

**Remarks by the Honorable Sean O’Keefe
NASA Administrator
Address to the Alabama State Legislature
Old House Chamber
State Capitol
Birmingham, Alabama
May 6, 2004**

Governor Riley (Bob Riley), thank you so much for that very gracious introduction, and for the high honor of your invitation to address members of the Alabama legislature in this historic chamber.

Lieutenant Governor Baxley (Lucy Baxley), Speaker Hammett (Speaker of the House Seth Hammett), President Pro Tempore Barron (Senator Lowell Barron) members of the legislature and distinguished guests:

I am honored to be here today as the representative of the dedicated men and women of NASA--many of who call Alabama their home--who

are helping to extend the reach of human civilization to the stars.

I am honored to join a list of distinguished NASA officials to have the distinct privilege to address the legislature.

As Governor Riley just mentioned forty-three years ago the first director of NASA's George C. Marshall Spaceflight Center, Dr. Wernher von Braun also addressed a joint session of the Alabama legislature.

Dr. von Braun spoke about the unique role your state would have in the dramatic race that would take the first human explorers to the Moon.

Indeed, 35 years ago this summer when the magnificent Saturn Five launch vehicle helped propel Neil Armstrong, Buzz Aldrin and Michael Collins on their way to the moon, in a very real sense you could say their journey began with the work of scientists, engineers, technicians here in Alabama.

In his remarks to the legislature, Dr. von Braun made two points that are quite pertinent to what I wish to speak to you about this afternoon.

First, he said the exploration of space is important because "it's our next frontier, our newest challenge, and the greatest unknown today."

Those words are as true today as they were back then when we had barely escaped the bounds of the Earth's gravity. By the way yesterday marked the 43rd anniversary of Alan Shepard's historic flight, when he became the first American in space.

Dr. von Braun added, "I am convinced the exploration of outer space will produce undreamed of benefits for all of us. And the very fact that nobody knows for sure what all of these benefits will be opens new prospects and excites our imagination to further progress."

Dr. Von Braun also spoke that day about the critical role Alabama would play in this new

enterprise as he successfully challenged the legislature to fund a long-term investment in your greatest resource: the youth of Alabama.

"Opportunity goes where the best people go, and the best people go where good education goes," he noted.

Sure enough, the very productive investment the legislature made in high technology education back then is a tremendous legacy of Alabama's response to Dr. Von Braun's challenge.

Now we are engaged in a new phase of this adventure without end that we call space exploration, one that holds similar promise for our country, and most certainly for forward looking states such as Alabama.

At the direction of President Bush, NASA's energies are focused on a long-term sustainable plan to extend our exploration reach throughout the solar system as the second century of flight unfolds.

Under our plan, we will use a combination of human pioneers and robotic explorers, assisted by teams here in Alabama and elsewhere, to explore the Moon, Mars and beyond.

As we head out into the cosmos know that the people of Alabama have achieved the goals Dr. Von Braun set for the state with respect to excellence in education. Indeed, the first astronaut to set foot on Mars could be an alumni of Auburn, as is astronaut Jan Davis, our Safety and Mission Assurance Director at the Marshall Space Flight Center or of the University of Alabama, as is astronaut Lee Morin, who is now on loan from NASA to the State Department where he is Deputy Assistant Secretary for Science. That astronaut could well be educated at Auburn by faculty member Janice Voss, a former astronaut and veteran of the International Space Station Expedition Two crew.

Indeed, we are tremendously proud of the large number of Alabama born and Alabama educated astronauts who make up the ranks of our NASA astronaut corps, and our other NASA officials with Alabama ties.

For example, we have with us today, our Deputy Associate Administrator for Institutions, Jim Jennings. Jim is responsible for managing all of NASA's institutional infrastructure. Jim attended Alabama A&M University and the University of Alabama in Huntsville. He is from Dadeville, Alabama, which is in Tallapoosa County. That is the next county over from Clay County, which is the county that the Governor is from.

Let me now tell you about one more astronaut with Alabama ties. This morning at the Smithsonian's new Udvar-Hazy Air Museum next to Dulles International Airport in Virginia, we introduced our astronaut class of 2004, including a

group of professional educators who have joined the ranks of the astronaut corps.

Joining Barbara Morgan as Educator Astronauts are three remarkable individuals who we believe will have a unique ability to inspire our youth to reach for the heavens as they teach lessons about the wonders of science from space.

You should be very proud that one of our new Educator Astronauts, Dottie Metcalf-Lindenburger, set upon her path to the stars after being an enthusiastic participant at Space Camp in Huntsville.

Dottie, a high school science teacher in Vancouver, Washington, is just one of thousands of young people who have benefited from the tremendous learning experiences that Space Camp provides. I suspect in the future, more and more of our astronauts will have this Space Camp pedigree.

If you ever have the chance to talk with Space Camp participants, I'm confident they'll convey they

are thrilled humans will be soon headed to the cosmos, and that they may be among the first to explore the surface of Mars.

