Program Announcement
PROtein SEquencing (PROSE)
Microsystems Technology Office

DARPA-PA-25-06
July 9, 2025

OVERVIEW INFORMATION:

- **Federal Agency Name:** Defense Advanced Research Projects Agency (DARPA), Microsystems Technology Office (MTO)
- **Funding Opportunity Title:** PROtein SEquencing (PROSE)
- **Announcement Type:** Program Announcement
- **Funding Opportunity Number:** DARPA-PA-25-06
- **Assistance Listing Number:** Not applicable
- **Dates/Time: All Times are Eastern Time Zone (ET)**
  - Special Notice Posting Date of DARPA-SN-25-86: June 18, 2025
  - Special Notice Closing Date: July 1, 2025
  - Proposers Day: June 30, 2025
  - Posting Date of DARPA-PA-25-06: July 9, 2025
  - Proposal Abstract Due Date: July 24, 2025, at 01:00 p.m.
  - Question Submittal Closed: August 14, 2025, at 01:00 p.m.
  - Notification of Intent to Propose: August 14, 2025, at 4:00 p.m.
  - Proposal Due Date: August 28, 2025, at 04:00 p.m.
- **Anticipated Individual Awards:** Multiple awards are anticipated
- **Types of Instruments That May Be Awarded:** Other Transactions for Research under 10 U.S.C. § 4021
- **NAICS Code:** 541715
- **Agency Contact:**

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Program Announcement
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PROtein SEquencing (PROSE)
Defense Advanced Research Projects Agency (DARPA)
Microsystems Technology Office (MTO)

Section I: Funding Opportunity Description

The Defense Advanced Research Projects Agency (DARPA) is soliciting innovative proposals in the following technical area: protein sequencing. Proposed research should investigate innovative approaches that enable revolutionary advances in science, devices, or systems. Specifically excluded is research that primarily results in evolutionary improvements to the existing state of practice.

A technical approach must provide a detailed scientific and technical justification that includes the following:

- Existing protein read capabilities including, but not limited to, read elements, measurement instrumentation and letter calling algorithms
- Clear technical plan to adapt existing read capabilities to achieve Phase 1 metrics
- Anticipated pre-processing steps required to adapt purified protein samples to the proposed sequencing approach
- Development of an integrated microsystem capable of achieving Phase 2 metrics
- Development of algorithms for letter calling capable of translating raw signal data into a specific amino acid sequence, along with an associated accuracy score
- Development of an integrated systems model to simulate accuracy, throughput, noise, and other relevant microsystem characteristics
- A list of at least 50 proposer-defined post-translational modifications, non-canonical amino acids, stereoisomers, etc. (i.e., letters)
- A commercialization strategy for advanced development of the protein sequencing technology beyond the PROSE program
- A plan to meet CUI requirements for the program

Specifically excluded are proposals that involve:

- Methods that are reliant upon the availability of a reference sequence (i.e., protein fingerprinting approaches)
- Approaches that cannot scale to meet throughput metrics
- Approaches that cannot scale to read the wide chemical complexity of amino acids and modified amino acids
- Approaches that do not include the development of a microsystem (e.g., CMOS, photonic ICs)

A. Background

The Department of Defense (DoD) lacks the ability to rapidly detect and identify unknown biothreats, such as natural and engineered protein-based biotoxins. New capabilities in synthetic biology and artificial intelligence (AI) enable the rapid design and production of novel protein-based biothreats. For example,

freely available, AI-based protein design tools can be used to generate thousands of re-engineered toxin molecules with similar structure, and likely function, as the parental toxin, but with such radically different sequences that they are unidentifiable as threats with current technology. PROSE will develop a high throughput sequencing technology to fill this critical gap in the DoD's threat response capabilities.

While current methods can rapidly identify threats with known genomes, we lack the capability to read biothreats that do not have genetic material, such as biological toxins, or threats with currently unreadable modifications that augment function. PROSE will enable the identification and characterization of these threats, significantly enhancing the DoD's ability to respond to emerging biothreats. PROSE will provide critical technology for several mission applications including threat/pathogen identification, warfighter health, in-field decision-making, and intelligence gathering.

Mass spectrometry excels at identifying individual amino acids and post-translationally modified amino acids (i.e., letters) with high accuracy. However, the accuracy of mass spectrometry diminishes significantly as protein length increases, presenting significant challenges for *de novo* sequencing beyond approximately 30 letters in length.

Optical and nanopore readers have been used to accurately read long sequences of DNA and RNA. These approaches rely on alternate physics to discriminate between chemical moieties and localize the measurement region. However, the non-homogeneity of proteins and orders of magnitude greater chemical complexity create significant technical challenges in applying these readers to proteins.

These limitations include:

1. *Inability to control protein translocation*: To read a sequence of letters, proteins will need to be moved close to or through a read element in a predictable way. Electrophoresis, widely applied to DNA and RNA, drives the movement of charged particles using an electric field based on their shape and charge. DNA and RNA have negatively charged backbones with similarly sized letters, making their translocation controllable through electrophoresis. However, proteins have a net-neutral backbone with variably charged and sized letters, which makes their translocation difficult to predict and control through electrophoresis.

