

## **REMARKS FOR ADMINISTRATOR BOLDEN**

### **NATIONAL SPACE SYMPOSIUM**

April 17, 2012

Thank you, Brendan (Curry). It's great to see so many friends and colleagues here this afternoon.

At the time of last year's National Space Symposium, we were still flying out the shuttle manifest. This morning, Discovery landed at Dulles International Airport on its way to its new home at the National Air and Space Museum's Udvar-Hazy center for millions of visitors to learn from and enjoy.

It's a tangible example that we are in a new era of exploration – one that I believe to be an era of great promise. The debate about our direction is over and we're moving strongly into implementing our exciting plans with wide bi-partisan agreement.

NASA is making substantial and exciting progress in our human exploration activities; our earth and space science missions; our space technology and innovation efforts; and in our aeronautics research.

If you're still wondering if this new era is real, you should try to get to the Kennedy Space Center in a couple of weeks for the highly anticipated April 30th launch of the SpaceX *Dragon* module atop its Falcon 9 launch vehicle. This is planned to include the first rendezvous and berthing of a private industry-owned capsule to the International Space Station. This will be an historic milestone! Our current plans call for Orbital Sciences to follow suit later in the year with its *Cygnus* module launched on their Antares launch vehicle.

In FY 2013, NASA plans for at least three flights delivering research and logistics hardware to the ISS by U.S.-developed

cargo delivery systems. I am committed to launching astronauts from American soil, on spacecraft built by American companies. NASA's FY13 budget provides the funding needed to bring our human space launches back home to the U.S. and get American companies transporting our astronauts once again.

That's far from all we have going on in commercial crew and cargo, however. Commercial Crew Integrated Capability Initiative proposals are in. With these, we're asking industry to complete the design of a fully integrated commercial crew transportation system that consists of the spacecraft, launch vehicle, ground operations, and mission control. These proposals are going to lead to Space Act Agreements for initial development and will advance our efforts to help NASA and the U.S. achieve safe, reliable, and cost effective human access to space.

All of our commercial partners continue to work diligently and innovatively toward their milestones. Pratt & Whitney

Rocketdyne, which is supporting The Boeing Company during the development of its CST-100 spacecraft in NASA's Commercial Crew Development Round 2, completed mission-duration hot-fire tests on a launch abort engine in March.

Blue Origin has successfully tested the aerodynamic design of its next-generation space vehicle in development, and the vehicle has completed a series of wind tunnel tests. Throughout the field, I've seen tangible examples like these.

Another very important indicator of the future is that people still want to be astronauts. We had a near record number of 6300 applicants for the class of 2013 and the 2009 class is already well into training for the missions of the future. Their first stop is going to be the International Space Station, now coming into its own as a laboratory and technology test bed like no other.

NASA's Robotic Refueling Mission (RRM) experiment aboard the ISS, for instance, recently demonstrated remotely controlled robots and specialized tools can perform precise satellite-servicing tasks in space.

We do great things on the ISS. We have Dextre and Canadarm 2 to help us maintain it and perform experiments and service payloads and instruments. We have a football field's worth of solar arrays powering life support and hundreds of experiments. More than 400 scientific studies were conducted on Station last year in an array of disciplines, not just those related to human health. There are probably 5-10 investigations going on any given day.

This science helps people here on Earth; just as much as it tells us about living in space and helps us make the next great leaps to farther destinations. We're learning a lot about the human immune system, inner ear response and balance, visual acuity

changes and bone density loss, for example. These studies are proving helpful with everyday problems of people of all ages here on Earth and are also applicable to astronauts on long space voyages. Some of this particular research is especially relevant to our senior population.

Each day, international crews of six (6) are performing research on the ISS and they also talk to students around the world and get them fired up about space and help us create the next generation of scientists and engineers we so critically need. K-12 students have been participating in ISS perhaps more than any other group, sending us their ideas for experiments, like the programmable *SPHERES* satellites and other concepts for experiments through programs like the YouTube Space Lab contest.

In this new era of space exploration, NASA will build the capabilities to send humans deeper into space than ever before.

