

Highlights of NASA's FY 2008 Budget Request and the Year Ahead

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Good afternoon. This is the second year in a row that the National Space Club has asked me to speak at a luncheon soon after we rolled out NASA's annual budget request to the Congress, so by the standards of the space business, it is now a tradition. In preparing for today, I looked back at my speech from a year ago, and was struck by how many of the goals then laid out for the year ahead were actually achieved. Then, of course, I fondly recalled the grilling I received from my wife Rebecca during Q&A. Last year, approximately 300 of my closest friends at the National Space Club got a glimpse of what life is like in the Griffin household with her tough questions and my "yes, dear" responses. From her own career in the space business, Becky's a harsher task-master than any reporter or member of Congress.

Seriously, though, I am amazed by the progress the entire NASA team has made this past year, and I am extremely proud of everyone who is a part of the team. This past year, we flew three shuttle missions and reinitiated assembly of the International Space Station. Today, the station is about 55 percent complete. With those return-to-flight missions under our belt, and following a thorough technical review, we decided that a servicing mission to the Hubble Space Telescope can be safely conducted. That servicing mission is currently planned for September 2008 with the space shuttle *Atlantis*. The next shuttle mission is slated for launch on March 15, also on *Atlantis*, and will be commanded by Marine Col. Rick Sturckow.

It is a busy time at NASA, and we need to stay focused upon the challenges remaining before us. The first of those is to fly the shuttle safely while using it to complete the space station by 2010. This keeps our nation's commitments to our international partners and, with that, the reputation of NASA and the United States as good partners through both joyous and difficult times. We want to go on, outward again beyond low Earth orbit, and we want to do it with today's partners and

others not yet part of the team. That will not happen, indeed nothing good can happen in the American civil space program, unless we demonstrate that we have the wherewithal to finish what we start. The future of human exploration and scientific discovery in the solar system rests on the foundation of keeping our commitments.

But what future do we want, and why?

A few weeks ago, Mike Coats asked me to speak at a dinner in Houston, where I discussed the “real reasons” and the “acceptable reasons” why those of us in the space business make the sacrifices we do to pursue the dream and the challenge of spaceflight. Some of you may have seen it. I’ve been enormously surprised by the outpouring of positive feedback I received from that speech, so with those thoughts I must have touched a nerve that the engineering side of me did not know was there. The real reasons that drive those of us who are in the space business are really more visceral, and even spiritual, than can be expressed in any tangible rationale. Spaceflight in all its forms is a strategic capability for this nation. We must understand the real reasons why that is so, we must explain those values to our children, to their

children, to the public and to the nation's leadership, lest it slip away.

So, before I discuss the NASA FY08 budget request currently before the Congress, let me take some time to discuss why it is so important.

From the dawn of the space age, we knew that it would provide unique new challenges, opportunities, rewards, and risks. We are by nature a competitive people, and I believe that our country is a better place for having accepted the challenge of space exploration. But I believe that we Americans need to ask ourselves what kind space program we would be proud to leave as our legacy, and what decisions and actions we are taking to ensure that legacy.

As I said a few weeks ago, I've reached the point where I firmly believe that if NASA were to disappear tomorrow, if the American space program were to disappear, if we never put another human into space, or never put up another Hubble, never sent another spacecraft to another planet, that most Americans would be profoundly distraught. We would feel less than ourselves, that our best days are behind us, that the future would be dimmer than the past. We would have fewer heroes in our pantheon, people like John Glenn and Neil Armstrong, or Eileen Collins,

Bob Curbeam, and Sunita Williams, to name a few of our modern-day pioneers. I think that we – as Americans – would feel that we had abandoned the accomplishment of great things, the hard things that President John F. Kennedy spoke of so eloquently in his speech at Rice University in September 1962 and in San Antonio on the day before he was assassinated.

In the space business, we live up to a creed of excellence, or die from the lack of it, and we make our entire society better for the acceptance of the challenge. In a quote I love, “Excellence is the result of caring more than others think wise, risking more than others think safe, dreaming more than others think practical and expecting more than others think possible.” So, even while you and I are here in the comfortable setting of this banquet room, there are NASA engineers and scientists working late into the night halfway around the world, and a crew on orbit on the station. I want to work with people like that. I want to spend my days surrounded with that kind of dedication to the incredible future before us. I always did. I still do. This is our shot at making a difference in the world. Ultimately, we face a very simple

choice: we can watch what happens, or, come what may, we can try to make a difference. I choose to try. And I'm glad to have you with me.

