



Broad Agency Announcement  
Low Temperature Logic Technology (LTLT)  
Microsystems Technology Office  
HR001121S0019  
March 10, 2021

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## PART I: OVERVIEW INFORMATION

- **Federal Agency Name:** Defense Advanced Research Projects Agency (DARPA), Microsystems Technology Office (MTO)
- **Funding Opportunity Title:** Low Temperature Logic Technology (LTLT)
- **Announcement Type:** Initial Announcement
- **Funding Opportunity Number:** HR001121S0019
- **Catalog of Federal Domestic Assistance Numbers (CFDA):** 12.910 Research and Technology Development
- **Dates:** (All times listed herein are Eastern Time)
  - Posting Date: March 10, 2021
  - Proposers Day: March 16, 2021
  - Abstract Due Date: April 2, 2021
  - FAQ Submission Deadline: April 28, 2021
  - Proposal Due Date: May 18, 2021
  - Estimated period of performance start: October 2021
- **Concise description of the funding opportunity:** The DARPA Microsystems Technology Office is soliciting research proposals for the development of low temperature (77K) FinFET technology to achieve a 25X improvement in the performance/power of state-of-the-art (SOA) central processing units (CPU) compared to room temperature (RT) operation.
- **Anticipated Funding Available for Award:** Approximately \$90M of total funding is anticipated for awards made against this BAA, with a distribution of:
  - \$70M for Technical Area 1 (TA1) across all program phases
  - \$20M for Technical Area 2 (TA2) across all program phases
- **Anticipated individual awards:** Multiple awards are anticipated
- **Anticipated funding type:**
  - 6.2 for TA1 (Anticipated to be restricted research for for-profit team members, and fundamental research for non-profit and university team members)(See "B. Fundamental Research" below).
  - 6.1 for TA2 (Anticipated to be fundamental research for all performers/team members)(See "B. Fundamental Research" below).
- **Types of instruments that may be awarded:**
  - TA1: Procurement contract or other transaction.
  - TA2: Procurement contract, cooperative agreement, grant, or other transaction.
- **Agency contact:**
  - Dr. Jason Woo, Program Manager  
BAA Coordinator: HR001121S0019@darpa.mil  
DARPA/MTO  
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Arlington, VA 22203-2114

## **PART II: FULL TEXT OF ANNOUNCEMENT**

### **I. Funding Opportunity Description**

The Defense Advanced Research Projects Agency (DARPA) often selects its research efforts through the Broad Agency Announcement (BAA) process. This BAA is being issued, and any resultant selection will be made, using the procedures under Federal Acquisition Regulation (FAR) 6.102(d)(2) and 35.016 and 2 C.F.R. § 200.203. Any negotiations and/or awards will use procedures under FAR 15.4, Contract Pricing. Proposals received as a result of this BAA shall be evaluated in accordance with evaluation criteria specified herein through a scientific review process.

DARPA BAAs are posted on the beta SAM website, under the Contract Opportunities (FBO) link, at <https://beta.sam.gov/>, and, as applicable, the grants.gov website at <http://www.grants.gov/>. The following information is for those wishing to respond to the BAA.

The Microsystems Technology Office at DARPA seeks innovative proposals for the research and development of a high-performance device/circuit technology that is optimized for operation at a temperature of 77K, enabling operation at low power supply voltage to reduce power dissipation. Many important semiconductor parameters are functions of temperature and there is evidence that such a high performance, low power technology is possible. However, this has not yet been realized due to the challenges that this program seeks to address. It is envisioned that this Low Temperature Logic Technology (LTLT) program will be fabricated in complementary metal-oxide-semiconductor (CMOS) through modifications to advanced very large scaled integration (VLSI) processes. LTLT will develop key low temperature (LT) optimized components operating at low power supply voltage and will culminate in compelling integrated circuit demonstrations at 77K. Proposed research should investigate innovative approaches to enable revolutionary advances in science, devices, or systems. Specifically excluded is research that primarily results in evolutionary improvements to the existing state of practice. As the LTLT program is expected to be realizable on advanced node VLSI manufacturing platforms, technologies such as superconducting electronics are not within scope of this program.

#### **A. Background**

High performance computing (HPC) enables critical Department of Defense (DoD) applications, including weather prediction, complex weapon design, multi-domain simulations for stockpile stewardship, cryptanalysis, and emerging mission needs for distributed data processing at the tactical edge, as well as numerous commercial and dual-use applications. Government applications often touch the extremes of supercomputing resources, while overall computational system performance is often limited by size, weight, and power (SWaP) factors associated with the computational elements and architectures themselves. To this end, the DoD has invested almost \$200M per year over the past two decades to accelerate technology development in the High Performance Computing Modernization Program (HPCMP). Other agencies in the U.S. government spend millions more, mainly on acquiring new systems.

Historically, improvements in HPC have been driven by new integrated circuit (IC) technology generations utilizing scaled transistors (Moore's law). That paradigm is no longer bringing significant advances to HPC due to the difficulty in continuing conventional scaling, particularly with respect to power reduction. HPC improvement has dramatically slowed from 32X per decade in the 1990's to only 1.5X per decade recently.<sup>1</sup> While microelectronics are typically designed to operate at ambient room temperature (RT), it is well known that device characteristics can improve significantly at reduced temperatures. Low temperature HPC for enhanced computing performance has been explored since the 1980s,<sup>2</sup> and has gained renewed interest as interface electronics for quantum computing.

Very low temperature devices (typically 4.2K or below), such as superconducting electronics and spintronics, have also been proposed recently to overcome the power scaling limit as well as for quantum computers, but their application to large scale integration is far more challenging. Such exotic technologies have yet to show appreciably scaled system performance comparable to CMOS.<sup>3</sup> Such specialized technologies are not within scope of this program.

## B. Program Description

The Low Temperature Logic Technology (LTLT) program will develop a semiconductor technology optimized for low temperature (77K) operation based on advanced VLSI manufacturing platforms and will demonstrate a 25X improvement in performance/power of state-of-the-art (SOA) CPUs compared to room temperature (RT) operation. The program objective is to realize these improvements in a FinFET device structure in 14 nm or below nodes, and to establish scalability to future technology nodes with similar performance/power improvement.

Specific LTLT program goals are to achieve low voltage, high performance, low temperature logic transistors operating with 4X reduction in nominal  $V_{DD}$  of the room temperature devices to sub 0.2 V (~0.18 V, a ~4X reduction of the supply voltage compared to current conventional 10 nm node RT-optimized transistors at 77K), and fast switching at low voltages ( $\leq 1$  ps intrinsic gate delay). LTLT also seeks to demonstrate a compact SRAM cell for 77K operation to complete the basic circuit elements needed for computational engines.

Performers in this program should be prepared to address several technical challenges (TCs). These include:

TC1: *Attaining high speed switching at low supply voltages.* Scaling of threshold voltage is essential as supply voltage is similarly scaled. Estimations are that the magnitude of transistor threshold voltages,  $V_{TH}$ , will need to be reduced by ~450 mV if supply voltages are reduced to sub-0.2V for 77K operation. Competing effects will need to be considered in order to realize useful and high speed LTLT transistors with very small  $V_{TH}$ .

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<sup>1</sup> The U.S. Exascale Computing Project: <https://www.exascaleproject.org/>

<sup>2</sup> "The ETA 10 liquid-nitrogen-cooled supercomputer system," in IEEE Transactions on Electron Devices, Aug. 1989.

<sup>3</sup> D. E. Nikonov and I. A. Young, IEEE Journal on Exploratory Solid-State Computational Devices and Circuits, 2015

TC2: *Minimizing device-to-device variability.* Achieving low variability of the threshold voltage is a prime technical challenge to realize a practical LTLT CMOS technology that operates at very low voltage with high switching speeds. LTLT will demonstrate LT logic transistors with threshold variability < 12 mV (a ~4X reduction of threshold variability with respect to RT-optimized transistors at the same node).

TC3: *Developing compact static memory cells for 77K operation.* Conventional computation engines usually contain large banks of memory for caching and the memory hierarchy. LTLT aims to demonstrate cells with read/write time  $\leq 0.5$  ns and a 20% reduction in cell size compared to the standard low voltage SRAM cell of the same technology node. Furthermore, these cells should operate with < 0.25 V  $V_{DD}$  (25X reduction in programming/sensing and standby energies compared to RT low voltage static random-access memory (SRAM) at 77K) to realize the essential device and circuit elements needed for subsequent compelling demonstrations of the technology.

Along with advances in LTLT transistors and memory cells, there is an opportunity for exploiting the reduced resistance of interconnects at low temperature in circuits since metal resistivity decreases when the operating temperature is reduced. The culmination of the LTLT program will be a demonstration of an integrated LT CPU with 25X performance/power improvements compared to the same design with SOA RT CMOS at 14 nm or below technology node.

### C. Program Structure

The LTLT program is a 48-month effort. It encompasses two main technical areas (TA): TA1- Low Temperature Logic Technology Demonstration and TA2- Advanced Device and Circuit Architecture Exploration. The total program is planned for three phases: 18-months for Phase 1 (Base), 18-months for Phase 2 (Option), and 12-months for Phase 3 (Option). At the end of Phase 1 and Phase 2, at the Government's sole discretion, options may be exercised based on technical progress measured against the metrics and milestones defined in the BAA and funding availability.

Proposers may not propose to more than one Technical Area in a single proposal. Proposers who wish to submit to more than one TA must submit a separate, standalone, full proposal package for each Technical Area. Tasks that would be duplicated in the effort if both TAs were awarded must be called out explicitly.

### D. Technical Areas

This LTLT Program BAA is soliciting research proposals for work in two technical areas:

#### **Technical Area 1 (TA1): Low Temperature Logic Technology Demonstration.**

This technical area encompasses the efforts to research, develop, and deliver a fabrication technology for highly integrated advanced node CMOS operating at 77K, with low supply voltage while maintaining high performance. The baseline technologies of interest are the 14nm



FinFET technology node and below, for which LTLT are expected to involve significant modifications of the RT processes. The main objective is to develop a scalable integration technology of (1) transistors with low threshold voltage with small variability when operated at 77K, (2) reduced SRAM cell size with 25X lower switching energy at 77K, and (3) LT circuit based on the LT modified advanced VLSI technology node. For circuit demonstrations, the test CPU to be used shall be of a state-of-the-art, propriety design with the following characteristics: Phase 2: a 16-bit CPU with 16-kbit cache; and Phase 3: 32-bit CPU with 1-Mbit cache. Potential examples include Arm, POWER, X86, Zen, and Ampere. Note that certain IP, such as Arm CPUs, may be available to proposers at a negotiated rate for the execution of the project under the DARPA Toolbox Initiative. Details can be found: <https://www.darpa.mil/work-with-us/darpa-toolbox-initiative>.

TA1 proposals are expected to provide concise discussions on the technical approach and rationale to address (1) achieving a high switching speed LT FinFET operating at low  $V_{DD}$ , and with  $I_{on}/I_{off} > 10^5$ , (2) low-power/low-energy and small footprint SRAM cells with fast read/write time, and (3) circuit techniques that can exploit LT transistors, LT SRAM cells, and low resistance interconnects. The proposals are also expected to include discussions on the first order analysis and risk mitigation strategy needed to meet the targeted metrics in each phase.

