

MEMORANDUM OF UNDERSTANDING  
BETWEEN  
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
AND  
U.S. DEPARTMENT OF ENERGY  
REGARDING  
ENERGY-RELATED CIVIL SPACE ACTIVITIES

The National Aeronautics and Space Administration (NASA) and the Department of Energy (DOE), through this Memorandum of Understanding (MOU), affirm their mutual interest in continuing their longstanding partnership on mutually beneficial collaborative activities in furtherance of civil space exploration, scientific discovery, and U.S. national space policy. In this MOU, NASA and DOE may be individually referred to as a “Party” and collectively referred to as the “Parties.”

The Department of Energy enters into this MOU under the authority of section 646 of the Department of Energy Organization Act (Pub. L. 95-91, as amended; 42 U.S.C. § 7256).

**I. Background**

NASA and DOE have successfully worked together for over 50 years in space science and applications, exploration, and technology development. The continuing partnership of NASA and DOE is critical in supporting the goals of various initiatives, including those in Space Policy Directive-1 to land the first woman and the next man on the Moon by 2024 and establish a sustainable lunar space exploration and utilization program to prepare for the first human mission to Mars.

NASA’s mission is to drive advances in science, technology, aeronautics, and space exploration to enhance knowledge, education, innovation, economic vitality, and stewardship of Earth. DOE’s civil space-related activities support the NASA mission in the DOE mission areas of applied energy and energy-related research and development; fundamental science (including user facilities and advanced technologies); space and Earth science; and science, technology, engineering, and mathematics education.

Additional opportunities for mutually beneficial collaboration between the Parties continue to emerge. In areas consistent with each Party’s mission and applicable law, the Parties intend to consider pursuing collaboration on civil space-related activities of mutual interest.

The broad categories for potential cooperative activities include, but are not limited to:

- Applied Energy and Energy-related Research and Development;
- Space Science;

- Earth Science;
- Space Life and Physical Sciences;
- Space Technology;
- Computing and Modeling;
- Private Sector and Commercial Development; and
- Science, Technology, Engineering, and Mathematics Education.

Areas of specific interest include, but are not limited to: scientific observations of the early Universe using the Moon, Gateway platform activities, high-performance computing, modeling and simulation, lunar surface activities, power systems, planetary defense from near-Earth objects, sensor and satellite development, space nuclear power and propulsion, space safety, space situational awareness, space weather, and technology transfer.

## **II. Implementation**

For NASA, the Administrator, and for DOE, the Secretary, will be ultimately responsible for the oversight of this MOU within their respective agencies. For NASA, the Deputy Administrator, and for DOE, the Deputy Secretary of Energy, will coordinate implementation of this MOU on behalf of their respective agencies.

### **A. Executive Committee**

An Executive Committee, comprised of Federal employees, will be co-chaired by the NASA Deputy Administrator and the Deputy Secretary of Energy, and shall meet on a regular basis to guide implementation of this MOU and ensure that issues cutting across organizational lines in either agency are resolved expeditiously. As appropriate, the Executive Committee will meet in executive session with the NASA Administrator and the Secretary of Energy presiding. The Executive Committee may consult with non-Federal employees such as lab employees on an individual, occasional basis.

1. The Executive Committee will consider the following:
  - a. Status of collaborative activity between the Parties;
  - b. Status of the senior-level working groups;
  - c. NASA energy and technology-related requirements;
  - d. DOE space-related capabilities and programs;
  - e. Respective long-term strategies, plans, and/or roadmaps of potential mutual interest;
  - f. Coordination of engagement on joint activities with relevant Congressional committees and other common stakeholder communities; and,
  - g. Policy and programmatic issues of mutual concern.
2. The Executive Committee co-chairs will nominate appropriate officials from their respective organizations to participate as members of the Committee. The co-

chairs will seek to nominate Committee members who hold sufficient authority within their respective organizations to fulfill the mandate of the Committee.

3. The DOE Office of Strategic Planning and Policy and the NASA Office of International and Interagency Relations will serve as the secretariat for the Executive Committee and will ensure coordination of Committee staff work.