The President has offered these young people a promising vision for our future in space. As the President has said, "Exploration is not an option we choose, it is a desire written in the human heart."

In the same spirit of hope and opportunity that Dr. von Braun spoke to this chamber about at the dawn of the Space Age, let me now proceed to tell you about the exciting long-term exploration journey we plan to conduct.

I wish to discuss how our exploration progress will help fuel American creativity, innovation, technology development and leadership, and in particular how we intend to tap the talents of this southern bastion as this exploration adventure unfolds.

Four months ago at NASA Headquarters in Washington, the President proposed that we focus on an ambitious yet affordable space exploration program on behalf of the American people.

As we implement our new space exploration vision, NASA will extend the reach of human civilization and the spirit of freedom throughout the solar system, using a meticulous stepping stone approach.

Those stepping stones are as follows: First, return the Space Shuttles safely to flight. Second, complete the International Space Station and use this research laboratory to test the long-term effects of space travel on human beings. Third, send robotic probes and then human explorers on to the Moon to demonstrate technologies needed for Mars and beyond. And finally, develop those capabilities that will allow humans to explore the far reaches of the solar system.

This approach will allow us to learn from our experiences and to incorporate new technological developments along the way.

We will reach our goals in space the way we have reached so many others, one lift off, one voyage, one landing at a time.

Work on our first goal of returning the Space Shuttle safely to flight is well underway. As many of you know, our Marshall Space Flight Center is sharing the responsibility for getting the Space Shuttle into orbit. The work for the Shuttle's eight and a half minute launch into orbit--the greatest light show on Earth--starts in Huntsville, and it is work we take very seriously.

Accordingly, our people at Marshall under the able leadership of Center Director Dave King and Deputy Center Director Rex Geveden, who's with us today, are laboring to make key safety improvements to the Shuttle's External Tank and are redesigning the

boltcatcher assembly on the Solid Rocket Boosters. I cannot give you a date certain on when the Shuttle's will fly again. But I can guarantee that we will launch again when we are certain that we are fit to fly.

As we look forward we are also redirecting research onboard the International Space Station, which is now well beyond 3 and ½ years of continuous human occupancy, into studies of the effects of long-term space exposure on the human body, preparing our travelers for the journeys to come.

By the way, in a book written 52 years ago, titled "the Mars Project," Dr. von Braun predicted that the ability to overcome physiological challenges such as radiation hazards beyond low-Earth orbit would be just as vital as the work of rocket scientists in enabling humans to travel to our neighboring planet.

It is also important to note that the kinds of Space Station research we are conducting on radiation, and also on mitigating the long-term degrading effects of spaceflight to our astronaut's bone and muscle mass, can help Earth-based medical research tremendously. If we can arrest this consequence of space flight, the remedy can be readily applied here on Earth to help those people who suffer from osteoporosis.

As NASA has proven every step of the way, our investment in space exploration will inevitably help improve life here on Earth for all of us.

Just as the Apollo program fueled important advances in computing and electronics, the potential spinoff benefits from this broad based exploration program could be considerable.

Since that time, MRI's, cataract detection, and heart pumps are all examples of NASA technologies

used to advance our exploration goals being applied to productive use in society.

We're confident the technology development necessary to execute and implement the President's vision will accelerate advances in robotics, autonomous and fault tolerant systems, human-machine interface, materials, life support systems and novel applications of nanotechnology and microdevices.

Now just as Alabama's economy, and that of the south as a whole, prospered due to the Apollo program, we believe similar benefits will result from our commitment to this exploration vision.

And as Dr. von Braun said in these chambers, our exploration activities will result in many surprising benefits, with the only difference this time being that we will engage in a long-term, sustaining journey, not a race.

Our 21st century space program will boost the opportunities we will have to become a smarter, safer, healthier and more intelligent world on a scale never seen before in the history of the planet, at a pace hardly thought possible.

NASA's positive role in providing rocket fuel for economic growth and technology development is not a point I need to dwell on with this audience, nor with the members of your congressional delegation.

When it comes to enthusiastic and thoughtful support for space exploration a few states may equal the positive example of Alabama's political leadership, but none excel.

In particular, Senators Sessions and Shelby and Congressmen Cramer and Aderholt have been champions. They have worked very hard to bring their colleagues in Congress around to the President's position.

I also wish to salute Governor Riley for his outstanding leadership in creating the Alabama Space Exploration Initiative.

This initiative will lead to tangible partnerships between the State of Alabama, our Marshall Space Flight Center, colleges and research universities throughout the state, and Alabama industry in order to build on Alabama's existing high technology strengths.

This is a great initiative, worthy of a state that always aims for the stars. NASA welcomes its role as a full partner in the initiative, and we will do our utmost to ensure that Alabama continues to reap the benefits of our nation's investment in space research and exploration.

