

Charles Bolden, NASA Administrator

The Forrestal Lecture

United States Naval Academy

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Thank you for that gracious introduction. I want to thank Superintendent, Vice Admiral Michael Miller, and Commandant, Captain Robert Clark, for the invitation to deliver this lecture. I also want to salute Brigade Commander, Jonathon David Monti, who is up here on stage with us, as well as this entire outstanding Brigade of Midshipmen. Welcome also to the students from the 27 or so other colleges and universities attending the Naval Academy Science and Engineering Conference who are with us this evening.

As alum of this great institution, I have to congratulate the football team on their great victory over Troy this past Saturday. I hope all enjoyed the uncharged overnight after the victory!

Being invited to deliver the Forrestal Lecture is quite special. Believe me, I know what an honor this is and given James Forrestal's outstanding military and political legacy, including his fight for an integrated Navy in the 1940s, I am especially honored and delighted to be here tonight. I'm very well aware – having sat in the audience where you the Brigade and your guests are tonight – of how feeling too proud about this honor can lead to really boring speeches if we speakers don't remember that you are all here to hear something that will be meaningful and useful in your lives. With that in mind, let me say that the overarching theme of my remarks tonight focuses on the critical importance of developing a vision and passion for service to others and making the world better.

I commend the Midshipmen for the decision you made in coming to the Academy where are learning to follow so that you can become effective leaders.

I also commend the students from the visiting schools who are attending the 2011 Science and Engineering Conference where you have been discussing the science and engineering issues and challenges of today. At NASA, we're looking for people like you to join us in the conduct of our mission.

If I understand correctly the three themes of your conference are: *Energy and Alternative Fuels; Social Robotics; and Social Media and Networks*. At NASA, much of the research effort in our Aeronautics Research Mission Directorate is in the area of engine design to accommodate use of emerging alternative fuels to produce cleaner, quieter, more efficient engines to use these fuels.

As you consider the uses of robots outside of industry and the military, I invite you to think about Robonaut-2 or R2, as we call our robotic member of the International Space Station crew. R2 is a humanoid robot developed through a three-year collaboration between NASA and General Motors (GM) to find a robot that would help offload some of the more risky tasks of astronauts in space and also improve physical safety for workers on the GM automobile production lines.

In an effort to better communicate our work and accomplishments to the general public, our Communications Division has begun an aggressive utilization of social media – YouTube, tweet ups, blogs, Facebook, and other outlets – to help better tell our story internationally.

Nothing gives me more pleasure than talking with, listening to and learning from the next generation of American leaders, so I'll keep my remarks brief so we can have that dialogue shortly.

Although I never dreamed of being an astronaut while I was growing up in Columbia, South Carolina, I did fulfill a childhood dream when I became a proud member of the Naval Academy's Class of 1968 after graduation from C.A. Johnson High School. I was breezing along pretty well as a Mid until I ran into the last course I needed to complete my requirements for a degree in electrical engineering – Electromagnetic Waves Theory II.

Though I really tried, the best I did in that class in my second class or junior year was an “F”, and with that earned a trip to the Academic Board. Although I could have been dismissed from the Academy, the Board, under the guidance of then-Superintendent Draper Kaufman, showed compassion, allowed to me to continue with an “F” on my academic record, and I went on to graduate – not exactly a Distinguished Graduate!

Little did I know when I left here with a Bachelor of Science degree in Electrical Science in 1968, that this experience would lead me round the world, literally out of this world, and back again.

My journey from here has included service as a wartime Naval aviator, test pilot, NASA astronaut, Marine Corps General Officer, and now Administrator of the world’s premier space agency.

I just want to spend a few minutes sharing with you some of the exciting things that are happening at NASA and to tell you how what we do connects to the Academy's increasing emphasis on Science, Technology, Engineering and Math, or STEM education, as highlighted by the 2011 Science and Engineering Conference which wraps up here tomorrow.

As you may know, this year we are celebrating the centennial of Naval Aviation. This year also marks the 50th anniversary of President John F. Kennedy's historic speech at Rice University, which was widely seen as the launch pad of America's modern space era. President Kennedy called the exploration of space "one of the greatest adventures of all time." He added, "No nation that expects to be the leader of other nations can expect to be behind in this race for space."

In the ensuing half-century, America has been the undisputed world leader in space exploration and United States Naval aviators have played a leading role in this adventure from the start. In NASA's 50-year history, dozens of men and women aviators have served the nation's space program on loan from the Navy, Marine Corps, and Coast Guard.

There are many "firsts" among their accomplishments, including Alan Shepard's first flight to space, John Glenn's first orbital flight, Neil Armstrong's first human footprint on the moon, and John Young and Bob Crippen's first flight of the Space Shuttle 30 years ago on STS-1. They were all Naval aviators.

I am proud to be among their ranks. I flew four times into space – twice as a Shuttle commander and twice as pilot. Each was an incredibly exhilarating ride that I hope all of you get to experience some day.