Phase 1 (Base) – The goal of Phase 1 is to verify the feasibility of the approach to realize a scalable FinFET based CMOS technology for computational circuits operating at 77K and at reduced supply voltage while maintaining high switching speed and other relevant performance measures. Elements include a low voltage high performance transistor and a compact SRAM cell. Proposals should provide the proposed relevant circuit building blocks for the Phase 2 and Phase 3 CPUs. In Phase 1, these circuit building blocks will be simulated and measured as part of the Phase 1 metric evaluation.

Phase 2 (Option) – The goal of Phase 2 is to demonstrate low power and high performance by a 16-bit CPU with 16-kbit on-chip SRAM array operating at 77K. Further development of devices realized in Phase 1 for improved device characteristics and performance enhancement will be a key part of this Phase.

Phase 3 (Option) – The goal of Phase 3 is to demonstrate the performance/power improvement of the LTLT devices, together with the lower interconnect resistivity, by a 32-bit CPU with 1-Mbit on-chip SRAM array operating at 77K.

**Table 1: TA1 Metrics by Phase**

	Metric	Phase 1 (18 months)	Phase 2 (18 months)	Phase 3 (12 months)
<i>Technical Challenge 1</i>	$V_{TH}$	$\leq 140$ mV	$\leq 70$ mV	$\leq 70$ mV
<i>Technical Challenge 2</i>	$V_{TH}$ Variability <sup>(2)(3)</sup>	$\leq 24$ mV	$\leq 12$ mV	$\leq 12$ mV
	On Current Improvement <sup>(2)(3)</sup>	10% higher $I_{on}/V_{DD}$ vs. 350 K	20% higher $I_{on}/V_{DD}$ vs. 350 K	20% higher $I_{on}/V_{DD}$ vs. 350 K
<i>Technical Challenge 3</i>	SRAM Bit Cell Area <sup>(4)</sup>	$< 12 F^2$	$< 12 F^2$	$< 10 F^2$
	Read & Write Voltage	$< 0.3$ V	$< 0.25$ V	$< 0.25$ V
	SRAM size <sup>(5)(6)</sup>	32-kbit array	1-Mbit array	1-Mbit array
<i>Technology Demo</i>	Design Complexity (equivalent or more complex)	Building blocks for CPU	16-bit CPU <sup>(8)(9)</sup> with 16-kbit cache	32-bit CPU <sup>(8)(9)</sup> with 1-Mbit cache
	Power Reduction		15X	20X
	Clock Increase		1.2X	1.25X

**Table 1 Notes:**

- (1) All measurements are at 77 K.
- (2)  $LN_2$  transistors are required to be tested at  $V_{DD}$  @ 0.18 V.
- (3)  $LN_2$  transistors are required to meet a minimal requirement of  $I_{on}/I_{off} > 10^5$ .
- (4) “F” is the minimum feature size. For typical FinFET technology, F is referred to the contacted gate pitch. For example, Intel 14nm technology node has a 70 nm contacted gate pitch.
- (5) 32-kbit SRAM is a typical building block, e.g. 256 columns x 128 rows, for a larger SRAM array. 1-Mbit SRAM can be constructed with 32, 32-kbit memory banks with additional supporting circuits.
- (6) SRAM array Read and Write time must be  $< 0.5$  ns.
- (7) Compared to the same proposed baseline technology node at 350 K ( $\sim 73$  °C), the nominal substrate temperature of SOA CPUs.
- (8) The test CPU to be used shall be of a state-of-the-art, propriety design. Potential examples include Arm, POWER, X86, Zen, and Ampere.
- (9) Certain IP may be available for performers for the execution of the project under the terms of the DARPA Toolbox; see: <https://www.darpa.mil/work-with-us/darpa-toolbox-initiative> for details.

**Technical Area (TA2): Advanced Low Temperature Device and Circuit Architecture Exploration.**

This technical area will address advanced research concepts to pursue high-risk/high payoff FinFET VLSI-compatible solutions for individual technical challenges at 77K, and include three sub-areas: (TA2a) ultra-low power high speed scaled transistors with new switching or new transport mechanisms; (TA2b) compact ( $< 5F^2$ ) high speed, low energy static-random-access memory cells; and (TA2c) new circuit techniques leveraging LTLT transistors, LTLT memory cells, and the  $>2X$  lower metal line resistivity to achieve a 45X performance/power improvement (in simulation). TA2 proposals can address one or more of the three sub-areas.

Proposals addressing TA2a and TA2b are expected to provide concise discussions on the technical approach and rationale to attain: 77K low power and fast switching speed transistors (TA2a), and 77K ultra-compact fast, low read/write energy static memory cells (TA2b). Proposers should detail: (1) novel device structure and the associated operating principles and physics as well as the modeled and simulated performance, (2) critical process development that is compatible with advanced CMOS fabrication platforms, and (3) risk mitigation paths to attain the performance metrics for each phase.

Proposals addressing TA2c are expected to provide a concise discussion on the technical approach and rationale to address (1) the proposed low voltage system topologies and (2) critical functional blocks and their dependence on LT transistor performance, LT memory cell performance, and interconnect resistance and capacitance. The proposal should clearly delineate a path with respect to the architecture, design, and analysis of the CPU consistent with meeting (or exceeding) the program goals.

The goals for each phase are:

Phase 1 (Base) – TA2a should demonstrate the proof of concept for high speed, low power switching devices operating at 77K, and use TCAD simulations to demonstrate the operating principles and device characteristics. TA2b should demonstrate the proof of concept for compact, high speed, low power static memory cells operating at 77K, and use TCAD simulations to demonstrate operating principles and device characteristics. TA2c should demonstrate the performance and power improvement of the IP blocks through circuit simulations.

Phase 2 (Option) – TA2a should prototype high speed, low power switching devices and experimentally demonstrate their performance at 77K. TA2b should prototype compact, high speed, low power static memory cells and experimentally demonstrating their performance at 77K. TA2c should demonstrate initial design and layout of a novel 77K CPU through circuit simulation.

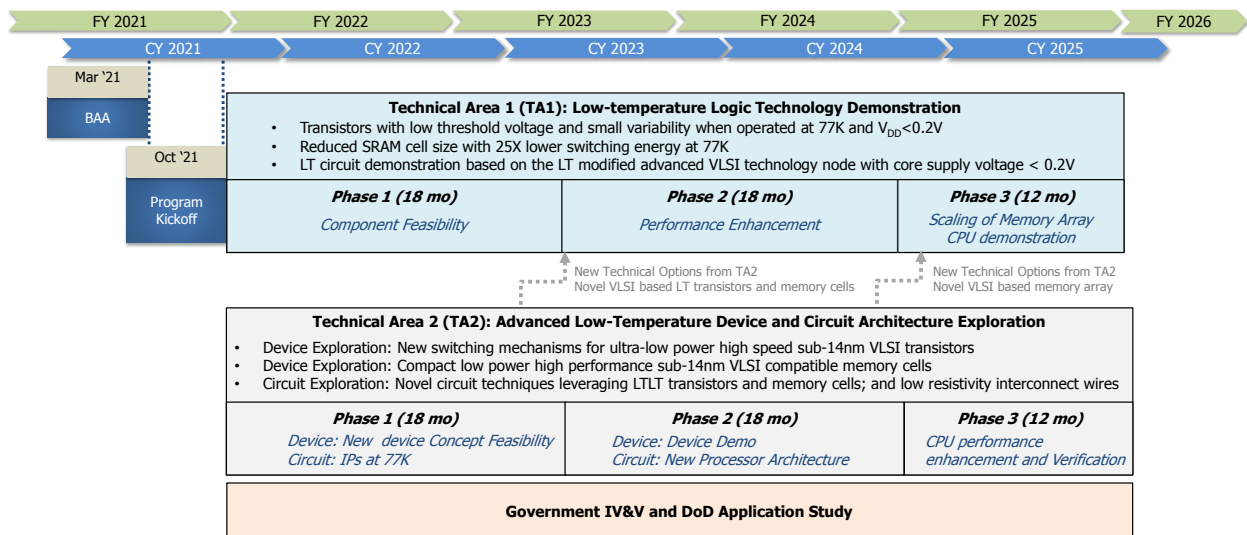
Phase 3 (Option) - TA2a should optimize the high speed, low power switching devices and experimentally verify their performance advantages at 77K. TA2b should optimize the compact, high speed, low power static memory cells and experimentally verify their performance advantages at 77K. TA2c should demonstrate the complex design and layout of a novel 77K CPU, achieving 45X better performance and power compared to a CPU with the same functionality operating at ambient temperature through simulation.

**Table 2: TA2 Metrics by Phase**

Research Topics	Metric	Phase 1 (18 months)	Phase 2 (18 months)	Phase 3 (12 months)
<b>TA2a: Novel transistors with footprint <math>\leq</math> FinFET @ same node and with <math>V_{DD} = 0.18</math> V</b>	<b>Energy-Delay Product</b> (with same load capacitance) compared to LTLT FinFET @ same node	<50% (simulation)	<75% (experimental)	<50% (experimental)
<b>TA2b: Compact (<math>&lt; 5F^2</math>) static memory cells</b>	<b>Read/write energy</b> (% of LTLT compact SRAM cell)	<50% (simulation)	<75% (prototype cell)	<50% (prototype cell)
	<b>Read/write time</b>	<1 ns (simulation)	<5 ns (prototype cell)	<1ns (prototype cell)
<b>TA2c: Novel circuit architecture based on LTLT components with 45X Performance/power improvement (by simulation)</b>	<b>Circuit complexity</b>	CPU IP blocks	Single-Core CPU with 128Kbit cache	Quad-Core CPU with 4Mbit cache

**E. Schedule/Milestones**

LTLT is a 48-month, three-phase program with an estimated period of performance start in October 2021. A mandatory program kickoff meeting will be held to present the technical approach, to discuss technical and programmatic items of concern, and to interact with the government team and other program performers. The end of each phase represents a major technical milestone in the program and end-of-phase review meetings will be scheduled approximately one month before the end of each phase. These meetings will be used to communicate technical progress toward the metrics during the entire phase. Technical progress towards the metrics of the program is the major deciding factor for continuation into subsequent phases and will be monitored through quarterly teleconference calls and occasional site visits by the DARPA program manager and other members of the government team.



**F. Deliverables**

**1. Program Review Meetings**

Technical review meetings with the LTLT Program Manager will be held quarterly, usually as a teleconference. The review meeting deliverable will be a technical slide presentation. Additional program reviews with all performers will be held at the beginning of each program phase, and may replace the quarterly technical review meetings. There will also be end-of-phase meeting with individual performers approximately one month before the end of each phase. Prior to each end-of-phase meeting, performers in both technical areas will provide to the Government a written report covering, a) technical results, and b) charts with explanations of how well the component(s)/system(s) meets, exceeds, or falls short of specified program metrics (as described in this BAA). Templates will be provided for quarterly teleconferences and will include technical updates with simulated and measured results to demonstrate progress toward the program metrics, as well as an up-to-date financial spend plan.

**2. Prototype Delivery**

Delivery of prototype devices (hardware) to the Government, in month 16 of Phase 1 and Phase 2, and month 10 in Phase 3 for TA1, and in month 16 of Phase 2 and month 10 in Phase 3 for

TA2 device exploration. This will allow the Government to independently verify performance of the demonstration devices and circuits. The performers are required to work with the Government team and deliver at least one copy of hardware (e.g. a wafer or packaged device/chip) with associated test plans and test results to demonstrate the program metrics were achieved.

