

**REIMBURSABLE SPACE ACT AGREEMENT  
BETWEEN  
THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
AMES RESEARCH CENTER  
AND  
GOOGLE LLC  
FOR  
CALIBRATION AND NOISE CHARACTERIZATION APPROACHES FOR  
QUANTUM HARDWARE**

**ARTICLE 1. AUTHORITY AND PARTIES**

In accordance with the National Aeronautics and Space Act (51 U.S.C. § 20113(e)), this Reimbursable Space Act Agreement (the “Agreement”) is entered into by the National Aeronautics and Space Administration Ames Research Center, located at Moffett Field, CA 94035 (hereinafter referred to as "NASA" or "NASA ARC") and Google LLC located at 1600 Amphitheatre Parkway, Mountain View, CA 94043-1351 (hereinafter referred to as "Partner" or "Google"). NASA and Partner may be individually referred to as a "Party" and collectively referred to as the "Parties.”

**ARTICLE 2. PURPOSE**

Under this Agreement, the NASA ARC Quantum Artificial Intelligence Laboratory (QuAIL) team will develop noise models, calibration, tuning, and error mitigation techniques, and simulation approaches for realistic noise experienced by Google’s quantum hardware. The noise modeling includes, but is not limited to, 1/f noise, leakage, cross talk, and decoherence. These noise models would be generally relevant to quantum gates and structured quantum circuits being investigated by Google for its current and future Google hardware and architectures, including a surface code architecture. The work includes analytical and numerical investigation. The simulation work aims to aid in deepening understanding of the noise faced by hardware, enable faster and more effective calibration, tuning and error mitigation, and generally improve performance. Google will work closely with NASA, guiding the research and validating the approaches explored, analyzed, and developed by the NASA ARC QuAIL team.

**ARTICLE 3. RESPONSIBILITIES**

A. NASA ARC will use reasonable efforts to:

1. Improve physics-based models for surface code implemented on superconducting qubit devices. Assist Google in validating the models.
2. Study the effects of noise and decoherence on structured quantum circuits. Work with Google to validate this study.
3. Contribute to a paper describing the results of the joint theoretical and numerical analysis of leakage in error correction relevant to Google's quantum processors
4. Develop numerical methods for more sophisticated noise modeling relevant to Google's quantum processors



5. Add code instantiating more sophisticated noise modeling to the jointly developed simulation code
6. Advance approximate models for simulating of error correction, building on prior joint work on large scale analysis of scrambling circuits and theory of rare events, effects of approximations on correlation, and instantiate into code
7. Simulate error mitigation techniques, such as dynamical decoupling, in conjunction with error correcting codes, and analyze results against noise model relevant to Google's processors
8. Contribute to papers on the theory and modeling of noise induced errors in superconducting devices, on calibration, tuning, or error mitigation in superconducting devices, and on techniques for simulating quantum processing on superconducting hardware under noise.

B. Partner will use reasonable efforts to:

1. Support NASA in validating the physics-based models for surface code implemented on superconducting qubit devices.
2. Work with NASA to validate the Study on the effects of noise and decoherence on structured quantum circuits.
3. Contribute to a paper describing the results of the joint theoretical and numerical analysis of leakage in error correction relevant to Google's quantum processors.
4. Support NASA in numerical methods for a more sophisticated noise modeling relevant to Google's quantum processors.
5. Add code instantiating more sophisticated noise modeling to the jointly developed simulation code.
6. Support NASA in advanced models for simulating error correction.
7. Work with NASA to validate the study of error mitigation techniques.
8. Contribute to papers on the theory and modeling of noise induced errors in superconducting devices, on calibration, tuning, or error mitigation in superconducting devices, and on techniques for simulating quantum processing on superconducting hardware under noise.

