

NONREIMBURSABLE MEMORANDUM OF AGREEMENT
BETWEEN
THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
GODDARD SPACE FLIGHT CENTER
AND DEPARTMENT OF THE NAVY U.S. NAVAL OBSERVATORY
FOR THE NATIONAL EARTH ORIENTATION SERVICE.

ARTICLE 1. AUTHORITY AND PARTIES

The National Aeronautics and Space Administration Goddard Space Flight Center, located at 8800 Greenbelt Road, Greenbelt, MD 20771 (hereinafter referred to as “NASA” or “NASA GSFC”), enters into this Memorandum of Agreement (hereinafter referred to as "MOA") with the Department of Navy's United States Naval Observatory (USNO), located at 3450 Massachusetts Ave NW, Washington, DC 20392 in accordance with the Space Act, Other Transactions Authority (OTA), 51 U.S.C. § 20113(e), DoDI 4000.19 (Interservice and Intergovernmental Support), and CNIC Instruction 4000.1B (Support Agreement Program). NASA and USNO may be individually referred to as a “Party” and collectively referred to as the “Parties.”

ARTICLE 2. PURPOSE

The National Earth Orientation Service (NEOS) is designed to provide Earth orientation time series and forecasts with the accuracy necessary to meet all U.S. Government requirements in the shortest possible time. The purpose of this MOA is to describe how NASA and USNO collaborate to operate the NEOS, to include sharing data; notifying each other of important decisions such as when it is necessary to remove essential instrumentation from or make major repairs to Very Long Baseline Interferometry (VLBI) stations; participating in collaborative efforts; engaging with other complementary programs that could provide benefit to NEOS sites; and investigating the utility of upgrading the NEOS sites to function as core reference observatories recommended by the Global Geodetic Observing System (GGOS). These GGOS sites would include Global Navigation Satellite System (GNSS), Satellite Laser Ranging (SLR) and VLBI Global Observing System (VGOS) instrumentation with colocation monitoring and real time data¹. Electronic distribution methods already in place at USNO are used to communicate the NEOS time series to users according to their requirements.

This MOA supersedes previous agreements on NEOS. NEOS was first established on 22 October 1985 between USNO and the National Oceanic and Atmospheric Administration (NOAA), and NASA joined on 3 September 1996. The National Earth Orientation Service (NEOS) organization is referenced in the “PROPOSAL submitted in response to the Call for Participation issued by the International Earth Rotation Service (IERS) on 15 November 1999” and signed by the USNO Scientific Director, Dr. Ken Johnston. In 2019, NASA and NOAA entered into a separate agreement for the “Coordination of Maintenance and Operation of Continuously Operating Reference Stations Toward an Improved National Reference Frame” that includes NOAA contributions related to this NEOS agreement. In addition, USNO and NOAA NEOS related cooperation will be

¹ GGOS Requirements for CORE sites (Revision 2); <https://cloud.ggos.org/index.php/s/8moCQT0oxn5rQdA>

arranged through a separate USNO-NOAA agreement.

ARTICLE 3. RESPONSIBILITIES

A. NASA will use reasonable efforts to:

1. Coordinate and maintain the joint VLBI operations schedules for the participating observing facilities
2. Serve as the lead Party for operating and maintaining the NEOS sites
3. Serve as the lead Party for VLBI research and development and for hardware and software standards for instrument configuration for VLBI measurement systems
4. Provide sustaining engineering and depot level maintenance for NASA-owned VLBI hardware and software through existing NASA contracts and agreements, such as the VLBI signal chains, the Field System software and hardware, and NASA VLBI equipment at Fortaleza, Brazil and the other NASA Space Geodesy Network sites
5. Provide for development, installation and maintenance of station and network operations monitoring and control software
6. Maintain and develop VLBI data reduction software
7. Analyze VLBI data for universal time (UT1)-coordinated universal time (UTC), polar motion, and nutation on a regular basis
8. Provide satellite laser ranging analysis for Earth Orientation Parameters on a regular basis

B. USNO will use reasonable efforts to:

1. Serve as the lead Party for the operation and maintenance of the NEOS VLBI Correlator (also referred to as The Washington VLBI Correlator)
2. Provide depot-level maintenance for Navy-owned VLBI hardware and software through existing Navy contracts and agreements and/or make arrangements with NASA to provide such maintenance through a separate agreement
3. Arrange for facilities support and utilities required at the Kōke'e Park NEOS site through the PMRF -- details to be defined between USNO, NASA, and PMRF in a separate agreement.

