



# THE STATE OF OUR NASA IS STRONG

*Remarks on the State of NASA by*  
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Thank you, Dave [Bowles].

This has been quite a year for Langley milestones, not the least of which is the fact we can now refer to our friend Dave as “Director David Bowles” as a result of my decision to bring your former Center Director, Steve Jurczyk, up to Headquarters to serve as Associate Administrator for the Space Technology Mission Directorate. What’s more, Langley marked the 95<sup>th</sup> anniversary of the first federally funded wind tunnel and you joined the entire NASA family in celebrating the 100-year anniversary of the NACA.

I’d be remiss also as we talk about our progress from air to space if I didn’t mention that this amazing center is preparing to celebrate its 100<sup>th</sup> anniversary next year. Wow!

This has been quite a year for aviation anniversaries, and I think there’s a real parallel between the birth of aviation and what we’re experiencing today in terms of commercial space. Both are stories about how we are able to accomplish great things when we combine strategic government investment and research with the native genius of American inventors and industry.

Speaking of accomplishing great things ...

This year, one of the giants in Langley history received the Presidential Medal of Freedom. Some of you may have worked with her before her retirement in 1986 after 33 years of service to Langley, to NASA and to the United States of America. Her

name is Katherine Johnson. She's an African-American woman who grew up during segregation at a time when it wasn't easy breaking into engineering as either a woman or an African-American. Katherine joined Langley in the NACA days and went on to play a role in virtually every major NASA space mission from Mercury through the Shuttle program. She also, quite literally, wrote the textbook on rocket science.

Now, I mention Katherine Johnson for a reason ...

Andrew Carnegie once said – and I quote – “*take away my people, but leave my factories, and soon grass will grow on the factory floors. [But] take away my factories [and] leave my people, and soon we will have a new and better factory.*”

It's because of the legacy of NASA employees like Katherine Johnson ... it's because of your work here at Langley ... it's because of the work of your colleagues at all our NASA Centers ... it's because of the work of our contractors and our partners in classrooms, boardrooms, laboratories and even garages across our country, that: **The state of our NASA is as strong as it's ever been** – and when I say “our,” I really mean it.

Because of the work of you and your NASA colleagues to make aviation cleaner, greener, safer and quieter ... *the state of our NASA is strong.*

Because NASA's study of the cosmos and robotic exploration of the solar system is unlocking the mysteries of places like Pluto, the Kuiper Belt, Jupiter, Europa, the Sun, Saturn, her moons and Mars ... *the state of our NASA is strong.*

Because NASA Earth Science is teaching us about our own planet's oceans, atmosphere, surface, energy cycle, water cycle, carbon cycle, weather and changing climate ... *the state of our NASA is strong.*

Because astronauts have been working off-the-Earth for-the-Earth for 15 continuous years aboard the International Space Station – and they will be through 2024 ... *the state of our NASA is strong.*

*It's also strong* because of the work that so many in our NASA family are doing to support the station's operations and scientific research.

*It's strong* because our commercial partners are transforming the U.S. space industry, opening up new markets and reducing the costs of space travel. *It's strong* because we're launching cargo to the Space Station from American soil and preparing to return human spaceflight launches to the U.S. as well. In fact, last year we announced

that four Americans – Bob Behnken, Suni Williams, Eric Boe and Doug Hurley -- will be the first NASA astronauts to train and fly to space on privately-owned spacecraft

*The state of our NASA is strong* ...because our most recent astronaut class – for the first time in history -- has the equal numbers of female and male candidates... and because we're accepting applications through February 18<sup>th</sup>, for a new, diverse generation of astronauts that will blaze a trail to Mars.

Because NASA and our partners are developing the technologies that drive both exploration and economic growth, I have 1,600 more reasons that *the state of our NASA is strong*: the 1,600 new technologies a year that we develop and the thousands of products, services and processes that we help businesses transfer into the market for job creation and economic growth.

While we're at it, *the state of our NASA is strong* because more venture capital was invested in America's space industry in 2015 than in all the previous 15 years combined.

Meanwhile, because for the fourth year in a row, we are the #1 rated best place to work in the federal government ... *the state of our NASA is strong*.