### **3. Technical Reports**

Technical reports shall be submitted on a monthly basis beginning within two weeks after the kick-off meeting and two working days prior to each subsequently scheduled program event, such as technical review meetings.

Other proposed deliverables specific to the objectives of the individual efforts. These may include registered reports, experimental protocols, publications, data management plan, intermediate and final versions of software libraries, code, and APIs, including documentation and user manuals, and/or a comprehensive assemblage of design documents, models, modeling data and results, and model validation data.

### **4. Monthly Financial Reports**

The financial report shall describe resources expended, resources available, any deviation from planned expenditures, and any potential issues requiring the attention of the Government team. This report shall be provided within 10 days from the end of each month.

### **5. Final Report**

After the end of each phase, the report shall summarize the effort in a comprehensive text document.

## **G. Government Furnished Equipment/Property/Information**

None

## **H. Intellectual Property**

It is expected that the data/software developed under LTLT will have the following minimum data rights:

- Government desires no less than Government Purpose Rights for TA1 and TA2.

See also Section IV.B.3, “Other Transaction Request, if applicable” and Section IV.B.11, “Intellectual Property.”

## **II. Award Information**

### **A. General Award Information**

Multiple awards are anticipated. The amount of resources made available under this BAA will depend on the quality of the proposals received and the availability of funds.

The Government reserves the right to select for negotiation all, some, one, or none of the proposals received in response to this solicitation, and to make awards without discussions with proposers. The Government also reserves the right to conduct discussions if it is later determined to be necessary. If warranted, portions of resulting awards may be segregated into pre-priced options. Additionally, DARPA reserves the right to accept proposals in their entirety or to select only portions of proposals for award. In the event that DARPA desires to award only portions of a proposal, negotiations may be opened with that proposer. The Government reserves the right to fund proposals in phases with options for continued work at the end of one or more of the phases, as applicable.

Awards under this BAA will be made to proposers on the basis of the evaluation criteria listed below (see section labeled “Application Review Information,” Sec. V.), and program balance to provide overall value to the Government. The Government reserves the right to request any additional, necessary documentation once it makes the award instrument determination. Such additional information may include but is not limited to Representations and Certifications (see Section VI.B.4., “Representations and Certifications”). The Government reserves the right to remove proposers from award consideration should the parties fail to reach agreement on award terms, conditions and cost/price within a reasonable time or the proposer fails to timely provide requested additional information. Proposals identified for negotiation may result in a procurement contract, grant, cooperative agreement, or other transaction, depending upon the nature of the work proposed, the required degree of interaction between parties, whether or not the research is classified as Fundamental Research, and other factors.

Proposers looking for innovative, commercial-like contractual arrangements are encouraged to consider requesting Other Transactions. To understand the flexibility and options associated with Other Transactions, consult <http://www.darpa.mil/work-with-us/contract-management#OtherTransactions>.

In accordance with 10 U.S.C. § 2371b(f), the Government may award a follow-on production contract or Other Transaction (OT) for any OT awarded under this solicitation if: (1) that participant in the OT, or a recognized successor in interest to the OT, successfully completed the entire prototype project provided for in the OT, as modified; and (2) the OT provides for the award of a follow-on production contract or OT to the participant, or a recognized successor in interest to the OT.

In all cases, the Government contracting officer shall have sole discretion to select award instrument type, regardless of instrument type proposed, and to negotiate all instrument terms and conditions with selectees. DARPA will apply publication or other restrictions, as necessary, if it determines that the research resulting from the proposed effort will present a high likelihood of disclosing performance characteristics of military systems or manufacturing technologies that are unique and critical to defense. Any award resulting from such a determination will include a requirement for DARPA permission before publishing any information or results on the program. For more information on publication restrictions, see the section below on Fundamental Research.

## **B. Fundamental Research**

It is DoD policy that the publication of products of fundamental research will remain unrestricted to the maximum extent possible. National Security Decision Directive (NSDD) 189 defines fundamental research as follows:

‘Fundamental research’ means basic and applied research in science and engineering, the results of which ordinarily are published and shared broadly within the scientific community, as distinguished from proprietary research and from industrial development, design, production, and product utilization, the results of which ordinarily are restricted for proprietary or national security reasons.

As of the date of publication of this solicitation, 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.

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 <http://www.darpa.mil/work-with-us/additional-baa>. 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.

## **III. Eligibility Information**

### **A. Eligible Applicants**

All responsible sources capable of satisfying the Government's needs may submit a proposal that shall be considered by DARPA.

#### **1. Federally Funded Research and Development Centers (FFRDCs) and Government Entities**

##### **a) FFRDCs**

FFRDCs are subject to applicable direct competition limitations and cannot propose to this solicitation in any capacity unless they meet the following conditions. (1) FFRDCs must clearly demonstrate that the proposed work is not otherwise available from the private sector. (2) FFRDCs must provide a letter, on official letterhead from their sponsoring organization, that (a) cites the specific authority establishing their eligibility to propose to Government solicitations and compete with industry, and (b) certifies the FFRDC's compliance with the associated FFRDC sponsor agreement's terms and conditions. These conditions are a requirement for FFRDCs proposing to be awardees or subawardees.

### **b) Government Entities**

Government Entities (e.g., Government/National laboratories, military educational institutions, etc.) are subject to applicable direct competition limitations. Government Entities must clearly demonstrate that the work is not otherwise available from the private sector and provide written documentation citing the specific statutory authority and contractual authority, if relevant, establishing their ability to propose to Government solicitations and compete with industry. This information is required for Government Entities proposing to be awardees or subawardees.

### **c) Authority and Eligibility**

At the present time, DARPA does not consider 15 U.S.C. § 3710a to be sufficient legal authority to show eligibility. While 10 U.S.C. § 2539b may be the appropriate statutory starting point for some entities, specific supporting regulatory guidance, together with evidence of agency approval, will still be required to fully establish eligibility. DARPA will consider FFRDC and Government Entity eligibility submissions on a case-by-case basis; however, the burden to prove eligibility for all team members rests solely with the proposer.

## **2. Other Applicants**

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.

## **B. Organizational Conflicts of Interest**

### FAR 9.5 Requirements

In accordance with FAR 9.5, proposers are required to identify and disclose all facts relevant to potential OCIs involving the proposer's organization and *any* proposed team member (subawardee, consultant). Under this Section, the proposer is responsible for providing this disclosure with each proposal submitted to the solicitation. The disclosure must include the proposer's, and as applicable, proposed team member's OCI mitigation plan. The OCI mitigation plan must include a description of the actions the proposer has taken, or intends to take, to prevent the existence of conflicting roles that might bias the proposer's judgment and to prevent the proposer from having unfair competitive advantage. The OCI mitigation plan will



specifically discuss the disclosed OCI in the context of each of the OCI limitations outlined in FAR 9.505-1 through FAR 9.505-4.

#### Agency Supplemental OCI Policy

In addition, DARPA has a supplemental OCI policy that prohibits contractors/performers from concurrently providing Scientific Engineering Technical Assistance (SETA), Advisory and Assistance Services (A&AS) or similar support services and being a technical performer. Therefore, as part of the FAR 9.5 disclosure requirement above, a proposer must affirm whether the proposer or *any* proposed team member (subawardee, consultant) is providing SETA, A&AS, or similar support to any DARPA office(s) under: (a) a current award or subaward; or (b) a past award or subaward that ended within one calendar year prior to the proposal's submission date. If SETA, A&AS, or similar support is being or was provided to any DARPA office(s), the proposal must include:

- The name of the DARPA office receiving the support;
- The prime contract number;
- Identification of proposed team member (subawardee, consultant) providing the support; and
- An OCI mitigation plan in accordance with FAR 9.5.

#### Government Procedures

In accordance with FAR 9.503, 9.504 and 9.506, the Government will evaluate OCI mitigation plans to avoid, neutralize or mitigate potential OCI issues before award and to determine whether it is in the Government's interest to grant a waiver. The Government will only evaluate OCI mitigation plans for proposals that are determined selectable under the solicitation evaluation criteria and funding availability.

The Government may require proposers to provide additional information to assist the Government in evaluating the proposer's OCI mitigation plan.

If the Government determines that a proposer failed to fully disclose an OCI; or failed to provide the affirmation of DARPA support as described above; or failed to reasonably provide additional information requested by the Government to assist in evaluating the proposer's OCI mitigation plan, the Government may reject the proposal and withdraw it from consideration for award.

### **C. Cost Sharing/Matching**

Cost sharing is not required; however, it will be carefully considered where there is an applicable statutory condition relating to the selected funding instrument. Cost sharing is encouraged where there is a reasonable probability of a potential commercial application related to the proposed research and development effort.

For more information on potential cost sharing requirements for Other Transactions for Prototype, see <http://www.darpa.mil/work-with-us/contract-management> and <https://acquisitioninnovation.darpa.mil>.

### **D. Other Eligibility Criteria**

#### **1. Collaborative Efforts**

Collaborative efforts/teaming are encouraged.

## **IV. Application and Submission Information**

PROPOSERS ARE CAUTIONED THAT EVALUATION RATINGS MAY BE LOWERED AND/OR PROPOSALS REJECTED IF PROPOSAL PREPARATION (PROPOSAL FORMAT, CONTENT, ETC.) AND/OR SUBMITTAL INSTRUCTIONS ARE NOT FOLLOWED.

### **A. Address to Request Application Package**

This announcement, any attachments, and any references to external websites herein constitute the total solicitation. If proposers cannot access the referenced material posted in the announcement found at [www.darpa.mil](http://www.darpa.mil), contact the administrative contact listed herein.

### **B. Content and Form of Application Submission**

All submissions, including abstracts and proposals must be written in English with type not smaller than 12 point font. Smaller font may be used for figures, tables, and charts. Copies of all documents submitted must be clearly labeled with the DARPA BAA number, proposer organization, and proposal title/proposal short title.

#### **1. Abstract Format**

Proposers are strongly encouraged to submit an abstract in advance of a full proposal. Abstracts should follow the format described below in this section. The cover sheet should be clearly marked "ABSTRACT" and the total length of Section II should not exceed 5 pages.

### **Section I. Administrative**

A. Cover sheet to include:

- (1) BAA number (HR001121S0019);
- (2) Technical area(s);
- (3) Lead Organization submitting abstract;
- (4) Type of organization, selected among the following categories:  
Large Organization, Small Disadvantaged Organization, Other Small Organization, HBCU, MI, Other Educational, Other Nonprofit;
- (5) Proposer's internal reference number (if any);
- (6) Other team members (if applicable) and type of organization for each;
- (7) Proposal title;
- (8) Technical point of contact to include:  
Salutation, last name, first name, street address, city, state, zip code (+4), telephone, fax (if available), electronic mail;
- (9) Administrative point of contact to include:  
Salutation, last name, first name, street address, city, state, zip code (+4), telephone, fax (if available), electronic mail;
- (10) Total funds requested from DARPA, and the amount of cost share (if any); AND
- (11) Date proposal abstract was submitted.

(Note: An official transmittal letter is not required when submitting a Proposal Abstract.)

## **Section II. Abstract Details**

### **A. Innovative Claims**

Summary of innovative claims for the proposed research. This section is the centerpiece of the abstract and should succinctly describe the uniqueness and benefits of the proposed approach relative to the current state-of-art alternate approaches.

### **B. Technical Approach**

Technical rationale, technical approach, and constructive plan for accomplishment of technical goals in support of innovative claims and deliverable production.