2. *Limited ability to distinguish chemical complexity*: Reader elements will need to demonstrate the ability to distinguish across the protein letter space. Compared to DNA and RNA, proteins have thousands and potentially millions of letters with unique chemical make ups. The challenge for readers is having elements that accommodate the wide range of physiochemical properties as well as differentiating between letters with very similar physiochemical properties, such as isomers.

3. *Lack of sufficient channel capacity*: Readers will need to convert the chemical complexity of different protein letters into information processable by a microsystem. Nanopore and optical readers for DNA and RNA transduce this chemical information into a change in current in a circuit, or a fluorescence signal read by a camera. For DNA and RNA, the channel capacity of existing approaches is exhausted by relatively limited chemical complexity across letters. Because proteins have orders of magnitude more letters to identify, with much broader chemical complexity, reader elements will need 1–2 orders of magnitude lower noise or higher signal intensity to create the channel capacity required to differentiate between response levels.

B. Program Description

PROSE will demonstrate molecular readers that can accurately read a broad range of amino acids and post-translational modifications (i.e., letters) in sequence for unknown protein samples. The program will seek hardware demonstrations of novel read element designs integrated with microsystem architectures, and demonstrations of advanced algorithms that translate signals from the integrated system into letter calls with associated accuracies for each letter. The program is open to a wide range of translocation and measurement approaches as well as microsystem architectures. However, these approaches must overcome the challenges associated with reading long protein sequences (≥ 300 letters) with high accuracy (≥ 99%) at high throughput (≥ 10^{10} letters/day). Furthermore, emerging techniques in synthetic biology are expected to increase the number of possible letters exponentially over the next decade. Therefore, readers must demonstrate scalability across a broad range of chemical complexity.

PROSE seeks to overcome the technical challenges through co-development of advanced protein read elements and sophisticated microsystems. In developing these integrated systems PROSE will exploit: (1) alternative translocation physics to move complex protein molecules, (2) novel measurement modalities to distinguish between a wide array of letters with unique and similar physiochemical properties, (3) bandwidth efficient microsystem architectures to increase signal-to-noise ratio in a data efficient manner, and (4) advanced algorithms to translate integrated system signals into a called sequence of letters.

C. Program Structure

PROSE is a 36-month program with a 15-month Phase 1 and a 21-month Phase 2. The program will address two technical challenges (TCs). TC1 will focus on developing protein read elements that can discriminate between multiple different letters. TC2 will focus on developing microsystem architectures that can read protein sequences at high accuracy. ***Proposals must describe credible plans to conduct research and development that address both technical challenges and provide a vision for fully integrated protein sequencing on a microsystem.*** Proposals must directly tie plans to technical approaches that address program metrics. The inclusion of prior results and/or modeling and simulation data to support technical assertions is encouraged.

Phase 1: Protein Read Elements

Phase 1 will focus on demonstrating novel approaches to reading the protein alphabet and de-risking the development of complex microsystems capable of high-accuracy, full-length protein sequencing, while de-risking costly microsystems fabrication in Phase 2. Proposals must provide a vision for meeting Phase 1 metrics. Proposals must describe existing read capabilities including, but not limited to, read elements, measurement instrumentation, and letter calling algorithms. Proposals must discuss how these could be leveraged and modified to meet Phase 1 metrics. Proposals must describe any anticipated pre-processing steps required to adapt purified protein samples to the proposed sequencing approach.

Proposals must describe the approach to realizing an integrated microsystem capable of achieving Phase 2 metrics. This includes describing microsystem designs and fabrication processes, read element designs and fabrication processes, and an integration approach inclusive of integrated system packaging (e.g., microfluidics integration). Proposals must describe the approach to algorithms and associated hardware that translate system signals into letter calls and associated quality scores, similar to POD5[1] files. Proposals must describe the approach to an integrated systems model, that includes integrated system noise and channel capacity, capable of simulating accuracy and throughput of an integrated system.

Proposals must describe a commercialization strategy for the protein sequencing technology, with an emphasis on developing the integrated system realized in Phase 2 into a commercially viable product that the DoD could acquire. This could include, but is not limited to, descriptions of:

- The major commercialization objectives and milestones.
- Potential risks and mitigation strategies with your commercialization plan.

Phase 1 will culminate with a design review that will assess progress towards metrics, read elements, microsystem designs, read algorithms, and system integration models to contribute to the determination of which technologies will advance to Phase 2.

Phase 2: High accuracy microsystems architectures

In Phase 2, selected performers will transition to microsystem manufacturing while continuing to refine read elements to achieve longer read lengths and broader alphabet coverage. At the culmination of Phase 2, performers will demonstrate integrated systems that read proteins at least 300 units in length with at least 99% accuracy and with at least 10^{10} letters/day throughput across a broad number of amino acids and post-translational modifications. As a constraint, performer integrated systems will demonstrate the ability to read an alphabet size of at least 100 letters.

Proposals must define a vision for meeting Phase 2 metrics. Proposals must describe an approach to executing on Phase 1 design activities, including microsystem tape out, continued development of read elements, development of fabrication processes to integrate read elements with microsystems, development of system packaging, continued development of letter calling algorithms, and continued development of an integrated systems model. These descriptions must provide a clear justification (e.g., prior results and/or modeling and simulation data) for how the approach contributes to integrated systems that meet Phase 2 metrics.