Because our people are making strides every day to encourage more Americans from under-served communities to pursue careers in science, technology, engineering and mathematics, *the state of our NASA is strong*.

Because we are hitting our benchmarks with new exploration systems like the Space Launch System rocket and the *Orion* Crew Vehicle ...

Because a new consensus is emerging in the scientific and policy communities around our vision, timetable and plan for sending American astronauts to Mars in the 2030s...

Because more and more of our neighbors are finding new meaning in the words "Mars matters" ...

And because we are closer today than ever before in human history to sending American astronauts to the Red Planet... *the state of our NASA is strong*.

Because the State of our NASA is strong, President Obama is recommending a \$19 billion budget for the next year to carry out our ambitious exploration and scientific discovery plans.

In fact, over his tenure, President Obama has now invested \$147 billion in America's space program.

Our elected leaders – on a bipartisan basis – have chosen to make this investment in our Agency, because they believe in NASA's Journey to Mars and recognize that investments in NASA's present are investments in America's future:

A future where we send American astronauts to Mars in the 2030s...

A future where more American's are making a good living working in STEM-based careers that pay well and contribute to our global economic competitiveness and when I say more Americans, I mean *all* Americans, including women and minorities who are under-represented in these fields today...

A future where our children and grandchildren breathe cleaner air, drink cleaner water and fly on cleaner, greener, more fuel-efficient aircraft; a future where humankind has a deeper understanding of our universe, our place in it and our own planet.

If you take a step back for a moment and reflect on what NASA's work means to our everyday lives here on Earth, it's very clear to me that every American benefits in some way from NASA's Journey to Mars.

Think about it. As we speak, there are Americans who are working today in virtually every state in jobs that are funded by NASA investments. Think of what it means to a young girl or boy who is able to go to school with a full stomach and decent school supplies because their parents have good jobs. Think of what it means to the person who runs a deli next to one of more than a thousand companies working in support of NASA's commercial space endeavors.

Beyond that, think of what investments in NASA mean to someone whose husband or wife is alive today thanks to NASA-driven advances in medicine...to a grandparent whose grandkids are driving over to their home – guided by GPS – on safer tires and highways...to a baby who is eating safer food...to a family gathered around the television set watching a movie delivered to Earth via a satellite signal.

Think of what it means to a community when NASA technologies are used to purify their drinking water or listen for beating hearts in the rubble after a natural disaster.

One of the most fortuitous things about investments in NASA is that as we leverage them, we're able to walk and chew gum at the same time. What I mean by that is we're able to achieve all these earthly benefits while still pushing farther out into the

universe ... while moving closer to sending human beings to Mars and to answering some of the oldest questions in the history of human civilization, including the question of whether we are alone in the universe.

This is what we mean by reaching new heights for the benefit of all humankind.

The investments in the President's FY2017 budget proposal announced today will empower the people of NASA to improve our quality of life today and prepare to send American astronauts to Mars in the 2030s.

We'll continue to make great progress on the Space Launch System – *SLS* – rocket and we're preparing for a second series of engine tests. At the Kennedy Space Center, our teams will outfit *Orion's* crew module with the spacecraft's heat-shielding thermal protection systems, avionics and subsystems like electrical power storage, cabin pressure control and flight software – to name just a few. Direct field acoustic testing will be completed in Colorado. Structural integrity tests will be performed at the Glenn Research Center in Cleveland – which celebrated its 75<sup>th</sup> anniversary this year, and splashdown tests will be performed right here at Langley.

At the same time, we'll continue to work with partners both in and out of government to develop the technologies that drive exploration, create jobs and continue to make launches more affordable. From small satellites to humanoid robots to green propellants and advanced navigation systems, our colleagues are working on what William Shakespeare would call "*such stuff as dreams are made on.*"

In the coming year, we'll test an expandable space habitat aboard the Space Station that could lay the groundwork for giving our astronauts a place to live during long duration space missions.

