The Coalition for Aerospace and Science (CAS) is an alliance of prominent American academic, industrial, and scientific organizations. We deeply appreciate the Congress’ strong support for investments in the National Aeronautics and Space Administration (NASA) in Fiscal Year (FY) 2016. This robust investment provides much needed fuel for the engine of America’s economy – our innovation ecosystem. As you allocate funding for FY 2017, we urge you to build on the strong foundation established in the Consolidated Appropriations Act of 2016 by providing real growth through at least a 5 percent increase for NASA to a topline of $20.3 billion in FY 2017.

Our recommendation echoes that of over 300 organizations from all fifty states representing American industry, higher education, science, and engineering, and a group of senior corporate leaders who recently endorsed the statement Innovation: An American Imperative (see attached). This statement urges Congress to enact policies and make investments that ensure the United States remains the global innovation leader.

As a mission-driven agency with a long-term R&D portfolio that comprises more than 60% of its budget, NASA thrives on stable and robust investments. One need only look to the last twenty years to see what happens when this is not the case. Between 1995 and 2015, NASA’s purchasing power decreased by 11.6 percent overall, with some parts of the Agency experiencing even further declines. As such, we are strongly concerned with the Administration’s FY 2017 request, especially with regards to the proposed sources of funding that do not currently exist. We ask the Congress to ensure that NASA receives the funding it needs to maintain its strong forward progress as it embarks on exciting new human exploration and science missions.

Every member of CAS has unique concerns and requests. However, the entire coalition is united in our support and advocacy for the Agency’s critical research, missions, and programs. As NASA-wide stakeholders, we respectfully request that within the aforementioned topline request, Congress take note of the following specific opportunities for progress:

**HUMAN EXPLORATION AND SPACE OPERATIONS**

We are deeply troubled by the Administration’s continued efforts to underfund the Orion Multi-Purpose Crew Vehicle and Space Launch System (SLS) programs, as evidenced by the President’s FY 2017 Budget Request. If enacted, the request would disrupt and delay highly complex, long-term programs and would have a detrimental impact on the timely development of SLS and Orion. It is important to ensure that the significant progress already made on the development of the SLS and Orion spacecraft continues. Consequently, we request $2 billion for SLS – the same as in FY 2016. Additionally, we recommend $210 million for the SLS Exploration Upper Stage, $1.35 billion for Orion, and $460 million for Exploration Ground Systems. These levels of funding will enable completion of these systems on a schedule to enable the first crewed Orion mission in 2021. Moreover, meeting these modest schedule commitments is essential to enable the type of international partnerships for human exploration that have made the ISS such a success.
In regard to other parts of the Human Exploration and Operations Directorate, CAS supports the President’s FY 2017 request for the International Space Station (ISS), its transportation systems, and a new deep space habitat. NASA should continue to be supported in its endeavors to ensure our near Earth, deep space, and space relay networks are demand-responsive and equipped for future critical missions.

**SCIENCE**

The Coalition requests that Congress fund NASA’s Science Mission Directorate at $5.9 billion, a 5 percent increase above FY 2016. Correspondingly, we request Congress provide $1.71 billion for NASA’s Planetary Science Division. The Coalition applauds Congress’ ambitious plans for exploring Europa, an exciting prospect for exploration in our search for life elsewhere in our solar system and a top Planetary Science Decadal Survey priority. This amount would ensure mission development continues apace toward the target launch date in the early 2020’s as directed in the FY 2016 Consolidated Appropriations Act report, as well as enabling the necessary development of Plutonium-238 – the fuel required for exploration to the outer reaches of our solar system. Beyond the Europa mission, this increase would ensure progress on the full suite of decadal priorities, keeping scientifically-productive ongoing missions on Mars and elsewhere and future Discovery and New Frontiers missions on track.

