



January 20, 2021

President Joseph R. Biden

Dear Mr. President,

The Coalition for Aerospace and Science (CAS) congratulates you on becoming the 46th President of the United States of America. CAS is an alliance of industry, university, and scientific organizations united in support of robust and sustained federal investments in the National Aeronautics and Space Administration (NASA).

NASA is an essential element of America's success as a global leader in science, technology, exploration, and inspiration. As you transition from a successful campaign to policy implementation, we request you consider the following principles and recommendations.

Maintain an Ambitious Exploration Agenda

NASA's human exploration agenda – and the global visibility and prestige it confers – is a priceless asset that has spurred immeasurable economic, inspirational, and soft power value. However, Administrations have frequently neglected to provide the political prioritization and resources required to take full advantage of NASA's ability to perpetuate this value into the future. Presidential transitions have frequently, and often inadvertently, resulted in a “whiplash” effect by re-vectoring human exploration strategies and the objectives that support destination-oriented activities.

CAS supports the existing Artemis program's goal of returning humans to the lunar surface as a precursor to a long-duration presence on the Moon and as a stepping stone to a future Mars mission. Artemis represents the latest and most ambitious mission architecture since the Apollo program, and the Coalition recommends your Administration supports the continued development of technological and scientific milestones currently underway. This includes:

- Testing of commercial partners' Human Landing System (HLS) concepts slated in FY 2021 and subsequent downselect.
- Diversifying the government's access to support existing and new launch and crewed vehicles to support the Artemis mission architecture. CAS supports ongoing development of NASA's Space Launch System and Orion Crew Capsule, in addition to leveraging the capabilities of longstanding commercial partners such as United Launch Alliance (ULA) and newer entrants like SpaceX, Blue Origin, and others.

NASA's Journey to Mars is its most ambitious ever and given its cost and complexity, it should be designed to incorporate science into its missions. Today, there is no short-term need to race another nation to Mars, instead there is considerable motivation for us to lead a group of international partners on this mission. This advances our goals and can help maximize value for taxpayers. Assuring that human exploration incorporates science from the start as a primary objective is essential for mission success and for enabling further exploration in the future.

Fully Leverage NASA's Role in Combating Climate Change

Climate Change is the challenge of our generation. NASA is a unique component in the federal government's ability to understand and manage climate change. The vantage point of space enables global monitoring and scientific study into drivers and impacts of climate change.

As the Administration seeks a whole-of-government approach to combating Climate Change, CAS recommends an expansion of funding and policy shifts that fully leverage the capabilities of NASA's workforce, academia, and industry. These include:

- Embracing the National Academies' 2017 Earth Science and Applications from Space (ESAS) Decadal Survey. Fulfillment of several top recommendations from ESAS 2017 are currently underway, however a key recommendation of establishing a competitive Earth Explorer mission concept has yet to be implemented.
- Creating an all-of-civil government effort to measure, record, coordinate, and disseminate climate change data across government, researchers, and state and local governments. This effort will combine federal Earth imaging systems from NASA, NOAA, USDA, USGS, BLM, and other civil agencies along with the purchase of remote sensing data and services from commercial companies. This effort will leverage the commercial remote sensing capabilities that have revolutionized the industry in the past decade. Efforts will be not only on the procurement of commercial data but also investment in IT and analytics to improve the impact of individual datasets to create measuring, reporting and verifying systems to measure appropriate societal indicators, such as the Sustainable Development Goals.
- Expanding the role of commercial remote sensing data providers to complement NASA's fleet of remote sensing missions. Expand the Commercial Smallsat Data Acquisition (CSDA) Program to enable more commercial companies to participate and expand the user community beyond NASA funded researchers to include all U.S. university students and researchers. This program was created in 2020 after a trial program in 2019. To date, there are 6 companies that participate in this program and provide commercial remote sensing data to NASA researchers. A number of new companies are being on-ramped into the program. The rate of peer-reviewed scientific papers using commercial data from this program and other education and research programs is accelerating rapidly. The CSDA Program should be expanded to increase funding to accommodate more commercial partners. Additionally, the program scope should be expanded beyond NASA researchers and include providing data to all U.S. university researchers. There is an opportunity to combine this program with European efforts and create a larger data access program for researchers in Europe and the U.S. This program is in line with the European Green Deal, it is a strong complement to the European Copernicus program, and it supports an overall integrated civil and commercial remote sensing space and ground architecture.

Promote Budgets that Enable Existing and Anticipated Scientific Priorities

NASA's Science Mission Directorate plays a unique and world-renowned role in advancing scientific understanding of our planet and the rest of the universe. This research – and the missions that enable them – is guided by 10-year consensus-based priorities developed by individual scientific disciplines under the auspices of the National Academies of Science, Engineering, and Medicine (NASEM). The launch of a NASA science mission is a pinnacle moment, and is preceded by years or decades of planning and engineering by men and women across the United States. A key endorsement of a mission's lifecycle is the support of the scientific community shown through the decadal process.