#### ARTICLE 4. SCHEDULE AND MILESTONES

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

Milestones	Estimated Completion Date
Develop numerical methods for more sophisticated noise modeling relevant to Google's quantum processors (NASA and Google)	March 2023
Complete a paper describing the theory and modeling of leakage in error correction (Google and NASA)	April 2023
Add code instantiating more sophisticated noise modeling to the jointly developed simulation code (NASA and Google)	June 2023



Simulate an error mitigation technique, such as dynamical decoupling, in conjunction with error correcting codes, and analyze results against noise model relevant to Google's processors (NASA)	September 2023
Complete a paper describing the theory and modeling of noise (Google and NASA)	December 2023
Develop numerical methods for yet more sophisticated noise modeling relevant to Google's quantum processors (NASA)	March 2024
Add code instantiating more sophisticated noise modeling to the jointly developed simulation code (NASA and Google)	May 2023
Simulate an error mitigation technique, such as dynamical decoupling, in conjunction with error correcting codes, and analyze results against noise model relevant to Google's processors (NASA)	September 2024
Complete a paper describing the results of the joint theoretical and numerical analysis in error correction relevant to Google's quantum processors (Google and NASA)	December 2024
Develop numerical methods for yet more sophisticated noise modeling relevant to Google's quantum processors (NASA)	March 2025
Add code instantiating more sophisticated noise modeling to the jointly developed simulation code (NASA and Google)	May 2025
Simulate error mitigated quantum computation appropriate for Google's hardware (NASA)	September 2025
Complete a paper describing error-mitigated quantum computation appropriate for Google's hardware (Google and NASA)	December 2025

**ARTICLE 5. FINANCIAL OBLIGATIONS**

A. Partner agrees to reimburse NASA an estimated cost of \$900,000 for NASA to carry out its responsibilities under this Agreement. Google agrees to pay NASA invoiced amounts as specified in the table below. These scheduled payment amounts are estimates. Should the costs exceed the estimate, NASA will notify Partner as outlined in paragraph C of this Article 5. In no event will NASA transfer any U.S. Government funds to Partner under this Agreement. Payment must be made by Partner in advance of initiation of NASA's efforts on behalf of the Partner.

<b>Payment Schedule</b>	<b>Date of Invoicing by NASA and Payment by Google</b>	<b>Amount</b>
First payment	Upon Google's issuance of Purchase Order to NASA	\$225,000
Second payment	Effective Date + 6 months, or July 30, 2023, whichever is earlier.	\$75,000
Third payment	Effective Date + 12 months, or January 30, 2024, whichever is	\$225,000



	earlier.	
Fourth payment	Effective Date + 18 months, or July 30, 2024, whichever is earlier.	\$75,000
Fifth payment	Effective Date + 24 months, or January 30, 2025, whichever is earlier.	\$225,000
Sixth payment	Effective Date + 30 months, or July 30, 2025, whichever is earlier.	\$75,000

- B. Payment shall be payable to the National Aeronautics and Space Administration through the NASA Shared Services Center (NSSC) (choose one form of payment): (1) U.S. Treasury FEDWIRE Deposit System, Federal Reserve Wire Network Deposit System; (2) pay.gov at <https://paygov.nssc.nasa.gov/> and select the appropriate NASA Center for the agreement from the drop down; or (3) check. A check should be payable to NASA and sent to: NASA Shared Services Center FMD – Accounts Receivable For the Accounts of: Ames Research Center Building 1111, Jerry Hlass Rd., Stennis Space Center, MS 39529. Payment by electronic transfer (#1 or #2, above), is strongly encouraged, and payment by check is to be used only if circumstances preclude the use of electronic transfer. All payments and other communications regarding this Agreement shall reference the Center name, title, date, and number of this Agreement.
- C. NASA will use reasonable efforts to provide monthly statements to Google that summarize expenses incurred. NASA will not provide services or incur costs beyond the existing payment. Although NASA has made a good faith effort to accurately estimate its costs, it is understood that NASA provides no assurance that the proposed effort under this Agreement will be accomplished for the above estimated amount. Should the effort cost more than the estimate, Partner will be advised by NASA as soon as possible. Partner shall pay all costs incurred and has the option of canceling the remaining effort, or providing additional funding in order to continue the proposed effort under the revised estimate. Should this Agreement be terminated, or the effort completed at a cost less than the agreed-to estimated cost, NASA shall account for any unspent funds within one (1) year after completion of all effort under this Agreement, and promptly thereafter return any unspent funds to Partner. Return of unspent funds will be processed via Electronic Funds Transfer (EFT) in accordance with 31 C.F.R. Part 208 and, upon request by NASA, Partner agrees to complete the Automated Clearing House (ACH) Vendor/Miscellaneous Payment Enrollment Form (SF 3881).
- D. Notwithstanding any other provision of this Agreement, 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).