The technology to take us farther into the solar system; the deep space rocket we call the Space Launch System; and the *Orion* multi-purpose crew vehicle are all making steady progress.

SLS Advanced Booster risk-reduction effort proposals are in.

We'll award a demonstration study contract this summer that will lead us ultimately to a decision on the boosters. The deep space rocket involves a tremendous amount of work. It is not easy to design a core that can take either solid or liquid boosters. But we're taking the time to get it right and work on our manufacturing approach and analyze the types of materials we'll be using.

The deadline also is coming up for advanced development proposals for the rocket. J-2X power pack tests of varying lengths are slated through summer at the Stennis Space Center's A-1 Test Stand to help us learn more about the upper stage. The space shuttle's RS-25D main engine inventory has been

relocated to the Stennis Space Center in Mississippi for use in the SLS core.

*Orion* has been undergoing parachute drop and water tests and thermal protection system work for the module continues at Ames.

A Lockheed Martin-sponsored exploration flight test of *Orion* will take place in 2014, with our first uncrewed NASA test flight of the integrated capsule and rocket scheduled for 2017. The 2014 flight will simulate about 80% of the speed of a lunar re-entry and will tell us a lot about the thermal protection system and provide many other data points.

Our commitment to science remains strong, although we can't do everything we'd like. There really has never been a time when there weren't more things on our wish list than we were able to pursue given our resources, but what we do have coming up is

quite impressive. We'll be at Jupiter with *Juno* and Pluto with *New Horizons* before you know it. Not to mention, *Dawn's* flight to the dwarf planet Ceres will begin when it completes its investigations from the orbit of the asteroid, Vesta.

Information is still flowing in by the terabyte from Hubble, LRO, MRO, SDO, *Cassini*, *Swift*, *Chandra*, *Fermi* and many others. *Kepler* is documenting an ever-increasing number of exo-planets - showing that our solar system is just one of countless others.

The James Webb Space Telescope is being developed for launch in 2018. Many of you here probably have connections to JWST. As the successor to the Hubble Space Telescope, Webb will allow us to continue to revolutionize our understanding of the universe by peering across space and back in time to the formation of the first stars and galaxies.

We are developing the next generation weather forecasting and climate monitoring capabilities with our partner, NOAA. We are making new global measurements, like sea surface salinity from the U.S.-Argentine satellite, *Aquarius SAC-D*, never made before. We are enabling others to use our data to protect lives, property, and the environment and supporting research that improves our understanding of our planet to improve the quality of life on Earth. The Mars Science Laboratory (MSL), the rover known as *Curiosity*, will land on Mars in August and demonstrate precision landing technology, enabling us to probe the mysteries of the red planet. This mission is also an excellent example of the synergy we're trying to nurture between exploration and science as it performs amazing science using the most sophisticated suite of tools we've ever been able to send to Mars.

We are developing an integrated strategy to ensure that the next steps for Mars exploration will support science as well as human

exploration goals, and potentially take advantage of the 2018-2020 exploration window for Mars missions.

I have asked Dr. John Grunsfeld, the head of our Science Mission Directorate, to lead the team that will craft this integrated Mars strategy.

Starting last week, the academic, scientific, and technical communities across the globe can submit ideas and abstracts online as part of NASA's effort to seek out the best and the brightest ideas from students, academics, researchers, and engineers in planetary science. Selected abstracts from industry, academia, and government will be presented and discussed at a workshop hosted by the Lunar and Planetary Institute June 12-14 in Houston. I hope many of you will participate.

In Space Technology, there are about 1000 projects developing the technologies we need for tomorrow's missions. Technology

demonstration mission proposals for green propellant alternatives to hydrazine are due April 30.

Small satellite proposals are due in April as well. We selected 80 space technology fellowships last year – students who will become the up and coming aerospace leaders as they complete their graduate work. We're in the process of selecting this year's class.

In the nation's laboratories and test chambers, NASA is driving advances in new high-payoff space technologies and developing and maturing broadly applicable technology in areas such as: in-space propulsion, robotics, space power systems, deep-space communications, cryogenic fluid handling, and entry, descent, and landing, which are essential for exploration beyond low Earth orbit.

