

**REMARKS FOR ADMINISTRATOR BOLDEN
CENTER FOR STRATEGIC AND INTERNATIONAL STUDIES
NASA and Accelerating American Innovation
March 10, 2011**

Thank you, John, for inviting me, and for your kind introduction.

When President Obama said in his State of the Union address that he wanted our nation to out-innovate, out-educate and out-build the rest of the world, we at NASA knew what he wanted. It's the kind of philosophy that has always driven our thinking and our missions. It's what got us to the Moon. It's why we have the world's most advanced fleet of Earth observing satellites. It's why so many of our exploration technologies have successfully made the transition from NASA to the private sector and your homes and businesses.

In his Fiscal Year 2012 budget request for NASA, the President addresses all of the elements of our strongly bi-partisan Authorization Act of 2010, which sets us on this path to create new technologies and win the future.

This budget requires us to live within our means so we can invest in that future. It maintains our strong commitment to human spaceflight and new

technologies. It establishes critical priorities and invests in excellent science, aeronautics research, and education programs.

At its core, NASA's mission remains fundamentally the same as it always has been and it responds to our new vision: “***To reach for new heights and reveal the unknown so that what we do and learn will benefit all humankind***”.

But now, we carry out this mission with a renewed commitment to focusing on what we do best, while engaging America’s innovators and entrepreneurs as partners in our journey.

What the President is talking about is a renewed commitment to the energies and expertise that we already possess and a charge to bring them to the next level. And that innovation will help drive our economy through the creation of high-tech jobs and breakthroughs that today we can't even imagine.

America is the nation we are today because of the technological investments made in the past fifty years. Our lives have been greatly

improved by directing scarce resources toward exploring space.

Knowledge from weather spacecraft, efficiency improvements in both ground and air transportation, biomedical applications such as blood-flow monitoring devices, implantable insulin pumps, pacemakers, and Lasik eye surgery, and the protective clothing and air packs that keep our military, firefighters and police safe all benefited from our nation's investment in exploration. NASA's space technology makes a difference in our lives every day and can be a spark to an economy that is becoming more technology-based over time.

NASA's successes and, yes, even its failures over the past 50 years have inspired countless people to pursue science, technology, engineering and mathematics careers and the outcome of NASA's endeavors, both in technology advancements and intellectual capital has transformed our world.

NASA's renewed focus on innovation and technology is vital. By investing in high payoff, disruptive technology that industry cannot tackle today, NASA matures the technology required for its future missions in aeronautics, science and exploration while proving the capabilities and

lowering the cost of other government agencies and commercial space activities.

Consider, for a moment, how the architectural options for human exploration of our solar system will change when reliable commercial access to low-Earth orbit, propellant depots, inflatable habitats, and advanced in-space propulsion technologies are available. For our science missions, consider the improvements possible from new optics, lightweight materials, structures, and power systems and high-bandwidth communications. Consider the efficiency gains in radiation shielding and closed loop life-support systems that may become possible from improved knowledge of human adaptability to the space environment gained through scientific experiments on the International Space Station.

The President's FY2012 Budget funds a diverse array of human spaceflight programs that maximize our use of current capabilities such as the International Space Station; facilitate innovative approaches to ensure U.S. leadership in low Earth orbit; and position us to explore the frontiers of deep space.

Taken together, these initiatives will enable America to retain its position as a leader in space exploration for generations to come.

To do this, we'll need to transform the way we do business. We will need to be innovative, creative and agile adapting to rapid changes in technology and business practices. By transforming the way we do business, we can help insure that our nation's space program is affordable, sustainable and realistic.

"Realistic" does not mean less exciting. NASA's Chief Technologist Bobby Braun is here today, and you'll get to hear from him in a little bit. What Bobby does is exciting. He'll tell you some more about what he has in mind for bringing NASA to the next level of technological readiness to achieve the big things we have in mind. As we increase our capabilities, we'll apply them to many different types of missions, and move on to the next challenge incrementally. We need to get started on a lot of these technologies today, and we will.

Over the next decade, innovative technology investments are required to bring future missions, such as exploration of near-Earth objects, the Moon,

and Mars within our reach. These transformative technologies will reduce the cost and risk of future missions. Similarly, technology needs abound in deep space exploration, astrophysics, aeronautics, and Earth science. In each case, NASA technology investment is critical – for without such an investment, these future missions will simply not occur.

Achieving great things also involves taking informed risk. The space program needs to return to our roots of informed and measured risk taking. Exploration and innovation have always come with risk. In fact, if we do not understand, accept and even embrace risk, we cannot move forward boldly. Landing on Mars will never be a low-risk venture, nor will the development of a telescope capable of detecting Earth-size planets around other stars, or the flight of a new generation of human-rated space systems. Our nation needs to dream big and these are precisely the right missions for NASA to pursue. An informed risk-taking strategy, commensurate with the agency's goals and expectations is not only acceptable, but also required. How else can we accomplish the grand achievements our nation has come to expect of NASA?

At NASA, a goal of the President's innovation strategy is to reposition the aerospace community on the cutting-edge, pushing the boundaries of the aerosciences with the technical rigor our nation expects of its space program. Innovation, education and technology development will be essential to America's success in the 21st century global marketplace. They will be required for us to reach new destinations in the solar system and are the engines that will create new products and services, new business and industries, and high-quality, sustainable jobs while improving the capabilities and lowering the cost of other government and commercial activities.