ARTICLE 6. PRIORITY OF USE



Any schedule or milestone in this Agreement is estimated based upon the Parties' current understanding of the projected availability of NASA goods, services, facilities, or equipment. In the event that NASA's projected availability changes, Partner shall be given reasonable notice of that change, so that the schedule and milestones may be adjusted accordingly. The Parties agree that NASA's use of the goods, services, facilities, or equipment shall have priority over the use planned in this Agreement. Should a conflict arise, NASA in its sole discretion shall determine whether to exercise that priority. Likewise, should a conflict arise as between two or more non-NASA Partners, NASA, in its sole discretion, shall determine the priority as between those Partners. This Agreement does not obligate NASA to seek alternative government property or services under the jurisdiction of NASA at other locations.

#### ARTICLE 7. NONEXCLUSIVITY

This Agreement is not exclusive; accordingly, NASA may enter into similar agreements for the same or similar purpose with other private or public entities.

#### ARTICLE 8. LIABILITY

- A. Partner hereby waives any claims against NASA or one or more of its Related Entities for any injury to, or death of, Partner or one or more of its Related Entities, or for damage to, or loss of, Partner's property or the property of its Related Entities, arising from or related to activities conducted under this Agreement, whether such injury, death, damage, or loss arises through negligence or otherwise, except in the case of willful misconduct. For purposes of this Agreement, "Related Entities" shall mean contractors and subcontractors of a Party at any tier; grantees, investigators, customers, and users of a Party at any tier and their contractors or subcontractor at any tier; or, employees of the Party or any of the foregoing.
- B. Partner further agrees to extend this unilateral waiver to its Related Entities by requiring them, by contract or otherwise, to waive all claims against NASA and its Related Entities for injury, death, damage, or loss arising from or related to activities conducted under this Agreement. In the event the U.S. Government incurs any liability based upon Partner's failure to provide for the waiver by Partner's Related Entities set out above, Partner agrees to indemnify and hold the U.S. Government harmless against such liability, including costs and expenses incurred by the U.S. Government in defending against any suit or claim for liability by Partner's Related Entities.
- C. In the event U.S. Government property is damaged as a result of activities conducted under this Agreement for the primary benefit of Partner, except in the case of gross negligence or willful misconduct by NASA, Partner shall be solely responsible for the repair and restoration of such property subject to NASA direction.
- D. Notwithstanding the other provisions of this Article, the waiver of liability set forth in this section shall not be applicable to:
  - i. Claims between Partner and its own Related Entity or between its own Related Entities;



- ii. Claims made by a natural person, his/her estate, survivors, or anyone claiming by or through him/her (except when such person or entity is a Party to this Agreement or is otherwise bound by the terms of this waiver) for bodily injury to, or other impairment of health of, or death of, such person;
- iii. Claims for damage caused by willful misconduct;
- iv. Intellectual property claims;
- v. Claims for damage resulting from a failure of Partner to extend the waiver of liability to its Related Entities, pursuant to paragraph B of this Article; or
- vi. Claims by Partner arising out of or relating to NASA's failure to perform its obligations under this Agreement.

## ARTICLE 9. INTELLECTUAL PROPERTY RIGHTS - DATA RIGHTS

### A. General

- 1. "Related Entity" as used in this Data Rights Article means a contractor, subcontractor, grantee, or other entity having a legal relationship with NASA or Partner that is assigned, tasked, or contracted to perform activities under this Agreement.
- 2. "Data" means recorded information, regardless of form, the media on which it is recorded, or the method of recording.
- 3. "Proprietary Data" means Data embodying trade secrets developed at private expense or commercial or financial information that is privileged or confidential, and that includes a restrictive notice, unless the Data is:
  - a. known or available from other sources without restriction;
  - b. known, possessed, or developed independently, and without reference to the Proprietary Data;
  - c. made available by the owners to others without restriction; or
  - d. required by law or court order to be disclosed.
- 4. Data exchanged under this Agreement is exchanged without restriction except as otherwise provided herein.
- 5. 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 meets one of the exceptions in 3., above. If a Party believes that any exceptions apply, it shall notify the other Party before any unrestricted use, disclosure, or reproduction of the Data.
- 6. The Parties will not exchange preexisting Proprietary Data under this Agreement unless authorized herein or in writing by the owner.
- 7. If the Parties exchange Data having a notice that the Receiving Party deems is ambiguous or unauthorized, the Receiving Party shall tell the Providing Party. If the notice indicates a restriction, the Receiving Party shall protect the Data under this Article unless otherwise directed in writing by the Providing Party.
- 8. The Data rights herein apply to the employees and Related Entities of Partner. Partner shall ensure that its employees and Related Entity employees know about and are bound by the obligations under this Article.