Proposals must describe advances to interim measurement systems required to meet interim read demonstrations.

Proposals must identify 50 letters (i.e., amino acid + post-translational modification) the integrated system will read by the last demonstration in Phase 2. For example, N-acetylgalactosamine (GalNAc) modification of serine is a letter unique from GalNAc modification of threonine. Proposals should also provide reasoning for why the letter was chosen (e.g., clinical significance). These letters must be different than the 50 identified by the government team in Table 3.

[1] https://github.com/nanoporetech/pod5-file-format

Technical abstracts and full proposals should present innovative approaches to each technical challenge and a cohesive workflow within each phase to achieve program goals. A successful team would likely be highly interdisciplinary, integrating expertise in several key areas. Core competencies might include protein chemistry and biochemistry for read element design and validation, microfabrication and materials science for microsystem development, advanced data analysis and algorithm development for signal processing and sequence reconstruction. Additionally, successful teams might likely have experience in scaling up academic research into practical, market ready technology with expertise in microfluidics, manufacturing, instrumentation, productization, and commercialization.

Independent Verification and Validation (IV&V)

The government will assemble and fund an IV&V team. PROSE performers will collaborate with the IV&V team. The primary functions of IV&V will be to: (1) interact collaboratively with performers to develop an IV&V plan that describes the performer-specific approach to IV&V, (2) prepare and maintain a library of control molecules to be used during technology development and program demonstrations, and (3) facilitate demonstrations at performer facilities.

IV&V plan
It is anticipated that each performer's approach to achieving program metrics will be unique, and the IV&V team will independently work with each performer team to develop an approach to evaluation that is specific to the technology being developed. For example, this will include working with performers to ensure that molecules provided at demonstrations are compatible with performer-defined sample preparation chemistries. Performers are solely responsible for preparing/adapting molecules from the library to their sequencing technology at the demonstrations.

Developing molecule library
Throughout the program, the IV&V team will develop a library of control proteins to evaluate performance against program metrics (Table 1) and constraints (Table 2) at milestone demonstrations. These controls will be thoroughly characterized by the IV&V team prior to being distributed to performers. It is intended that this library will eventually be made commercially available, providing a valuable resource for the broader proteomics community to accelerate technology development beyond the scope of this program.

Providing subject matter expertise (SME) to the government
Throughout the program, the IV&V team will provide SME to the government to assist the government in assessing performer progress towards program metrics. This includes periodic interaction with the performer team. In particular, the IV&V team will perform a detailed assessment of performer progress towards program goals following the design review at the end of Phase 1.

Facilitating demonstrations at performer facilities
IV&V partners will coordinate with each performer team to schedule and drive performance demonstrations per the program schedule. The IV&V team will provide molecules from the library to the performer team and observe sample preparation and instrument function. The IV&V team will take possession of all raw data generated by the instrument and the outputs of letter calling algorithms, which will be used for test and evaluation purposes only.

Phase 2 challenge opportunities

Phase 2 offers performers the potential to realize additional funding by demonstrating enhanced capabilities. DARPA and government transition partners, with inputs from government and industry stake

holders, may issue specific challenges, such as new letters to identify, and performers that successfully meet these challenges will receive the associated funding through a fixed-price milestone added to their existing agreement. The goals are to (1) test the performer's ability to be reactive to novel letters or system needs that might be encountered in the future and (2) engage with commercialization stakeholders to catalyze future commercial investment. Specific details about these opportunities will be shared with Phase 2 performers. **Please note: This information is provided for awareness only and does not constitute a solicitation for activities or associated costs under this PA.**

Technical Areas and Metrics

PROSE will have a single technical area. A summary of the proposed program metrics is presented in Table 1, with metrics applying to the last demonstration in each phase. Performers will complete five capability demonstrations throughout the course of the program. Table 2 lists constraints placed on these demonstrations. Table 3 lists the alphabet of letters the government team requires to be read by the end of Phase 2. Proposals must describe credible plans to meet these metrics and read across the chemical complexity of the protein alphabet.

Table 1. Proposed Program Metrics

Metric	Phase 1 Objective Protein read elements	Phase 2 Objective High accuracy microsystem architectures
Length	≥ 100	≥ 300
Accuracy(1)	≥ 99%(2)	≥ 99%
Throughput	≥ 10^{10} letters / day(2)	≥ 10^{10} letters / day

(1) Single letter read accuracy. Performers must identify each letter in sequence with the associated accuracy for each letter called.
(2) Simulated from integrated system model.

Table 2. Demonstration Constraints

Metric	Phase 1		Phase 2		
	Demo 1	Demo 2	Demo 3	Demo 4	Demo 5
	EOM6	EOM12	EOM21	EOM27	EOM35
Alphabet Size(3)	10(4)	20(4)	50(5)	75(5)	100(5)
Length	≥ 50	≥ 100	≥ 150	≥ 200	≥ 300

(3) Alphabet consists of natural amino acids, non-natural amino acids, and modified amino acids. Alphabet size is cumulative throughout program (e.g. 50 = 20 previously demonstration + 30 new letters).
(4) Phase 1 demonstrations will cover all 20 natural amino acids. Sequences will be determined by the government.
(5) Demo 3 will include all letters from the government (Table 3). The remaining demos will select letters from the performer defined list. Sequences will be determined by the government.