4. Install and maintain any Navy VLBI hardware used at the NEOS VLBI sites, such as the 12 meter and 20 meter radio telescopes including their integrated systems, masers, Mark5 and Mark6 recorders and digital back-ends
 5. Provide observing schedules for daily one-hour intensive observations, and weekly 24-hour observations known as R4 weekly sessions
 6. Determine quasar source structure for selected sources once every three months
 7. Produce International Earth Rotation and Reference Systems Service Bulletin A and associated daily Earth Orientation Parameters (EOP) results
 8. Publish and distribute NEOS publications
 9. Provide polar motion series based on analysis of Global Positioning Satellite (GPS) orbits
 10. Cooperate, as resources permit, with NASA in VLBI data reduction software maintenance and development
 11. Cooperate, as resources permit, with NASA in technology refresh of VLBI systems
 12. Analyze Rapids (24 hour) and Intensives data for UT1-UTC, polar motion, and nutation on a regular basis
 13. Conduct at least two Research and Development VLBA (RDV) sessions per calendar year for the purpose of improving the celestial reference frame.
- C. The Parties will use reasonable efforts to carry out the following joint responsibilities:
1. Cooperate in the production of the NEOS data from Kōke'e Park, Fortaleza, Brazil and other NEOS sites² as mutually agreed.
 2. Cooperate in developing, maintaining, and operating the NEOS correlation capabilities as mutually agreed.
 3. Analyze relevant VLBI data for the celestial and terrestrial reference frames.
 4. Maintain open and direct communications, and inform the other of any issues that may preclude any of the responsibilities outlined above.

ARTICLE 4. SCHEDULE AND MILESTONES

This MOA shall be reviewed as required by both Parties for assuring the currency of the MOA content and making required amendments.

² NEOS sites are VLBI sites specifically run by NASA Goddard and for the purpose of generating operational VLBI (and VGOS) products, such as, but not limited to, KPGO, GGAO, and Fortaleza.)

The planned major milestones for the activities defined in the Responsibilities Article are as follows:

1. Daily exchange of analyzed Intensive VLBI data for Earth Orientation Parameters.
2. Weekly exchange of analyzed Rapid VLBI data for Earth Orientation Parameters.

ARTICLE 5. FINANCIAL OBLIGATIONS

There will be no transfer of funds between the Parties under this Agreement and each Party will fund its own participation. All activities under or pursuant to this Agreement are subject to the availability of funds, and no provision of this Agreement shall be interpreted to require obligation or payment of funds in violation of the Anti-Deficiency Act (31 U.S.C. § 1341). To the extent that any transfer of funds is required, such as to provide NASA support services to the USNO on a reimbursable basis, the transfer will be implemented through a separate reimbursable instrument Interagency Agreement.

ARTICLE 6. PRIORITY OF USE

Any schedule or milestone in this MOA is estimated based upon the Parties' current understanding of the projected availability of its respective goods, services, facilities, or equipment. In the event that either Party's projected availability changes, NASA or USNO, respectively, shall be given reasonable notice of that change, so that the schedule and milestones may be adjusted accordingly. The Parties agree that NASA's and USNO's use of its own goods, services, facilities, or equipment shall have priority over the use planned in this MOA.

ARTICLE 7. LIABILITY

Each Party agrees to assume liability for its own risks arising from or related to activities conducted under this MOA.

ARTICLE 8. INTELLECTUAL PROPERTY RIGHTS - DATA RIGHTS

NASA and USNO agree that the information and data exchanged in furtherance of the activities under this MOA will be exchanged without use and disclosure restrictions unless required by national security regulations (e.g., classified information) or as otherwise provided in this MOA or agreed to by NASA and USNO for specifically identified information or data (e.g., information or data specifically marked with a restrictive notice).