### **C. Deliverables**

Deliverables associated with the proposed research and the plans and capability to accomplish technology transition and commercialization.

### **D. Cost and Schedule**

Provide a cost estimate for resources (e.g. labor, materials) and any subcontractors over the proposed timeline of the project, broken down by Government fiscal year.

## **2. Full Proposal Format**

All full proposals must be in the format given below. Proposals shall consist of two volumes: Volume I – Technical and Management Proposal (3 sections), and Volume II – Cost Proposal (4 sections). The submission of other supporting materials along with the proposals is strongly discouraged and will not be considered for review. Section II of Volume I, Technical and Management Proposal, shall not exceed 30 pages for TA1 proposals and 20 pages for TA2 proposals. The page limitation for full proposals includes all figures, tables, and charts. There is no page limit for Volume II, Cost Proposal.

A summary slide of the proposed effort, in PowerPoint format, should be submitted with the proposal. A template slide is provided as Attachment 2 to the BAA. Submit this PowerPoint file in addition to Volumes I and II of your full proposal. This summary slide does not count towards the total page count.

### **a. Volume I, Technical and Management Proposal**

## **Section I. Administrative**

### **A. Cover sheet to include:**

- (1) BAA number (HR001121S0019);
- (2) Technical area(s);
- (3) Lead Organization submitting proposal;
- (4) Type of organization, selected among the following categories:

- Large Organization, Small Disadvantaged Organization, Other Small Organization, HBCU, MI, Other Educational, Other Nonprofit;
- (5) Proposer's internal reference number (if any);
  - (6) Other team members (if applicable) and type of organization for each;
  - (7) Proposal title;
  - (8) Technical point of contact to include:
    - Salutation, last name, first name, street address, city, state, zip code (+4), telephone, fax (if available), electronic mail;
  - (9) Administrative point of contact to include:
    - Salutation, last name, first name, street address, city, state, zip code (+4), telephone, fax (if available), electronic mail;
  - (10) Total funds requested from DARPA, and the amount of cost share (if any); AND
  - (11) Date proposal was submitted.

**B. Official transmittal letter.**

The transmittal letter should identify the BAA number, the proposal by name, and the proposal reference number (if any), and should be signed by an individual who is authorized to submit proposals to the Government.

**Section II. Detailed Proposal Information**

**A. Executive Summary**

Summarize the technical approach, anticipated performance, and expected outcomes of the proposed effort. The executive summary should be concise and to the point. Tables, graphs, and diagrams can be used as supplemental material along with narrative to convey the information.

**B. Technical Approach**

This section is the centerpiece of the proposal and should succinctly summarize the innovative claims for the proposed research and clearly describe the proposed approach without using any jargon. This section should demonstrate that the proposer has a clear understanding of the state-of-the-art and should provide sufficient justification for the feasibility of the proposed approach(es). This section should include a detailed technical rationale, technical approach, and constructive plan for accomplishment of technical goals in support of innovative claims and deliverable creation.

For TA1 proposals, the Technical Approach is expected to clearly articulate:

1. Technical approaches to achieve high speed VLSI CMOS transistors with  $0.18 \text{ V } V_{DD}$ ,  $70 \text{ mV } V_{TH}$ , and  $12 \text{ mV } V_{TH}$  variability at 77K; and compact low power SRAM cells using these transistors.
2. Fabrication process flow to realize these transistors and SRAM cells based advanced VLSI manufacturing platform.
3. Technical risks and mitigation approaches for each risk.

For proposals addressing TA2a and TA2b, the Technical Approach is expected to clearly articulate:

1. Novel device concepts to achieve: (TA2a) high speed, low power switches; and (TA2b) ultra-compact static memory cells.
2. Assessment of the switch and memory cell compatibility with advanced 14nm and below VLSI CMOS technology platforms such as FinFET and beyond.
3. Technical risks and mitigation approaches for each risk.

For proposals addressing TA2c, the Technical Approach is expected to clearly articulate:

1. Novel circuit concepts using LTLT components to achieve high speed low power operation at 77K.
2. Technical risks and mitigation approaches for each risk.

### **C. Statement of Work (SOW)**

In plain English, clearly define the technical tasks/subtasks to be performed, their durations, and dependencies among them. The page length for the SOW will be dependent on the amount of the effort. The SOW must not include proprietary information. For each task/subtask, provide:

1. A general description of the objective (for each defined task/activity);
2. A detailed description of the approach to be taken to accomplish each defined task/activity;
3. Identification of the primary organization responsible for task execution (prime, sub, team member, by name, etc.);
4. The completion criteria for each task/activity - a product, event or milestone that defines its completion.
5. Definitions all deliverables (reporting, data, reports, software, etc.) to be provided to the Government in support of the proposed research tasks/activities; AND
6. Clear identification of any tasks/subtasks (prime or subcontracted) that will be accomplished on-campus at a university, if applicable.

*Note: Each phase of the program must be separately defined in the SOW. Include a SOW for each subcontractor and/or consultant in the **Cost Proposal Volume**. Do not include any proprietary information in the SOW(s).*

### **D. Schedules and measurable milestones**

Schedules and measurable milestones for the proposed research. (Note: Measurable milestones should capture key development points in tasks and should be clearly articulated and defined in time relative to start of effort.) Where the effort consists of multiple portions which could reasonably be partitioned for purposes of funding, these should be identified as options. Additionally, proposals should clearly explain the technical approach(es) that will be employed to meet or exceed each program metric and provide ample justification as to why the approach(es) is/are feasible. The milestones must not include proprietary information.

### **E. Results and Technology Transfer**

Description of the results, products, transferable technology, and expected technology transfer. This should also address mitigation of life-cycle and sustainment risks associated with transitioning intellectual property for U.S. military applications, if applicable. See also

Section IV.B.11, “Intellectual Property.” If there are no proprietary claims, this should be stated.

**F. Risk Analysis and Mitigation Plan**

Identify the major technical and programmatic risks in the program. Include a risk matrix. For each risk, assign a probability of occurrence on a scale of 1-10, where 10 indicates a high likelihood that the risk will impact program success, as well as an assessment of impact, also on a scale of 1-10, where 10 indicates that this risk would maximally limit the program from delivering prototypes on schedule or meeting performance objectives. For each item with total risk (likelihood × impact) exceeding 40, include a plan for mitigating the risk and assessing risk reduction.

**G. Ongoing Research**

Comparison with other ongoing research indicating advantages and disadvantages of the proposed effort

**H. Proposer Accomplishments**

Discussion of proposer’s previous accomplishments and work in closely related research areas.

**I. National Security Impact Statement**

To reduce the potential for unintended foreign access to critical U.S. national security technologies developed under this effort, proposals shall describe:

- How the proposed work contributes to U.S. national security and U.S. technological capabilities. The proposer may also summarize previous work that contributed to U.S. national security and U.S. technological capabilities.
- Plans and capabilities to transition technologies developed under this effort to U.S. national security applications and/or to U.S. industry. The proposer may also discuss previous technology transitions to the benefit of U.S. interests.
- Any plans to transition technologies developed under this effort to foreign governments or to companies that are foreign owned, controlled or influenced. The proposer may also discuss previous technology transition to these groups.
- How the proposer will assist its employees and agents performing work under this effort to be eligible to participate in the U.S. national security environment.

**J. Facilities and Equipment**

Description of the facilities and equipment that would be used for the proposed effort and how they will support meeting program metrics.

**K. Teaming**

Describe the formal teaming arrangements which will be used to execute this effort. Describe the programmatic relationship between investigators and the rationale for choosing this teaming strategy. Present a coherent organization chart and integrated management strategy for the program team. For each person, indicate: (1) name, (2) affiliation, (3) abbreviated listing of all technical area tasks they will work on with roles, responsibilities, and percent

time indicated, (4) discussion of the proposers' previous accomplishments, relevant expertise and/or unique capabilities.

#### **L. Security Management**

If applicable, describe security management architecture and/or approach for the proposed effort. Detail unique additional security requirements information system certification expertise for controlled unclassified information (CUI) or classified processing, OPSEC, program protection planning, test planning, transportation plans, work being performed at different classification levels, and/or utilizing test equipment not approved at appropriate classification level (may not be applicable for fundamental research).

### **Section III. Additional Information**

Information in this section may include a brief bibliography of relevant technical papers and research notes (published and unpublished) which document the technical ideas upon which the proposal is based. Copies of not more than three (3) relevant prior papers may be included in the submission.

#### **b. Volume II, Cost Proposal – {No Page Limit}**

All proposers, including FFRDCs, must submit the following:

#### **Section I. Administrative**

Cover sheet to include:

- (1) BAA number (HR001121S0019);
- (2) Technical area(s);
- (3) Lead Organization submitting proposal;
- (4) Type of organization, selected among the following categories:  
Large Organization, Small Disadvantaged Organization, Other Small Organization, HBCU, MI, Other Educational, Other Nonprofit;
- (5) Proposer's internal reference number (if any);
- (6) Other team members (if applicable) and type of organization for each;
- (7) Proposal title;
- (8) Technical point of contact to include:  
Salutation, last name, first name, street address, city, state, zip code (+4), telephone, fax (if available), electronic mail (if available);
- (9) Administrative point of contact to include:  
Salutation, last name, first name, street address, city, state, zip code (+4), telephone, fax (if available), and electronic mail (if available);
- (10) Award instrument requested:  
Cost-Plus-Fixed Fee (CPFF), Cost-contract—no fee, cost sharing contract—no fee, or other type of procurement contract (*specify*), Grant, Cooperative Agreement, or Other Transaction;
- (11) Place(s) and period(s) of performance;

- (12) Total proposed cost separated by basic award and option(s), if any, by calendar year and by government fiscal year;
- (13) Name, address, and telephone number of the proposer's cognizant Defense Contract Management Agency (DCMA) administration office (*if known*);
- (14) Name, address, and telephone number of the proposer's cognizant Defense Contract Audit Agency (DCAA) audit office (*if known*);
- (15) Date proposal was prepared;
- (16) DUNS number;
- (17) TIN number;
- (18) CAGE Code;
- (19) Subcontractor Information;
- (20) Proposal validity period (120 days is recommended); AND
- (21) Any Forward Pricing Rate Agreement, other such approved rate information, or such documentation that may assist in expediting negotiations (if available).

**Attachment 1, the Cost Volume Proposer Checklist, must be included with the coversheet of the Cost Proposal.**

## **Section II. Detailed Cost Information (Prime and Subcontractors)**

The proposers', to include eligible FFRDCs', cost volume shall provide cost and pricing information (See Note 1), or other than cost or pricing information if the total price is under the referenced threshold, in sufficient detail to substantiate the program price proposed (e.g., realism and reasonableness). In doing so, the proposer shall provide, for **both the prime and each subcontractor**, a "Summary Cost Breakdown" by phase and performer fiscal year, and a "Detailed Cost Breakdown" by phase, technical task/sub-task, and month. The breakdown/s shall include, at a minimum, the following major cost items along with associated backup documentation:

Total program cost broken down by major cost items:

### **A. Direct Labor**

A breakout clearly identifying the individual labor categories with associated labor hours and direct labor rates, as well as a detailed Basis-of-Estimate (BOE) narrative description of the methods used to estimate labor costs;

### **B. Indirect Costs**

Including Fringe Benefits, Overhead, General and Administrative Expense, Cost of Money, Fee, etc. (must show base amount and rate);

### **C. Travel**

Provide the purpose of the trip, number of trips, number of days per trip, departure and arrival destinations, number of people, etc.;

### **D. Other Direct Costs**

Itemized with costs; back-up documentation is to be submitted to support proposed costs;



**E. Material/Equipment**

(i) An itemization of any information technology (IT) purchase, as defined by FAR 2.101 – Documentation supporting the reasonableness of the proposed equipment costs (vendor quotes, past purchase orders/purchase history, detailed engineering estimates, etc.) shall be provided, including a letter stating why the proposer cannot provide the requested resources from its own funding for prime and all sub-awardees.