Table 3. Government Defined Letters

Phase 1	Phase 2
Arginine	Phosphoserine
Histidine	Phosphothreonine
Lysine	Phosphotyrosine
Aspartic Acid	N-acetyl-lysine
Glutamic Acid	N-acetyl-serine
Serine	N-acetyl-threonine
Threonine	N-acetyl-tyrosine
Asparagine	N-methyl-lysine
Glutamine	N,N-dimethyl-lysine
Cysteine	N,N,N-trimethyl-lysine
Glycine	N-methyl-arginine
Proline	Hydroxyproline
Alanine	Hydroxylysine
Valine	N-formylmethionine
Isoleucine	Citrulline
Leucine	S-palmitoyl-L-cysteine
Methionine	S-farnesyl-L-cysteine
Phenylalanine	S-glutathionyl-L-cysteine
Tyrosine	S-nitrosocysteine
Tryptophan	Nitrotyrosine
	Biotinylated lysine
	O-GlcNAc-Ser
	Dehydroalanine
	Dehydrobutyrine
	Azidohomoalanine (AHA)
	Homopropargylglycine (HPG)
	p-Azido-phenylalanine (AzF)
	p-Benzoyl-phenylalanine (Bpa)
	Norleucine
	Homoserine

D. Schedule, Milestones, and Deliverables

Program Schedule

PROSE is a 36-month program structured into two phases: a 15-month Phase 1 focusing on protein read element development, followed by a 21-month Phase 2 dedicated to high-accuracy microsystem integration. Key milestones include monthly technical reports, annual reviews, site visits, and five capability demonstrations distributed throughout the program. A design review at the end of Phase 1 will determine which technologies advance to Phase 2, with final hardware and software delivery occurring at the program's conclusion.

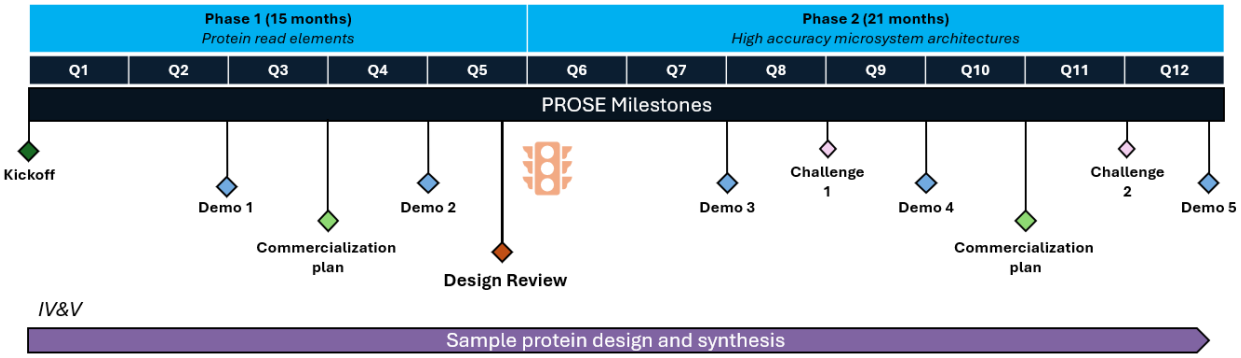

Figure 1. Program schedule.

Deliverables

All products, material and otherwise, to be provided to the government as outcomes from conducted research should be defined in the proposal. Performers need to allot time and budget to fulfill obligations for travel to review meetings and the transmission of report documentation.

Monthly Technical Reports

Technical review meetings with the PROSE Program Manager are anticipated to be held every month, usually as a teleconference. Written technical reports should be submitted monthly beginning after the kick-off meeting and either two working days prior to each subsequently scheduled technical review meeting or within 10 days from the beginning of each month, whichever is closest to the beginning of the month. Other proposed deliverables specific to the objectives of the individual efforts may include registered reports, experimental protocols, publications, data management plan, intermediate and final versions of software libraries, code and application programming interfaces (APIs), documentation and user manuals, and/or a comprehensive assemblage of design documents, models, modeling data and results, and model validation data.

Annual reviews

The Principal Investigator (PI) from each performer team (with additional key personnel at the discretion of the PI) will be required to present research progress in person at program review meetings. The purpose of these reviews is to ensure adequate engagement with the DARPA team to discuss progress towards milestones and scientific goals and any ongoing technical or programmatic challenges that must be overcome to achieve the overarching goals of the program.

Annual site visits

The government team will visit the performer site at least once per year. Performers should provide in-depth technical and programmatic updates, as well as facility tours, for the government team during the site visit. Details for the site visit agendas and reports will be in collaboration with the Program Manager and performers.

Kickoff slide package

Performers will prepare a presentation that outlines their proposed approach to the PROSE program. Performers will provide finalized slides to the government team no more than 5 business days following the kickoff event.

Demonstrations and demonstration reports

Performers will conduct five capability demonstrations throughout the course of the program. In collaboration with the IV&V team, these demonstrations will be conducted at the performer site. Each demonstration must showcase measurable improvements in protein read element design and/or integrated system performance. The IV&V team will provide characterized control proteins from their library for use during these demonstrations. Performers will be responsible for sample preparation, instrument operation, data acquisition, and letter calling algorithm execution. Performers should provide comprehensive technology transfer packages (including all raw data generated by the instrument and letter calling software) to provide to the IV&V team. Performers will also provide a report outlining the results from each demonstration.