Small businesses have generated 64 percent of net new jobs over that past fifteen years, leading the innovation push into the future. NASA's budget calls for increases in the maximum award values to small businesses that propose innovative research and development ideas aligned with NASA's technology needs. NASA will invest \$184 million in research and technology development by small businesses next year – money that will directly fuel the number of jobs that small businesses create in America. NASA also will continue to fund prizes and competitions that seek creative

solutions to technical problems in aerospace technology – solutions that can immediately transfer into the commercial marketplace.

As the President recently pointed out, "innovation isn't just how we change our lives; it's how we make a living." Nowhere is this more true than at NASA, where America continues to reach for new heights, seek breakthroughs and new technologies, some that we can't even imagine yet.

Let me give you some examples:

Earth science is all about innovation. All of our satellite instruments are, more or less, one-of-a-kind experiments in "seeing" in new ways. And the same could be said about our science missions that explore our solar system and look beyond it.

The Global Hawk, a gift from the Air Force, has now been made into a drone for science. Its flight capabilities come from the military, but the way we've been able to zip it around the U.S. is new, and the science it's been able to perform -- like crisscrossing a hurricane a dozen times or more -- has not been possible before.

How about measuring the changes in ice sheets all over the world with lasers? ICESat did that, and we have a new/improved ICESat II on the drawing board now at the Goddard Space Flight Center.

Then there's the GRACE pair of satellites. Who would have thought that we'd be able to learn about our world by precisely measuring small mass changes across the Earth? Already they've measured declines in the water aquifers under California and Pakistan. This has never been done before!

We were deeply saddened by the loss of the Glory mission last week. My heart goes out, on a very personal level, to the scientists and engineers who expended so much of their intellectual capital and passion on Glory over the course of its development. The good news is that eventually, those people will be actively working on the innovations for the next mission.

That's the thing about innovation. It keeps going.

NASA is also innovating our development, acquisition, and program management approaches to ensure continued U.S. leadership in human spaceflight. Our Commercial Orbital Transportation Services program,

among many milestones, last year helped SpaceX become the first commercial company to launch a capsule, orbit the Earth and retrieve it intact. SpaceX and Orbital will be the first to carry our space station cargoes to space, but there are many others working on their own systems and also the supporting businesses for commercial space, both cargo and crew transportation.

We have taken another major step with the successful commercial cargo and Commercial Crew Development (CCDev) efforts during the past year. As we direct resources toward developing these capabilities, we not only create multiple means for accessing low Earth orbit, we also spark an engine for long-term job growth.

NASA is counting on American industry to come through as they have time and time again for this country. And we're facilitating the success of this emerging sector of the American economy. The CCDev acquisition strategies include innovative pay-for-performance milestones, a fixed government investment, the use of negotiated service goals instead of detailed design requirements, and a partnership approach that includes private capital investment. Among the current participants are Blue Origin,

with its launch abort system, and Sierra Nevada, with its Dream Chaser space vehicle. We have to embrace the innovators who may be able to do things more cheaply and effectively than we can; that can be nimble and entrepreneurial and pass those benefits on to us. New capabilities in commercial space, for crew and cargo, must succeed, and I have every confidence they will.

NASA is also putting in place fresh acquisition and program management approaches, including the way we manage risk, to reduce recurring and operations costs in both the Multi-Purpose Crew Vehicle and the Space Launch System. It's going to be a challenge to get these systems flying on the timetable that has been laid out for us. This streamlining process is one of the ways we're going to help move those schedules along.

And those programs themselves, the new rocket that will allow humans to once again reach beyond low Earth orbit, and the capsule in which they'll travel, require us to think in new ways, create new technologies, and meet the challenges not only of the mission at hand, but the broader needs of our space program across a generation.

So our innovations will not always be technical, but will involve new ways of looking at our work. We're going to do what government does well -- seed the future, help push things along to the next level; accelerate a market that might otherwise be just too big a nut for industry to crack on its own; drive the development of new technologies to reach those far-off destinations in the solar system and to make discoveries in other galaxies.

At the end of the day, we're going to accelerate what people think is possible. Speed is the vibrancy of innovation. And inspiration is a constant companion to innovation. How many people entered a STEM career because of Apollo; or because they saw an astronaut doing a spacewalk from the shuttle or the ISS; or because Hubble blew them away with an image from another galaxy?

Our Nation has made great progress throughout its history by developing innovative solutions to the enormously difficult challenges it has encountered. The grand challenge to build an intercontinental railway, or to land a man on the Moon and return him safely to Earth not only utilized our best talent, but also created new technologies and innovations. These achievements also inspired generations to pursue challenging goals,

created new industries, and ultimately improved our country and the world. Similar opportunities are in front of us now. However, we will not get there without being innovative and taking risks.

Robert F. Kennedy once said, “Only those who dare to fail greatly can ever achieve greatly.” This thought applies to NASA today just as much as it did to the NASA of the 1960s. New York Times journalist and critic Brooks Atkinson once aptly said, “This nation was built by men who took risks -- pioneers who were not afraid of the wilderness, business men who were not afraid of failure, scientists who were not afraid of the truth, thinkers who were not afraid of progress, dreamers who were not afraid of action.”

These are the facets of the larger picture of innovation at NASA. It's about technology, engaging a broad community of innovators, building fresh perspectives and embracing change. We're looking forward to many more years of harnessing the power to lead the world in the new ideas and technologies that will make the global space enterprise a reality.

Thank you.