

**As Prepared**

**REMARKS FOR ACTING ADMINISTRATOR**

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**FAA 21<sup>ST</sup> ANNUAL COMMERCIAL SPACE**

**TRANSPORTATION CONFERENCE**

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- **Thank you, Megan** (Mitchell, Blue Origin).
  
- I have to say I wasn't counting on being your speaker today as Acting Administrator, but I'm **proud to continue leading the amazing NASA team**, which has a lot of energy and is accomplishing incredible things.

- I know a lot of people you've heard from and will hear from today are discussing in a lot more detail some of the things I'll touch on -- from **government investment in commercial space to moving the model farther, beyond LEO, and next steps** as part of the big picture of exploration.
- I obviously **can't go into details about the FY19 federal budget** to be released next week, but I think it's no secret that commercial space is a big part of our push going forward.

- We've **accomplished so much already** since this strategy of seeding commercial activity for services in low-Earth orbit really started gaining momentum.
  
- **During five missions in 2017, NASA's commercial cargo partners Orbital ATK and SpaceX launched more than 32,900 pounds of critical supplies** to the International Space Station, including crew supplies and equipment to support the station's hundreds of **crucial science experiments** and technology demonstrations. Splashing down in the Pacific Ocean following three resupply missions,

the SpaceX Dragon capsule also returned more than 13,000 pounds of research and equipment.

- Boeing and SpaceX, our Commercial Crew Program providers, made a lot of **progress this past year on the Starliner and Crew Dragon** spacecraft and systems.

Boeing revealed its spacesuit design early last year and conducted important parachute and qualification tests.

SpaceX also unveiled its spacesuit, and worked with NASA and the Air Force to refine its procedures to retrieve astronauts from the water following a mission to the space station.

- Both companies are scheduled to begin **flight tests to prove the space systems meet NASA's requirements for certification in the coming year.**
  
- **Sierra Nevada Corporation successfully completed a free-flight test** of its Dream Chaser spacecraft, meeting the final milestone of a space act agreement for the Commercial Crew Program. The test also supported a milestone in preparation to carry cargo and science investigations to the space station under next phase of our commercial resupply contracts.

- And of course, I also I want to **congratulate Elon, Gwynne,**  
**and the entire SpaceX team on the successful launch of**  
**the Falcon Heavy** on Tuesday! All of us in this business  
know the effort it takes to get to a first flight of any new  
vehicle and recognize the tremendous accomplishment we  
witnessed this week.

- It's also **great to have another class of launch vehicle**  
**available here in the United States.** I look forward to  
seeing how the Falcon Heavy becomes part the nation's  
capability in meeting our critical mission needs. NASA's

exploration program can benefit from a variety of launchers in addition to the Space Launch system.

- Finally, I am really **proud of the hard work of our NASA team, in particular KSC, for its transformation into a multi-user spaceport.** Watching the Falcon Heavy rise above the historic pad that has been the launch point for so many critical missions is a true testament to the hard work transitioning our nation's launch infrastructure in support of the commercial launch industry.

- And I know a lot of companies, from **Blue Origin**, to our **partners at United Launch Alliance** and innovators large and small are helping all of us raise our sights to what can be accomplished in space
- Of course, there's **getting there and then there's what we do there.**
- I know there's a panel after this about **research in LEO**, and I hope everyone is aware of the growing value of this work.

- **Research on station continues to be critical** on a lot of fronts, from helping us to learn how to live and work in space, to demonstrating its commercial relevance.
- For instance, take **ZBLAN**.
- We had an **investigation to test manufacturing fiber optic filaments in microgravity**. The payload consists of the fiber preforms, furnace, and the spooling subsystem that conducts fiber pulling.

- ZBLAN is the material. **Combining it with other metallic elements boosts the infrared signal power**, and ZBLAN signals can potentially outperform the silica fibers commonly used in fiber optic cables today.

- **ZBLAN fiber has a broad infrared transmission range**, and all infrared wavelengths (imaging, lasers, and remote spectroscopy) could benefit from this fiber, which has low transmission reduction, but is most successful in infrared delivery and fiber lasers.

- **ZBLAN fibers were returned on Dragon** with the completion of SpaceX CRS-13. Made in Space has the payload back, and the fibers are now being analyzed. This is the **third piece of hardware Made in Space sent to station** after the first-generation 3-D printer in 2014 and the additive manufacturing facility (AMF) in 2016.
- And that's **just one of many exciting potentials** that are being developed now and will emerge in the coming years using the unique capabilities of our microgravity lab.

- **CASIS is at capacity.** We've got a full slate of crew time and experiments for them to focus on.
  
- **Suborbital research through Flight Opportunities** is getting a lot of payloads to space that we might not have been able to accommodate even a few years ago.
  
