EXTENDING OUR REACH TO SPACE & LEADERSHIP ON EARTH (CSIS)

Remarks by
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to the
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CENTER FOR STRATEGIC AND INTERNATIONAL STUDIES
Remarks for Administrator Bolden
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Thank you all very much. It's great to be here with you at the Center for Strategic and International Studies. One of the things that I appreciate about your organization is that you recognize the relationship between space exploration, innovation, job creation, and a safer, more secure nation.

After having spent three and a half decades serving in the United States Marine Corps, I appreciate the important voice you have in our nation's defense and security policy. As the Administrator of NASA, I appreciate your voice on issues ranging from space policy to technology to energy and climate change. As a fellow American, I greatly admire your work to ensure that American remains a force for good in the world – using "soft or smart" power to advance democratic principles.

We share this aspiration at NASA where our mission statement calls upon us to reach for new heights for the benefit of all humankind. I think President Obama said it best

when he said – and I quote – *"we will not only extend humanity's reach in space -- we will strengthen America's leadership here on Earth."*

This duality of purpose is mutually reinforcing – and it is what I want to talk with you about today.

In a relatively short period of time, the space program has not only expanded humanity's reach and knowledge about our universe, it has revolutionized the way we practice medicine, insulate our houses, and purify our drinking water.

It has not only planted the American flag on the moon, it has impacted how we plant and raise crops.

It has not only sent us stunning pictures of places like Mars and Pluto, it's beamed nightly television into our homes, and improved the eyeglasses many of us use to watch it.

NASA technology has not only brought us closer to Mars, it's also brought us closer to one another. When we go to visit loved ones, we drive on highways that are safer because of NASA technologies, or we travel on airplanes that fly safer, cleaner and quieter because every American aircraft and air traffic control tower is equipped with NASA technology.

Our technology has also brought us closer to our neighbors throughout the globe, allowing us to exercise smart or soft power through both our humanitarian work and our work to provide developing space programs with assistance as they seek to lift off.

By the way, despite the popular misconception, we can't claim credit for Velcro or Tang!

THE PAST SIX YEARS

A poet once wrote that "the universe is made of stories." With this in mind, I have a story I'd like to share with you this afternoon. It's a story about a great country – the greatest on Earth – that has always aspired to do very, very big things. For half of a century, her presidents, planetary scientists, pilots, and poets alike dreamed of sending her astronauts to Mars. In all honesty, they were not alone. If you think about it, for as long as humanity has known about Mars, human beings in all corners of our globe have dreamed of one day setting foot on the Red Planet.

However, at the dawn of the 21st century, getting to Mars was no more than a distant, horizon goal. There was no realistic or sustainable plan in place for getting there. There was no timetable. There was nothing close to a consensus on Mars as a destination.

Yet, the people of this country's space agency, never stopped dreaming.

Over a half century, the people of this country had achieved some brilliant, amazing things, including a reusable aircraft with the beauty of an airplane – actually the world's largest glider – and the capacity to carry eight astronauts to space with a 60-foot payload bay.

But on February 1, 2003, tragedy struck, and they lost a Space Shuttle called *Columbia* along with the heroes – six of their own countrywomen and men, and one from an allied country.

The Columbia Accident Investigation Board gave things a long, hard look, and recommended that the Shuttle Program be phased out. Many in the space community – including the fellow who's talking to you – agreed. You see, every technology evolves over time, and it was time to focus on reaching further into deep space.

Their President at the time, a man by the name of George W. Bush, agreed and he directed the phase out of the Shuttle Program.

Fast forward to 2009. A new President named Barack Obama takes office, and he asks an independent committee chaired by former Lockheed CEO Norm Augustine to review the nation's plans for human spaceflight. The committee includes astronauts, scientists, executives, educators, engineers and a retired Air Force General – people as distinguished as the late Sally Ride. Their findings, quite frankly, are sobering. I quote: *"The U.S. human spaceflight program appears to be on an unsustainable trajectory."*

It gives me no joy to recall these words, but it's an important benchmark of how far all of us have come since that time.

Determined to replace an "unsustainable trajectory" with a clear, financially, stable and ambitious way forward, in 2010, this new President comes to his nation's great spaceport, the Kennedy Space Center in Cape Canaveral, Florida, and issues the people of his space agency a challenge: send our astronauts to Mars in the 2030s and do so in a way that strengthens our economy, our environment, and our

understanding of the universe, our place in it, and the most important planet of them all: Earth.