Design Review

A design review will occur at the end of Phase 1 to assess technical progress, evaluate design choices, and contribute to the determination of which technologies will advance to microfabrication in Phase 2. Performers shall prepare and present a comprehensive design review package that demonstrates progress towards program metrics, details the design of their read elements and microsystems, outlines their amino acid calling algorithms, and presents their integrated system models. The government team will ultimately decide the requirements for the deliverables included in the design review package, and it may include the following:

a. Comprehensive description of the read element, encompassing its design rationale, fabrication or engineering protocols, predicted and experimentally validated performance characteristics (sensitivity, selectivity, translocation, scalability, robustness, and microsystem compatibility), along with a thorough analysis of potential limitations and mitigation plans.
b. Comprehensive documentation detailing the microsystem's architecture, functional description, operating modes, fabrication approach, and target specifications, providing a clear understanding of the system's overall design and performance goals.
c. Description of the approach to integrating the read element with the microsystem, detailing methods for physical and electrical interconnection, fluidic interfacing, and overall system packaging to achieve optimal performance and robustness.
d. Submission of experimental data and test results obtained during read element and microsystem development that shows achievement of metrics, including detailed descriptions of experimental protocols, raw data, processed data, and statistical analyses.
e. Report detailing the performance of the prototype read element and integrated system in regards to the specified program metrics (as described in Table 1 and Table 2).
f. Delivery of fully documented computational models used for predicting throughput, noise, and accuracy, along with the experimental data used for model validation.
g. Detailed description of the computational models used for translating raw signals into amino acid calls, including model architecture, training data, and performance metrics.

Commercialization Plan

Among the goals of the program is to ensure PROSE technologies, if successful, will have a credible transition path that matures the integrated systems beyond the scope of the program and achieves rapid adoption by the government through successful commercialization. Performers will deliver an initial commercialization plan in Phase 1 that that details the specific tasks required to achieve the performer’s

commercialization strategy. This plan will be updated in Phase 2.

Hardware and Software Delivery

To facilitate independent government assessment and potential future use, the program requires specific hardware and software deliverables. In Phase 1, performers will deliver protein read element devices and preliminary software with supporting documentation. Phase 2 culminates in the delivery of a fully integrated microsystem, associated software and hardware, and documentation sufficient for the government team to conduct independent evaluation. These deliverables will be critical for the government team to evaluate the performer progress towards metrics, determine advancement from Phase 1 to Phase 2, and for internal documentation of technology development throughout the course of the program.

A summary of the program milestones and deliverables is provided below:

Phase	Milestone/Deliverable	Frequency
1 and 2	Technical Reports	Monthly
1 and 2	Performer Technical Execution Milestones	Performer defined
1	Kickoff	Month 1
1	Demonstration 1 Report	Month 6
1	Initial Commercialization Plan	Month 9
1	Demonstration 2 Report	Month 12
1	Design Review	Month 14
1	Hardware and Software Delivery	Month 15
2	Demonstration 3 Report	Month 21
2	Demonstration 4 Report	Month 27
2	Final Commercialization Plan	Month 30
2	Demonstration 5 Report	Month 35
2	Final Technical Report	Month 36
2	Hardware and Software Delivery	Month 36

A notional list of meetings with anticipated locations is provided below:

Meeting Type	Anticipated Location	Frequency
Kickoff	Arlington, VA	One per phase
Site visit/Design Review	Performer site	Annually
PROSE Principal Investigator meeting	Arlington, VA	One per Phase
Technical & financial update	Teleconference/videoconference	At least monthly

E. Considerations for Technology Development

In accordance with the Controlled Unclassified Information (CUI) guidance for PROSE, all results, data, and process information regarding read element integration with microsystems will be controlled at the CUI level. DARPA anticipates that PROSE may also produce unclassified, fundamental research. Subject to a review by DARPA, unclassified information can move off CUI-compliant information systems. DARPA requires a second pre-publication review of specific materials to establish public releasability. The paragraphs below provide additional details on PROSE's CUI controls, and describe DARPA facilitated access to CUI systems for optional performer use (e.g., AWS GovCloud). Workshops will afford an

opportunity for review, and will include performers, DARPA, IV&V partner, the program's Agreement Officer Representatives (AORs), and government stakeholders and transition partners. ***Proposals must describe credible approaches to complying with PROSE's CUI guide.***

Platforms to Handle Controlled Unclassified Information (CUI)

Performers will need to operate at the CUI level in accordance with the PROSE CUI Guide. This includes prospective individual researchers and all information technology (IT) systems, including but not limited to data analysis, storage, networking and data transfer, cloud, high-performance-computing (HPC), and document systems. Performers will be responsible for ensuring their systems and research adhere to CUI standards (NIST 800-171). Performers may provide their own CUI-certified systems, including laptops, desktops, cloud, HPC, etc. Proposers' Price Volume may include IT asset requests, provided requests are NIST 800-171 compliant. Solutions may include but are not limited to AWS GovCloud, local servers, etc. Proposed approaches must meet this requirement. See PROSE CUI Guide for more information.