ARTICLE 9. INTELLECTUAL PROPERTY RIGHTS - HANDLING OF DATA

A. In the performance of this Agreement, NASA or USNO (as "Disclosing Party") may provide the other Party (as "Receiving Party") with:

1. data of third parties that the Disclosing Party has agreed to handle under protective arrangements or is required to protect under the Trade Secrets Act (18 U.S.C. § 1905) ("Third Party Proprietary Data"), or

2. Government data, including software, the use and dissemination of which, the Disclosing Party intends to control (“Controlled Government Data”).

B. All Third Party Proprietary Data and Controlled Government Data provided by Disclosing Party to Receiving Party shall be marked by Disclosing Party with a restrictive notice and protected by Receiving Party in accordance with this Article.

C. Disclosing Party provides the following Data to Receiving Party. The lists below may not be comprehensive, are subject to change, and do not supersede any restrictive notice on the Data.

1. Third Party Proprietary Data: The Disclosing Party’s Third Party Proprietary Data, if any, will be identified in a separate technical document.

2. Controlled Government Data: The Disclosing Party’s Controlled Government Data, if any, will be identified in a separate technical document.

3. NASA software and related Data will be provided to Partner under a separate Software Usage Agreement (SUA). USNO shall use and protect the related data in accordance with this Article: None

D. For such Data identified with a restrictive notice pursuant to paragraph B of this Article, including Data identified in an accompanying funding document, Receiving Party shall:

1. Use, disclose, or reproduce such Data only as necessary under this Agreement;

2. Safeguard such Data from unauthorized use and disclosure;

3. Allow access to such Data only to its employees and any Related Entity requiring access under this Agreement;

4. Except as otherwise indicated in D.3., preclude disclosure outside Receiving Party’s organization;

5. Notify its employees with access about their obligations under this Article and ensure their compliance, and notify any Related Entity with access about their obligations under this Article; and

6. Dispose of such Data as Disclosing Party directs.

E. If the Parties exchange Data having a notice deemed ambiguous or unauthorized by the receiving Party, it should tell the providing Party. If the notice indicates a restriction, the receiving Party must protect the Data under this Article unless otherwise directed in writing by the providing Party.

F. Notwithstanding any restrictions provided in this Article, the Parties are not restricted in the use, disclosure, or reproduction of Data provided under this Agreement that is:

1. known or available from other sources without restriction;

2. known, possessed, or developed independently, and without reference to the Proprietary Data;

3. made available by the owners to others without restriction; or

4. required by law or court order to be disclosed.

If a Party believes that any exceptions apply, it shall notify the other Party before any unrestricted use, disclosure, or reproduction of the Data.

ARTICLE 10. INTELLECTUAL PROPERTY RIGHTS - INVENTION AND PATENT RIGHTS

Unless otherwise agreed upon by NASA and USNO, custody and administration of inventions made (conceived or first actually reduced to practice) under this MOA will remain with the respective inventing Party. In the event an invention is made jointly by employees of the Parties (including by employees of a Party's contractors or subcontractors for which the U.S. Government has ownership), the Parties will consult and agree as to future actions toward establishment of patent protection for the invention.

ARTICLE 11. RELEASE OF GENERAL INFORMATION TO THE PUBLIC AND MEDIA

NASA or USNO may, consistent with Federal law and this Agreement, release general information regarding its own participation in this MOA as desired. Insofar as participation of the other Party in this MOA is included in a public release, NASA and USNO will seek to consult with each other prior to any such release, consistent with the Parties' respective policies. Pursuant to Section 841(d) of the NASA Transition Authorization Act of 2017, Public Law 115-10 (the "NTAA"), NASA is obligated to publicly disclose copies of all agreements conducted pursuant to NASA's 51 U.S.C. §20113(e) authority in a searchable format on the NASA website within 60 days after the agreement is signed by the Parties. The Parties acknowledge that, if this MOA is entered into pursuant to NASA's 51 U.S.C. §20113(e) authority, this MOA will be disclosed, without redaction, in accordance with the NTAA.