9. Disclaimer of Liability: NASA is not restricted in, or liable for, the use, disclosure, or reproduction of Data without a restrictive notice or for Data Partner gives, or is required to give, the U.S. Government without restriction.
10. Partner may use the following or a similar restrictive notice:

**Proprietary Data Notice**

The data herein include Proprietary Data and are restricted under the Data Rights provisions of Space Act Agreement SAA2-403706.

Where feasible, Partner should also mark each page containing Proprietary Data with the following or a similar legend: **“Proprietary Data – Use And Disclose Only Under the Notice on the Title or Cover Page.”** Where not feasible, Partner should mark Proprietary Data with a marking that reflects its proprietary status when used or transmitted.

**B. Data First Produced by Partner Under this Agreement**

If Data first produced by Partner or its Related Entities under this Agreement is given to NASA, and the Data is Proprietary Data, and it includes a restrictive notice, NASA will use reasonable efforts to protect it. The Data will be disclosed and used (under suitable protective conditions) only for U.S. Government purposes.

**C. Data First Produced by NASA Under this Agreement**

If Partner requests that Data first produced by NASA under this Agreement be protected, and NASA determines it would be Proprietary Data if obtained from Partner, NASA will mark it with a restrictive notice and use commercially reasonable efforts to protect it for one year after its development. During this restricted period the Data may be disclosed and used (under suitable protective conditions) for U.S. Government purposes only, and thereafter for any purpose. Partner must not disclose the Data without NASA’s written approval during the restricted period. The restrictions placed on NASA do not apply to Data disclosing a NASA owned invention for which patent protection is being considered.

**D. Publication of Results**

The National Aeronautics and Space Act (51 U.S.C. § 20112) requires NASA to provide for the widest practicable and appropriate dissemination of information concerning its activities and the results thereof. As such, NASA may publish unclassified and non-Proprietary Data resulting from work performed under this Agreement. The Parties will coordinate publication of results allowing a reasonable time to review and comment.

**E. Data Disclosing an Invention**

If the Parties exchange Data disclosing an invention for which patent protection is being considered, and the furnishing Party identifies the Data as such when providing it to the



Receiving Party, the Receiving Party shall withhold it from public disclosure for a reasonable time (one (1) year unless otherwise agreed or the Data is restricted for a longer period herein).

#### F. Copyright

Data exchanged with a copyright notice and with no restrictive notice is presumed to be published. The following royalty-free licenses apply:

1. If indicated on the Data that it was produced outside of this Agreement, it may be reproduced, distributed, and used to prepare derivative works only for carrying out the Receiving Party's responsibilities under this Agreement.
2. Data without the indication of F.1. is presumed to be first produced under this Agreement. Except as otherwise provided in paragraph E. of this Article, and in the Invention and Patent Rights Article of this Agreement for protection of reported inventions, the Data may be reproduced, distributed, and used to prepare derivative works for any purpose.
3. Under the earlier, related Reimbursable Space Act Agreement between NASA and Partner (SAA No. SAA2-403706), a NASA Related Entity first produced with involvement from Partner a computer software code entitled "Noise modeling software for analysis, characterization, and calibration of quantum gates" (ARC-18817-1). For the code encompassed by ARC-18817-1, and to the extent code first produced under this Agreement is subject to copyright protection due to involvement of the NASA support service contractor who first produced the code encompassed by ARC-18817-1, NASA will use reasonable efforts to secure a copyright transfer assignment from such support service contractor. Upon any such rights being assigned to NASA, Partner will have rights to use, reproduce, distribute, and prepare derivative works of such code, including derivative works thereof authored by such support service contractor under this and the prior Agreement, for any purpose.

