U.S. HOUSE OF REPRESENTATIVES COMMITTEE ON
SCIENCE, SPACE, & TECHNOLOGY
Opening Statement

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of the Subcommittee on Space and Aeronautics

Subcommittee on Space and Aeronautics Hearing:
Accelerating Deep Space Travel with Space Nuclear Propulsion

October 20, 2021

Good morning, and welcome to today's hearing on "*Accelerating Deep Space Travel with Space Nuclear Propulsion*."

I want to welcome our panel of impressive expert witnesses, and I thank you for being here today.

If we're serious about deep space exploration to Mars with humans, which I and others on this Subcommittee are, we need to take bold steps to make it happen and make it sustainable.

Today, we're talking about one bold effort that could get us much closer to achieving the Mars goal—space nuclear propulsion.

Space nuclear propulsion can produce thrust far more efficiently than conventional chemical systems, allowing for shorter trip times to Mars.

Why does this matter? One reason is that shortening the trip reduces the risk of space radiation exposure to our astronauts.

Another is that, depending on the technology used, space nuclear propulsion may enable more frequent trips to Mars than the typical 26-month intervals that rely on favorable Earth and Mars alignment. Reducing that 26-month interval increases mission flexibility to enable both cargo deliveries and human missions to Mars.

However, building an operational space nuclear propulsion system is hard and the technical challenges are many.

Choosing a nuclear fuel type and source, developing a space-qualified fission reactor, developing the requisite materials and infrastructure, and carrying out testing, all while managing the required safety protocols for nuclear activities, are just a few examples of those challenges.

To date, the U.S.'s use of space nuclear technology has been in battery-like radioisotope power sources for probes traveling to distances where sunlight is insufficient to produce power for the spacecraft.

When it comes to propulsion, the United States has yet to fly a fully integrated space nuclear propulsion system in space. Government work on space nuclear propulsion dates back to the 1960s, was curtailed in the early 1970s, but follow-on efforts have largely been intermittent since that time.

That prior work, however, provided a foundation and a baseline that is still useful today.

A recent NASA-commissioned National Academies of Sciences, Engineering, and Medicine study on space nuclear propulsion found that a system could be ready to support a human mission to Mars in 2039, but only if we act aggressively now.

According to the study, the required space nuclear propulsion systems would need to be available in 2033 for advanced cargo emplacement and risk reduction prior to a human mission. That's slightly more than 11 years from now.

If the United States is serious about leading in a human mission to Mars, we have no time to lose.

Congress has prioritized development of nuclear space propulsion over the past several years, directing about $100 million annually for NASA to advance nuclear thermal propulsion capabilities with the goal of conducting a future in-space flight test.

I hope that at today's hearing we can examine what progress NASA has made with these dedicated investments, and what further investment is needed in order to achieve the human to Mars goal in the 2030s. And how can NASA leverage other contributions, whether from different parts of the U.S. government or from commercial industry, to reach that goal?

Because NASA is not alone in seeing the potential for space nuclear propulsion. The Defense Advanced Research Projects Agency—DARPA—has its own nuclear thermal propulsion project, albeit for national security interests. And the Department of Energy, with its nuclear expertise and infrastructure, is also involved.

We need to see how the various agencies are collaborating, including on a government-wide strategy and vision for space nuclear propulsion.

The time is ripe for America to act and take bold, well-considered, steps towards the goal of sending humans to Mars, a goal that will both inspire and lead to significant technological advances that will benefit all of us here on Earth. Development of space nuclear propulsion is one such necessary step, and this Subcommittee has an essential role in setting the policy to get us there.

I look forward to our witnesses' testimony.