

Charles Bolden, NASA Administrator

Humans to Mars Summit

George Washington University

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Thank you, Artemis Westenberg [President, Explore Mars, Inc.] for that gracious introduction. I also want to thank Explore Mars as well as GW President, Steven Knapp and Scott Pace of the GW Space Policy Institute for bringing us together for this second annual Humans to Mars Summit. With Mars making its closest approach to Earth last week and currently appearing as the brightest body in the Eastern sky during the month of April, this is an ideal time for this conference. As the Red Planet draws nearer to Earth, NASA, with your help, is drawing nearer to our goal of sending humans to Mars.

During the next three days, you are going to get an update on NASA's stepping stone approach to Mars from some of the leading experts at the agency, including Ellen Stofan, NASA's Chief Scientist; Bill Gerstenmaier, Associate Administrator for our Human Exploration and Operations Mission Directorate; and Michael Garazik, Associate Administrator of NASA's Space Technology Mission Directorate. And we will be listening and learning from all of you as you share your thoughts on the best path forward. But let me set the stage by reminding us of why we are all here.

While humans have been fascinated with Mars since the beginning of time, there are a number of very tangible reasons why we need to learn more about our closest planetary neighbor. For one thing, Mars' formation and evolution are comparable to Earth's and we know that at one time Mars had conditions suitable for life.

What we learn about the Red Planet may tell us more about our own home planet's history and future and help us answer a fundamental human question – does life exist beyond Earth?

While NASA has been on a path to Mars for decades with our earlier Mars rovers and orbiters, a critical national policy statement in support of our strategy was in on April 15, 2010 during a visit by President Obama to Kennedy Space Center where he challenged the nation to send humans to an asteroid by 2025 and to Mars in the 2030s. The U.S. National Space Policy, set in 2011, further supports those goals and over the past several years NASA has been developing the capabilities to meet these goals through a bipartisan space exploration plan agreed to by the Administration and Congress in the 2010 Authorization Act and embraced by the international space community in the 2013 *Global Exploration Roadmap (GER)*.

While robotic explorers have studied Mars for more than 40 years, NASA's path for the human exploration of Mars begins in low-Earth orbit aboard the International Space Station (ISS), our springboard to the exploration of deep space. As we speak, astronauts aboard the ISS are helping us learn how to safely execute extended missions deeper into space. We are guaranteed this unique orbiting outpost for at least another decade by the Administration's commitment to extend the ISS until at least 2024. This means an expanded market for private space companies, more groundbreaking research and science discovery in micro-gravity and opportunities to live, work and learn in space over longer periods of time. And as most of you know, we are working to return both cargo and human launches to the ISS to American soil. The President's 2015 budget supports the Administration's commitment that NASA be a catalyst for the growth of a vibrant American commercial space industry.

Already, two American companies – SpaceX and Orbital Sciences – are making regular cargo deliveries to the Space Station. While the Russian Federal Space Agency remains a strong and reliable partner, later this year NASA intends to select from American companies competing to send astronauts to the Station from American soil. If Congress fully funds our FY 2015 request, we believe we can do this by the end of 2017.

Our next step is deep space, where NASA will send the first mission to capture and redirect an asteroid to orbit the moon. Astronauts aboard the *Orion* spacecraft will explore the asteroid in the 2020s, returning to Earth with samples. This experience in human spaceflight beyond low-Earth orbit will help NASA test new systems and capabilities – such as Solar Electric Propulsion – we’ll need to support a human mission to Mars. Beginning in 2017, NASA’s powerful Space Launch System (SLS) rocket will enable these “proving ground” missions to test new capabilities.

Human missions to Mars will rely on *Orion* and an evolved version of SLS that will be the most powerful launch vehicle ever flown.

A fleet of robotic spacecraft and rovers already are on and around Mars, dramatically increasing our knowledge about the Red Planet and paving the way for future human explorers. The Mars Science Laboratory *Curiosity* rover measured radiation on the way to Mars and is sending back radiation data from the surface. This data will help us plan how to protect the astronauts who will explore Mars. Future missions like the Mars 2020 rover, seeking the signs of past life, also will demonstrate new technologies that could help astronauts survive on Mars.

Engineers and scientists around the country are working hard to develop the technologies astronauts will use to one day live and work on Mars, and safely return home.

This conference is bringing together the best minds to share ideas about the path ahead.

It is important to remember that NASA sent humans to the moon by setting a goal that seemed beyond our reach. With Mars as our focus, we are steadily building the capability to enable human missions to Mars. The challenge is huge, but we are making real progress today as a radiation monitor on the *Curiosity* rover records the Martian radiation environment that our crews will experience; advanced entry, descent and landing technologies needed for landing on Mars are ready for entry speed testing high-above the waters of the Pacific Ocean in June; *Orion* is finishing preparation for a heat shield test in December and flight hardware for the heavy lift rocket necessary for Mars missions begins manufacture in New Orleans.

We are counting on the support of Congress, the scientific community and all of you at this Summit to help us realize that goal. The future of space exploration is bright, but it will be up to all of us in this assembly to bring the rest of the world along on the great adventure that awaits all humanity.

Thank you.