## B. Working Groups

1. As necessary, the Executive Committee will establish senior-level strategic working groups, comprised of Federal employees, which will report to the Executive Committee on mutual policy and program opportunities and challenges, as well as on areas where senior executive leadership engagement is needed. Where appropriate, these working groups will build on already established relationships between the Parties. The working groups may consult with non-Federal employees such as lab employees on an individual, occasional basis.
  - a. Initially, three joint working groups will be established. The first will focus on infrastructure that is needed on the lunar surface. The second will focus on nuclear power and propulsion in space. The third will focus on space science and innovation, to include space safety and planetary defense. The three joint working groups shall report back to the Executive Committee within six weeks of the signing of this Memorandum and provide one-page papers that report on:
    - i. Planning and designing the infrastructure needed for the Artemis lunar base on the Moon's surface.
    - ii. Developing, testing, and evaluating the Artemis lunar base power supply and grid systems. This effort should include a legislative plan and funding framework.
    - iii. Developing a multibillion-dollar plan to research, develop, test, and evaluate nuclear propulsion systems for Mars missions transporting astronauts. This effort should include a legislative plan and funding framework.
    - iv. Space science and high-end computing capabilities and data initiatives for developing space situational awareness, space weather, and planetary defense. This effort could include sensor development that focuses on radiation for space weather applications and a planetary science sensor package design that is optimized for bolide detection and data collection. This effort should include a legislative plan and funding framework.
  - b. Where appropriate, include plans to involve additive and advanced manufacturing methods and processes.
2. At the discretion of the Executive Committee, these working groups will be led by NASA Associate Administrator/DOE Assistant Secretary-level co-chairs designated by the Executive Committee and will include the appropriate policy

and program officials and experts needed to fulfill the charge of the working group.

3. The Executive Committee working groups will be defined such that their work will complement, and not interfere with, NASA-DOE project or program-specific working groups, or other interagency forums where NASA and DOE are participants.
4. Additional NASA-DOE working groups to consider potential collaboration and address issues in specific areas may be established at any level between the Parties.

C. Collaboration on Specific Activities

Should both Parties agree to enter into binding obligations in connection with the activities described in this MOU, the Parties will negotiate and enter into separate agreements, independent of this MOU, and as permitted by and in accordance with law and the respective Parties' policies and processes.

**III. Miscellaneous**

- A. This MOU is strictly for the management and planning purposes of each of the Parties.
- B. This MOU does not support an obligation of funds, nor does it constitute a binding commitment upon either Party or create any legal rights or obligations for either Party.
- C. Each Party shall be responsible for any and all expenses incurred by that Party relating to this MOU, and neither Party will be responsible for any expense incurred by the other Party unless specifically agreed to in writing, separate from and independent of this MOU.
- D. Nothing in this MOU shall be interpreted as limiting, superseding, or otherwise affecting a Party from conducting normal operations or making decisions in carrying out its mission and duties.
- E. This MOU does not limit or restrict the Parties from participating in similar activities or arrangements with other entities.
- F. This MOU becomes effective upon the date of the last signature below ("Effective Date") and shall remain in effect until either (a) a Party decides to terminate its participation according to Section III.G of this MOU, or (b) ten (10) years from the Effective Date, whichever comes first.

- G. This MOU may be terminated by mutual agreement of the NASA Administrator and the Secretary of Energy, or by either Party, upon thirty (30) calendar days written notice to the other Party.
- H. Any modification to this MOU will be executed, in writing, and signed by an authorized representative of NASA and DOE.
- I. This MOU supersedes the Memorandum of Understanding Between National Aeronautics and Space Administration and U.S. Department of Energy Regarding Energy-Related Civil Space Activities, signed on July 9, 1992.
- J. This MOU does not supersede nor modify other memoranda or agreements existing between the Parties, such as the Memorandum of Understanding Between the National Aeronautics and Space Administration and the Department of Energy Concerning Radioisotope Power Systems, signed October 31, 2016.

**IV. Signatures**

The respective authorized officials of each organization hereby execute this MOU on the date set forth below.



James F. Bridenstine  
Administrator  
National Aeronautics and Space Administration

Date: 10/19/20



Dan Brouillette  
Secretary of Energy  
U.S. Department of Energy

Date: 10/16/20