#### G. Data Subject to Export Control

Whether or not marked, technical data subject to the export laws and regulations of the United States provided to Partner under this Agreement must not be given to foreign persons or transmitted outside the United States without proper U.S. Government authorization. As necessary, the Parties will cooperate in determining the applicable export classification for any technical data provided by NASA to Partner under this Agreement.

#### H. Handling of Background, Third Party Proprietary, and Controlled Government Data

1. NASA or Partner (as Disclosing Party) may provide the other Party or its Related Entities (as Receiving Party):
  - a. Proprietary Data developed at Disclosing Party's expense outside of this Agreement (referred to as Background Data);
  - b. Proprietary Data of third parties that Disclosing Party has agreed to protect or is required to protect under the Trade Secrets Act (18 U.S.C. § 1905) (referred to as Third Party Proprietary Data); and
  - c. U.S. Government Data, including software and related Data, Disclosing Party intends to control (referred to as Controlled Government Data).





2. All Background, Third Party Proprietary 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.
3. Disclosing Party provides the following Data to the Receiving Party. The lists below may not be comprehensive, are subject to change, and do not supersede any restrictive notice on the Data.
  - a. Background Data: The Disclosing Party's Background Data, if any, will be identified in a separate technical document. For clarity, Data associated with Partner's superconducting quantum computing hardware and related software that includes a proprietary notice are considered Google's Background Data.
  - b. Third Party Proprietary Data: The Disclosing Party's Third Party Proprietary Data, if any, will be identified in a separate technical document.
  - c. Controlled Government Data: The Disclosing Party's Controlled Government Data, if any, will be identified in a separate technical document.
  - d. Notwithstanding H.4., NASA software and related Data will be provided to Partner under a separate Software Usage Agreement (SUA). Partner shall use and protect the related Data in accordance with this Article. Unless the SUA authorizes retention, or Partner enters into a license under 37 C.F.R. Part 404, the related Data shall be disposed of as NASA directs.
4. For such Data identified with a restrictive notice pursuant to H.2. including such Data identified pursuant to this Article, the Receiving Party shall:
  - a. Use, disclose, or reproduce such Data only as necessary under this Agreement;
  - b. Safeguard such Data from unauthorized use and disclosure;
  - c. Allow access to such Data only to its employees and any Related Entity requiring access under this Agreement;
  - d. Except as otherwise indicated in 4.c., preclude disclosure outside Receiving Party's organization;
  - e. 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
  - f. Dispose of such Data as Disclosing Party directs.

#### I. Oral and visual information

If Partner discloses Proprietary Data orally or visually, NASA will have no duty to restrict, or liability for disclosure or use, unless Partner:

1. Orally informs NASA before initial disclosure that the Data is Proprietary Data, and
2. Reduces the Data to tangible form with a restrictive notice and gives it to NASA within ten (10) calendar days after disclosure.

### ARTICLE 10. INTELLECTUAL PROPERTY RIGHTS - INVENTION AND PATENT RIGHTS

#### A. General



1. NASA has determined that 51 U.S.C. § 20135(b) does not apply to this Agreement. Therefore, title to inventions made (conceived or first actually reduced to practice) under this Agreement remain with the respective inventing party(ies). No invention or patent rights are exchanged or granted under this Agreement, except as provided herein.
2. "Related Entity" as used in this Invention and Patent Rights Article means a contractor, subcontractor, grantee, or other entity having a legal relationship with NASA or Partner assigned, tasked, or contracted with to perform activities under this Agreement.
3. The invention and patent rights herein apply to employees and Related Entities of Partner. Partner shall ensure that its employees and Related Entity employees know about and are bound by the obligations under this Article.

#### B. NASA Inventions

NASA will use reasonable efforts to report inventions made under this Agreement by its employees. Upon request, NASA will use reasonable efforts to grant Partner, under 37 C.F.R. Part 404, a negotiated license to any NASA invention made under this Agreement. This license is subject to paragraph E.1. of this Article.