(ii) A priced Bill-of-Material (BOM) clearly identifying, for each item proposed, the quantity, unit price, the source of the unit price (i.e., vendor quote, engineering estimate, etc.), the type of property (i.e., material, equipment, special test equipment, information technology, etc.), and a cross-reference to the Statement of Work (SOW) task/s that require the item/s. At time of proposal submission, any item that exceeds \$2,000 must be supported with basis-of-estimate (BOE) documentation such as a copy of catalog price lists, vendor quotes or a written engineering estimate (additional documentation may be required during negotiations, if selected).

(iii) If seeking a procurement contract and items of Contractor Acquired Property are proposed, exclusive of material, the proposer shall clearly demonstrate that the inclusion of such items as Government Property is in keeping with the requirements of FAR Part 45.102. In accordance with FAR 35.014, “Government property and title,” it is the Government’s intent that title to all equipment purchased with funds available for research under any resulting contract will vest in the acquiring nonprofit institution (e.g., Nonprofit Institutions of Higher Education and Nonprofit Organizations whose primary purpose is the conduct of scientific research) upon acquisition without further obligation to the Government. Any such equipment shall be used for the conduct of basic and applied scientific research. The above transfer of title to all equipment purchased with funds available for research under any resulting contract is not allowable when the acquiring entity is a for-profit organization; however, such organizations can, in accordance with FAR 52.245-1(j), be given priority to acquire such property at its full acquisition cost.

**F. Consultants**

If consultants are to be used, proposer must provide a copy of the consultant’s proposed SOW as well as a signed consultant agreement or other document which verifies the proposed loaded daily / hourly rate and any other proposed consultant costs (e.g. travel);

**G. Subcontracts**

Itemization of all subcontracts. Additionally, the prime contractor is responsible for compiling and providing, as part of its proposal submission to the Government, subcontractor proposals prepared at the same level of detail as that required by the prime. Subcontractor proposals include Interdivisional Work Transfer Agreements (ITWA) or similar arrangements. If seeking a procurement contract, the prime contractor shall provide a cost reasonableness analysis of all proposed subcontractor costs/prices. Such analysis shall indicate the extent to which the prime contractor has negotiated subcontract costs/prices and whether any such subcontracts are to be placed on a sole-source basis.

All proprietary subcontractor proposal documentation, prepared at the same level of detail as that required of the prime, which cannot be uploaded to the DARPA BAA website

(<https://baa.darpa.mil>, BAAT) or Grants.gov as part of the proposer's submission, shall be made immediately available to the Government, upon request, under separate cover (i.e., mail, electronic/email, etc.), either by the proposer or by the subcontractor organization. This does not relieve the proposer from the requirement to include, as part of their submission (via BAAT or Grants.gov, as applicable), subcontract proposals that do not include proprietary pricing information (rates, factors, etc.).

A Rough Order of Magnitude (ROM), or similar budgetary estimate, is not considered a fully qualified subcontract cost proposal submission. Inclusion of a ROM, or similar budgetary estimate, may result in the full proposal being deemed non-conforming or evaluation ratings may be lowered;

#### **H. Cost-Sharing**

The amount of any industry cost-sharing (the source and nature of any proposed cost-sharing should be discussed in the narrative portion of the cost volume).

#### **I. Fundamental Research**

Written justification required per Section II.B, "Fundamental Research," pertaining to prime and/or subcontracted effort being considered Contracted Fundamental Research.

Note 1:

- (a) "Cost or Pricing Data" as defined in FAR 15.403-4 shall be required if the proposer is seeking a procurement contract per the referenced threshold, unless the proposer requests and is granted an exception from the requirement to submit cost or pricing data. Per DoD Class Deviation 2018-O0012, dated 13 April 2018, the threshold for obtaining certified cost and pricing data is \$2,000,000. Per DFARS 215.408(5), DFARS 252.215-7009, Proposal Adequacy Checklist, applies to all proposers/proposals seeking a FAR-based award (contract).
- (b) In accordance with DFARS 215.403-1(4)(D), DoD has waived cost or pricing data requirements for nonprofit organizations (including educational institutions) on cost-reimbursement-no-fee contracts. In such instances where the waiver stipulated at DFARS 215.403-1(4)(D) applies, proposers shall submit information other than cost or pricing data to the extent necessary for the Government to determine price reasonableness and cost realism; and cost or pricing data from subcontractors that are not nonprofit organizations when the subcontractor's proposal exceeds the cost and pricing data threshold at FAR 15.403-4(a)(1).
- (c) Per Section 873 of the FY2016 National Defense Authorization Act (Pub L. 114-92), "Pilot Program For Streamlining Awards For Innovative Technology Projects," small businesses and nontraditional defense contractors (as defined therein) are alleviated from submission of certified cost and pricing data for new contract awards valued at less than \$7,500,000. In such instances where this "waiver" applies, proposers seeking a FAR-based contract shall submit information other than certified cost or pricing data to the extent necessary for the Government to determine price reasonableness and cost realism; and certified cost or pricing data from subcontractors that are not small businesses or nontraditional defense contractors when such subcontract proposals exceed the cost and pricing data threshold at FAR 15.403-4(a)(1).

Note 2:

Proposers requesting an Other Transaction who meet the definition of “nontraditional defense contractor,” as defined at 10 U.S. Code § 2302(9), should submit information similar to “data other than certified cost or pricing data,” as defined at FAR 2.101, to the maximum extent possible to allow for the Government to evaluate cost realism. Proposers (to include subcontractors) who do not meet the definition of a nontraditional defense contractor (who are, therefore, considered a traditional defense contractor) shall submit “data other than certified cost or pricing data.” It is incumbent on a proposer requesting an Other Transaction to provide an adequate amount of cost information needed in order for the Government to be able to evaluate cost realism. Failure to provide an adequate amount of cost information will result in the proposal being deemed non-conforming.

Note 3:

Proposers are required to provide the aforementioned cost breakdown as an editable MS Excel spreadsheet, inclusive of calculations formulae, with tabs (material, travel, ODC’s) provided as necessary. The Government also requests and recommends that the Cost Proposal include MS Excel file(s) that provide traceability between the Bases of Estimate (BOEs) and the proposed costs across all elements and phases. This includes the calculations and adjustments that are utilized to generate the Summary Costs from the source labor hours, labor costs, material costs, etc. input data. It is requested that the costs and Subcontractor proposals be readily traceable to the Prime Cost Proposal in the provided MS Excel file(s) – although this is not a requirement, providing information in this manner will assist the Government in understanding what is being proposed both technically and in terms of cost realism. NOTE: If the PDF submission differs from the Excel submission, the PDF will take precedence.

Note 4:

The Government strongly encourages that proposers use the provided MS Excel™ DARPA Standard Cost Proposal Spreadsheet in the development of their cost proposals. A customized cost proposal spreadsheet may be an attachment to this solicitation. If not, the spreadsheet can be found on the DARPA website at <http://www.darpa.mil/work-with-us/contract-management> (under “Resources” on the right-hand side of the webpage). All tabs and tables in the cost proposal spreadsheet should be developed in an editable format with calculation formulas intact to allow traceability of the cost proposal. This cost proposal spreadsheet should be used by the prime organization and all subcontractors. In addition to using the cost proposal spreadsheet, the cost proposal still must include all other items required in this announcement that are not covered by the editable spreadsheet. Subcontractor cost proposal spreadsheets may be submitted directly to the Government by the proposed subcontractor via e-mail to the address in Part I of this solicitation. **Using the provided cost proposal spreadsheet will assist the Government in a rapid analysis of your proposed costs and, if your proposal is selected for a potential award, speed up the negotiation and award execution process.**

Any questions pertaining to use of the DARPA Standard Cost Proposal Spreadsheet, to include permitted changes and prohibited changes thereto, should be directed to [costproposal@darpa.mil](mailto:costproposal@darpa.mil). Please read the instructions provided within the DARPA Standard Cost Proposal Spreadsheet, "General" tab, to include the General Spreadsheet Instruction document embedded therein. It is very important that proposers not make changes to the format of the spreadsheet where specifically instructed not to do so.

### **Section III. Other Transaction Request, if applicable**

All proposers requesting an Other Transaction (OT) must include a detailed list of payment milestones (Milestone Plan). Each milestone must include the following:

- Milestone description
- Completion/Exit criteria (to include identifying all associated data deliverables excluding those specifically providing project status)
- Due date
- Payment/funding schedule (to include, if cost share is proposed, awardee and Government share amounts)
- For each data deliverable, identify the proposed Government data rights (keeping in mind how each data deliverable will need to be used by the Government given the goals and objectives of the proposed project)

It is noted that, at a minimum, milestones should relate directly to accomplishment of program technical metrics as defined in the BAA and/or the proposer's proposal. Agreement type, expenditure or fixed-price based, will be subject to negotiation by the Agreements Officer. Do not include proprietary data.

### **Section IV. Other Cost Information**

Where the effort consists of multiple portions which could reasonably be partitioned for purposes of funding, these should be identified as options with separate cost estimates.

The cost proposal should include identification of pricing assumptions of which may require incorporation into the resulting award instrument (i.e., use of Government Furnished Property/Facilities/Information, access to Government Subject Matter Experts, etc.).

The proposer should include supporting cost and pricing information in sufficient detail to substantiate the summary cost estimates and should include a description of the method used to estimate costs and supporting documentation.

Cost proposals submitted by FFRDC's (prime or subcontractor) will be forwarded, if selected for negotiation, to their sponsoring organization contracting officer for review to confirm that all required forward pricing rates and factors have been used.

### **3. Proprietary Information**

Proposers are responsible for clearly identifying proprietary information. Submissions containing proprietary information must have the cover page and each page containing such information clearly marked with a label such as "Proprietary" or "Company Proprietary." Note, "Confidential" is a classification marking used to control the dissemination of U.S. Government National Security Information as dictated in Executive Order 13526 and should not be used to identify proprietary business information.

#### 4. Security Information

##### a. Program Security Information

Proposers should include with their proposal any proposed solution(s) to program security requirements unique to this program. Common program security requirements include but are not limited to: operational security (OPSEC) contracting/sub-contracting plans; foreign participation or materials utilization plans; program protection plans (which may entail the following) manufacturing and integration plans; range utilization and support plans (air, sea, land, space, and cyber); data dissemination plans; asset transportation plans; classified test activity plans; disaster recovery plans; classified material / asset disposition plans and public affairs / communications plans.

##### b. Controlled Unclassified Information (CUI)

For Unclassified proposals containing controlled unclassified information (CUI), applicants will ensure personnel and information systems processing CUI security requirements are in place.

##### i. CUI Proposal Markings

If an unclassified submission contains CUI or the suspicion of such, as defined by Executive Order 13556 and 32 CFR Part 2002, the information must be appropriately and conspicuously marked CUI in accordance with DoDI 5200.48. Identification of what is CUI about this DARPA program will be detailed in a DARPA CUI Guide and will be provided as an attachment to the BAA or may be provided at a later date.