Speaking of the Space Station – in March, Scott Kelly will return home from his year in space, the first ever by an American astronaut. In March, astronaut Jeff Williams will become the first American to spend three long-duration expeditions aboard the Space Station. In May, astronaut Kate Rubins launches to the ISS and plans to become the first person to perform DNA sequencing in space after she arrives at the Station. In November, astronaut Peggy Whitson, former Expedition 16 Commander, will add to the 192 days she's already logged in space and become the only woman to fly two missions on the ISS.

Next year we'll announce a new team of astronaut candidates, the next generation of space explorers who will leave planet Earth from U.S. soil and carry out missions to advance America's Journey to Mars.

Meanwhile, as we broaden the robotic exploration of our solar system and beyond, this year will bring us a lot of excitement... *Juno's* arrival at Jupiter... further progress on the James Webb Space Telescope... missions to study cosmic rays and neutron stars and the launch of OSIRIS-REx, the first U.S. spacecraft to collect samples from an asteroid and return them home to Earth.

Here on Earth, we'll move closer toward making the Next Generation of air traffic management a reality. We'll continue your work to make flight even safer ... to make it quieter ... and through a healthy investment in aeronautics, we'll reach new heights in pursuit of making it cleaner and greener. In the coming years, we'll accelerate aviation energy efficiency. We'll transform propulsion systems and we'll enable major improvements in aviation mobility.

After six years of cutting edge research, we've learned that we could save the commercial airline industry as much as \$255 billion – that's billion with a “b” – over twenty-five years and these findings came *before* this new investment.

Most importantly, we might just help save our planet from the effects of our changing climate.

Speaking of Earth – the most important planet – the next year will see a continuation of our important work on Earth Science take shape -- including ocean observations that will allow us to track the rise of global sea levels and better forecast the strength of hurricanes, tides and currents.

As I wrap up, I want to make one final point. Among the big anniversaries we celebrated this year, we also marked five years since President Obama laid out his plan for NASA and for a Journey to Mars that will take American astronauts to the Red Planet in the 2030s.

I mentioned earlier that there's a bipartisan consensus emerging around this plan and timetable and it's a consensus that extends far beyond Washington to the various corners of science, policy, higher learning, industry, non-profits, citizen scientists and so forth.

Less often are folks asking, “*Why aren't you doing things my way?*” or “*is Mars the right destination?*” Rather, they're asking, “*How can we be a part of this?*” and “*What are some areas where we can work together?*”

I like to think that part of this is because our plan is clear, affordable, sustainable and attainable. Another reason is simply because “Mars Matters.”

I've spent a lot of time today talking about the future – our immediate future and the decades ahead. The truth is that the only thing we can hope to know for certain about our future is that it is uncertain.

Growing up in the segregated South, I never dreamed my own journey would take me to the U.S. Marine Corps as a combat pilot, let alone to space or to that mysterious planet known as “Washington, D.C.” I certainly never thought it would take me to the Administration of the first Black president, or to be Administrator of NASA at a time when our people are preparing to return human space launches to American soil and laying the foundation for a Journey to Mars.

While our future is unknown, we can say with a great deal of certainty that investments in NASA's today are investments in our children's and grandchildren's tomorrow.

Ultimately, this tomorrow will be shaped by the choices made by future leaders.

When it comes to aeronautics and space, President Obama has set us on a visionary course. It's my sincere hope that future leaders from all sides of the political spectrum see it through.

Because in this tomorrow, we all want our children and grandchildren to breathe cleaner air, drink cleaner water, go to work in good jobs alongside Americans of all genders, races, sexual orientation, ethnicities and geographic and economic backgrounds in jobs supported by NASA's work.

We all want a future where NASA technologies are saving even more lives and improving all of our quality of life...

... A future where we know more about our solar system and beyond...

... A future where we have an answer to the age-old question of whether we're alone in the universe...

... A future where, as President Obama put it, we've pushed farther into the solar system not just to visit but to stay...

... A future where there is a continuous human presence on Mars.

Thanks to each and every one of you here at Langley and at each of our NASA centers and facilities for all you continue to do to turn science fiction into science fact and to make the impossible possible. It's because of every one of you, I can say with great confidence today – **the State of Our NASA is Strong!**