#### C. NASA Related Entity Inventions

NASA will use reasonable efforts to report inventions made under this Agreement by its Related Entity employees, or jointly between NASA and Related Entity employees, where NASA has the right to acquire title. Upon request, NASA will use reasonable efforts to grant Partner, under 37 C.F.R. Part 404, a negotiated license to any of these inventions where NASA has acquired title. This license is subject to paragraph E.2. of this Article.

#### D. Joint Inventions With Partner

The Parties will use reasonable efforts to report, and cooperate in obtaining patent protection on, inventions made jointly between NASA employees, Partner employees, and employees of either Party's Related Entities. Upon timely request, NASA may, at its sole discretion and subject to paragraph E. of this Article:

1. refrain from exercising its undivided interest inconsistently with Partner's commercial business; or
2. use reasonable efforts to grant Partner, under 37 C.F.R. Part 404, an exclusive or partially exclusive negotiated license.

#### E. Rights to be Reserved in Partner's License

Any license granted Partner under paragraphs B., C., or D. of this Article is subject to the following:

1. For inventions made solely or jointly by NASA employees, NASA reserves the irrevocable, royalty-free right of the U.S. Government to practice the invention or have it practiced on behalf of the United States or on behalf of any foreign



government or international organization pursuant to any existing or future treaty or agreement with the United States.

2. For inventions made solely or jointly by employees of a NASA Related Entity, NASA reserves the rights in 1. above, and a revocable, nonexclusive, royalty-free license retained by the Related Entity under 14 C.F.R. § 1245.108 or 37 C.F.R. § 401.14 (e).

#### F. Protection of Reported Inventions

For inventions reported under this Article, the Receiving Party shall withhold all invention reports or disclosures from public access for a reasonable time (1 year unless otherwise agreed or unless restricted longer herein) to facilitate establishment of patent rights.

#### G. Patent Filing Responsibilities and Costs

1. The invention and patent rights herein apply to any patent application or patents covering an invention made under this Agreement. Each Party is responsible for its own costs of obtaining and maintaining patents covering sole inventions of its employees. The Parties may agree otherwise, upon the reporting of any invention (sole or joint) or in any license granted.
2. Partner shall include the following in patent applications for an invention made jointly between NASA employees, its Related Entity employees and Partner employees: The invention described herein may be manufactured and used by or for the U.S. Government for U.S. Government purposes without the payment of royalties thereon or therefore.

#### H. Quantum Hardware

Google retains all right, title, and interest to its quantum hardware, which are and will continue to be the proprietary and confidential information of Google, its affiliates or licensors. During the Agreement Term, Google grants NASA a right to access and use its quantum hardware via the Google cloud API provided to NASA by Google for the activities described in Article 3. To the extent NASA-provided feedback related to the activities set forth in Article 3 (i.e., to Google's quantum hardware) that is produced and shared under this Agreement is disclosed without restrictions, contains no markings and is not subject to intellectual property protection, Google is free to use any such NASA-provided feedback that NASA produces and shares under this Agreement. In the unlikely event that such feedback is subject to intellectual property protection, upon request, NASA may consider either: 1) refraining from exercising its rights inconsistently with Partner's commercial business; or 2) using reasonable efforts to grant Partner, under 37 CFR Part 404, a negotiated license. The Parties agree that nothing in this paragraph alters the rights and obligations of the Parties under Articles 9 and 10 of this Agreement.

### ARTICLE 11. USE OF NASA NAME AND NASA EMBLEMS

#### A. NASA Name and Initials

Partner shall not use "National Aeronautics and Space Administration" or "NASA" in a way that



creates the impression that a product or service has the authorization, support, sponsorship, or endorsement of NASA, which does not, in fact, exist. Except for releases under the “Release of General Information to the Public and Media” Article, Partner must submit any proposed public use of the NASA name or initials (including press releases and all promotional and advertising use) to the NASA Associate Administrator for the Office of Communications or designee (“NASA Communications”) for review and approval. Approval by NASA Office of Communications shall be based on applicable law and policy governing the use of the NASA name and initials.

#### B. NASA Emblems

Use of NASA emblems (i.e., NASA Seal, NASA Insignia, NASA logotype, NASA Program Identifiers, and the NASA Flag) is governed by 14 C.F.R. Part 1221. Partner must submit any proposed use of the emblems to NASA Communications for review and approval.