##### ii. CUI Submission Requirements

Unclassified submissions containing CUI may be submitted via DARPA's BAA Website (<https://baa.darpa.mil>) in accordance with Part II Section VIII of this BAA.

Proposers submitting proposals involving the pursuit and protection of DARPA information designated as CUI must have, or be able to acquire prior to contract award, an information system authorized to process CUI information IAW NIST SP 800-171 and DoDI 8582.01.

##### c. Unclassified Submissions

DARPA anticipates that submissions received under this BAA will be unclassified. However, should a proposer wish to submit classified information, an *unclassified* email must be sent to the BAA mailbox notifying the Technical Office PSO of the submission and the below guidance must be followed.

Security classification guidance and direction via a Security Classification Guide (SCG) and/or DD Form 254, "DoD Contract Security Classification Specification," will not be provided at this time. If a determination is made that the award instrument may result in access to classified

information, a SCG and/or DD Form 254 will be issued by DARPA and attached as part of the award.

#### **d. Classified Submissions**

For classified proposals, applicants will ensure all industrial, personnel, and information systems processing security requirements are in place and at the appropriate level (e.g., Facility Clearance Level (FCL), Automated Information Security (AIS), Certification and Accreditation (C&A), and any Foreign Ownership Control and Influence (FOCI) issues are mitigated prior to submission. Additional information on these subjects can be found at <http://www.dss.mil>.

The effort being solicited by this BAA is classified or otherwise involves access to, or generation of, classified information. Security classification guidance via a Security Classification Guide (SCG) and/or DD Form 254, “DoD Contract Security Classification Specification,” is provided as an attachment to the BAA.

Classified submissions shall be transmitted in accordance with the following guidance. Additional information on the subjects discussed in this section may be found at <http://www.dss.mil/>.

If a submission contains Classified National Security Information as defined by Executive Order 13526, the information must be appropriately and conspicuously marked with the proposed classification level and declassification date. Similarly, when the classification of a submission is in question, the submission must be appropriately and conspicuously marked with the proposed classification level and declassification date. Submissions requiring DARPA to make a final classification determination shall be marked as follows:

“CLASSIFICATION DETERMINATION PENDING. Protect as though classified \_\_\_\_\_ (insert the recommended classification level, e.g., *Top Secret, Secret or Confidential*).”

NOTE: Classified submissions must indicate the classification level of not only the submitted materials, but also the classification level of the anticipated award.

Submissions containing both classified information and CUI must be appropriately and conspicuously marked with the proposed classification level as well as ensuring CUI is marked in accordance with DoDI 5200.48.

Proposers submitting classified information must have, or be able to obtain prior to contract award, cognizant security agency approved facilities, information systems, and appropriately cleared/eligible personnel to perform at the classification level proposed. All proposer personnel performing Information Assurance (IA)/Cybersecurity related duties on classified Information Systems shall meet the requirements set forth in DoD Manual 8570.01-M (Information Assurance Workforce Improvement Program).

Proposers choosing to submit classified information from other collateral classified sources (i.e., sources other than DARPA) must ensure (1) they have permission from an authorized individual at the cognizant Government agency (e.g., Contracting Officer, Program Manager); (2) the proposal is marked in accordance with the source Security Classification Guide (SCG) from which the material is derived; and (3) the source SCG is submitted along with the proposal.

When a proposal includes a classified portion, and when able according to security guidelines, we ask that proposers send an e-mail to HR001120S0019@darpa.mil as notification that there is a classified portion to the proposal. When sending the classified portion via mail according to the instructions, proposers should submit six (6) hard copies of the classified portion of their proposal and two (2) CD-ROMs containing the classified portion of the proposal as a single searchable Adobe PDF file. Please ensure that all CDs are well-marked. Each copy of the classified portion must be clearly labeled with HR001120S0019, proposer organization, proposal title (short title recommended), and Copy \_ of \_.

### **Confidential and Secret Information**

Use transmission, classification, handling, and marking guidance provided by previously issued SCGs, the DoD Information Security Manual (DoDM 5200.01, Volumes 1 - 4), and the National Industrial Security Program Operating Manual, including the Supplement Revision 1, (DoD 5220.22-M and DoD 5200.22-M Sup. 1) when submitting Confidential and/or Secret classified information.

Confidential and Secret classified information may be submitted via ONE of the two following methods:

- Hand-carried by an appropriately cleared and authorized courier to the DARPA CDR. Prior to traveling, the courier shall contact the DARPA Classified Document Registry (CDR) at 703-526-4052 to coordinate arrival and delivery.

OR

- Mailed via U.S. Postal Service (USPS) Registered Mail or USPS Express Mail. All classified information will be enclosed in opaque inner and outer covers and double-wrapped. The inner envelope shall be sealed and plainly marked with the assigned classification and addresses of both sender and addressee.

The inner envelope shall be addressed to:

Defense Advanced Research Projects Agency  
ATTN: Program Security Officer, MTO  
Reference: HR001121S0019  
675 North Randolph Street  
Arlington, VA 22203-2114

The outer envelope shall be sealed with no identification as to the classification of its contents and addressed to:

Defense Advanced Research Projects Agency  
Security & Intelligence Directorate, Attn: CDR  
675 North Randolph Street  
Arlington, VA 22203-2114

### **Top Secret Information**

Use classification, handling, and marking guidance provided by previously issued SCGs, the DoD Information Security Manual (DoDM 5200.01, Volumes 1 - 4), and the National Industrial Security Program Operating Manual, including the Supplement Revision 1, (DoD 5220.22-M and DoD 5200.22-M Sup. 1). Top Secret information must be hand-carried by an appropriately cleared and authorized courier to the DARPA CDR. Prior to traveling, the courier shall contact the DARPA CDR at 703-526-4052 to coordinate arrival and delivery.

### **Sensitive Compartmented Information (SCI)**

SCI must be marked, managed and transmitted in accordance with DoDM 5105.21 Volumes 1 - 3. Questions regarding the transmission of SCI may be sent to the DARPA Technical Office PSO via the BAA mailbox or by contacting the DARPA Special Security Officer (SSO) at 703-812-1970.

Successful proposers may be sponsored by DARPA for access to SCI. Sponsorship must be aligned to an existing DD Form 254 where SCI has been authorized. Questions regarding SCI sponsorship should be directed to the DARPA Personnel Security Office at 703-526-4543.

### **Special Access Program (SAP) Information**

SAP information must be marked in accordance with DoDM 5205.07 Volume 4 and transmitted by specifically approved methods which will be provided by the Technical Office PSO or their staff.

Proposers choosing to submit SAP information from an agency other than DARPA are required to provide the DARPA Technical Office Program Security Officer (PSO) written permission from the source material's cognizant Special Access Program Control Officer (SAPCO) or designated representative. For clarification regarding this process, contact the DARPA Technical Office PSO via the BAA mailbox or the DARPA SAPCO at 703-526-4102.

Additional SAP security requirements regarding facility accreditations, information security, personnel security, physical security, operations security, test security, classified transportation plans, and program protection planning may be specified in the DD Form 254.

*NOTE: prior to drafting the submission, if use of SAP Information Systems is to be proposed, proposers must first obtain an Authorization-to-Operate from the DARPA Technical Office PSO (or other applicable DARPA Authorization Official) using the Risk Management Framework (RMF) process outlined in the Joint Special Access Program (SAP) Implementation Guide (JSIG), Revision 3, dated October 9, 2013 (or successor document).*



*SAP IT disposition procedures must be approved in accordance with the DoD CIO Memorandum of April 20, 2020<sup>4</sup>.*

## **5. Disclosure of Information and Compliance with Safeguarding Covered Defense Information Controls**

The following provisions and clause apply to all solicitations and contracts; however, the definition of “controlled technical information” clearly exempts work considered fundamental research and therefore, even though included in the contract, will not apply if the work is fundamental research.

DFARS 252.204-7000, “Disclosure of Information”

DFARS 252.204-7008, “Compliance with Safeguarding Covered Defense Information Controls”

DFARS 252.204-7012, “Safeguarding Covered Defense Information and Cyber Incident Reporting”

The full text of the above solicitation provision and contract clauses can be found at

<http://www.darpa.mil/work-with-us/additional-baa#NPRPAC>.

Compliance with the above requirements includes the mandate for proposers to implement the security requirements specified by National Institute of Standards and Technology (NIST) Special Publication (SP) 800-171, “Protecting Controlled Unclassified Information in Nonfederal Information Systems and Organizations” (see <https://doi.org/10.6028/NIST.SP.800-171r1>) and DoDI 8582.01 that are in effect at the time the solicitation is issued.

For awards where the work is considered fundamental research, the contractor will not have to implement the aforementioned requirements and safeguards. However, should the nature of the work change during performance of the award, work not considered fundamental research will be subject to these requirements.

## **6. Human Subjects Research (HSR)/Animal Use**

Proposers that anticipate involving human subjects or animals in the proposed research must comply with the approval procedures detailed at <http://www.darpa.mil/work-with-us/additional-baa>, to include providing the information specified therein as required for proposal submission.

## **7. Approved Cost Accounting System Documentation**

Proposers that do not have a Cost Accounting Standards (CAS) compliant accounting system considered adequate for determining accurate costs that are negotiating a cost-type procurement contract must complete an SF 1408. For more information on CAS compliance, see <http://www.dcaa.mil/cas.html>. To facilitate this process, proposers should complete the SF 1408 found at <http://www.gsa.gov/portal/forms/download/115778> and submit the completed form with the proposal. To complete the form, check the boxes on the second page, then provide a narrative explanation of your accounting system to supplement the checklist on page one. For more information, see ([http://www.dcaa.mil/preaward\\_accounting\\_system\\_adequacy\\_checklist.html](http://www.dcaa.mil/preaward_accounting_system_adequacy_checklist.html)).

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<sup>4</sup> The title of this memorandum is CUI and the memo is classified SECRET//HANDLE VIA SPECIAL ACCESS CHANNELS ONLY. This memorandum may be provided under separate cover.

## 8. Section 508 of the Rehabilitation Act (29 U.S.C. § 749d)/FAR 39.2

All electronic and information technology acquired or created through this BAA must satisfy the accessibility requirements of Section 508 of the Rehabilitation Act (29 U.S.C § 794d)/FAR 39.2.

## 9. Grant Abstract

Per Section 8123 of the Department of Defense Appropriations Act, 2015 (Pub. L. 113-235), all grant awards must be posted on a public website in a searchable format. To comply with this requirement, proposers requesting grant awards must submit a maximum one (1) page abstract that may be publicly posted and explains the program or project to the public. The proposer should sign the bottom of the abstract confirming the information in the abstract is approved for public release. Proposers are advised to provide both a signed PDF copy, as well as an editable (e.g., Microsoft word) copy. Abstracts contained in grant proposals that are not selected for award will not be publicly posted.

## 10. Small Business Subcontracting Plan

Pursuant to Section 8(d) of the Small Business Act (15 U.S.C. § 637(d)) and FAR 19.702(a)(1), each proposer who is a small business concern and seeking a procurement contract that has subcontracting possibilities is required to submit a subcontracting plan with their proposal. The plan format is outlined in FAR 19.704. As of the date of publication of this BAA, per FAR 19.702, the threshold for submission of a small business subcontracting plan is \$700,000 (total contract amount including options).

