ANNEX NO. 1
BETWEEN
THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
LANGLEY RESEARCH CENTER
AND
GEORGE MASON UNIVERSITY
UNDER SPACE ACT UMBRELLA AGREEMENT SAA1-38690
FOR
INTERATOMIC POTENTIAL DEVELOPMENT FOR ATOMISTIC SIMULATIONS

ARTICLE 1. PURPOSE

This Annex shall be for the purpose of developing computational software tools and algorithms needed to model and understand in detail the fundamental physical processes and properties of materials at the atomic scale including thermophysical behavior, mechanical deformation, and failure mechanisms.

All use of NASA LaRC's inventions, covered by the NASA case numbers specified in the separate technical document referenced in Article 5, is limited to Partner's responsibilities under this Annex. Any other use requires written permission from NASA LaRC and may require appropriate license agreement(s) with NASA and/or third parties. No such licenses are guaranteed."

The legal authority for this Annex, consistent with the Umbrella Agreement, is in accordance with the National Aeronautics and Space Act (51 U.S.C. § 20113(e)).

This Annex supports NASA's 2022 Strategic Plan and Strategic Objective 3.2 Drive Efficient and Sustainable Aviation.

ARTICLE 2. RESPONSIBILITIES

A. NASA LaRC will use reasonable efforts to:

1. Provide data to support development of novel computational methods for creating new interatomic potentials for understanding fundamental processes in materials in terms of theoretical formulation and its software implementation.
2. Implement and validate the developed novel or improved existing computational methods for creating new interatomic potentials for understanding fundamental processes in materials.
3. Perform high performance computing optimization of the software implementation.
4. Assist in report compilation, conference presentations, and journal articles.

B. Partner will use reasonable efforts to:

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1. Develop new and improve existing computational methods for creating interatomic potentials for understanding fundamental processes in materials in terms of theoretical formulation with software implementation.
2. Provide a complete description of the theoretical formulation and software code documentation where applicable.
3. Assist in and verify the correctness of the high performance computing optimization of the software implementation performed by NASA.
4. Assist in report compilation, conference presentations, and journal articles.

ARTICLE 3. SCHEDULE AND MILESTONES

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

NASA LaRC will provide data to Partner to support development of novel computational methods for creating new interatomic potentials in terms of a theoretical formulation with software implementation.	Within six (6) months after the start of the Annex
Partner shall develop new and improve existing computational methods for creating interatomic potentials for understanding fundamental processes in materials in terms of theoretical formulation with software implementation.	Within eighteen (18) months after the start of the Annex
Partner shall provide a complete description of the theoretical formulation and software code documentation where applicable.	Within thirty (30) months after the start of the Annex
NASA LaRC will implement and validate the developed novel or improved existing computational methods for creating new interatomic potentials for understanding fundamental processes in materials.	Within forty two (42) months after the start of the Annex
NASA LaRC will perform high performance computing optimization of the software implementation.	Within fifty four (54) months after the start of the Annex
Partner will provide verification of the correctness of the high performance computing optimization of the software implementation performed by NASA.	Within six (6) months after completion of milestone 6
NASA LaRC and Partner to collaborate on report compilation, conference presentations, and journal articles.	Ongoing throughout the period of performance

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ARTICLE 4. <u>FINANCIAL OBLIGATIONS</u>

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).

ARTICLE 5. <u>INTELLECTUAL PROPERTY RIGHTS - DATA RIGHTS</u>

A. Data produced under this Annex which is subject to paragraph C. of the Intellectual Property Rights - Data Rights Article of the Umbrella Agreement will be protected for the period of two (2) years.

B. Under paragraph H. of the Intellectual Property Rights - Data Rights Article of the Umbrella Agreement, 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 provided.
1. Background Data: *The Disclosing Party's Background Data, if any, will be identified in a separate technical document.*
2. Third Party Proprietary Data: *The Disclosing Party's Third Party Proprietary Data, if any, will be identified in a separate technical document.*
3. Controlled Government Data: *The Disclosing Party's Controlled Government Data, if any, will be identified in a separate technical document.*
4. The following software and related Data will be provided to Partner under a separate Software Usage Agreement: *The Disclosing Party's Controlled Government Data, if any, will be identified in a separate technical document.*

ARTICLE 6. <u>TERM OF ANNEX</u>

This Annex 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 five (5) years from the Effective Date, whichever comes first, unless such term exceeds the duration of the Umbrella Agreement. The term of this Annex shall not exceed the term of the Umbrella Agreement. The Annex automatically expires upon the expiration of the Umbrella Agreement.

ARTICLE 7. <u>RIGHT TO TERMINATE</u>

Either Party may unilaterally terminate this Annex by providing thirty (30) calendar days written notice to the other Party.

ARTICLE 8. <u>POINTS OF CONTACT</u>

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

Management Points of Contact

<u>NASA Langley Research Center</u>
Edward Glaessgen
Senior Researcher, Computational Materials
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Professor
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ARTICLE 9. <u>MODIFICATIONS</u>

Any modification to this Annex shall be executed, in writing, and signed by an authorized representative of NASA and the Partner. Modification of an Annex does not modify the terms of the Umbrella Agreement.

ARTICLE 10. <u>SIGNATORY AUTHORITY</u>

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

NATIONAL AERONAUTICS AND
SPACE ADMINISTRATION
LANGLEY RESEARCH CENTER

GEORGE MASON UNIVERSITY

DocuSigned by:
Michael Laskofski
058C8AFCD01C4D3...

BY:_____

BY:_____

John H. Koelling
Director, Aeronautics Research
Directorate

Michael Laskofski
Associate VP of Research Operations

4/10/2024

DATE:_____

DATE:_____