

NONREIMBURSABLE INTERAGENCY AGREEMENT
BETWEEN
THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
GLENN RESEARCH CENTER
AND
UNITED STATES DEPARTMENT OF THE NAVY
NAVAL INFORMATION WARFARE CENTER ATLANTIC
FOR
QUANTUM INFORMATION SCIENCE COLLABORATION

SERIAL NUMBER: 071-24-030

ARTICLE 1. AUTHORITY AND PARTIES

The National Aeronautics and Space Administration Glenn Research Center, located at 21000 Brookpark Road, Cleveland, OH 44135 (hereinafter referred to as "NASA" or "NASA GRC") enters this Interagency Agreement (hereinafter referred to as "IAA") in accordance with 51 U.S.C. § 20113(e). United States Department of the Navy, Naval Information Warfare Center (NIWC) Atlantic, located at 1 Innovation Drive, Hanahan, SC 29410-4200 (hereinafter referred to as "Partner" or "NIWC Atlantic"), enters this IAA in accordance with Space Act, Other Transactions Authority (OTA), 51 U.S.C. § 20113(e). NASA and NIWC Atlantic may be individually referred to as a "Party" and collectively referred to as the "Parties."

ARTICLE 2. PURPOSE

This Agreement will be for the joint benefit of NASA and NIWC Atlantic, in their quantum metrology practices, to establish characterization of broadband quantum entanglement sources for quantum range-finding applications. This activity will benefit NASA by expanding laboratory capability to characterize broadband spontaneous parametric down conversion sources, that will be used for quantum sensing applications. This capability will provide additional opportunity for GRC to participate with quantum sensor network teams and projects as they continue to develop nationally. Supporting quantum sensing technology maturation is directly aligned with the recommendations found within NASA's Independent Panel Report for Technical Assessment of NASA and External Quantum Sensing Capabilities. This activity will benefit NIWC Atlantic by providing a quantum metrology infrastructure, along with an expert staff, to support characterization of entanglement sources that are key to furthering work within the LightTouch Project.

ARTICLE 3. RESPONSIBILITIES

A. NASA will use reasonable efforts to:

1. Provide training to NIWC Atlantic staff on the test and safety procedures while working in the NASA Quantum Metrology Laboratory.

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2. Work collaboratively with NIWC Atlantic staff to calibrate joint spectral intensity hardware. Specifically, calibrate optical fiber and monochromator to meet requirements for testing.
3. Develop code for performing joint spectral intensity measurements for compatibility with NIWC Atlantic quantum sources.
4. Work collaboratively with NIWC Atlantic staff to perform quantum metrology of NIWC Atlantic entanglement sources. Metrologies of interest include joint spectral intensity and coincidence measurements.
5. Write, edit, or provide consultation in the documentation of results from quantum metrology measurements.

B. NIWC Atlantic will use reasonable efforts to:

1. Provide NASA with necessary specifications and operating conditions for the quantum sources of interest in preparation of metrological services.
2. NIWC Atlantic staff will assist in code development for running optical fiber calibration, joint spectral intensity, and coincidence measurements within the NASA Quantum Metrology Laboratory. Additionally, NIWC Atlantic will observe and assist while experiments are taking place for a period up to ten (10) weeks.
3. Provide entanglement sources, and relevant associated hardware, for test within the NASA Quantum Metrology Laboratory for the term of the agreement as stated in Article 11.
4. Work collaboratively with NASA staff in the (1) calibration of metrology hardware, (2) code for performing joint spectral intensity measurements, and (3) performance of metrology.
5. Write, edit, or provide consultation in the documentation of results from quantum metrology measurements.

ARTICLE 4. SCHEDULE AND MILESTONES

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

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| 1. NASA will train NIWC Atlantic staff regarding quantum metrology setups within the NASA Quantum Metrology Laboratory. | On or about 9/30/2024 |
| 2. NIWC Atlantic and NASA will work together to calibrate the optical fiber that will be utilized for joint spectral intensity measurements. | On or about 10/31/2024 |
| 3. NIWC Atlantic and NASA will jointly create software for performing joint spectral intensity measurements of | On or about 1/31/2025 |

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broadband entanglement sources.