DARPA-Facilitated CUI Compute Options

To assist with the requirement to operate at the CUI level, DARPA can facilitate CUI systems and components thereof.

If desired, DARPA can facilitate access to free shared DoD HPC allocation that is CUI compatible. Shared allocation for running compute jobs would not be on demand but instead involve jobs being processed after waiting in queues shared across the wider DoD community. Users will be required to use either a DoD CAC or a provided YubiKey, and to undergo online training. If desired, proposals should describe how they would utilize this service.

If desired, DARPA's Information Technology Directorate (ITD) can facilitate the creation of CUI-compatible GovCloud Accounts through Amazon Web Services (that are separate from and can interface with DARPA-provided HPC). If proposers would like to utilize this facilitated service, the proposal should include estimates of storage, compute, and any other services (e.g., batch compute, datastores, on-demand parallel clusters for HPC, software development / ML sandboxes, data egress costs/storage transfer, etc.) using the public AWS pricing calculator, choosing their desired AWS GovCloud region. Performers will be responsible for all changes and charges within their provided AWS Account, including, but not limited to, final responsibility for ensuring compliance with NIST 800-171. Should performers utilize this offering, DARPA ITD will have limited consulting availability to provide best practices and advice on environment architecture, CUI compatibility, and other technical and deployment matters.

DARPA and the IV&V team may also facilitate or provide additional compute, HPC, or other system and components thereof that are CUI-compatible. Performers from selected proposals will have the option of utilizing any such potential systems and components presented during award negotiation and initial planning with the IV&V team. In this similar event, best practices and limited consulting availability may be available. Performers electing to utilize any such potential services will still bear responsibility for ensuring compliance with NIST 800-171.

F. Intellectual Property

To enable the program goals around commercialization, performers shall maintain ownership of all Intellectual Property (IP) developed under any PROSE Agreement and will have the right to commercialize IP, including the right to grant licenses to third parties. The government will have a non-exclusive, non-transferable, irrevocable, paid-up license, allowing it to use the IP for government purposes. The government requires a level of rights to all hardware and software data deliverables, to include form, fit,

and function data, which would allow for full test and evaluation of the deliverable by the government team.

Form, fit, and function data is technical data that describes the required overall physical, functional, and performance characteristics (along with the qualification requirements, if applicable) of an item, component, or process to the extent necessary to permit identification of physically and functionally interchangeable items.

Government purposes includes, but is not limited to, use by or on behalf of the government, including use by government contractors, for research, development, testing, evaluation, production, operation, maintenance, repair, modification, or disposal. Government Purpose does not include use for commercial purposes.

Section II: Evaluation Criteria

- Proposals will be evaluated using the following criteria listed in ***descending order of importance***: Overall Scientific and Technical Merit; Potential Contribution and Relevance to the DARPA Mission; and Budget and Price.
    - **Overall Scientific and Technical Merit**: The proposed technical approach is innovative, feasible, achievable, and complete. The proposed technical team has the expertise and experience to accomplish the proposed tasks. Task descriptions and associated technical elements provided are complete and in a logical sequence with all proposed deliverables clearly defined such that a final outcome that achieves the goal can be expected as a result of award. The proposal identifies major technical risks, and planned mitigation efforts are clearly defined and feasible. The timeline for achieving major milestones is aggressive but rationally supported with a clear description of the requirements and risks. The proposer's prior experience in similar efforts must clearly demonstrate an ability to deliver products that meet the proposed technical performance within the proposed budget and schedule. The proposed team has the expertise to manage the cost and schedule.
    - **Potential Contribution and Relevance to the DARPA Mission**: The potential contributions of the proposed effort bolster the national security technology base and support DARPA's mission to make pivotal early technology investments that create or prevent technological surprise. The proposed intellectual property restrictions (if any) will not significantly impact the government's ability to transition the technology. The proposed approach includes a commercialization strategy that is feasible and complete and includes a clear path to market enabling future use by the DoD.
    - **Budget and Price:** The proposed solution is realistic and affordable. The budget is realistic and accurately reflects the technical goals and objectives of the solicitation and reflects a sufficient understanding of the level of effort and staffing needed to successfully accomplish the proposed technical approach. It is expected that the effort will leverage all available relevant prior research in order to obtain the maximum benefit from the available funding. For proposals that contain resource share, the proposer has provided sufficient rationale as to the appropriateness of the resource share arrangement relative to the objectives of the proposed solution (e.g., high likelihood of commercial application, etc.).
- Unless otherwise specified in this announcement, for additional information on how DARPA reviews and evaluates proposals through the Scientific Review Process, please visit: Proposer Instructions and General Terms and Conditions.

Section III: Program Announcement Authority

- Given the program focus on dual-use technology development and commercialization, this program Announcement (PA) will result in the award of Other Transaction (OT) for Research agreements. In alignment with 10 U.S.C. § 4021, and in consideration for Intellectual Property rights and mutually beneficial capability development, the government will consider resource share commensurate with the proposed approach for both Phase 1 and Phase 2. To the maximum extent practicable, proposers are encouraged to consider resource sharing which generally consists of labor, materials, equipment, software, and facilities costs directly related to the project. The final amount of any proposed and recognized resource share will be based on full consideration of factors such as the team's existing tools, equipment, and staff, prior investment in the technology, commercial versus military relevance, and unusual performance risk.