- All of this is **widening access to space, getting the most out of the station, and advancing the field as a whole** so that LEO becomes that new segment of the economy with a lot of activity not just linked to government, that we've

facilitated and supported as a goal of this program from the beginning.

- So as we **push toward opening station and LEO to new opportunities**, we're also **looking ahead to what commercial partners can do in the lunar space**.
- We're at the **early stages of soliciting input on what those partnerships might look like**, but the technologies and capabilities we'll need are coming into sharp focus.

- NASA continues to use its Next Space Technologies for Exploration Partnerships (**NextSTEP**) public-private partnership model to seek commercial development of deep space exploration capabilities.
  - We **selected three companies** for the development of a first-generation, in-space, multi-material fabrication laboratory, or **FabLab**, **prototypes** for space missions;
  - We selected **five companies for studies for the gateway power and propulsion element** that is the foundation of our enlarged presence at the Moon;

- Most recently, NASA announced we are **seeking proposals to advance critical In Situ Resource Utilization (ISRU)** capabilities to higher technology readiness levels. The proposals are **due March 5**.
  
- And our partners are developing **full-size ground prototypes of deep space habitat structures**.
  
- **NextSTEP has allowed us great flexibility in seeking private-sector innovations** for deep space capabilities.

- Under the NextSTEP Omnibus BAA, we are **able to issue appendices as needed to solicit studies, concepts and technologies** to demonstrate key capabilities on the International Space Station and for future human missions in deep space.
  
- **Most NextSTEP efforts require some level of corporate contributions**, and this model of public-private partnerships stimulates the economy and fosters a stronger industrial base and commercial space market.

- **If I counted right, we have 18 companies working on 21 contracts under NextSTEP** to develop options for deep space concepts, hardware, and systems in areas like I just mentioned.
- So you can **expect concept studies and prototypes and a lot of energy around developing solutions** for some of the challenges we'll face as we travel farther.
- We will **continue to leverage NextSTEP and other partnership methods** to engage U.S. industry.

**Lunar CATALYST** is our effort to work with U.S. industry to develop **commercial lunar lander services**.

- Since 2014, Lunar CATALYST (Lunar Cargo Transportation and Landing by Soft Touchdown) initiative has been **accelerating the development of U.S. private-sector robotic lunar landers** that can enable **commercial payload transportation services to the lunar surface** for both public and private customers.
- We competitively **selected three industry partners to fund or fund-raise all of their own lander development**, while

**NASA loans equipment and provides the partners with technical expertise and access to test facilities.**

- With NASA's support through these highly collaborative technical partnerships, **each of the industry partners has made substantial progress in developing their lunar landers**, while managing their respective businesses with complete autonomy.

- Based on the significant progress each partner has made, **we announced in November 2017 that NASA has extended by two years and updated the Space Act**

**Agreements with the goal of seeing the first commercial cargo deliveries to the Moon over the next few years.**

- So, yes, we've **come a long way from COTS**. And having to make the case that investing in commercial space was going to **pay off for the government in not having to own certain capabilities** anymore.
- And **pay off for the economy** in good jobs.

- And **pay off in strengthening our industrial base** since the capabilities we're developing are applicable across a wide range of needs and users.
  
- At NASA, we're working on those **bigger issues**, the things that mission success feeds into:
  - **Maintaining and expanding U.S. global leadership** in space and aeronautics to support national interests, the **industrial base**, and global influence
  - **Expanding human knowledge** through new scientific discoveries

- **Extending continuous U.S. presence deeper into space, and**
- Addressing **societal challenges** and catalyzing **economic growth**
  
- **And commercial space informs all of them.**
  
- **SPD-1**, the President's directive for us to return to the Moon and build partnerships of many kinds, has the word **commercial up front and center.**

- I don't think that's going away any time soon. Especially since I think we're really **on the cusp of something bigger here than just what government does in space.**
  
- **We've lived aboard the station for more than 17 years now.** That means that a high school graduate this spring has never known a time when humans were not living and working in space.
  
- So as we continue to mature activities in LEO, and by WE, I mean NASA and partners of many different kinds, it is time **to look toward how we can replicate that model, and**

**draw on that innovation for the lunar environment** and the next opportunities.

- We certainly have a lot of **challenges yet to overcome in LEO, but I think humans will always be there.** We're permanent at this point. And we're ready to build on what we've learned to go farther.
  
- I know **here at the FAA's Commercial Space Transportation Conference** there's been and will be a **lot of discussion of these issues** from many perspectives,

and we **welcome that dialogue**, not only here at the conference, but throughout the year.

- It's an exciting time for all of us, with a lot of hard work and legwork starting to pay off, and **I look forward to sharing even more progress with you next year.**

- **Thank you.**