4. NIWC Atlantic will send NASA quantum sources and associated hardware prior to joint measurements within the Quantum Metrology Laboratory. These items may either be shipped or hand-carried to NASA. On or about 3/30/2025
5. NIWC Atlantic and NASA will jointly perform joint spectral intensity and coincidence measurements on entanglement sources of interest On or about 4/30/2025
6. Creation of document (i.e., conference paper, journal article, presentation, etc.) on findings from this study. On or about 8/31/2025

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 will be interpreted to require obligation or payment of funds in violation of the Anti-Deficiency Act (31 U.S.C. § 1341).

ARTICLE 6. PRIORITY OF USE

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

ARTICLE 7. LIABILITY

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

ARTICLE 8. INTELLECTUAL PROPERTY RIGHTS - DATA RIGHTS

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

ARTICLE 9. INTELLECTUAL PROPERTY RIGHTS - INVENTION AND PATENT RIGHTS

Unless otherwise agreed upon by NASA and NIWC Atlantic, custody and administration of inventions made (conceived or first actually reduced to practice) under this IAA 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 10. RELEASE OF GENERAL INFORMATION TO THE PUBLIC AND MEDIA

NASA or NIWC Atlantic may, consistent with Federal law and this Agreement, release general information regarding its own participation in this IAA as desired. Insofar as participation of the other Party in this IAA is included in a public release, NASA and NIWC Atlantic 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 IAA is entered into pursuant to NASA's 51 U.S.C. §20113(e) authority, this IAA will be disclosed, without redaction, in accordance with the NTAA.

ARTICLE 11. TERM OF AGREEMENT

This IAA becomes effective upon the date of the last signature below ("Effective Date") and will remain in effect until the completion of all obligations of both Parties hereto, or 1 year from the effective date, whichever comes first.

ARTICLE 12. RIGHT TO TERMINATE

Either Party may unilaterally terminate this Agreement by providing 30 calendar days written notice to the other Party.

ARTICLE 13. 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] will survive such expiration or termination of this Agreement.

ARTICLE 14. POINTS OF CONTACT

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

IAA QUANTUM INFORMATION SCIENCE COLLABORATION

Management Points of Contact:

NASA

Felix A. Miranda, Ph.D.
Deputy Chief, Communications and
Intelligent System
Mail Stop: 54-4
21000 Brookpark Road
Cleveland, OH 44135
Phone: (216) 433-6589
felix.a.miranda@nasa.gov

United States Department of the Navy
Naval Information Warfare Center Atlantic
Robert Regal
Forecasting, Assessment and Transition
1 Innovation Drive
Hanahan, SC 29410-4200
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Technical Points of Contact:

NASA

Evan J. Katz, Ph.D.
Research AST, Telecommunications
Mail Suite: 77-1
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Phone: (843) 218-3999
ryan.l.wilmington2.civ@us.navy.mil

ARTICLE 15. DISPUTE RESOLUTION

All disputes concerning questions of fact or law arising under this IAA will be referred by the claimant in writing to the appropriate person identified in this IAA as the "Points of Contact." The persons identified as the "Points of Contact" for NASA and NIWC Atlantic will consult and attempt to resolve all issues arising from the implementation of this IAA. If they are unable to come to agreement on any issue, the dispute will be referred to the signatories to this IAA, 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 16. MODIFICATIONS

Any modification to this IAA will be executed, in writing, and signed by an authorized representative of NASA and the NIWC Atlantic.

ARTICLE 17. 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 18. LOAN OF GOVERNMENT PROPERTY

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

ARTICLE 19. SIGNATORY AUTHORITY

Approved and authorized on behalf of each Party by:

NATIONAL AERONAUTICS AND
SPACE ADMINISTRATION
GLENN RESEARCH CENTER

UNITED STATES DEPARTMENT OF
THE NAVY, NAVAL INFORMATION
WARFARE CENTER ATLANTIC

BY: _____
W. ALLEN KILGORE
Acting Director of Aeronautics

BY: _____
M. R. O'NEAL
Captain, U.S. Navy, Commanding Officer

DATE: _____

DATE: 19 July 2024