For the Earth Science Division, the Coalition requests $2.02 billion, an increase of $96 million or 5 percent above the FY 2016 enacted amount. This amount ensures the development of two high-priority missions – Pre-Aerosol, Clouds, and Ocean Ecosystem (PACE) and Surface Water and Ocean Topography (SWOT). Through its instrumentation suite, PACE will help monitor oil spills and the detection of harmful algal blooms. These blooms have a significant negative impact on ocean ecology, human health, and fisheries that support the economies of the Gulf and lower Atlantic states. Meanwhile, SWOT represents an ambitious mission designed to conduct the first-ever global survey of Earth’s surface water. Data from the satellite has promising uses for flood and drought management at local, regional, and national levels; improved risk assessments by the insurance industry; harnessing energy; and optimizing both military and commercial marine operations. Our request also supports the launch of Landsat 9 as early as 2021 and Landsat 10 in approximately 2029, as well as funding to increase the capabilities and uses of multi-spacecraft constellations of very small scientific satellites.

The Coalition strongly urges the Congress to ensure that the funding stream used for the development of the James Webb Space Telescope remain within the Astrophysics Division. A transfer of funding outside of the Division, or even the Directorate, would jeopardize future decadal priorities and represent a threat to America’s status as a global leader in astronomical innovation and discovery.

To maintain progress on the top astronomy and astrophysics decadal survey priorities—including a 2024 launch for WFIRST—and to continue operating the current suite of scientifically-productive missions, CAS requests $767 million for the Astrophysics Division, a 5 percent increase above FY 2016, and $37 million for SMD-wide STEM education activities. Within Astrophysics, the Coalition requests $100 million for WFIRST, $75 million for Research and Analysis, and $62 million for missions that have undergone the 2016 Senior Review and been deemed to have enough scientific value to merit continued operations. Furthermore, CAS requests that Congress direct NASA to conduct a feasibility study of an analogous New Horizons mission class within Astrophysics, referred to informally as Astrophysics Probes, in time for consideration by the next decadal survey committee. It is anticipated that this class of mission could achieve more frequent launches to satisfy the needs of the astronomy community with the potential for being less technically demanding and costly than large multi-billion flagship missions.

As technology continues to play a growing role in our daily lives, it is crucial that we advance our understanding of the Sun and the space environment. In 1859, a large Coronal Mass Ejection – known as the Carrington Event - sent charged particles to Earth from the Sun, causing widespread failure of the telegraph system. Should a similar event happen today, the economic impact to the United States alone is estimated to reach as much as $2.6 trillion. This is not to mention the perpetual threat that solar activity poses to our civil and defense space-based assets and to future human deep space exploration. Research through NASA’s Heliophysics Division, guided by the Solar and Space Physics Decadal Survey, seeks to understand this critical Sun-Earth relationship. As such, the Coalition requests $700 million for the
Division, an increase of $50.2 million or 7.7 percent. This amount would ensure an increased tempo in nimble, cost-effective Explorer missions as well as implementation of the NASA-NSF DRIVE initiative and the cross-agency Space Weather Action Plan.

TECHNOLOGY

The Space Technology Mission Directorate represents an important component of NASA-wide innovation, technology development, and the primary vehicle for bringing new technologies to market. One such promising innovation is the Laser Communications Relay Demonstration program, scheduled for a test in 2020 and is expected to break new ground in optical communication technology. This is NASA's next premier optical communication demonstration that has the potential to revolutionize the way we send and receive data, video and other information. The Coalition remains concerned that the recent unfunded transfer of the RESTORE-L program threatens to impact the Directorate’s exciting technology development programs, including grants to engineers and researchers at many of our universities and small businesses. As such, CAS requests $831.7 million for the Directorate to cover the transfer of RESTORE-L, while ensuring the Directorate remains a strong technological backbone for the Agency. Within that amount, CAS requests that Congress provide a $5 million increase to the Directorate’s Technology and Innovation Division for NASA’s successful Technology Transfer Program, which has seen a 76 percent reduction in its budget over the last ten years.

AERONAUTICS

For NASA’s Aeronautics Research Mission Directorate, we request $790 million for FY 2017, an increase of $156 million over FY 2016. This allocation will ensure a comprehensive research effort that cements America’s status as a global aeronautics leader. A major component of this funding is a return to full-scale demonstrator aircraft testing of a wide range of concepts—from blended wing bodies to low supersonic boom travel. Additionally, we are supportive of the Agency’s efforts to dramatically increase the capacity of the nation’s airspace to support Unmanned Aerospace Systems, passenger growth, and advanced hypersonic research collaboration with the Department of Defense.

