August 31, 2010

The Honorable Bart Gordon
Chairman, House Committee on Science and Technology
2321 Rayburn Building
Washington, D.C. 20515

Dear Chairman Gordon—

NASA has long been a critical component of American economic competitiveness, inspiring young people to enter careers in science and engineering, ensuring American leadership in human spaceflight, and driving cutting-edge research. However, we have watched with concern in recent years as NASA's programs for advanced technology, commercial spaceflight, student research, and robotic exploration have been scaled back or postponed. The data are sobering: since 2005, NASA's technology program has been cut by more than 50 percent; robotic exploration precursor missions were eliminated; NASA was unable to fund commercial systems for carrying crew to the International Space Station despite a pressing need to avoid extended reliance on the Russian Soyuz; and NASA-sponsored university research was sharply curtailed.

President Obama's new strategy revitalizes and expands our investments in technology, commercial spaceflight, student research, and robotic exploration precursors. **These are the key elements of the President's new plan for NASA that must be retained in any consensus solution reached by Congress and the White House.**

These investments will benefit all parts of our space program. Indeed, human space exploration beyond Earth orbit can only be truly sustainable and affordable if commercial spaceflight to low Earth orbit and innovative research and development efforts are pursued as well.

We feel that the following programs, which are substantially underfunded in the current House Science Committee authorization bill, are especially critical:

Technology Development

Since 2005, NASA's aeronautics budget has decreased by 40%, the science budget has been flat or declining, and technology programs in other elements of NASA's budget have been reduced by more than 50%. While we commend the decision to begin reversing cuts to aeronautics and science, we are extremely concerned that the House Science Committee bill does not substantially address the impacts of years of similar cuts to technology R&D. This decline in spending should not only be reversed, but in fact, innovative technology development must once again become a high priority at NASA. In particular, the Exploration Technology Program, which will develop, test, and demonstrate technologies to make both human and robotic space exploration more affordable and capable, needs to be robustly funded. This will strengthen

NASA's network of research centers, including Ames Research Center in northern California, Glenn Research Center in Ohio, the Jet Propulsion Lab and Dryden Flight Research Center in Southern California, Goddard Space Flight Center in Maryland, and Langley Research Center in Virginia. Unfortunately, the House Science Committee bill essentially eliminates the Exploration Technology Program, cutting more than $3.7 billion over the next three years. Overall, we urge that NASA's total technology investment (including the Exploration Technology Program and the Space Technology Program) be increased to levels significantly closer to the President's request.

Commercial Spaceflight

Low-cost commercial cargo and crew capabilities are crucial because they enable NASA to focus its own funds on exploration beyond Earth orbit and expanded technology investments. Leveraging commercial spaceflight capabilities will help lower NASA's launch costs by stimulating competition, by enabling other customers to share some of the fixed costs, and by using vehicles that are already flying today with validated reliability or are on a path to demonstrate the required success. Just as importantly, commercial crew is key to reducing our dependence on foreign launch systems. Without commercial crew, America will be forced to rely for astronaut access to space on the Russian Soyuz for years to come. NASA should invest far more in America's launch industry than it invests in Russia's launch industry, but the current House Science Committee authorization bill fails this test, sending over $900 million to Russia to buy seats on Soyuz over the next three years but only putting $450 million into commercial crew during the same period, and only allocating $14 million for the Commercial Cargo Program. We recommend full funding for the Commercial Crew Program and the Commercial Cargo Program per the President's budget request. Further, we also urge full support for the Commercial Reusable Suborbital Research Program (CRuSR), a small NASA initiative that will allow scientists and educators to fly experiments on innovative low-cost suborbital commercial vehicles.

Robotic Precursors

To ensure the highest scientific return on human exploration missions and to maximize the safety of human explorers traveling to new destinations, it is critical that NASA send robotic precursor missions to characterize hazards and scout out locations of future exploration interest. While there have been and may continue to be scientific missions to potential human exploration destinations such as asteroids, the Moon and Mars, only the Robotic Precursors Program funds those missions that are explicitly designed with measurements for human exploration in mind. In addition, robotic precursors also provide a nearer-term source of public excitement through a steady stream of exciting "firsts" at distant worlds. The Robotic Precursors program was canceled after just one mission in order to fund the Constellation Program, and we strongly recommend that adequate funding be restored.