As you've hopefully, guessed by now: this country is our country.

What's more, this story is *our* story. Because NASA's Journey to Mars was never designed to be just about NASA. It is a Journey we will take together with partners in industry, academia, non-profits, and other space agencies across our ever shrinking planet.

Given your focus here at CSIS, I'm going to spend the balance of my time talking about this last group, our international partners – but first, I want to say a quick word about how we're working with industry to create and strengthen commercial space markets – especially since there are a number of companies that play in both the civil and military arena.

President Obama asked NASA to work simultaneously with industry partners both in low-earth orbit and in deep space and that's exactly what we've done.

We're working with commercial carriers so that the greatest country in the world can launch cargo and crew from our own soil to the International Space Station. Today, our commercial partners have delivered tens of thousands of pounds of cargo to Station.

Furthermore, we're poised to end our sole reliance on Russia to get our astronauts to space. Our American commercial partners Boeing and SpaceX are close to being ready to take our astronauts to the International Space Station – allowing NASA to support job creation right here in the good ole U.S. of A.

From Day 1, the President's strategy was to use these initiatives to build a commercial market in low earth orbit – strengthening America's economic competitiveness in the global innovation economy, and strengthening communities throughout our country by putting Americans to work. Today, our neighbors are working across more than 1,000 companies in nearly every state in support of NASA's commercial space initiatives.

When it comes to deep space, the President asked us to work with American entrepreneurs, innovators and inventors on developing the technologies that drive exploration and job creation. These would come to be technologies like habitats, 3D printers, space veggies, medical devices, propulsion systems and so forth … technologies that astronauts will use to one day live and work on Mars and safely

return home … technologies that have a lot of potential spinoff benefits here on Earth.

INTERNATIONAL LEADERSHIP

Moving on to international partnerships … Neil Armstrong and Buzz Alderin famously put a plaque on the moon that read *"we came in peace for all mankind."* While they took their giant leap for all humankind, the United States had conducted this mission essentially on its own.

This will not be the case when American astronauts reach Mars in the 2030s. It does not make sense for one country to build every instrument, launch every satellite, or conduct every research experiment.

We have over 50 years and more than 4,000 agreements to build upon.

The principles of our agency come from the principles of our democracy – things like free and open access to scientific data, free markets and competition, and meritocracy: for instance, any American can work for NASA if they have demonstrated that they have the "right stuff." Our most recent astronaut class is the first ever to have an equal number of women and men. For the next class, more than 18,000 Americans applied to be astronauts and I for one cannot wait to see what the class will look like.

When it comes to global leadership, we lead both by example and by action.

Sometimes, our most significant "giant leaps" occur right here on Earth, where NASA's technologies are being used to put America's best foot forward – advancing American smart or soft power.

For example, technologies we designed to detect signs of life on Mars is also being used to allow emergency workers on our own planet to listen for beating hearts in the rubble after a disaster. Technologies we developed to recycle wastewater aboard the International Space Station are being put to use to provide our global neighbors in remote areas of Asia, South and Central America with clean drinking water. Medical diagnosis tools that astronauts use in space are now being adapted to save the lives of people living in places where CT scans, MRIs and even simple X-ray exams are not accessible.

When it comes to space itself, I cannot say enough about the diplomatic benefits of the International Space Station. Today, a child who is 15 years old or younger has lived every day of her or his life while human beings from multiple countries are living and working together in space aboard the International Space Station.

Tens of thousands of people from across 15 countries have been involved in its operation. Astronauts from 17 countries have spent time on board. It has hosted more than 1,700 research investigations from researchers in more than 83 countries! I truly believe it ought be considered for a Nobel Prize.

What's more, most recently, American astronaut Scott Kelly and Russian cosmonaut Mikhail Kornienko each spent a year together in space aboard Station – this at a time when sometimes the relationship between their two home countries back here on Earth presented challenges.

[KERRY STORY]

President Obama and Congress have twice extended the life of the Station through 2024. As we look toward the future, the question we will need to answer is how to keep the momentum going; how will we assemble equally durable and productive coalitions in the future. As the next decade begins anew, the future could potentially bring new partners – be they countries and/or commercial partners – as well as new goals.

The fact of the matter is, our world is changing. Traditional space powers are expanding their efforts in low-Earth orbit and the regions beyond. Meanwhile the ability to utilize space has dramatically shifted to include dozens of developed and developing nations, large and small companies and even private entrepreneurs. In the last ten years, new spacefaring nations gained experience building satellites and developing applications from their data. Over the past few years, as NASA has expanded its "global reach" to emerging spacefaring nations, our international partnerships have grown in scope, importance, and diversity.

