

REMARKS FOR ACTING ADMINISTRATOR LIGHTFOOT

As Prepared

HUMANS TO MARS SUMMIT

May 9, 2017

Thank you for asking me to open this gathering. You'd think Mars was really becoming a "thing."

I was just at a summit last week hosted by the Aeronautics and Space Exploration Board of the National Research Council. The topic was America's Future in Civil Space, and I can tell you Mars was a hot topic.

Our future is Mars. Humans reaching the Red Planet is our horizon goal. The science is awesome. Ever since Viking, we've kind of said, "Wow, we need to be there." And with everything we've discovered since, well, humans need to go. Certainly, the current administration is supportive of this goal, both vocally, and with our budget.

Curiosity and the Mars Reconnaissance Orbiter have been game changers. We've got wheels on the ground and an eye in sky telling us about geologic history and where water might have been and still is. That's pretty exciting, because back when we

first flew by Mars in the 1960s with Mariner, the conclusion was that it was a dry dead world and so, ho hum, let's move on and chart history.

But now we're charting the present. The real goals of humanity to reach Mars, and our search for evidence of life elsewhere in the solar system.

And that's what you all are here for. We want to reach that horizon goal for humanity, and we also want to do everything in our power to search for other forms of life. Even microbes.

Especially microbes. Think what an advance like that would mean if we found microbes on Mars.

To a certain extent, it's a needle in a haystack proposition. Mars is a big planet, and even Earth's own history was not discovered except through massive exploration at numerous sites. Physical human presence can dramatically change the rate of discovery.

Bringing humans to Mars will allow human intuition and intelligence to directly search the Mars environment for clues and areas for deeper investigation and shorten the discovery or even enable discovery of a needle.

But beyond the “life” proposition, there’s the desire to extend the boundaries of our existence as a species.

Our landing on the moon, our great observatories looking into other galaxies, our planetary missions that have touched Pluto and currently orbit Jupiter and are doing risky dives near Saturn... they all reflect our common desire to know what else this solar system holds. I don’t think any among us is untouched by the images we receive from other worlds. And if you’re old enough to remember when the first Viking images came back – that was a mind blower. Truly spectacular and unprecedented, and it made

us want to do more. The image of human beings on Mars such as the Apollo astronauts on the moon is even more compelling.

So today, at the annual gathering of the Humans to Mars Summit, we're looking at horizon goals, and we're also looking at where we are today – what's realistic and what we aspire to. Because aspirations become tomorrow's realities.

Mars is a big thing. Not only is it expensive, and complex, it's a civilization-level game changer.

I don't say that lightly. But when you think about it, remember how the moon landing changed us. There were papers in Japan, for instance, that said, "We Did It." It was a shared triumph of humanity.

Space race aside, it was something everyone was in awe of. So imagine what it will be like when we go to Mars.

And it will be an international crew. It's going to take a global effort to get us there. Even today, international partners are key on missions like InSight, launching next year, and Mars 2020,

which are the precursors to a human presence on Mars, even as they make their own amazing scientific discoveries.

You know, very soon, we're going to announce our new astronaut class, and this, I think, is going to be the Mars class. Because they are going to be training and learning about the systems that are going to take us back to deep space. First to the moon neighborhood, and then to farther destinations.

We still have a lot to learn. That is certain. Radiation. Heat shields. Closed loop life support so the astronauts have

something to drink besides their own urine... ! Mass to the surface... the list goes on. It's huge. We know this.

But we are not just thinking about these things, we are doing them. We have radiation sensors on Mars that are taking daily measurements, for instance. Surprisingly, the radiation environment on Mars is about the same as the ISS even during solar particle events. ISS is also testing technologies and systems for Mars today.

But we're working on it! You know we called a lot of the workforce creating the technologies of tomorrow "The Real Martians" when

the movie *The Martian* came out, but it's true. Things like farming in space, wide ranging surface rovers, and, yes, closed loop life support are currently real and being perfected, and that work is taking place across the country and indeed across the world. And in space aboard the ISS.

We may not always agree on the process or particular outcomes, but the global community wants to go to Mars. We want to take that model of cooperation that has been refined aboard the International Space Station and move it to the next thing, the generational goal of bringing humans to Mars.

We already have a good start through a lot of international cooperation on science missions. A number of nations also are training astronauts and we've seen many countries fly with us to the station.

The desire is there. The dedication and the knowledge is there.

And I've seen first-hand how much excitement there is among young people around the world to contribute whatever they can -- whether that's learning robotics, or training as the scientists who evaluate the massive amounts of data we're getting, or people who want to put it all on the line and go to the Red Planet itself.

There are a lot of discussions going on about how we do it, or whether it should be government or industry (I think both, especially since we've proven a model with commercial cargo resupply missions to the station, and crew in the near future), or what role the moon will play. I think ultimately, however, the decision has been made that we're going.

How we do it is still a work in progress. NASA is very pleased with its progress on the Space Launch System rocket and the Orion spacecraft, which will get us back to deep space, to the moon and farther. Our scientific commitment to Mars is unflagging, with

InSight next year and Mars 2020 bringing a global partnership to Mars' surface again very soon.

And as I mentioned, the technologies we need to get to Mars with human beings are being stretched and tested and perfected across the globe.

Mars is not an easy ask. But it's the next thing we want to do.

That we must do.

As I said, it's a civilization-level game changer. We don't have to find little green men. Getting there alone will change us. It's

changing us right now. Our goal of reaching Mars is expanding our horizons and helping us look across borders to see what other nations want to do around this huge goal.

When we do reach Mars, the world will have changed again. In an instant. After decades of hard work. As I said, I think it's going to be an international crew, because it's going to be a human moment. Just as everyone remembers where they were when they heard about the moon landing, so too will it be when we reach Mars. And that's something that will endure for centuries. Centuries. Can anyone even contemplate that span of time?

A lot of science fiction deals with Earth as an entity doing things in space. Mars is that. Whatever we do or find, it will be as the human race.

I do think the U.S. will lead the effort, because we have the biggest enterprise, and we've been working at it since the 60s, when Mariner first flew by Mars and we thought we'd seen enough.

But since then, the international interest in space has been overwhelming, in the most positive way, and space has been a point of pride for many nations, from India sending MOM to Mars,

to the European Space Agency sending its orbiter there last year,
and more missions planned.

That's an enormously positive thing. And it's only going to grow
and evolve.

Mars is hard! We know that. The wreckage of more than one
spacecraft on the planet's surface is a testament to human
dreams not achieved. But that makes us work even harder.

So I thank all of you for coming together at this summit to discuss
some of the biggest ideas confronting humanity today. Beyond

any budget cycle or even any generation, what we're talking about today is humanity's next giant leap.

That's so important. And it's not just talk. As I said, NASA is at work in labs and manufacturing facilities around the world. At the diplomatic table and in space above us on the International Space Station as we learn what it really takes to live and work in space for the long term.

I congratulate Peggy Whitson for her record breaking stay in space – showing us all what it really takes to live this journey.

She's perhaps the first Martian.

And I look forward to the enthusiasm and accomplishments of the next astronaut class.

Certainly I'm not alone in seeing on a global scale how much enthusiasm there is for space and how excited the next generation is to carry our torch in the decades to come.

It's a very hopeful enterprise in which we are engaged. And it's hope with purpose and muscle behind it.

I hope everyone here has an engaging and insightful summit. I hope the ideas discussed here will infuse your work as you return to your home institutions, and that, together, we will all put boots on Mars in our lifetimes.

Thank you.