Indeed, through the National Space and Technology Center we formed between NASA and the state's government, industry and higher education

institutions, we have in place a vehicle for accomplishing Governor Riley's goal.

Some numbers may be useful in illustrating the bang that Alabama currently gets from our space program buck. In the last fiscal year, NASA's total direct impact to the state through salaries and procurement exceeded \$900 million. We employ 6,500 civil servants and contractors at Marshall, including nearly 2000 graduates of your states' higher education institutions.

The Alabama Space Exploration Initiative will certainly build on the strong aerospace foundation you have built up over these past four decades and create new economic opportunities for Alabama's skilled workforce in the years ahead.

Keeping in mind Dr. von Braun's point about the best people going where good education goes, we are also helping to make an investment in your next generation of explorers.

Last fiscal year, some \$44 million in NASA grants and contracts were awarded to educational and non-profit institutions across the state, with \$4 million of that figure going to Historically Black Colleges and Universities. The Alabama Space Grant Consortium, funded by NASA's National Space Grant College and Fellowship Program, unites researchers at seven major colleges and universities, seven affiliated education organizations, and the U.S. Space and Rocket Center in Huntsville.

We are similarly reaching out to students and educators in your K-12 system. Marshall's Hands-on Activity Science Program brings focused science lessons to 90 schools and more than 42,000 Alabama students each year. This year 84 Alabama students participated in NASA's Great Moonbuggy Race, an annual "Lunar Rover" design and race competition held in Huntsville.

NASA is also supporting a number of NASA Explorer Schools in Alabama. These are specially designated schools throughout the country that will benefit over the next three years from NASA efforts to engage and inspire students using NASA-funded technology tools, activities and resources.

If we do our job in nurturing these students today, they will indeed grow up to help us develop the technologies we will need in the future to help carry this space exploration vision beyond the boundaries of our current imagination.

One such technology we will develop is a Crew Exploration Vehicle that will enable our explorers to return to the Moon some time in the next decade, as well as to extend the duration and boundaries of human spaceflight.

Marshall's talented staff has devoted a lot of attention to the Orbital Space Plane, which has

evolved to our work on the Crew Exploration Vehicle under Project Constellation.

Our new Exploration Systems Enterprise, which is under the direction of retired Admiral Craig Steidle, is working diligently with our people at Marshall and at other centers on defining concepts for Project Constellation.

The President's Commission on Implementation of the U.S. Space Exploration Policy, capably led by former Undersecretary of Defense and Secretary of the Air Force Pete Aldridge, is helping us craft a strategy for Project Constellation and other elements of our space exploration program.

With the support of the Crew Exploration Vehicle, our next exploration steps will be logically aimed at the Moon, which will provide us the resources and proving ground to allow us to function in other, more challenging environments.

Finally, our new vision anticipates the development of revolutionary capabilities through new technologies that will enable us to reach to Mars and beyond.

One technological option being pursued by our center of excellence for space propulsion at Marshall is the development of highly efficient nuclear power and propulsion systems for human and robotic spacecraft.

Through our ongoing Project Prometheus we are looking at propulsion systems that will allow deep space missions for the first time to be redirected to take advantage of circumstances as they unfold, just as Lewis and Clark redirected their voyage nearly 200 years ago when it became clear there was no single water passage to the Pacific Ocean.

We hope to demonstrate these technologies in the next decade on a complex robotic mission to Jupiter's icy moons with multiple orbit passes, thus

breaking loose of the "fly-by" limitations we've been living with for years.

Of course when people ask me how we are going to make our new vision for human and robotic exploration of the Solar System work, given the significant technological hurdles we have ahead of us, I have a simple response. We are making it work today.

Currently, our remarkable Mars Exploration Rovers Spirit and Opportunity are proving what we can do when we bring new capabilities such as mobility together with our best science tools.

This summer, our Cassini spacecraft will begin orbiting Saturn and send the Huygens (Hoy-Gens) probe hurtling into the liquid filled atmosphere of Saturn's mysterious moon Titan.

And closer to home, we continue to conduct daring scientific projects, as evidenced by the recent launch of Gravity Probe B, the Marshall managed

project to test Albert Einstein's theory that space and time are distorted by the presence of massive objects. And congratulations to Rex Geveden who was project manager for Gravity Probe B on this accomplishment.

The best is yet to come. This summer people here in Alabama and throughout the country will commemorate the 35th anniversary of the first lunar landing. These celebrants will be able to cheer the fact that our next landing on the moon is just around the corner.

The dream of interplanetary exploration is alive again. It is our challenge and our opportunity to make this dream come true for the benefit of everyone. Once again I thank Governor Riley and this body for Alabama's unfaltering support for this dream and for all that you are doing to create a bright future for your state's and our nation's future generations of explorers.

Thank you once again for your tremendous hospitality and for the honor of speaking to this distinguished assembly.

God bless you and God bless the great state of Alabama.