



MEMORANDUM OF UNDERSTANDING
BETWEEN
THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
AND
THE UNITED STATES SPACE FORCE

The National Aeronautics and Space Administration (NASA) and the United States Space Force (USSF), through this Memorandum of Understanding (MOU), affirm a strong interest in continuing their longstanding partnership for mutually beneficial collaborative activities in furtherance of space exploration, scientific discovery, and security. In this MOU, NASA and USSF may be individually referred to as a “Party” and collectively referred to as the “Parties.”

I. BACKGROUND

NASA and relevant precursor organizations of the USSF share a long history of mutually beneficial cooperation that contributes to the Parties’ respective civil and defense roles. Such cooperation was built on synergies in certain operational capabilities and in research and development activities in science and technology. With the historic establishment of USSF as a new branch of the Armed Forces in December 2019, and with NASA’s Artemis Program under way to land the first woman and next man on the Moon by 2024, NASA and USSF hereby reaffirm and continue their rich legacy of collaboration in space launch, in-space operations, and space research activities, all of which contribute to the Parties’ separate and distinct civil and defense endeavors.

USSF is a military service that operates under Title 10 of U.S. Code. Its mission is to organize, train, and equip space forces that protect and defend U.S. and allied interests in space and provide space capabilities to U.S. and allied warfighting forces. Its responsibilities include developing military space systems and doctrine, as well as presenting space forces to support the warfighting Combatant Commands.

NASA is a civil agency authorized under Title 51 of U.S. Code. Its mission is to drive advances in science, technology, aeronautics, and space exploration – to enhance knowledge, education, innovation, economic vitality, and stewardship of Earth.

Despite their disparate missions, NASA and USSF share a common domain of operations – space – and with it a shared interest in similar capabilities, technologies, and best practices. Since NASA’s inception in 1958, NASA and the Department of Defense (DoD) have shared knowledge regarding common interests. Specifically, NASA has made available to agencies directly concerned with national security, information on discoveries and technologies that have military value or significance. Conversely, national security agencies have shared with NASA, discoveries and information collected which have value or significance to its exploration, science, and technology missions.

Historically, areas of collaboration have included space launch and range safety, space communications, human spaceflight support, space flight safety and space situational awareness, scientific research, and technology development.

For example, NASA has operated aboard the International Space Station (ISS) since November 2000. During this period, DoD space forces have provided range control and airspace security; launch, landing, and abort site weather services; crew search and rescue; space traffic reporting; and back-up communications networks in support of ISS NASA operations. NASA, in turn, has hosted a number of these space forces' scientific payloads and experiments aboard ISS.

As NASA's human presence extends beyond ISS to the lunar surface, cislunar, and interplanetary destinations, and as USSF organizes, trains, and equips to provide the resources necessary to protect and defend vital U.S. interests in and beyond Earth-orbit, new collaborations will be key to operating safely and securely on these distant frontiers.

When established in December 2019, USSF was tasked with defending and protecting U.S. interests in space. Until now, the limits of that mission have been in near Earth, out to approximately geostationary range (22,236 miles). With new U.S. public and private sector operations extending into cislunar space, the reach of USSF's sphere of interest will extend to 272,000 miles and beyond – more than a tenfold increase in range and 1,000-fold expansion in service volume. USSF now has an even greater surveillance task for space domain awareness (SDA) in that region, but its current capabilities and architecture are limited by technologies and an architecture designed for a legacy mission.

NASA has a long-standing Planetary Defense mission as a result of Congressional direction that requires the Agency to detect, track, and characterize, by the end of 2020, 90 percent of all asteroids and comets that pass within five million miles of Earth, and are large enough to be potentially hazardous. Despite years of effective use of all available assets, NASA will not be able to meet that survey deadline without leveraging future technical capabilities.

Both Parties are at current capability limits for extending SDA beyond geosynchronous orbit and addressing the need for Near Earth Object (NEO) detection and tracking. However, there is considerable overlap between the technologies required to enable NEO detection and for SDA beyond geosynchronous orbit, such as the USSF Space Surveillance Telescope. Just as current capabilities of the national security architecture – used to detect bright fireball meteors (*bolides*) as asteroids enter Earth's atmosphere – provide important data for NASA's Planetary Defense mission, capabilities to improve detection and tracking of human-made objects in cislunar space also could be used for detection and characterization of NEOs. There is a direct and strong correlation between cislunar SDA and NEO search and tracking. While the Parties' domains, missions, and operational cadence remain distinct and different, the benefits of shared technologies and observational data are of increasing interest to both communities. The Parties will most effectively achieve their respective goals through collaboration in a strategic and proactive manner as each establishes its own mission architectures.