Exploring and developing the space frontier is hard, demanding, thankless and often dangerous work. We must respect the dedication it requires in others as in ourselves, we must dedicate ourselves to it, and we cannot afford to be cynical about that dedication, lest it slip away and consign our best years to the purview of historians. Space exploration, scientific discovery and cutting-edge aeronautics research are today the most technically difficult things a society can undertake. The phrase by which we describe lesser tasks, "it's not rocket science" is funny as the punch line for a joke, but is also an implicit recognition of the fact that the enterprise in which we are engaged is way of life that lifts up that better self within us all -- and our nation in the process.

I fear that with the passage of time and the press of other concerns, our community is in danger of losing sight of some of the critical observations from the Columbia Accident Investigation Board (CAIB) of our nation's space program. That group explicitly recognized the strategic value of spaceflight to our nation when they stated that merely

determining the proximate cause of the accident, and providing recommendations to return the shuttle to flight, would be an insufficient remedy to the systemic problems inherent in our nation's civil space program. They held up our nation's space policy for all to see, and observed: "The U.S. civilian space effort has moved forward for more than 30 years without a guiding vision."

That was a damning statement, citing as it did a lack of leadership in space policy, a strategic interest for the United States, reaching to the highest levels of our nation for over a generation. Set forth during NASA's darkest days, it reflected the need for proper goals, strategic goals, for our nation's space program, lest it just slip away. The CAIB's observations provided the guiding philosophy, which directly underpins the Vision for Space Exploration. I have said many times that we all owe them a debt of gratitude for the thorough and thoughtful manner in which they articulated what was needed.

The FY 2008 budget request for NASA, a 3.1 percent increase over the prior year's request, demonstrates the President's commitment to setting our space program on its proper course and his willingness to

provide the necessary resources to maintain our nation's leadership in space and aeronautics research.

It is now up to us in the space business to carry forward the Vision and make it a reality. We are making a once-in-a-generation transition from the space shuttle to new exploration systems, and we must apply to the future the lessons from the Apollo-to-shuttle transition, in order to avoid the malaise we experienced in the late 1970s at NASA's spaceflight centers, with high unemployment, people simply abandoning their houses, and the brain drain of highly-skilled aerospace engineers and technicians.

For those of you who might cynically believe that, under a future administrator, NASA will simply resort to flying the shuttle past 2010 if *Orion* is not far enough along, let me remind you of what the CAIB referred to as an inescapable conclusion, one that I share: The CAIB observed, "Because of the risk inherent in the original design of the space shuttle, because that design was based in many aspects on now-obsolete technologies, and because the shuttle is now an aging system but still developmental in character, it is in the nation's interest to

replace the Shuttle as soon as possible as the primary means for transporting humans to and from Earth orbit.” For this very reason, the CAIB expressed dismay at how “previous attempts to develop a replacement vehicle for the aging shuttle represent a failure of national leadership” and called for a rigorous vehicle safety recertification if the Shuttle were to be operated past 2010.

This brings us to today. What are we doing today to build the new *Orion* crew exploration vehicle and the *Ares* launch systems to support it? What are we doing today to inform our national leadership about the budget resources needed to develop these new systems? As the CAIB noted: *“this approach can only be successful: if it is sustained over the decade; if by the time a decision to develop a new vehicle is made there is a clearer idea of how the new transportation system fits into the nation’s overall plans for space; and if the U.S. government is willing at the time a development decision is made to commit the substantial resources required to implement it.”*

We have made tremendous strides this past year in building *Orion* and *Ares*. Just last week at Kennedy Space Center, we handed over the

Apollo-era Operations and Checkout facility where new Orion spacecraft will undergo final assembly before launch. The Langley Research Center has been conducting airbag landing drop tests over the course of the past several months; these may end up in the final design of *Orion*. The *Ares* launch vehicle team at the Marshall Spaceflight Center, led by Steve Cook, has been conducting a series of drop tests on the pilot chutes for the *Ares I* recovery system at the Army's Yuma Proving Grounds in Arizona. We have reached agreement with the Air Force to a joint development of the RS-68B engine which will be used for our *Ares V* heavy-lift launch vehicle. The use of this engine will save billions of dollars in life cycle costs for future missions to the moon, as compared to our original plans to use the space shuttle main engines.

During the past year, we have refined the system requirements for *Orion* and *Ares*, and we are well into the design phase now. The *Ares I* upper stage competitive procurements with industry are now under way, with the request for proposals to be issued later this month, and awards

for the structural work planned for August and for the avionics work planned by October.

Now, we all know that the elephant in the room is the potential impact that the House-passed FY 2007 appropriation will have on *Orion* and *Ares* development, with \$577 million less for NASA's exploration systems. While we have made significant progress this past year, a smaller appropriation clearly means that we must slow our pace, in accordance with our "go-as-you-pay" strategy. Quite simply, less funding than in the original FY07 request means that there will be impacts to people, projects, and programs. This potential reduction jeopardizes our ability to manage an effective transition from the shuttle to *Orion*.

