

**Remarks by NASA Administrator Charles F. Bolden, Jr.
Wernher Von Braun Memorial Symposium
Dinner Address
Huntsville, Alabama
October 21, 2009**

Randy, my thanks for that introduction and also my thanks to the National Space Club-Huntsville. I want to congratulate all of you for the work of your group in putting this dinner together. The National Space Club is an important voice in helping to educate and communicate the value of space exploration and technology, and I appreciate everything you are doing today both here in Huntsville and throughout the nation. A job well done!

These past few weeks have been great for space and for NASA. Week before last I had the privilege of joining the President and first family for the First Lady's 'Science and Astronomy Night' at the White House. The event brought 150 local middle school students to the South Lawn to star gaze and conduct hands-on experiments with astronomers from around the country. I am happy to report that we had clear skies, plenty of telescopes, and that Jupiter and four of its moons looked fantastic when viewed above the White House trees. The kids got some sky pointers from three of my

close friends – Astronauts Sally Ride, John Grunsfeld and Mae Jemison -- who were on hand to share their excitement for space. Middle school is a critical age for engaging our youngsters in science and math, and I believe that these kids were seriously engaged as were the President and Mrs. Obama as well as daughters, Sasha and Melia.

Our President is passionate about science and space. Over the last six months, in addition to the White House Star Party, the President has hosted a videoconference with the International Space Station, made a call to the Space Shuttle, hosted two separate shuttle crews in the Oval Office, and met with the crew of Apollo 11. These are signs of a President who is interested and engaged in space and science issues. A few weeks ago, at the ceremony in which he awarded the National Medal of Science and the Medal of Technology and Innovation, the President celebrated what he called the incredible contributions of the scientific endeavor itself. He noted the promise, not just for our economy but for our country's health and well-being -- in the human capacity for creativity and ingenuity. He reminded us of the power of free and open inquiry, for the solutions to our economic problems are found in the heart of new technologies and new

innovative approaches. When it comes to science, technology and the value of space exploration, this President “gets it”.

Another reason that this was an exciting few weeks for space is that we just conducted the impact of the LCROSS lunar satellite and its rocket’s upper stage into the Moon. Now, many of you will have heard about the recent news that one of NASA’s instruments, onboard an Indian space probe, detected quantities of water molecules distributed across the lunar surface. LCROSS – which stands for the Lunar Crater Observation and Sensing Satellite – was meant to follow up on those significant observations by aiming for a permanently shadowed crater of the moon’s South Pole, where some scientists postulate that there could be deposits of water ice. This is exciting science. Whether or not we find signs of water ice, I believe that LCROSS is the kind of mission of which NASA needs to do more.

What is amazing is that this sequence of events has not been unusual over this summer and fall. We have been busy. From the successful Hubble repair, to the expansion of ISS to a 6 member crew, to the recent fly-by of Mercury, to new results showing that this summer’s arctic sea ice extent is the third lowest on record, the past

three months at the agency have been solid with activity and achievement.

Among the many significant issues facing NASA today is the future of human spaceflight. The panel headed by Norm Augustine will soon release its full report, providing the nation and the Obama Administration with a thoughtful and comprehensive review of where we have been and where we could be headed both in low Earth orbit and beyond. I want to thank Norm and his committee for their deliberations and for addressing the complex issues that confront our nation in civil space policy. NASA welcomes this conversation. We are digesting and analyzing the panel's options and supporting data, which are substantial. We also embrace the analytical rigor that Norm's team has demonstrated. It will prove to be a key step in making sure our selection of vehicles, missions, and destinations constitute the right path for America to take in space. While I cannot today predict what the final decision will be, I am confident that the result will give us a strong and clear direction in space for decades to come.

Whatever direction NASA takes, technology and innovation will be keys to success. Tonight, I would like to speak with you about these subjects, and their relationship to NASA.

The man for whom this dinner is named understood how important innovation was to space flight. In his time here in Huntsville, Dr. Wernher Von Braun helped America drive towards the Moon by designing a space program whose innovative approaches to vehicle design was matched by an overarching vision of how all of these complex elements fitted together. Those who worked with him knew that he had no pride of authorship when it came to recognizing a new idea or ways to orchestrate how all of the moving parts of Apollo -- from designs for the great Saturn boosters to ways to test and verify rocket engines -- could come together to realize President Kennedy's lunar challenge. For Von Braun, as with our managers and leaders today, it was all about the vision, the mission, the goal for the nation. In the process, he helped give rise to a tradition of management and technological excellence here at Marshall that continues to inform the 21st century space program of today -- technology innovation that reveals itself in the smallest parts of our biggest launchers.

The innovation exemplified by Apollo is in this city's DNA. In preparing for this evening, I was told that Forbes Small Business magazine recently named Huntsville the nation's top mid-sized city for launching and growing a business; and U.S. News named Huntsville one of the nation's top 10 cities for tech jobs. Huntsville can be proud of those well-deserved accolades.

Were it not for this city's strong technology base in space and missile development, Huntsville today would not be a thriving center for a growing base of businesses in life sciences, electronics, information, automotive parts manufacturing, and many other technology sectors. We at NASA are proud to play our part in making Huntsville a technology and small business leader and helping to grow this economy.

For more than 10 years, NASA has funded the National Space Biomedical Research Institute (NSBRI), established to work on countermeasures to the health-related problems and physical and psychological challenges men and women will face on long-duration missions. The research consortium's primary objective is to ensure safe and productive human spaceflight. Projects also address key technologies required to enable and enhance exploration. In

particular, NSBRI scientists and physicians are developing technologies to provide medical monitoring, diagnosis and treatment in the extreme environments of the moon and Mars. NSBRI discoveries impact medical care on Earth. While solving space health issues, the Institute is transferring the solutions to patients suffering from similar conditions, including osteoporosis, muscle wasting, shift-related sleep disorders, balance disorders and cardiovascular system problems.