II. COOPERATIVE AREAS

NASA and USSF look forward to continuing their fruitful partnership in existing areas of collaboration, as well as establishing new relationships, in the following areas:

1. Deep space survey and tracking technologies to support extended SDA and NEO detection beyond geosynchronous orbit;
2. Detection and data collection on bolides caused by natural objects entering Earth's atmosphere, to provide timely reporting to the public and the scientific community;
3. Capabilities and practices enabling safe, sustained near-Earth and cislunar operations such as communications; navigation; space structure servicing, assembly, and manufacturing; and interoperability among those capabilities to support resilience for functions in this remote region;
4. Search, rescue, and recovery operations for human spaceflight;
5. Launch support;
6. Space logistical supply and support;
7. Ride shares and hosted payloads to and beyond Earth orbit;
8. Establishing standards and best practices for safely operating in space, to include conjunction assessment, space situational awareness sharing, orbital debris mitigation, and space systems protection;
9. Interoperable spacecraft communications networks for Earth orbit and beyond;
10. Fundamental scientific research and technology development cooperation; and
11. Developing and sharing a talent pool of premier space professionals and expertise.

NASA and USSF agree to further investigate opportunities for potential collaboration in these and other areas of mutual interest during this exciting new era for both of the Parties.

III. TERMS

- A. This MOU supersedes the "Memorandum of Understanding between Air Force Space Command and the National Aeronautics and Space Administration concerning a Partnership to Achieve Goals in Space Access and Operations," executed on December 14, 2006.
- B. This MOU is strictly for the management and planning purposes of each of the Parties.
- C. This MOU does not support an obligation of funds, does not document or provide for an exchange of funds or manpower, does not constitute a binding commitment upon either Party, and does not create any legal rights or obligations for either Party.
- D. 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.

- E. 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.
- F. This MOU does not limit or restrict the Parties from participating in similar activities or arrangements with other entities.
- G. 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.H of this MOU, or (b) nine (9) years from the Effective Date, whichever comes first.
- H. This MOU may be terminated by the mutual written agreement of the NASA Administrator and the USSF Chief of Space Operations, or by either Party, upon thirty (30) calendar days’ written notice to the other Party.
- I. Any modification to this MOU will be executed, in writing, and signed by an authorized representative of NASA and USSF. This MOU will be reviewed annually on or around the anniversary of its effective date, and triennially in its entirety.
- J. 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.
- K. Administration of this MOU and coordination of subsequent NASA-USSF agreements for activities identified in Section II of this MOU will be the responsibility of the NASA Office of International and Interagency Relations and the USSF Office of the Chief of Space Operations. Points of Contact:

USSF Primary	Alternate
Lt Gen B. Chance Saltzman	Col Stuart A. Pettis
USSF Chief Operations Officer	USSF Dep. Dir. Operations
1670 Air Force Pentagon	1670 Air Force Pentagon
Washington, DC 20330-1670	Washington, DC 20330-1670
703-697-5948	703-614-1964
bradley.saltzman@us.af.mil	stuart.a.pettis.mil@mail.mil
NASA Primary	Alternate
Mr. Benjamin Alvin Drew, Jr.	Mr. Thomas Plumb
NASA Interagency Liaison	NASA Interagency Liaison
300 E Street SW	150 Vandenberg St
Washington, DC 20546	Colorado Springs, CO 80914
202-358-1542	202-812-3736
b.a.drew@nasa.gov	thomas.j.plumb@nasa.gov

- L. Each Party is responsible for all costs of its personnel, including pay and benefits, support, and travel. Each Party is responsible for supervision and management of its personnel.
- M. Any disputes relating to this MOU will, subject to any applicable law, Executive order, directive, or instruction, be resolved by consultation between the Parties or through both Parties' chains of command.
- N. This MOU is not transferable except with the written consent of the Parties.
- O. It is expressly understood and agreed that this MOU embodies the entire understanding between the Parties regarding the MOU's subject matter.

IV. AUTHORITY

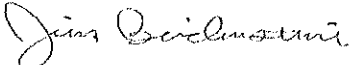
USSF enters into this MOU under the authority of:

- 1. The United States Space Force Act, §951 of the National Defense Authorization Act for Fiscal Year 2020 (Public Law No: 116-92).
- 2. 10 U.S.C. § 9013, 3. DoDI 4000.19, Support Agreements, 25 April 2013.

V. SIGNATURES

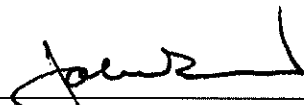
The respective authorized officials of each organization hereby execute this MOU on the date set forth below.

NATIONAL AERONAUTICS AND
SPACE ADMINISTRATION

BY: 
James F. Bridenstine
NASA Administrator

DATE: 09/16/20

UNITED STATES SPACE FORCE

BY: 
John W. Raymond, General, USSF
Chief of Space Operations, USSF

DATE: 09/21/2020