As the number of actors benefiting from space rises, the pool of stakeholders expands, creating a powerful source of stability as norms regarding long-term sustainability of outer space become more widely shared.

I'm not the first person to point out that space is on the verge of becoming more "contested, congested, and competitive." Needless this to say this phenomenon will continue to bring with it new challenges … challenges like orbital traffic management and debris mitigation.

Anyone who is following space policy on the international scene will nod in agreement when I say that as a world community we've yet to find a consensus on a set of guidelines for the long-term sustainability of the space environment, although

we are committed to that end. . Nonetheless, the positive benefits of space cooperation, and the undeniable leadership of the U.S. in pushing space exploration beyond the boundaries, are powerful incentives for nations to become good, responsible actors – and partners – in the space domain.

While all of this is as of yet undetermined, I frequently meet with senior leaders from around the world and time and again they tell me that they are looking for the United States to set the course, and they will follow our lead. At NASA, we intend to provide that leadership in space exploration, while seeking opportunities for mutually beneficial cooperation.

I have occasion to meet with the heads of space agencies from all over the world, including just recently in Colorado at the Space Symposium. Time and again they tell me that they are looking for the United States to set the course, and they will follow our lead.

We're no longer in a "space race" against each other. Rather, we're traveling together as a human race that's looking to expand the outer-bounds of human possibility and progress. All told, at NASA we have roughly 700 active agreements with more than 120 international partners.
One of the things that NASA is doing today, is talking to, and working with nations that are just beginning to understand how space activities might have a profound benefit on their citizen's daily lives – and incidentally this has diplomatic as well as scientific value. Working initially in the areas of scientific research, education and Earth science applications, NASA is in the process of expanding its global reach in a manner that will establish relationships able to endure far into the future.

I spoke earlier about the International Space Station. This is one of many examples where we are already working together with other countries and have the potential to include new participants from other nations.

Let me be specific: when it comes to Earth science satellites over half of NASA's operating missions include significant international involvement. Additionally, the United States along with Europe, China, Japan, India, and other partners are already sharing Earth observation data; creating a constellation of satellites that operate as part of an overall Earth observation system.

Today, people from all walks of life are using this data to change – and perhaps even save – our planet. They're working on farms and in classrooms, labs, hospitals, boardrooms, and garages across our world to improve the efficacy of agriculture and

education, to detect outbreaks of disease and forest fires; and to study our planet's changing climate.

CONCLUSION

Final point. If you look at all we've accomplished over these past six years – and if you consider that we are closer today to sending human beings to Mars than anyone, anywhere, at any time, has ever been, it is very clear to me that President Obama has set us on a visionary course. It is my sincere hope that future leaders from all sides of the political spectrum see it through.

Because when I close my eyes and imagine the future that my generation will be leaving to my beautiful grandchildren if we choose to stay the course, I see a pathway to boundless progress; progress that reaches all the way to Mars and beyond.

I see a future where my grandchildren's children with be accustomed to human beings living and working on Mars … A future, where NASA and its international partners are using Mars as a stepping stone to the rest of the solar system.

I see a future, where a robust commercial space market is fueling innovation and job creation alike – and where these innovations have spinoff benefits for our national security, our quality of life, and economy … a future where we are able to launch human beings, cargo and satellites of all sizes to space at a significantly lower price-point – thanks to the work we're doing today to make launches more affordable and to advance emerging small-satellite technologies like "CubeSats" and "Nanosats."

I see a future where our grandchildren's children are drinking cleaner water, breathing cleaner air and making use of cleaner energy.

I see a world where girls and young people of color are more excited about pursuing education in science, technology, engineering, the arts and math.

I see a future where people in even the most remote corners of our world have access to Wi-Fi – as do astronauts living and working in space.

I see a future where maybe, just maybe, humanity finds the answer to the age-old question of whether we're alone in the universe.

Last but not least, I see a world where our grandchildren live in greater security thanks to American leadership, thanks to technology, and thanks to humanity's achievement of what John F. Kennedy called – and I quote – *"the kind of peace the makes life on earth*

worth living, the kind that enables [people] and nations to grow and to hope and to build a better life for their children – not merely peace for Americans but peace for all men and women – not merely peace in our time, but peace for all time." Thank you all very much.