### ARTICLE 12. RELEASE OF GENERAL INFORMATION TO THE PUBLIC AND MEDIA

NASA or Partner may, consistent with Federal law and this Agreement, release general information regarding its own participation in this Agreement as desired. 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 a copy of this Agreement will be disclosed, without redactions, in accordance with the NTAA.

### ARTICLE 13. DISCLAIMER OF WARRANTY

Goods, services, facilities, or equipment provided by NASA under this Agreement are provided “as is.” NASA makes no express or implied warranty as to the condition of any such goods, services, facilities, or equipment, or as to the condition of any research or information generated under this Agreement, or as to any products made or developed under or as a result of this Agreement including as a result of the use of information generated hereunder, or as to the merchantability or fitness for a particular purpose of such research, information, or resulting product, or that the goods, services, facilities or equipment provided will accomplish the intended results or are safe for any purpose including the intended purpose, or that any of the above will not interfere with privately-owned rights of others. Neither the government nor its contractors shall be liable for special, consequential or incidental damages attributed to such equipment, facilities, technical information, or services provided under this Agreement or such research, information, or resulting products made or developed under or as a result of this Agreement.

### ARTICLE 14. DISCLAIMER OF ENDORSEMENT

NASA does not endorse or sponsor any commercial product, service, or activity. NASA’s participation in this Agreement or provision of goods, services, facilities or equipment under this Agreement does not constitute endorsement by NASA. Partner agrees that nothing in this



Agreement will be construed to imply that NASA authorizes, supports, endorses, or sponsors any product or service of Partner resulting from activities conducted under this Agreement, regardless of the fact that such product or service may employ NASA-developed technology.

#### ARTICLE 15. COMPLIANCE WITH LAWS AND REGULATIONS

- A. The Parties shall comply with all applicable laws and regulations including, but not limited to, safety; security; export control; environmental; and suspension and debarment laws and regulations. Access by a Partner to NASA facilities or property, or to a NASA Information Technology (IT) system or application, is contingent upon compliance with NASA security and safety policies and guidelines including, but not limited to, standards on badging, credentials, and facility and IT system/application access, including use of Interconnection Security Agreements (ISAs), when applicable.
- B. With respect to any export control requirements:
1. The Parties will comply with all U.S. export control laws and regulations, including the International Traffic in Arms Regulations (ITAR), 22 C.F.R. Parts 120 through 130, and the Export Administration Regulations (EAR), 15 C.F.R. Parts 730 through 799, in performing work under this Agreement or any Annex to this Agreement. In the absence of available license exemptions or exceptions, the Partner shall be responsible for obtaining the appropriate licenses or other approvals, if required, for exports of hardware, technical data and software, or for the provision of technical assistance.
  2. The Partner shall be responsible for obtaining export licenses, if required, before utilizing foreign persons in the performance of work under this Agreement or any Annex under this Agreement, including instances where the work is to be performed on-site at NASA and where the foreign person will have access to export-controlled technical data or software.
  3. The Partner will be responsible for all regulatory record-keeping requirements associated with the use of licenses and license exemptions or exceptions.
  4. The Partner will be responsible for ensuring that the provisions of this Article apply to its Related Entities.
- C. With respect to suspension and debarment requirements:
1. The Partner hereby certifies, to the best of its knowledge and belief, that it has complied, and shall comply, with 2 C.F.R. Part 180, Subpart C, as supplemented by 2 C.F.R. Part 1880, Subpart C.
  2. The Partner shall include language and requirements equivalent to those set forth in subparagraph C.1., above, in any lower-tier covered transaction entered into under this Agreement.
- D. With respect to the requirements in Section 889 of the National Defense Authorization Act (NDAA) for Fiscal Year 2019, Public Law 115-232:
1. In performing this Agreement, Partner will not use, integrate with a NASA system, or procure with NASA funds (if applicable), “covered telecommunications equipment or services” (as defined in Section 889(f)(3) of the NDAA).



2. The Partner will ensure that the provisions of this Article apply to its Related Entities.

ARTICLE 16. TERM OF AGREEMENT

This Agreement becomes effective upon the date of the last signature below (“Effective Date”) and shall remain in effect until the completion of all obligations of both Parties hereto, or three years from the Effective Date, whichever comes first.

