisLunar space to complement the core human spaceflight and large payloads provided by SLS and Orion, while also allowing NASA to focus on pressing forward into deep space.



At ULA, we have already taken the first steps in achieving this goal. ULA’s CisLunar 1000 roadmap envisions a commercially established, self-sustaining community of around 1,000 people supported by some 200 companies in the space between Earth and the Moon. Bigelow Aerospace, a company that is preparing to provide a space habitat for nearly 20 people to live and work in CisLunar space during the first phase of the project, has already selected ULA’s Vulcan Centaur rocket to launch their B330 space habitat. Additionally, Astrobotic, a commercial lunar logistics company in Pittsburgh, has chosen to fly their Peregrine lander on ULA’s flight proven Atlas V. This will mark the first launch of a commercial lunar lander to the lunar surface from the United States. America’s leaders understand the indispensable scientific and exploratory roles played by human activities in Low Earth Orbit (LEO) and CisLunar space. Our leaders also understand the vast economic opportunities we can achieve there. Developing the valuable resources that are abundant on near earth asteroids and the lunar surface will provide a financial foundation for the new “Econosphere.”



Acts of Congress and presidential directives reflect the high priority that the United States Government has long placed on human space exploration. With this continuing commitment, Americans will surely land on Mars as they landed on the Moon.

The ingenuity, capabilities, and resources of America's private sector, as well as those of NASA, will be required to achieve the goal of extending human presence from LEO, to CisLunar space, to Mars and beyond. I am confident that, together, Americans are more than equal to the task.

Thank you again for inviting me to be here before you today. I look forward to your questions.

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