University and Student Research

Revitalizing university research is critical for strengthening NASA's human space exploration efforts, as university research is key to both developing new, innovative technologies and producing the motivated graduates that will comprise the 21st century space workforce. Especially at a time when America needs more students to enter STEM careers, eliminating opportunities for students to get hands-on experience is a poor strategy for ensuring American economic leadership. At NASA, university research is primarily funded out of the science and technology accounts, so increasing funding for NASA's technology programs, as we propose, will benefit students nationwide.

Sustaining These Investments Into the Future

A one-year increase in technology, commercial, robotic, and university investments will not be sufficient to reverse years of neglect. We must avoid a repeat of the situation between 2005 and 2009 where, despite initial promises, funds had to be transferred from other areas of NASA activity, and especially from investments in research and technology, to the Constellation Program because Constellation had a level of ambition that exceeded its allocated funding. We have several recommendations for avoiding this outcome in the future: first, allow commercial providers to handle operations in low Earth orbit so that NASA's human spaceflight program can focus on exploration beyond Earth orbit instead of trying to "do it all," which is unaffordable. Second, NASA should also take into consideration, in terms of potential efficiencies, the full range of federal investments, including investments already made by the Department of Defense, when designing a new space launch program.

In conclusion, we strongly recommend that any consensus reached by the Congress and the White House should revitalize NASA's investments in technology, commercial spaceflight, student research, and robotic exploration precursors. These investments will help ensure continued American space leadership.

Sincerely,

The undersigned Nobel Laureates, former senior NASA officials, former NASA astronauts, and other space and science educators:

Nobel Laureates:

Dr. David Baltimore
Recipient, Nobel Prize in Physiology/Medicine
President Emeritus, California Institute of Technology
Professor, California Institute of Technology

Dr. Baruch 'Barry' Blumberg
Recipient, Nobel Prize in Physiology/Medicine
Former Director, NASA Astrobiology Institute
Former Senior Advisor to the NASA Administrator, NASA HQ

Dr. Leon Cooper
Recipient, Nobel Prize in Physics
Brown University

Dr. Riccardo Giacconi
Recipient, Nobel Prize in Physics
Former Director, Hubble Space Telescope Science Institute, Baltimore, Maryland
Former President, Associated Universities Inc. (Operator, Nat'l Radio Astronomy Observatory)
Former Principal Investigator for the NASA Chandra X-Ray Telescope and Einstein Observatory
Research Professor, Johns Hopkins University, Maryland

Dr. Russell Hulse
Recipient, Nobel Prize in Physics
Former Associate Vice President for Research, University of Texas - Dallas

Dr. Wolfgang Ketterle
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Dr. F. Sherwood Rowland
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Former Chairman, Board on Atmospheric Sciences and Climate, National Academy of Sciences
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Dr. George Smoot
Recipient, Nobel Prize in Physics
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Dr. Joe Taylor
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Dr. Charles Townes
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Former Provost, Massachusetts Institute of Technology
Former Vice President and Director of Research, Institute for Defense Analyses
Former Vice Chairman, Science Advisory Committee to the President of the United States
Former Chairman, NASA Science and Technology Advisory Committee for the Apollo Program
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Former NASA Senior Officials:

Dr. Julian Earls
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Dr. Lennard Fisk
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Former Deputy Associate Administrator for Aeronautics and Space Technology, NASA HQ
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Joe Rothenberg
Former Associate Administrator for Human Space Flight, NASA HQ
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Former NASA Astronauts:

Dr. Joseph Allen
Former NASA Assistant Administrator and Apollo Mission Controller
Two-Time Space Shuttle Astronaut
Missions: STS-5 and STS-51A
Former President and CEO, Space Industries Inc
Former Chairman, Veridian Corporation
Former Chairman, Challenger Learning Centers

Dr. Roger K. Crouch
Two-Time Space Shuttle Astronaut
Missions: STS-83 and STS-94
Former NASA Lead Scientist for the International Space Station
Former NASA Lead Scientist for the Life and Microgravity Sciences Program

Dr. Samuel Durrance
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Missions: STS-35, STS-67
Former Executive Director, Florida Space Research Institute
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Missions: STS-51-D, STS-35, STS-46, STS-61, STS-75
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Missions: STS-84, STS-106, International Space Station Expedition 7
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Associate Dean, University of Virginia Department of Engineering

Other Space and Science Educators:

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Member, Columbia Accident Investigation Board (CAIB)

Bill Nye
Executive Director-Designate, The Planetary Society
'The Science Guy'

Cc: Speaker of the House Nancy Pelosi, House Majority Leader Steny Hoyer