ARTICLE 17. RIGHT TO TERMINATE

Either Party may unilaterally terminate this Agreement by providing thirty (30) calendar days written notice to the other Party. In the event of such termination, Partner will be obligated to reimburse NASA for all costs for which the Partner was responsible and that have been incurred in support of this Agreement up to the date the termination notice is received by NASA. Where Partner terminates this Agreement, Partner will also be responsible for termination costs.

ARTICLE 18. 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”, “Intellectual Property Rights”-related clauses, and “Financial Obligations” shall survive such expiration or termination of this Agreement.

ARTICLE 19. 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 Ames Research Center  
Nahri Ahn  
Agreement Manager  
Moffett Field, CA 94035  
Phone: 650-604-1179  
[nahri.i.ahn@nasa.gov](mailto:nahri.i.ahn@nasa.gov)

Google LLC  
Jared Sisk  
1600 Amphitheatre Parkway  
Mountain View, CA 94043-1351  
Phone: 650-960-6354  
[jmsisk@google.com](mailto:jmsisk@google.com)

Technical Points of Contact

NASA Ames Research Center  
Eleanor Rieffel  
Senior Researcher  
Moffett Field, CA 94035  
Phone: 650-604-0019  
[eleanor.rieffel@nasa.gov](mailto:eleanor.rieffel@nasa.gov)

Google LLC  
Yu Chen  
1600 Amphitheatre Parkway  
Mountain View, CA 94043-1351  
[bryanchen@google.com](mailto:bryanchen@google.com)





## ARTICLE 20. DISPUTE RESOLUTION

Except as otherwise provided in the Article entitled “Priority of Use,” the Article entitled “Intellectual Property Rights – Invention and Patent Rights” (for those activities governed by 37 C.F.R. Part 404), and those situations where a pre-existing statutory or regulatory system exists (e.g., under the Freedom of Information Act, 5 U.S.C. § 552), all disputes concerning questions of fact or law arising under this Agreement shall be referred by the claimant in writing to the appropriate person identified in this Agreement as the “Points of Contact.” The persons identified as the “Points of Contact” for NASA and the Partner will consult and attempt to resolve all issues arising from the implementation of this Agreement. If they are unable to come to agreement on any issue, the dispute will be referred to the signatories to this Agreement, or their designees, for joint resolution. If the Parties remain unable to resolve the dispute, then the NASA signatory or that person’s designee, as applicable, will issue a written decision that will be the final agency decision for the purpose of judicial review. Nothing in this Article limits or prevents either Party from pursuing any other right or remedy available by law upon the issuance of the final agency decision.

## ARTICLE 21. MODIFICATIONS

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

## ARTICLE 22. ASSIGNMENT

Neither this Agreement nor any interest arising under it will be assigned by the Partner or NASA without the express written consent of the officials executing, or successors, or higher- level officials possessing original or delegated authority to execute this Agreement.

## ARTICLE 23. APPLICABLE LAW

U.S. Federal law governs this Agreement for all purposes, including, but not limited to, determining the validity of the Agreement, the meaning of its provisions, and the rights, obligations and remedies of the Parties.

## ARTICLE 24. INDEPENDENT RELATIONSHIP

This Agreement is not intended to constitute, create, give effect to or otherwise recognize a joint venture, partnership, or formal business organization, or agency agreement of any kind, and the rights and obligations of the Parties shall be only those expressly set forth herein.

## ARTICLE 25. LOAN OF GOVERNMENT PROPERTY

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



ARTICLE 26. SIGNATORY AUTHORITY

The signatories to this Agreement covenant and warrant that they have authority to execute this Agreement. By signing below, the undersigned agrees to the above terms and conditions.

**NATIONAL AERONAUTICS AND  
SPACE ADMINISTRATION  
AMES RESEARCH CENTER**

**GOOGLE LLC**

BY: \_\_\_\_\_  
NAME: Dr. Rupak Biswas

BY: \_\_\_\_\_  
NAME: Philipp Schindler

TITLE: Director of Exploration Technology

TITLE: SVP, Chief Business Officer

DATE: \_\_\_\_\_

DATE: \_\_\_\_\_