The Shuttle program was the centerpiece of NASA's space activities for 30 years. During much of that time, our astronauts flew Shuttle flights to and from our amazing orbiting research center, the International Space Station (ISS). Those missions to the ISS have helped expand our knowledge of our solar system, improve life on earth, and teach us what we need to know about living and working in space.

Under the direction of President Obama and the Congress, NASA is now taking a step beyond where we've ever been. We are now embarking on an exciting journey into deep space and developing a Space Launch System that will be capable of transporting astronauts and cargo to Mars, asteroids, and other places we beyond low Earth orbit.

As a result, we are beginning to transition transport to and from the ISS to America's commercial space sector rather than continuing to rely solely on the Russians.

In addition, NASA has recently launched science missions to Jupiter (Juno) with the Juno spacecraft and the Moon with our twin GRAIL spacecraft. The satellite, *Dawn*, is now orbiting a giant asteroid, Vesta, and *MESSENGER*, the first satellite to orbit Mercury is now sending back unprecedented data just beginning to be analyzed. A few weeks ago, we launched our latest earth-observing satellite, NPP, to gather more information about our earth's climate and its changes. In a few more weeks, we'll launch the *Curiosity* rover to Mars.

The Webb Telescope Space Telescope, now in development, will be the successor to the Hubble Space Telescope and the most powerful space telescope ever built. We'll continue to undertake these world-class science missions to observe our planet, reach destinations throughout the solar system, and peer even deeper into the universe.

We also continue to advance aeronautics research, in partnership with other agencies, to create a safer, more

environmentally friendly and efficient air travel network for the Next Generation Air Transportation System.

But what I want emphasize to you tonight is that none of this would be possible without the kind of focus on science, technology, engineering, and math that is so much a part of the curriculum here at the Naval Academy.

Last Friday, I had the opportunity to go down to Houston's Johnson Space Center for the graduation of NASA's latest group of astronaut candidates -- the first post-Shuttle astronauts who represent the future of human space flight. In addition to several naval aviators, they include two medical doctors, as well as experts in molecular biology, physics, and other science disciplines.

These new astronauts will form the core of the scientific and research brainpower needed to maximize the potential of the International Space Station. And we are already making plans to recruit our next class of astronauts in 2013 – just two years from

now. They will play key roles in helping our commercial partners design and build the vehicles in which they will be flying to orbit.

Their backgrounds in STEM disciplines have equipped them with the right skills, the right stuff and the right mindset to pursue NASA's new course.

As NASA Administrator, one of my greatest challenges and passions is to lead our NASA team in inspiring the next generation of Americans to once again become interested in STEM disciplines.

NASA's partnerships with schools, universities, and communities in every corner of this country is not just about keeping our own workforce pipeline fresh and flowing.

It is also about ensuring that America will have the technological expertise needed to win the future in this 21st century global economy. As President Obama has wisely noted, "The country that out-educates us today will out-compete us tomorrow."

That is why STEM is the foundation of NASA's education initiatives. In the coming year, we will continue to capitalize on the excitement of NASA's mission to inspire student and educator interest and proficiency in STEM disciplines.

We are continuing to partner with academic institutions like the Naval Academy, professional education associations, industry, and other government agencies to provide K-12 teachers and university faculty with NASA experiences that they can bring back to the classroom to spark their students' interest and involvement.

We are providing similar hands-on experiences to students – offering them opportunities that blend NASA research and engineering with classroom study and mentoring.

We plan to increase the use of NASA resources and expand the availability of opportunities to an even more diverse audience of educators and students, including women, minorities, and persons with disabilities.

And we are broadening community college participation in NASA research and STEM workforce development.

All of this means growth for our economy, prosperity for our country and jobs for our people – including the thousands of veterans who are returning from the conflicts in the Middle East.

In explaining what it took to win World War II, James Forrestal said, “From 1941 to 1945 we won a war by enlisting the whole-hearted support of all our people and all our resources.”

We must marshal that same spirit and commitment to win the future and no resource is more critical to our success than a healthy pipeline of STEM educated workers. I am committed to inspiring more young people like you to study STEM disciplines and pursue STEM careers.

As long as there is new knowledge to uncover... new worlds to discover, NASA will launch itself ever deeper into the unknown and education is the vehicle that will take us there. That is what we do at NASA.

Whether the future you are creating involves military or civilian service, you will play a leading role in America's enduring effort to "build a more perfect union." No matter where you come from...no matter your race...gender, cultural perspective or background, you have pledged to dedicate yourselves to a common purpose and vision not much different than the one we have at NASA: "to reach new heights and reveal the unknown so that what we do and learn will benefit all humankind".

No matter what college or university you represent here tonight, you can make a difference if you work diligently to pursue your passion – not just in school, but once you get to the fleet or into the workforce. This is your moment!

The choice will be each of yours and I hope you choose a future of exploration and discovery.

Thank you!