ARTICLE 12. TERM OF AGREEMENT

This MOA becomes effective upon the date of the last signature below ("Effective Date") and shall remain in effect for five (5) years, with two (2), five (5) year options, , exercised thru an amendment signed by both Partners and prior to the MOA end date, or until the completion of all obligations of both Parties hereto, whichever comes first.

ARTICLE 13. RIGHT TO TERMINATE

Either Party may unilaterally terminate this Agreement by providing one hundred eighty (180) calendar days written notice to the other Party.

ARTICLE 14. CONTINUING OBLIGATIONS

The rights and obligations of the Parties that, by their nature, would continue beyond the expiration or termination of this Agreement, e.g., "Liability and Risk of Loss" and "Intellectual Property Rights" and related clauses ["Financial Obligations" if reimbursable] shall survive such expiration or termination of this Agreement.

ARTICLE 15. POINTS OF CONTACT

The following personnel are designated as the Points of Contact between the Parties in the performance of this Agreement.

Management Points of Contact:

NASA

Dr. Stephen Merkowitz
Project Manager, Space Geodesy Project
NASA/GSFC
Code:61A
Greenbelt, MD 20771
Phone: 301.286.9412
Email: Stephen.m.merkowitz@nasa.gov

USNO

CAPT Hartwell F. Coke, USN
Superintendent
3450 Massachusetts Ave NW
Washington DC 20392
Phone: 202.762.1538
Email:
Hartwell.f.coke2.mil@us.navy.mil

Technical Points of Contact:

NASA

Dr. Frank Lemoine
Space Geodesy Project Scientist
NASA/GSFC
Code:61A
Greenbelt, MD 20771
Phone: 301.614.6109
Email: frank.g.lemoine@nasa.gov

USNO

Mr. Nicholas Stamatakos
Head, Earth Orientation Department
3450 Massachusetts Ave NW
Washington, DC 20392
Phone: 202.762.1444
Email:
Nicholas.g.stamatakos.civ@us.navy.mil

ARTICLE 16. DISPUTE RESOLUTION

All disputes concerning questions of fact or law arising under this MOA shall be referred by the claimant in writing to the appropriate person identified in this MOA as the “Points of Contact.” The persons identified as the “Points of Contact” for NASA and USNO will consult and attempt to resolve all issues arising from the implementation of this MOA. If they are unable to come to agreement on any issue, the dispute will be referred to the signatories to this MOA, or their designees, for joint resolution after the Parties have separately documented in writing clear reasons for the dispute. As applicable, disputes will be resolved pursuant to The Department of the Treasury’s Intragovernmental Transaction Guide (Treasury Financial Manual, Vol. 1, Chapter 2, Part 4700, Appendix 10 (hereinafter, the “Intragovernmental Transaction Guide”)).

ARTICLE 17. MODIFICATIONS

Any modification to this MOA shall be executed, in writing, and signed by an authorized representative of NASA and the USNO.

ARTICLE 18. APPLICABLE LAW

U.S. Federal law governs this IAA for all purposes, including, but not limited to, determining the

validity of the IAA, the meaning of its provisions, and the rights, obligations and remedies of the Parties.

ARTICLE 19. LOAN OF GOVERNMENT PROPERTY

The parties shall enter into a NASA Form 893, Loan of NASA Equipment, for NASA equipment loaned to Partner.

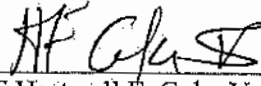
ARTICLE 20. SIGNATORY AUTHORITY

Approved and authorized on behalf of each Party by:

NATIONAL AERONAUTICS AND SPACE
ADMINISTRATION
GODDARD SPACE FLIGHT CENTER

UNITED STATES NAVY
UNITED STATES NAVAL
OBSERVATORY

BY: _____
Makenzie B. Lystrup, GSFC Center Director

BY: 
CAPT Hartwell E. Coke V, USN
Superintendent

DATE: _____

DATE: 29 AUG 2023