

REMARKS FOR ADMINISTRATOR BOLDEN
82nd ANNUAL NATIONAL TECHNICAL ASSOCIATION CONFERENCE
"Diversifying the Labor Force to Innovate 2020 Technical Solutions"
HOWARD UNIVERSITY
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Thank you for inviting me to speak today.

It's quite a pleasure for me to be able to address this 82nd Annual Conference of the National Technical Association (NTA) since I have been unable to participate in most of your activities for a number of years now. In my earlier days with NASA, I attempted to be quite active with NTA, but I must confess to allowing my participation to fall off quite a bit. It is my hope that I'll be able to take a more active role in the work of the Association in the future because making sure there is a new generation of young minority and women professionals to become leaders in space and technology has to be one of our highest priorities. From the first decade until today, NTA leadership along with its members have had a remarkable history of achievement in the areas of education, research, engineering, science and technology. I think all of us can agree that high tech careers are not only the wave of the future, but that wave is hitting the shore right now.

As many of you know, my parents were career educators so I was I have been truly blessed in that regard because a passion for learning and high expectations for pursuing my education were integral to my growing up. And maybe that's why, although my current title is Administrator of NASA, I now consider myself an educator on some level.

Students who are just starting their college careers are excited about the future as many in this audience I hope will attest. They are fired up about what lies ahead for the space program and the chance to create capabilities that we don't have today. They want to be a part of something larger and they want to contribute to national goals. I spoke earlier this week at Purdue University and last spring at MIT and Houston Tillotson. In between I've been to elementary schools, middle schools, and universities of every description and that passion has been evident in the students everywhere I've been.

That's really what it's all about. We who already have careers in space are passionate about engineering or our scientific disciplines, and we can work at it all day and maybe even on the weekends (although I try to encourage work/life balance). But I think our motivation is that we want our passion to contribute to something that benefits the whole of humanity.

We're often asked to justify the space program -- which, by the way is only about .6% of the entire federal budget -- we're asked to justify it in light of so many other pressing world problems here on the ground, from poverty to disease and war. But the fact is that space exploration has made huge contributions to all of the problems we face as a people on this planet.

Technology like we use in our water processing systems on the International Space Station (ISS), for instance, is helping people in remote areas across the globe

get access to water. ISS research has helped us learn more about the bacterial disease Salmonella and has led to a candidate vaccine. We're also studying other pathogens. Many of the tools and technologies we take for granted came about as a result of exploration – from your cell phones to your laptops to the cordless drill you might have used recently, or the padding in the helmet I hope you wear when you ride your bike – or your motorcycle if you're a Hog enthusiast like me.

Those are just a couple of examples, but I am a firm believer that what we do has a huge ripple effect. Our NASA missions may be spectacular, but the end result is much more than just finding out, for instance, that there's a certain mineral on Mars. It's the inspiration a kid at home feels when he sees those pictures from Mars and maybe decides he or she wants to pursue a career where they work on projects like that. Or maybe that technology we use to take images of the Martian surface from space has an application in medical science to detect tumors in the breast or brain.

Those are some tangible reasons why following a science and technology career has a wide ranging impact on the world and connects us to national goals.

President Obama issued a new National Space Policy in June that makes research and technology development a fundamental thrust of our country's activity. This is crucial as the future seems to be approaching ever faster, and even in the lifetime of someone who is, say 20 right now, things have changed tremendously. I

know you weren't Tweeting and writing on your friends' Facebook walls even 5 or 6 years ago.

At NASA we're the cornerstone in the Space Policy, along with several other technical and defense agencies – the critical executors of this new national focus on research and development. It's a critical time for this new direction, as we've under-invested in this area for years. We know a lot about the capabilities we need to achieve the big things we're going to be called on to do in the future, and the President has given us his backing and a blueprint to help us make them real.

One of the most important things about this focus on innovation is that it gives our nation a chance to reignite the excellence that it possesses. As leaders in science and technology, with a drive to create grand new things that didn't exist before, we must challenge ourselves and to push the envelope of our human potential.

Now, I know this conference is about the diversifying the workforce in order to find technical solutions to the emerging 21st century challenges. I understand that, but my point is, any workforce that is going to do something meaningful has to be excited, has to be passionate, and has to see a greater good that its efforts are helping to bring about. Exploration and all of the science and technology that makes it happen and brings about new discoveries with it -- these are such professions. We who are today in the fields of science, engineering, and technology are very lucky, and most of us didn't just fall into them by chance.

It is very exciting to be part of the innovative and future-driven agenda that the President has set for the nation. And those of you who have chosen to pursue a career in science, technology, engineering or math are going to be vitally needed in the workforce of the future.

I get asked all the time how NASA is going to deal with the large number of retirements that are expected to happen in the coming years. How do we plan to create a more diverse workforce. These are two big challenges, but we at NASA are undaunted. Because of that excitement I see out there in the schools and universities and because of the big, exciting things we have coming up of which I think many people are going to want to be a part, I'm confident we will meet these challenges. But we'll need the help of the NTA and other organizations like yours.