The next several years are set to usher in a new era of robotic exploration missions, starting with the arrival of NASA's Perseverance rover to Mars this February and launch of the James Webb Space

Telescope in October 2021. This same period will also coincide with the release of several decadal and mid-term reviews, including the Astronomy and Astrophysics Decadal Survey (Spring, CY 2021); Planetary Science and Astrobiology Decadal Survey (CY 2023); Earth Science and Applications from Space Mid-Term Assessment (CY 2023); Solar and Space Physics (CY 2024). Each report will prioritize new missions that are likely to remain unrealized until after your presidency. However, the Administration's posture towards and prioritization of activities within NASA's Science Mission Directorate will heavily influence the scientific community's level of ambition in setting its priorities. Robust budget increases and policies that promote scientific exploration will translate into aspirational decadal reports that further cement America's unchallenged role in pioneering Earth and space science research.

Diversify and Modernize NASA's Workforce and Partnerships with Stakeholders

NASA is currently engaged in internal efforts to diversify their STEM workforce and to ensure that their practices are in line with and in support of bringing more diverse perspectives into leadership roles at the agency. NASA must attract, fully utilize, and retain the best talent. This includes being viewed as an employer of choice for a diverse workforce. CAS recommends the continued execution of NASA's Diversity and Inclusion Strategic Implementation Plan, to:

- Fully integrate diversity and inclusion into the strategic decision making of the Agency to enhance organizational effectiveness, help achieve mission goals, and meet the challenges that lie ahead.
- Strategically utilize and expand workforce talents, skills, and opportunities to maximize individual potential and productivity Agency wide.

CAS also recommends NASA support and expand the efforts of SMD leadership to increase diversity in space mission leadership. The National Academies of Science, Engineering, and Math is developing a report that will *"examine the current mission proposal system at NASA SMD and identify humanistic elements of the system that may present impediments to applicants, limiting the diversity of the competitive pool."* This study, undertaken at the request of SMD, will have proposed actions for SMD to implement to improve said diversity.

Programs such as Space Grant help make space-related careers a reality by providing scholarships and fellowships for students pursuing careers in STEM, as well as curriculum enhancement and faculty development. Other NASA education programs, such as the Minority University Research and Education Project (MUREP), help ensure the diversification of our workforce by supporting STEM programs at U.S. Historically Black Colleges and Universities (HBCUs) and Minority Serving Institutions (MSIs).

Maintain Balance Based on Consensus of Stakeholders to Ensure Long-term Health of Programs

NASA leaders can best leverage investments in the United States space program by continuing to develop a balanced portfolio for aeronautics, space exploration, and space science across the directorates. It is essential to maintain a strong commitment to all of the agency's missions – small, medium and flagship missions. It is also essential to maintain balance between NASA's individual investigator grants and support for missions. The optimal balance will inevitably change over time as new science discoveries and technological improvements are made. That adds to the inherent difficulty of optimizing the NASA portfolio, however, the science, engineering, and technology communities make an effort to reach a consensus within their community on what that balance should look like. It is then up to NASA and the administration to use the community consensus as a guide when making decisions

about how to invest resources. NASA should avail itself of entities like the National Academies and the NASA Advisory Councils to determine the community consensus.

Encourage Innovative Industry Partnerships to Maximize Impact of Federal Support

Maximizing the impact of taxpayer supported research and development requires healthy government investments and industry investments. The curiosity-driven research conducted at NASA often requires the development of innovative technologies. Industry partnerships have been necessary to this technology development. In fact, every NASA mission in recent history has relied on industry partners to successfully complete the mission. Based on these successes, NASA should continue to support industry partnerships in its missions.

As NASA strives to maximize the impact of limited budgets, emphasis should be made to prioritize purchasing hardware, data, and services from the commercial sector when available. Enabling commercial companies to provide products, services, and data in fields that have commercial markets and use cases, enables NASA to prioritize its workforce and funding to develop programs and technologies that advance NASA’s scientific and mission capabilities yet do not currently have robust commercial markets.

NASA’s Technology Transfer Program, within the Office of the Chief Technologist, facilitates the transfer of technology developed during these missions to the private sector by engaging with businesses and industrial sectors to support the commercialization of technological innovation. For example, NASA utilizes the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs. These programs encourage domestic small businesses and nonprofit research institutions to engage in federally supported research and development. SBIR/STTR can serve as a potential source of seed funding for small businesses to further develop those technologies that have the potential for commercialization. NASA should continue to ensure adequate mechanisms to transfer technology from federal agencies to the private sector and to provide opportunities for small businesses and nonprofit research institutions to participate in technology development.

Thank you for your consideration of these recommendations. CAS stands ready to work you’re your Administration on these NASA priorities.

Sincerely,

Julia A. Smith and Ann Zulkowsky
Co-Chairs of the Coalition for Aerospace & Science