You should also know that we haven't forgotten the first “A” in NASA. In aeronautics, our investments are driving technology breakthroughs for cleaner, safer, and more efficient aircraft. The millions of air travelers around the world will benefit from our work and our partnership with the greater aviation community to transform our air travel system.

We are accelerating the nation’s transition to the Next Generation Air Transportation System (NextGen) and making commercial aviation safer, more fuel efficient, quieter, and more environmentally friendly through investments in revolutionary concepts for air vehicles and air traffic management.

Our FY13 budget also continues support for the integration of unmanned aircraft systems (UAS) into the National Airspace System as well as the validation of complex aviation systems.

NASA is not only still in business, we're pushing the envelope of current capabilities and bringing new ones to life. You can do a lot with the \$17.7 billion budget request we have for FY13 and we will - we are.

The budget includes \$4 billion for space operations including the International Space Station (ISS); and \$4 billion for exploration activities in the Human Exploration Operations Mission Directorate.; \$4.9 billion for science; \$699 million for space technology; and \$552 million for aeronautics research.

This is a stable budget, not a shrinking budget. Some tough decisions had to be made, but I believe we have the right balance to accomplish great things, now and in the future.

Here's a tangible example of what some of that funding means. It supports more than 80 science missions – 60 currently in operation like I already mentioned and 26 now under

development – that cover the vital data we need to understand our own planet; enhance exploration farther into our solar system; and support the next generation of observatories peering beyond the reaches of our neighborhood to other galaxies and their solar systems and undiscovered phenomena.

Despite constrained economic times, we have made sustainable choices to provide stability and continuity to existing priority programs and set the pace for opening the next great chapter in exploration

Under the president's leadership, NASA and the nation are embarking on an ambitious program of space exploration that will build on new technologies as well as proven capabilities as we expand our reach into the solar system, including to new destinations such as an asteroid and Mars.

When you look at the NASA budget, you will see that we have a good balance of programs. The FY 2013 Budget Request of \$699M for the Space Technology Program, for instance, is a modest increase above the FY 2012 congressionally enacted level, and enables the continuation of on-going, priority Space Technology projects such as the things I just mentioned, cryogenic fuel handling, in-space robotics and the like. The budget request supports the teams across the country that are building, testing, and demonstrating these advanced technologies needed for our future. The program focuses on the critical capabilities required for NASA's future science and exploration missions, enables a vibrant and competitive U.S. space industry, forges technology-based partnerships with other government agencies and will increase our nation's capability to operate in space and enable deep space exploration.

It's an exciting time to be in aerospace. Everyone here – the full spectrum of industry, the defense world, and other government

agencies – is going to benefit from what NASA is doing right now. Our belief is that it will bring down launch costs and give us multiple capabilities.

Our modernization plans for a 21<sup>st</sup> Century Space Launch Complex, for example, will improve capabilities and infrastructure for a low-cost multi-user space transportation facility at the Kennedy Space Center in conjunction with Exploration Ground System efforts for SLS and *Orion*. This will benefit many users besides just NASA.

I've thrown a lot of stuff on the table today, because I want to give you a sense of the wide variety of ambitious initiatives that we're undertaking.

Just because the shuttle has retired doesn't mean NASA is shuttered – far from it. I believe that the best is yet to come. Our bigger dreams are just starting to come to fruition.

At its core, NASA is more than ever about American innovation and American ingenuity. It's about keeping the U.S. the world leader in space exploration and showcasing our knack for solving problems and improving life here on Earth.

It's going to be an amazing ride. As Discovery lands at NASM, we see the fruits of the last time we embarked on a mission to do something no one else had done – to build a reusable space vehicle and demonstrate an expanding flexibility and capability to live and work in space.

As NASA transfers the shuttle orbiters to museums across the country, we also embark on an exciting new space exploration journey.

The future is literally happening right now, and NASA intends to lead the march to it. I hope most of you share my enthusiasm and are willing to join us in this great adventure.

Thank you.