## 11. Intellectual Property

All proposers must provide a good faith representation that the proposer either owns or possesses the appropriate licensing rights to all intellectual property that will be utilized under the proposed effort.

### a. For Procurement Contracts

Proposers responding to this BAA requesting procurement contracts will need to complete the certifications at DFARS 252.227-7017. See [www.darpa.mil/work-with-us/additional-baa](http://www.darpa.mil/work-with-us/additional-baa) for further information. If no restrictions are intended, the proposer should state “none.” The table below captures the requested information:

Technical Data Computer Software To be Furnished With Restrictions	Summary of Intended Use in the Conduct of the Research	Basis for Assertion	Asserted Rights Category	Name of Person Asserting Restrictions
(LIST)	(NARRATIVE)	(LIST)	(LIST)	(LIST)

## **b. For All Non-Procurement Contracts**

Proposers responding to this BAA requesting a Grant, Cooperative Agreement, Technology Investment Agreement, or Other Transaction for Prototypes shall follow the applicable rules and regulations governing these various award instruments, but, in all cases, should appropriately identify any potential restrictions on the Government's use of any Intellectual Property contemplated under the award instrument in question. This includes both Noncommercial Items and Commercial Items. Proposers are encouraged use a format similar to that described in Paragraph a. above. If no restrictions are intended, then the proposer should state "NONE."

### **12. Patents**

Include documentation proving your ownership of or possession of appropriate licensing rights to all patented inventions (or inventions for which a patent application has been filed) that will be utilized under your proposal for the DARPA program. If a patent application has been filed for an invention that your proposal utilizes, but the application has not yet been made publicly available and contains proprietary information, you may provide only the patent number, inventor name(s), assignee names (if any), filing date, filing date of any related provisional application, and a summary of the patent title, together with either: (1) a representation that you own the invention, or (2) proof of possession of appropriate licensing rights in the invention.

### **13. System for Award Management (SAM) and Universal Identifier Requirements**

All proposers must be registered in SAM unless exempt per FAR 4.1102. FAR 52.204-7, "System for Award Management" and FAR 52.204-13, "System for Award Management Maintenance" are incorporated into this solicitation. See <http://www.darpa.mil/work-with-us/additional-baa> for further information.

International entities can register in SAM by following the instructions in this link:

[https://www.fsd.gov/fsd-gov/answer.do?sysparm\\_kbid=dbf8053adb119344d71272131f961946&sysparm\\_search=KB0013221](https://www.fsd.gov/fsd-gov/answer.do?sysparm_kbid=dbf8053adb119344d71272131f961946&sysparm_search=KB0013221).

### **14. Funding Restrictions**

Not applicable.

## **C. Submission Information**

DARPA will acknowledge receipt of all submissions and assign an identifying control number that should be used in all further correspondence regarding the submission. DARPA intends to use electronic mail correspondence regarding HR001121S0019. Submissions may not be submitted by fax or e-mail; any so sent will be disregarded.

Submissions will not be returned. An electronic copy of each submission received will be retained at DARPA and all other non-required copies destroyed. A certification of destruction

may be requested, provided the formal request is received by DARPA within 5 days after notification that a proposal was not selected.

All administrative correspondence and questions on this solicitation, including requests for clarifying information on how to submit an abstract or full proposal to this BAA should be directed to [HR001121S0019@darpa.mil](mailto:HR001121S0019@darpa.mil). DARPA intends to use electronic mail for correspondence regarding HR001121S0019. Proposals and abstracts may not be submitted by fax or e-mail; any so sent will be disregarded. DARPA encourages use of the Internet for retrieving the BAA and any other related information that may subsequently be provided.

## **1. Submission Dates and Times**

For consideration during the initial round of selections, proposers are required to follow the deadlines specified below. Proposers are warned that the likelihood of available funding is greatly reduced for proposals submitted after the initial closing date deadline.

### **a. Abstract Due Date**

Abstracts must be submitted to DARPA/MTO on or before 1:00 PM, Eastern Time, 2 April 2021. Abstracts received after this time and date may not be reviewed.

### **b. Full Proposal Date**

Full proposals must be submitted to DARPA/MTO on or before 1:00 PM, Eastern Time, 18 May 2021, in order to be considered during the single round of selections. Proposals received after this deadline will not be reviewed.

### **c. Frequently Asked Questions (FAQ)**

DARPA will post a consolidated Question and Answer (FAQ) document on a regular basis. To access the posting go to: <http://www.darpa.mil/work-with-us/opportunities>. Under the HR001121S0019 summary will be a link to the FAQ. Submit your question/s by e-mail to [HR001121S0019@darpa.mil](mailto:HR001121S0019@darpa.mil). In order to receive a response sufficiently in advance of the proposal due date, send your question/s on or before 1:00 PM, Eastern Time, 28 April 2021.

## **2. Abstract Submission Information**

Proposers are strongly encouraged to submit an abstract in advance of a full proposal in order to provide potential proposers with a rapid response and to minimize unnecessary effort in proposal preparation and review. DARPA will acknowledge receipt of the submission and assign a control number that should be used in all further correspondence regarding the abstract.

All abstracts sent in response to HR001121S0019 shall be submitted via DARPA's BAA Website (<https://baa.darpa.mil>). Visit the website to complete the two-step registration process. Submitters will need to register for an Extranet account (via the form at the URL listed above) and wait for two separate e-mails containing a username and temporary password. After

accessing the Extranet, submitters may then create an account for the DARPA BAA website (via the "Register your Organization" link along the left side of the homepage), view submission instructions, and upload/finalize the abstract. Proposers using the DARPA BAA Website may encounter heavy traffic on the submission deadline date; it is highly advised that submission process be started as early as possible.

All abstracts submitted electronically through the DARPA BAA Submission website must be uploaded as zip files (.zip or .zipx extension). The final zip file should only contain the document(s) requested herein and must not exceed 50 MB in size. Only one zip file will be accepted per abstract; abstracts not uploaded as zip files will be rejected by DARPA.

**NOTE: YOU MUST CLICK THE 'FINALIZE PROPOSAL ABSTRACT' BUTTON AT THE BOTTOM OF THE CREATE PROPOSAL ABSTRACT PAGE. FAILURE TO DO SO WILL RESULT IN YOUR ABSTRACT NOT BEING OFFICIALLY SUBMITTED TO THIS BAA AND THEREFORE NOT BEING REVIEWED.**

Please note that the DoD-issued certificate associated with the BAA website is not recognized by all commercial certificate authorities, resulting in untrusted connection errors/messages. You can either bypass the warning (possibly by adding <https://baa.darpa.mil> to your listed of trusted sites, or [arpa.mil](https://arpa.mil) as a trusted domain), or visit DISA's site to download the Root Certificate Authority (CA): <https://public.cyber.mil/from-iase/>.

Technical support for DARPA's BAA Website may be reached at [BAAT\\_Support@darpa.mil](mailto:BAAT_Support@darpa.mil), and is typically available during regular business hours, (9:00 AM - 5:00 PM EST Monday - Friday).

Note: DO NOT SUBMIT ABSTRACTS TO GRANTS.GOV.

### **3. Proposal Submission Information**

The typical proposal should express a consolidated effort in support of one or more related technical concepts or ideas. Disjointed efforts should not be included into a single proposal. Proposals not meeting the format described in the BAA may not be reviewed.

#### **a. For Proposers Requesting Grants or Cooperative Agreements:**

Proposers requesting grants or cooperative agreements must submit proposals through one of the following methods: (1) electronic upload per the instructions at <https://www.grants.gov/applicants/apply-for-grants.html> (DARPA-preferred); or (2) hard-copy mailed directly to DARPA. If proposers intend to use Grants.gov as their means of submission, then they must submit their entire proposal through Grants.gov; applications cannot be submitted in part to Grants.gov and in part as a hard-copy. Proposers using Grants.gov do not submit hard-copy proposals in addition to the Grants.gov electronic submission. Submissions: In addition to the volumes and corresponding attachments requested elsewhere in this solicitation, proposers must also submit the three forms listed below.

*Form 1: SF 424 Research and Related (R&R) Application for Federal Assistance, available on the Grants.gov website at [https://apply07.grants.gov/apply/forms/sample/RR\\_SF424\\_2\\_0-V2.0.pdf](https://apply07.grants.gov/apply/forms/sample/RR_SF424_2_0-V2.0.pdf). This form must be completed and submitted.*

To evaluate compliance with Title IX of the Education Amendments of 1972 (20 U.S.C. § 1681 et.seq.), the Department of Defense (DoD) is collecting certain demographic and career information to be able to assess the success rates of women who are proposed for key roles in applications in science, technology, engineering or mathematics disciplines. In addition, the National Defense Authorization Act (NDAA) for FY 2019, Section 1286, directs the Secretary of Defense to protect intellectual property, controlled information, key personnel, and information about critical technologies relevant to national security and limit undue influence, including foreign talent programs by countries that desire to exploit United States' technology within the DoD research, science and technology, and innovation enterprise. This requirement is necessary for all research and research-related educational activities. The DoD is using the two forms below to collect the necessary information to satisfy these requirements. Detailed instructions for each form are available on Grants.gov.

*Form 2: Research and Related Senior/Key Person Profile (Expanded), available on the Grants.gov website at [https://apply07.grants.gov/apply/forms/sample/RR\\_KeyPersonExpanded\\_2\\_0-V2.0.pdf](https://apply07.grants.gov/apply/forms/sample/RR_KeyPersonExpanded_2_0-V2.0.pdf). This form must be completed and submitted.*

The Research and Related Senior/Key Person Profile (Expanded) form will be used to collect the following information for all senior/key personnel, including Project Director/Principal Investigator and Co-Project Director/Co-Principal Investigator, whether or not the individuals' efforts under the project are funded by the DoD:

- Degree Type and Degree Year.
- Current and Pending Support, including:
  - A list of all current projects the individual is working on, in addition to any future support the individual has applied to receive, regardless of the source.
  - Title and objectives of the other research projects.
  - The percentage per year to be devoted to the other projects.
  - The total amount of support the individual is receiving in connection to each of the other research projects or will receive if other proposals are awarded.
  - Name and address of the agencies and/or other parties supporting the other research projects
  - Period of performance for the other research projects.

Additional senior/key persons can be added by selecting the “Next Person” button at the bottom of the form. Note that, although applications without this information completed may pass Grants.gov edit checks, if DARPA receives an application without the required information, DARPA may determine that the application is incomplete and may cause your submission to be rejected and eliminated from further review and consideration under the solicitation. DARPA reserves the right to request further details from the applicant before making a final determination on funding the effort.

*Form 3: Research and Related Personal Data, available on the Grants.gov website at [https://apply07.grants.gov/apply/forms/sample/RR\\_PersonalData\\_1\\_2-V1.2.pdf](https://apply07.grants.gov/apply/forms/sample/RR_PersonalData_1_2-V1.2.pdf). Each applicant must complete the name field of this form, however, provision of the demographic information is voluntary. Regardless of whether the demographic fields are completed or not, this form must be submitted with at least the applicant's name completed.*

Grants.gov requires proposers to complete a one-time registration process before a proposal can be electronically submitted. If proposers have not previously registered, this process can take between three business days and four weeks. For more information about registering for Grants.gov, see [www.darpa.mil/work-with-us/additional-baa](http://www.darpa.mil/work-with-us/additional-baa). See the Grants.gov registration checklist at <http://www.grants.gov/web/grants/register.html> for registration requirements and instructions.