- DARPA will consider a variety of proposed resource contributions to include cash and in-kind contributions, provided they are allowable, allocable, reasonable, and consistently accounted for by the Performer. The proposed resource sharing should be 1) straightforward and clearly described; and 2) include assets that will be used in the performance of the program, not just items of inherent value. It is the responsibility of the proposer to provide detailed justification for any proposed resource sharing to include **value assessments and determinations, rationale as to the relevance to the proposed scope of work, and a commitment schedule.**

- DARPA will not consider foregone profit or fee on this resultant award or other awards, previously funded government research, pre-existing IP, Internal Research and Development (IR&D) conducted prior to the OT award, or cost of money as resource share.

- Regardless of the type of resource-shared asset offered, **any resource-shared Research OT will not include payment of profit or fee to the performer.** Such a payment would skew the share ratio and would be contrary to the principles behind the purpose of resource sharing.

- To enable the rapid transition of emerging technologies, performers demonstrating successful technology under this agreement may be considered for follow-on agreements under the authority of 10 U.S.C. § 4023, Procurement for Experimental Purposes. This authority allows the government to acquire quantities of the Phase 2 integrated systems on a non-competitive basis, when necessary for (1) continued experimentation and technical evaluation; (2) assessment of operational utility in realistic environments; or (3) maintaining a limited residual operational capability for assessment purposes. The government's decision to exercise this authority will be based on demonstrated technical capability and performance of the integrated systems, feedback from transition partners and potential end-users regarding operational suitability, and availability of funding to support experimentation and evaluation. Selection for a follow-on agreement under 10 U.S.C. § 4023 is at the sole discretion of the government and is not guaranteed by successful performance under this initial agreement.

Section IV: Submission Information

- **Proposer Instructions and General Terms and Conditions**: Proposer Instructions and General Terms and Conditions
- **Other Transaction agreements**: Proposer Instructions: Other Transactions

- This announcement contains an abstract phase. Abstracts are required. Abstracts are due no later than the due date and time stated in the Overview section. Additional instructions for abstract submission will be contained within **Attachment A**.

- Full proposals are due no later than the due date and time stated in the Overview section. **Attachments B, C, D, E, F, G, H, and I** will contain specific instructions and templates and constitute a full proposal submission. Please visit Proposer Instructions and General Terms and Conditions for specific information regarding submission methods through the Broad Agency Announcement Tool (BAAT).

- DARPA is interested in whether, and to what extent, proposers are using artificial intelligence (AI) tools to contribute to Volume 1 of proposals submitted in response to DARPA solicitations. Therefore, proposers must answer the following questions on the cover sheet of Volume 1 of this solicitation:
  - Did you use AI tools to assist in preparing this proposal?
  - If yes, what tools did you employ?

  Any content in Volume 1 that utilized an AI tool to generate information, assist in technical understanding, or guide the technical work should have a citation and a corresponding reference in the Bibliography section of Volume 1. The citation should specify the tool, content, and purpose. For example, "[AI tool] was used to understand existing state of the art in manufacturing."

  NOTE – THIS INFORMATION WILL NOT BE USED FOR EVALUATION PURPOSES. Proposals will be evaluated in accordance with the Evaluation Criteria outlined in the solicitation regardless of whether AI tools were employed.

- All technical, contractual, and administrative questions regarding this notice must be emailed to PROSE@darpa.mil. Emails sent directly to the Program Manager or any other address may result in delayed or no response. All questions must be in English and must include the name, email address, and telephone number of a point of contact. DARPA will attempt to answer all questions in a timely manner and post an FAQ list on the DARPA/MTO Opportunities page at (http://www.darpa.mil/work-with-us/opportunities). The list will be updated on an ongoing basis until two weeks prior to the proposal due date.

Section V: Special Considerations

- This announcement, stated attachments, and websites incorporated by reference constitute the entire solicitation. In the event of a discrepancy between the announcement, attachments, or websites, the announcement shall take precedence.

- All responsible sources capable of satisfying the government's needs, including both U.S. and non-U.S. sources, may submit a proposal that shall be considered by DARPA. Historically Black Colleges and Universities, Small Businesses, Small Disadvantaged Businesses and Minority Institutions are encouraged to submit proposals and join others in submitting proposals; however, no portion of this announcement will be set aside for these organizations' participation due to the impracticality of reserving discrete or severable areas of this research for exclusive competition among these entities. Non-U.S. organizations and/or individuals may participate to the extent that such participants comply with any necessary nondisclosure agreements, security regulations, export control laws, and other governing statutes applicable under the circumstances.

- As of the time of publication of this announcement, all proposal submissions are anticipated to be unclassified.

- This program is subject to **Attachment J: PROSE Controlled Unclassified Information (CUI) Guide** . It is the expectation that the Prime contractor will be capable of handling and protecting CUI. All individuals accessing CUI agree to protect CUI in accordance with *DoD Instruction 5200.48 CONTROLLED UNCLASSIFIED INFORMATION (CUI)* and *NIST Special Publication 800-171 Protecting Controlled Unclassified Information in Nonfederal Systems and Organizations*.