Equally troubling in the House resolution is the re-direction of funding; to absorb a \$545 million cut in planned FY07 funding for NASA, human spaceflight as an enterprise has been directed to absorb nearly \$700 million in reductions, while other portfolios in NASA have been kept nearly level, or increased. This is not the fashion in which I

believe the nation's civil space priorities are best managed, if reductions are necessary.

I believe that everyone here knows that “the gap”, as we have labeled it, between shuttle retirement in 2010 and operational deployment of *Orion* and *Ares* has been a publicly stated concern of mine since my Senate confirmation hearing. I know that I am joined in this concern by many of you, and by many others in the space policy arena, in both the legislative and executive branches of government. This is expressed in the NASA Authorization Act by the requirement that we develop the capability of “launching the crew exploration vehicle as close to 2010 as possible”. But despite that concern, given the press of our existing commitments, the best we had been able to do was to hold the presidentially mandated date of “not later than 2014”.

That date is now in jeopardy. For at least four years, and maybe more, we will be forced to rely on services-for-hire from our international partners to meet our logistics and crew rotation requirements for the International Space Station. We're trying to hedge our bets with the Commercial Orbital Transportation Services (COTS)

agreements, whereby we're providing "seed money" for the development of commercial capability. But by the very nature of the Space Act agreements underpinning the COTS effort, NASA cannot guarantee a successful outcome for these ventures.

So, with the plans presently in place, we are courting an interruption of several years in our domestic capability to support and utilize the space station we will have built. We are courting the loss of highly specialized capability in human spaceflight operations. And we are doing these things at a time when several other nations will, or can be expected to, have such capabilities. In America, we have for two generations seen ourselves as leaders on the space frontier. It is very hard to lead from behind.

I wonder what the reaction from the nation's space community would be if we were anticipating a gap of four or more years in our ability to conduct space science missions? For four years, no Earth or planetary science missions, no new astrophysics missions, no solar or space science missions. What would be the reaction to such a desert of opportunity?

So, I have promised to keep our stakeholders in the White House and Congress informed of the impact of reduced and re-directed funding on the multi-year space and aeronautics projects and programs that we carry out. I will do so, and I will keep them informed as to the resources necessary to build these new systems. I will repeat, from the CAIB report: *“this approach can only be successful... if the U.S. government is... to commit the substantial resources required to implement it.”*

Turning now to the task immediately before us, with the plan defined and our industry teams coming together, we are addressing the detailed transition plans for our workforce, infrastructure, and assets from the space shuttle to our next generation human spaceflight systems. The total space shuttle program employs almost 18,000 NASA employees and contractors. All shuttle equipment is worth approximately \$12 billion, and the facilities are worth almost \$6 billion. Over the course of the coming year, we will determine how many of those facilities and equipment should transition to new exploration systems.

I believe that NASA's next generation crew launch vehicle, the *Ares I*, should require at least an order of magnitude fewer labor hours to process than the space shuttle. The savings in launch vehicle operating costs can then be applied to other systems, like the *Ares V* heavy-lift launch vehicle, the lunar lander, or other systems rather than simply operating and maintaining a system to reach low Earth orbit. There is plenty of new and exciting work for engineers, both young and old. It will be good for young engineers to learn their trade on the space shuttle program before working on exploration, or on commercial crew and cargo systems. There will never be a better opportunity to get early experience in manned spaceflight.

We have defined crew and launch vehicles that are safer than the space shuttle, and are not simply bound to low Earth orbit. They are capable of leaving Earth orbit, of long-duration flight around the moon, and of atmospheric entry from cislunar space. The most important decision arising from our 2005 exploration systems architecture study was that the safest and most effective launch system to use in our plans going forward was a launch system based on shuttle-derived

technologies. We borrowed the best ideas from the shuttle and Apollo architectures. The so-called “new” exploration systems use shuttle-derived first stages and a modernized and upgraded J-2 engine from the Saturn rockets, for higher performance on the *Ares* upper stages. In building for the future, we have utilized every possible asset developed with the resources of our past.

Let me turn now to some very practical considerations. As I have said in the past, the transition from shuttle to *Orion* and *Ares* will be NASA’s greatest management challenge. We don’t have a lot of experience with it; this kind of upheaval occurs only once in a generation, if that, and we will need the help of everyone here to do it safely and effectively. We have prepared a set of “meat and potatoes” legislative and administrative tools to help the agency manage it. I hope that we will be able to discuss these provisions soon with the Congress.