This coming November, we're going to reach a comet, Hartley 2, for extended observations with the Epoxi spacecraft. We're going to insert a spacecraft, Messenger, in orbit around Mercury for the first time ever next March. In November 2011 we're going to launch a rover the size of a small car to Mars – the Mars Science Laboratory. This November – a little under two months from now – the Space Shuttle will take its first robotic crew member to orbit – Robonaut 2 or R2 – a product of a Space Act Agreement between NASA and General Motors. The International Space Station is now nearly complete – a football field sized facility orbiting some 250 miles above us. This is just the very beginning of the things that are going on RIGHT NOW.

As I mentioned earlier, in the future President Obama wants us to focus on capabilities we need to achieve the big things we've wanted to do for decades. He wants to send humans to an asteroid by 2025 and to orbit Mars by 2035.

When you think about it, this is not a long timeline for the people we're talking about actually doing these missions. Today's college sophomores will be about 35 by the time we reach an asteroid in 2025 as the President has proposed. This is pretty early in their careers. They will be in their mid-40s by the time a manned mission to Mars takes place. I want them to have the chance to excel and create the world of tomorrow – fully realizing the stunning possibilities for all of us like the Mercury, Gemini and Apollo generation did.

There are many other destinations we want to visit, both with humans and robots. More and more people are going to be going into space on commercial rockets, or able to send experiments to the space station or suborbital space. And let's not forget aeronautics. Basic research is on a huge upswing there, and we're going to be developing the next generation of cleaner, safer aircraft and a whole new national system for managing the millions of trips we make every day.

So, yes, our retirement and diversity and inclusion issues are big, but so is our vision. I won't deny that improving diversity and inclusion is very hard work. I tell my people I want all sorts of diversity, not just race and gender, but geography, political views, cultures and ideas. I want us to be inclusive – affording everyone a voice in the

decision-making process – and to promote diversity and inclusion and equal opportunity of all forms. The bottom line is that I want the best people we can get at NASA.

I can guarantee that what someone who grew up in, say, Iowa -- not to pick on any particular state -- learned about principles and life is dramatically different than what I experienced growing up in the segregated South in Columbia, South Carolina. What matters to me is that we make our workforce cohesive and strong. It is hard, and it does not happen on its own. You have to work at it. We have to go out and find people who look different, think differently, have different philosophic and political views.

I was lucky enough to be on international missions on the space shuttle. From orbit the borders between nations of our world below don't exist, unless Mother Nature created them, and we all -- as a crew, as a team -- worked together toward common goals. And that is what we do at NASA. I don't care about your race, gender, sexual persuasion, or political affiliation. Those are not critical factors – they don't make a difference in your performance and that's what counts. If you can help me put boots on Mars, that's what I'm looking for.

We all know that African Americans and other minorities are under-represented in science and engineering. We here at this conference are a huge group of exceptions – a wonderful group. I need you all to be NASA recruiters and get out there and talk about your passions and why you do what you do. Tell your brothers and sisters and their friends. Tell your neighbors back home. Tell your friends, re-Tweet us, and share

links to our stories. Blog. Learn more about all the things NASA is doing, or whatever is going on right now in your field. Share your excitement, and it will be infectious.

People who have taken the risk of getting into very difficult areas of study – science, technology, engineering and math have made an incredible decision. I know I'm preaching to the choir when I say it's tough. We all know that if you can just get through the first year, it may not get easier, but it usually gets better. I applaud all of you; the students who are working hard in your studies; the professionals who are already out in the working world making your mark. Ours are not easy fields of endeavor, but I know I wouldn't make a different choice if I had to go back.

I ask you to stay focused on why you entered your field. Why is perhaps the most important question you need to ask yourself. If you don't know why you are doing something, it's hard to remain motivated and you open yourself up to failure. You have to be passionate. If your passion is exploration, no one will drive you away from it. And we have a very bright future ahead.

My daughter is a plastic surgeon and my son a lieutenant colonel in the U.S. Marine Corps. My wife and I have always given them this advice: dream big dreams, do what you want to do, don't listen to anyone who tells you can't do something or you don't belong. Don't waste your time trying to explain to someone why you are here. Do your job and do it very well. If they have any sense at all, they'll eventually understand why you became their boss.

And just keep following that STEM path. You will have a broad array of choices in front of you. We never know where those choices are going to lead us. When I finished flight training around the time of the Apollo 13 mission and was engrossed in the crew's drama along with the rest of the nation as well as people around the world, it really hadn't occurred to me yet that I might be one of those guys up there one day. There are many paths we can take in this great wide world that continues to unfold for us.

The new age of exploration and discovery has just begun, and it is open to all who are willing to accept the challenges it brings. As I stated in my opening paragraph, from the first decade until today, NTA leadership along with its members have had a remarkable history of achievement in the areas of education, research, engineering, science and technology. NTA is and always has been about rising above the impossible; taking on new challenges, helping others along the way as mentors and role models, and making a difference in the world.

I will leave you with a favorite story of mine about a young man from a small village, Kwa Zulu Natal, South Africa.

- ***Do all you can***
- ***With what you have***
- ***In the time that you have***
- ***In the place that you are***

-- Nkosi Johnson, 2001