In addition to human health and safety, our needs for advanced capabilities are increasing, as more and more complex missions emerge from the drawing boards. To stimulate and sustain a steady flow of new ideas and new approaches, I have asked my senior leadership team to take a close look at how we can encourage and drive further innovation, both inside and outside the agency.

A small but important step we have recently taken is the agency's new Innovative Technology Initiative. This program will enhance NASA's efforts to nurture new technologies and novel ideas to revolutionize aeronautical and space enterprises for the benefit of every American family. The program will support NASA innovators who are in the early stages of developing concepts for bold new

technologies and new processes that have the potential to revolutionize the way NASA performs its missions or enables whole new capabilities in space flight, science, aeronautics and exploration. New technologies or processes that have the potential to also address other national and global challenges are of particular interest for this program. The first class of projects is reporting out this week, and I'm told that our people produced some spectacular work, including Jan Rogers at Marshall, who focused on low mass solar cells.

While most people identify with NASA's missions to explore new worlds and the mysteries of our universe, many of our agency's greatest innovations are those which contribute to understanding and health of our home planet.

Technology development is the foundation for every flight, and challenges us to find new ways to achieve our missions. For example, to survive and prosper on the moon's surface and eventually on Mars, we must develop ways to create, collect, store and use energy. Other sources of energy must be developed and converted into practical resources that humans can use in extreme environments.

These technologies that help us explore new sources of energy and delivery methods for explorers on distant worlds can also help us address the demand for energy right here on Earth. Space exploration requires cleaner and more efficient sources of energy that can operate in extreme environments without toxic effects. One example of such clean energy sources that offer tremendous potential is solar power. We at NASA helped advance the use of solar cells and continue to push the limits of this technology today. Technologies for capturing and utilizing solar power hold the promise of a clean and abundant energy source.

NASA's work has led to discoveries that contribute to sustainability in many other ways. For instance, in space travel, physical space is limited, weight is critical and resources are severely constrained. Every watt of energy is accounted for; every resource is transported and monitored. Space exploration drives the development of technologies with minimal impact to these tiny ecologies - and, by extension, to the ecology of Planet Earth. These technologies include advanced recycling techniques, treating waste and converting it back into usable resources as well as new, green power systems

Through space exploration, quality of life on Earth is improved today and for the next generation. For NASA, as we look out to explore our solar system and what lies beyond, we discover more about our own world in ways we never imagined and with benefits we are only beginning to appreciate.

NASA's missions have deepened our understanding of the universe, advanced technology breakthroughs, improved air travel safety and security, and expanded the frontiers of scientific research. What do all of these achievements have in common? Education. We must continue to strive for excellence in science, technology, engineering and mathematics education to ensure that the next generation of Americans has the training they will need in shaping our future. We will continue the Agency's tradition of investing in the Nation's education programs and supporting our teachers and educators who play a key role in preparing and nurturing the young minds of today who will take their place in the workforce of tomorrow. I'm glad to learn that Huntsville City Schools are leading the way in this effort. Of the more than 22,000 students attending Huntsville schools, 77 percent scored at or above the state and national ACT averages, and 92 percent of graduating seniors said they planned on

continuing their education beyond high school. But these levels of achievement are not equally achieved in the counties surrounding this city. Huntsville's tech sector must extend its reach into outlying communities as well, helping students and their schools with new programs that help teachers and students in undeserved communities. At NASA, our commitment is to every student, no matter where they live, or what their background. If they're willing to accept the challenge to study the tough but rewarding STEM subjects, we'll reach out to them, helping to provide the tools that will help them succeed.

To continue this commitment, we have three goals: we will develop and put in place programs that strengthen our workforce. We will strive to attract and retain students who study science, technology, engineering and mathematics, or STEM, disciplines. And we will pursue innovative ideas that can engage all Americans in communicating and understanding the value of NASA's missions. For all of us know that education gives value to everything NASA does, for inspiration leads to innovation.

We recently celebrated the 40th anniversary of the Apollo 11 mission, and of the spirit of the Apollo era. Back then, when NASA

was a young agency, we sought bold direction and flew bold missions of discovery and exploration, missions that ignited the imaginations of a generation. The Saturn boosters that took us to the Moon were born here in this city, a product of a genius' dream and a nation's commitment. They were forged in a partnership that spanned industry and academia. It established, for NASA and for America, a reputation for leadership in space, a reputation that we continue to build today. Huntsville remains today a hotbed of technology, a place where innovative approaches to propulsion and launch vehicle design, spacecraft development and systems engineering are vital tools for the future. That spirit of the Apollo days -- crafting new technologies, building innovative partnerships and a commitment to education and public outreach -- continues in the agency I lead today.

I'll leave you with a thought from the late Professor Carroll Quigley of the Georgetown University School of Foreign Service:

"America is the greatest nation in the history of the world because our people have always believed in two things: that tomorrow can be better than today and that every one of us has a personal moral responsibility to make it so."

I challenge each of you here this evening to join me in demonstrating to the world that Professor Quigley was right in his assertion – that we remain the greatest nation in the history of the world. NASA is an ever-young agency, infused with exciting missions just as bold as when the Saturns rose and space heroes first flew, a spirit that's alive in innovative technologies that will ensure the value of space exploration, engage the next generation with programs that can advance American technological and space leadership and make tomorrow better than today. The adventure of our young nation and its space exploration is a never ending story, with new worlds to discover and new minds to inspire. I can only hope you're as excited about our challenges as am I.

God bless you all, and may God bless the United States of America.