We look forward to working with you as you formulate FY 2017 appropriations. Thank you once again for your leadership on NASA budget and policy matters.

Member Organizations Include:

Aerospace Industries Association
American Astronautical Society
American Astronomical Society
American Geophysical Union
Association of American Universities
American Society of Agronomy
Consortium for Ocean Leadership
Crop Science Society of America
The Planetary Society
New Mexico State University
Northrop Grumman Corporation
Raytheon Company
Soil Science Society of America
SPIE – the international society for optics and photonics
Woods Hole Oceanographic Institute
University Corporation for Atmospheric Research
University of Arizona
University of Colorado – Boulder
University of New Hampshire
University of Washington
INNOVATION: AN AMERICAN IMPERATIVE

A call to action by American industry, higher education, science, and engineering leaders urging Congress to enact policies and make investments that ensure the United States remains the global innovation leader.

Our nation knows what it takes to innovate: a sustained commitment to scientific research, a world-class workforce, and an economic climate that rewards entrepreneurship and innovation. As the most dynamic and prosperous nation in the world, the United States has long benefited from policies and investments that have promoted innovation and in turn driven productivity and economic growth, bolstered American trade, ensured our health and national security, and safeguarded the American dream. Our leadership is now at risk because of years of under-prioritizing federal scientific research investments and policies that promote innovation.

Now is not the time to rest on past success. As noted by the American Academy of Arts and Sciences in its 2014 Report Restoring the Foundation: The Vital Role of Research in Preserving the American Dream, “There is a deficit between what America is investing and what it should be investing to remain competitive, not only in research but in innovation and job creation.” Competitor nations are challenging our leadership by copying our playbook for success. At the same time our nation’s support for scientific research and innovation is stagnating. If these trends continue, other countries will soon surpass the United States as the global innovation leader.

We must heed the warnings in the Restoring the Foundation report and other salient reports of the past decade and act decisively. In particular, Congress must:

Renew the federal commitment to scientific discovery
by ending sequestration’s deep cuts to discretionary spending caps and providing steady and sustained real growth in funding of at least four percent for basic scientific research at: the National Science Foundation, the National Institutes of Health, the Department of Energy's Office of Science, the Department of Defense, NASA, the National Institute of Standards and Technology, USDA, and NOAA;

Make permanent a strengthened federal R&D tax credit
as a part of comprehensive tax reform to encourage more private-sector innovation investment here in America instead of in competitor countries;

Improve student achievement in science, technology, engineering, mathematics (STEM)
through increased funding of proven programs and incentives for science and math teacher recruitment and professional development;

Reform U.S. visa policy
to welcome and keep highly educated international professionals, particularly those holding STEM degrees from U.S. universities;

Take steps to streamline or eliminate costly and inefficient regulations
and practices governing federally funded research to help unburden researchers to focus more time on conducting research and training the next generation of scientists, engineers, health care professionals, and business leaders;

Reaffirm merit-based peer review
as the primary mechanism major federal agencies should employ in making competitive scientific research grants to ensure the most effective use of taxpayer dollars; and

Stimulate further improvements in advanced manufacturing
through support for programs aimed at accelerating manufacturing innovation and new federal-industry-academic partnerships.

We, the signatories, urge support for these actions to keep the United States the global innovation leader. We stand ready to do our part.

Samuel R. Allen
Chairman & CEO
John Deere

Norman R. Augustine
Co-Chair
Restoring the Foundation

Wes Bush
Chairman, President & CEO
Northrop Grumman

Kenneth C. Frazier
Chairman & CEO
Merck & Co., Inc

Marillyn A. Hewson
Chairman, President, & CEO
Lockheed Martin Corporation

Charles O. Holliday
Chairman
Royal Dutch Shell plc

Joseph Jimenez
CEO
Novartis

W. James McNerney, Jr.
Chairman of the Board & CEO
The Boeing Company

Satya N. Nadella
CEO
Microsoft

Jay Timmons
President & CEO
National Association of Manufacturers