Regarding NASA’s science portfolio, there are no strategic changes from the FY 2007 president’s budget request. The Science Mission Directorate is funded at \$5.5 billion in FY08, and we are planning to launch ten missions that year. The rate of growth for science

remains at 1 percent annual growth in FY08-11, given the need to complete the International Space Station and retire the space shuttle by 2010, while avoiding an even more prolonged gap in U.S. human spaceflight capability. I realize that many in the science community do not like this choice; I don't like it either, not even a little bit. But I would note that before I came to NASA, the space shuttle was slated to fly 28 missions. We pared that down to only 17 flights, focusing on ISS assembly and making the hard choice to forego utilization until after it is completed. Further, the exploration program was the primary bill-payer for shuttle return to flight costs, and also contributed to paying the costs of shuttle and ISS operations between FY06-11. So, contrary to what some have claimed, science at NASA was *not* cut to pay for the "moon/Mars program". Rather, the growth of both science and exploration was slowed in order to fulfill multi-decade commitments to our international partners on the space station.

Keeping these commitments will reap many benefits when we team with them in future endeavors of space exploration and scientific discovery. Today, more than half of all our science missions, as well as

those under development, have some form of international collaboration. Many more missions in formulation have international partnerships. I believe that's a testament to how NASA, through good times and in bad, has been a generally good partner, acting in good faith. Promises have sometimes been made that could not be kept, and we must strive to the greatest possible extent never to repeat such experiences. But I think that, overall, international collaboration has genuinely been one of our strong suits.

In this vein, I will be heading to Japan next month to discuss progress in various areas of collaboration, but most notably as part of the FY 2008 budget request, NASA plans to work closely with the Japanese Space Agency on the Global Precipitation Measurement mission. GPM was one of the priorities of the recently published National Academy of Sciences decadal survey for Earth science, and we are looking to collaborate with the Japanese on a radar instrument and launch vehicle for the first core satellite of the GPM mission not later than 2013.

Our collaboration with the German Aerospace Center was tested last year with the SOFIA aircraft, and the telescope they provided as part

of that mission. NASA had numerous technical and management problems with the flightworthiness of the SOFIA 747 aircraft and telescope cavity doors. We are not done yet, but over the course of the past year, we have made a concerted effort to turn the SOFIA program around. As we notified the Congress last summer, NASA has reinstated SOFIA in the recently released FY 2008 budget.

Also in FY08, our planetary sciences program creates a small lunar science budget in order to take advantage of missions of opportunity, instruments, data archiving, research and analysis of NASA and many international missions planned for the moon over the next several years.

NASA's Science program, based on the priorities of the National Academy of Sciences decadal surveys, continues to develop world-class missions and research results. Today, our science portfolio is allocated 32 percent of the overall Agency budget, while in the early 1990s, the science budget represented 24 percent of the budget.

You will see that the FY 2008 budget increases the budget profile for aeronautics research over the president's FY 2007 request. More importantly, we have properly aligned our aeronautics activities with the

president's Aeronautics Research and Development Policy released last December. Like the Vision for Space Exploration, this policy was developed because of the recognized need for a unifying vision for aeronautics research and development across the federal government. NASA's refocused program advances our technological leadership in aeronautics, with broad support to our research community in industry, academia, and other government agencies including the FAA and DoD.

In closing, let me again remind everyone here that our FY 2008 budget request does not yet reflect the outcome of the FY 2007 appropriation. If the outcome of that appropriation means \$545 million less for NASA's top line than the president's request, then soon after enactment, I will inform the Congress of the effect upon our programs, projects, and people in the near- and long-term. I do not have those answers yet.

As I said earlier, I hope that such events do not distract us from the great tasks before us. I have seen a renewed spirit of dedication in the agency this past year. We have come through the loss of *Columbia*, we are turning around, we are focusing our efforts, and we are tackling the

challenges before us. NASA's FY 2008 budget, especially, demonstrates the President's commitment to our nation's leadership in space and aeronautics. It is up to us to fulfill that commitment.

Last week, the NASA family honored those whom we have lost in the exploration of space. Shana, I, and several others were joined by one of my personal heroes, Sen. John Glenn, the first American to orbit our Earth, at Arlington National Cemetery. We paid what could only be an inadequate, but nonetheless heartfelt, tribute to those who have perished on the space frontier. We, here, need to remember always why they did it, why we sent them, and our obligation to them.

In Arlington Cemetery, not far from the memorials to the Challenger and Columbia crews, rests the man who a thousand years from now will still be the one who said it best: "We choose to go to the moon. We choose to go to the moon in this decade and do the other things, not because they are easy, but because they are hard, because that goal will serve to organize and measure the best of our energies and skills, because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one which we intend to win."

I ask that all of us consider the values the space program brings to our nation, and then re-affirm to ourselves that we will make a difference, lest it just slip away.

Thank you.