- DARPA encourages technical solutions from all responsible sources capable of satisfying the government's needs. To ensure fair competition across the ecosystem, DARPA prohibits contractors/performers from concurrently providing Systems Engineering Technical Assistance (SETA), Advisory and Assistance Services (A&AS), or similar support services and being a technical performer, unless the DARPA Deputy Director grants a written waiver. DARPA extends this prohibition to University-Affiliated Research Centers (UARCs) and Federally Funded Research and Development Centers (FFRDCs) and government laboratories including National Laboratories.

- UARCs, FFRDCs, and government laboratories are prohibited from proposing as performers. UARCs, FFRDCs, and government laboratories interested in this solicitation must contact the Agency Point of Contact (POC) listed in the Overview section to discuss potential participation as part of the government team. Please note that this paragraph supersedes the "Special Eligibility Considerations for Federally Funded Research and Development Centers (FFRDCs) and government Entities" section found at Proposer Instructions and General Terms and Conditions.

- As of the date of publication of this announcement, the government expects that program goals as described herein may be met by proposed efforts for fundamental research and non-fundamental research. Some proposed research may present a high likelihood of disclosing performance characteristics of military systems or manufacturing technologies that are unique and critical to defense. Based on the anticipated type of proposer (e.g., university or industry) and the nature of the solicited work, the government expects that some awards will include restrictions on the resultant research that will require the awardee to seek DARPA permission before publishing any information

or results relative to the program. For additional information on fundamental research, please visit Proposer Instructions and General Terms and Conditions.

- Proposers should indicate in their proposal whether they believe the scope of the research included in their proposal is fundamental or not. While proposers should clearly explain the intended results of their research, the government shall have sole discretion to determine whether the proposed research shall be considered fundamental and to select the award instrument type. Appropriate language will be included in resultant awards for non-fundamental research to prescribe publication requirements and other restrictions, as appropriate. This language can be found at Proposer Instructions and General Terms and Conditions.

- For certain research projects, it may be possible that although the research to be performed by a potential awardee is non-fundamental research, its proposed subawardee's effort may be fundamental research. It is also possible that the research performed by a potential awardee is fundamental research while its proposed subawardee's effort may be non-fundamental research. In all cases, it is the potential awardee's responsibility to explain in its proposal which proposed efforts are fundamental research and why the proposed efforts should be considered fundamental research.

- Performers are encouraged to plan for commercialization early on. Additional assistance is available for eligible performers with limited commercialization experience. Based on budget, national security priorities, and performer's ability to achieve technical milestones, some performers may be nominated to participate in the Embedded Entrepreneur Initiative/Minimum Viable Product (EEI/MVP) program. The goal of the EEI/MVP program is to speed transition of critical capabilities to the warfighter and address a broad array of market inefficiencies that inhibit the creation of a sustainable supply of that technology, usually through leveraging dual-use commercial markets. Moreover, the EEI/MVP program works to identify and de-risk key barriers to commercialization including adoption risk, development risk, compliance barriers, supply chain gaps, and talent gaps. Performers that are nominated, elect to participate, and are awarded EEI funding will work with DARPA Commercial Strategy Senior Commercial Advisors to perform technological/economic mapping, identify top entrepreneurial talent, connect to both DoD and commercial customers, and prepare for connections to non-adversarial capital necessary to mature, refine, and validate their commercialization strategy

- The APEX Accelerators program, formerly known as the Procurement Technical Assistance Program (PTAP), focuses on building a strong, sustainable, and resilient U.S. supply chains by assisting a wide range of businesses that pursue and perform under contracts with the DoD, other federal agencies, state and local governments and with government prime contractors. See https://www.apexaccelerators.us/ for more information. APEX Accelerators helps businesses:
  - Complete registration with a wide range of databases necessary for them to participate in the government marketplace (e.g., SAM)
  - Identify which agencies and offices may need their products or services and how connect with buying agencies and offices
  - Determine whether they are ready for government opportunities and how to position themselves to succeed
  - Navigate solicitations and potential funding opportunities
  - Receive notifications of government contract opportunities on a regular basis
  - Network with buying officers, prime contractors, and other businesses

  - Resolve performance issues and prepare for audit, only if the service is needed, after receiving an award

- Project Spectrum is a nonprofit effort funded by the DoD Office of Small Business Programs to help educate the Defense Industrial Base (DIB) on compliance. Project Spectrum is vendor-neutral and available to assist businesses with their cybersecurity and compliance needs. Their mission is to improve cybersecurity readiness, resilience, and compliance for small/medium-sized businesses and the federal manufacturing supply chain. Project Spectrum events and programs will enhance awareness of cybersecurity threats within the manufacturing, research, and development, as well as knowledge-based services sectors of the industrial base. Project Spectrum will leverage strategic partnerships within and outside of the DoD to accelerate the overall cybersecurity compliance of the DIB. www.Projectspectrum.io is a web portal that will provide resources such as individualized dashboards, a marketplace, and Pilot Program to help accelerate cybersecurity compliance.

- DARPAConnect offers free resources to potential performers to help them navigate DARPA, including "Understanding DARPA Award Vehicles and Solicitations," "Making the Most of Proposers Days," and "Tips for DARPA Proposal Success." Join DARPAConnect at https://www.darpaconnect.us to leverage on-demand learning and networking resources.

- DARPA has streamlined our Program Announcements and is interested in your feedback on this new format. Please send any comments to DARPAsolicitations@darpa.mil.