Once Grants.gov has received a proposal submission, Grants.gov will send two email messages to advise proposers as to whether or not their proposals have been validated or rejected by the system; IT MAY TAKE UP TO TWO DAYS TO RECEIVE THESE EMAILS. The first email will confirm receipt of the proposal by the Grants.gov system; this email only confirms receipt, not acceptance, of the proposal. The second will indicate that the application has been successfully validated by the system prior to transmission to the grantor agency or has been rejected due to errors. If the proposal is validated, then the proposer has successfully submitted their proposal. If the proposal is rejected, the proposed must be corrected and resubmitted before DARPA can retrieve it. If the solicitation is no longer open, the rejected proposal cannot be resubmitted. Once the proposal is retrieved by DARPA, the proposer will receive a third email from Grants.gov. To avoid missing deadlines, proposers should submit their proposals in advance of the final proposal due date with sufficient time to receive confirmations and correct any errors in the submission process through Grants.gov. For more information on submitting proposals to Grants.gov, visit the Grants.gov submissions page at: <http://www.grants.gov/web/grants/applicants/apply-for-grants.html>.

Proposers electing to submit grant or cooperative agreement proposals as hard copies must complete the same forms as indicated above.

#### **b. For Proposers Requesting Technology Investment Agreements**

Proposers requesting Technology Investment Agreements (TIA) awarded under 10 U.S.C. 2371 must include the completed form indicated below. This requirement only applies only to those who expect to receive a TIA as their ultimate award instrument.

The National Defense Authorization Act (NDAA) for FY 2019, Section 1286, directs the Secretary of Defense to protect intellectual property, controlled information, key personnel, and information about critical technologies relevant to national security and limit undue influence, including foreign talent programs by countries that desire to exploit United States' technology within the DoD research, science and technology, and innovation enterprise. This requirement is necessary for all research and research-related educational activities. The DoD is using the form below to collect the necessary information to satisfy these requirements.

The Research and Related Senior/Key Person Profile (Expanded) form, available on the Grants.gov website at

[https://apply07.grants.gov/apply/forms/sample/RR\\_KeyPersonExpanded\\_2\\_0-V2.0.pdf](https://apply07.grants.gov/apply/forms/sample/RR_KeyPersonExpanded_2_0-V2.0.pdf), will be used to collect the following information for all senior/key personnel, including Project Director/Principal Investigator and Co-Project Director/Co-Principal Investigator, whether or not the individuals' efforts under the project are funded by the DoD:

- Degree Type and Degree Year.

- Current and Pending Support, including:
  - A list of all current projects the individual is working on, in addition to any future support the individual has applied to receive, regardless of the source.
  - Title and objectives of the other research projects.
  - The percentage per year to be devoted to the other projects.
  - The total amount of support the individual is receiving in connection to each of the other research projects or will receive if other proposals are awarded.
  - Name and address of the agencies and/or other parties supporting the other research projects
  - Period of performance for the other research projects.

Additional senior/key persons can be added by selecting the “Next Person” button at the bottom of the form. Note that, although applications without this information completed may pass Grants.gov edit checks, if DARPA receives an application without the required information, DARPA may determine that the application is incomplete and may cause your submission to be rejected and eliminated from further review and consideration under the solicitation. DARPA reserves the right to request further details from the applicant before making a final determination on funding the effort.

### **c. For Proposers Requesting Contracts or Other Transaction Agreements**

Proposers requesting contracts or other transaction agreements must submit proposals via DARPA's BAA Website (<https://baa.darpa.mil>). Note: If an account has already been created for the DARPA BAA Website, this account may be reused. If no account currently exists for the DARPA BAA Website, visit the website to complete the two-step registration process. Submitters will need to register for an Extranet account (via the form at the URL listed above) and wait for two separate e-mails containing a username and temporary password. After accessing the Extranet, submitters may then create an account for the DARPA BAA website (via the "Register your Organization" link along the left side of the homepage), view submission instructions, and upload/finalize the proposal. Proposers using the DARPA BAA Website may encounter heavy traffic on the submission deadline date; it is highly advised that submission process be started as early as possible.

All unclassified full proposals submitted electronically through the DARPA BAA website must be uploaded as zip files (.zip or .zipx extension). The final zip file should not exceed 50 MB in size. Only one zip file will be accepted per submission and submissions not uploaded as zip files will be rejected by DARPA.

**NOTE: YOU MUST CLICK THE ‘FINALIZE FULL PROPOSAL’ BUTTON AT THE BOTTOM OF THE CREATE FULL PROPOSAL PAGE. FAILURE TO DO SO WILL RESULT IN YOUR PROPOSAL NOT BEING OFFICIALLY SUBMITTED TO THIS BAA AND THEREFORE NOT BEING REVIEWED.**

Classified submissions and proposals requesting assistance instruments (grants or cooperative agreements) should NOT be submitted through DARPA's BAA Website (<https://baa.darpa.mil>), though proposers will likely still need to visit <https://baa.darpa.mil> to register their organization



(or verify an existing registration) to ensure the BAA office can verify and finalize their submission.

Please note that the DoD-issued certificate associated with the BAA website is not recognized by all commercial certificate authorities, resulting in untrusted connection errors/messages. You can either bypass the warning (possibly by adding <https://baa.darpa.mil> to your listed of trusted sites, or [arpa.mil](https://arpa.mil) as a trusted domain), or visit DISA's site to download the Root Certificate Authority (CA): <https://public.cyber.mil/from-iase/>.

Technical support for DARPA's BAA Website may be reached at [BAAT\\_Support@darpa.mil](mailto:BAAT_Support@darpa.mil), and is typically available during regular business hours (9:00 AM - 5:00 PM EST, Monday - Friday).

#### **d. Classified Submission Information**

See Section IV.B.4, "Security Information," for guidance on submitting classified abstracts and proposals.

#### **4. Other Submission Requirements**

Not applicable.

### **V. Application Review Information**

#### **A. Evaluation Criteria**

Proposals will be evaluated using the following criteria, listed in descending order of importance:

##### **1. 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.

##### **2. Potential Contribution and Relevance to the DARPA Mission**

The potential contributions of the proposed effort are relevant to the national technology base. Specifically, DARPA's mission is to make pivotal early technology investments that create or prevent strategic surprise for U.S. National Security.

The proposer clearly demonstrates its plans and capabilities to contribute to U.S. national security and U.S. technological capabilities. The evaluation will consider the proposer's plans

and capabilities to transition proposed technologies to U.S. national security applications and to U.S. industry. The evaluation may consider the proposer's history of transitioning or plans to transition technologies to foreign governments or to companies that are foreign owned, controlled, or influenced. The evaluation will also consider the proposer's plans and capabilities to assist its employees and agents to be eligible to participate in the U.S. national security environment.

### **3. Cost Realism**

The proposed costs are realistic for the technical and management approach and accurately reflect the technical goals and objectives of the solicitation. The proposed costs are consistent with the proposer's Statement of Work and reflect a sufficient understanding of the costs and level of effort needed to successfully accomplish the proposed technical approach. The costs for the prime proposer and proposed subawardees are substantiated by the details provided in the proposal (e.g., the type and number of labor hours proposed per task, the types and quantities of materials, equipment and fabrication costs, travel and any other applicable costs and the basis for the estimates).

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 efforts with a likelihood of commercial application, appropriate direct cost sharing may be a positive factor in the evaluation. DARPA recognizes that undue emphasis on cost may motivate proposers to offer low-risk ideas with minimum uncertainty and to staff the effort with junior personnel in order to be in a more competitive posture. DARPA discourages such cost strategies.

## **B. Review and Selection Process**

### **1. Review Process**

It is the policy of DARPA to ensure impartial, equitable, comprehensive proposal evaluations based on the evaluation criteria listed in Section V.A, and to select the source (or sources) whose offer meets the Government's technical, policy, and programmatic goals.

DARPA will conduct a scientific/technical review of each conforming proposal. Conforming proposals comply with all requirements detailed in this solicitation; proposals that fail to do so may be deemed non-conforming and may be removed from consideration. Proposals will not be evaluated against each other since they are not submitted in accordance with a common work statement. DARPA's intent is to review proposals as soon as possible after they arrive; however, proposals may be reviewed periodically for administrative reasons.

Award(s) will be made to proposers whose proposals are determined to be the most advantageous to the Government, all factors considered, including the potential contributions of the proposed work to the overall research program and the availability of funding for the effort.

It is the policy of DARPA to ensure impartial, equitable, comprehensive proposal evaluations based on the evaluation criteria listed above and to select the source (or sources) whose offer

meets the Government's technical, policy, and programmatic goals. Pursuant to FAR 35.016, the primary basis for selecting proposals for acceptance shall be technical, importance to agency programs, and fund availability. In order to provide the desired evaluation, qualified Government personnel will conduct reviews and (if necessary) convene panels of experts in the appropriate areas.

## **2. Handling of Source Selection Information**

DARPA policy is to treat all submissions as source selection information (see FAR 2.101 and 3.104), and to disclose their contents only for the purpose of evaluation. Restrictive notices notwithstanding, during the evaluation process, submissions may be handled by support contractors for administrative purposes and/or to assist with technical evaluation. All DARPA support contractors performing this role are expressly prohibited from performing DARPA-sponsored technical research and are bound by appropriate nondisclosure agreements.

Subject to the restrictions set forth in FAR 37.203(d), input on technical aspects of the proposals may be solicited by DARPA from non-Government consultants/experts who are strictly bound by the appropriate non-disclosure requirements.

## **3. Federal Awardee Performance and Integrity Information (FAPIIS)**

Per 41 U.S.C. 2313, as implemented by FAR 9.103 and 2 CFR § 200.205, prior to making an award above the simplified acquisition threshold, DARPA is required to review and consider any information available through the designated integrity and performance system (currently FAPIIS). Awardees have the opportunity to comment on any information about themselves entered in the database, and DARPA will consider any comments, along with other information in FAPIIS or other systems prior to making an award.

# **VI. Award Administration Information**

## **A. Selection Notices**

### **1. Abstracts**

DARPA will respond to abstracts with a statement as to whether DARPA is interested in the idea. If DARPA does not recommend the proposer submit a full proposal, DARPA will provide feedback to the proposer regarding the rationale for this decision. Regardless of DARPA's response to an abstract, proposers may submit a full proposal. DARPA will review all conforming full proposals using the published evaluation criteria and without regard to any comments resulting from the review of an abstract.

### **2. Proposals**

As soon as the evaluation of a proposal is complete, the proposer will be notified that (1) the proposal has been selected for funding pending contract negotiations, in whole or in part, or (2)

the proposal has not been selected. These official notifications will be sent via email to the Technical POC identified on the proposal coversheet.

## **B. Administrative and National Policy Requirements**

### **1. Meeting and Travel Requirements**

All key participants are required to attend the program kickoff meeting. Performers should also anticipate regular program-wide PI Meetings and periodic site visits at the Program Manager's discretion.

### **2. Solicitation Provisions and Award Clauses, Terms and Conditions**

Solicitation clauses in the FAR and DFARS relevant to procurement contracts and FAR and DFARS clauses that may be included in any resultant procurement contracts are incorporated herein and can be found at [www.darpa.mil/work-with-us/additional-baa](http://www.darpa.mil/work-with-us/additional-baa).

### **3. Controlled Unclassified Information (CUI) and Controlled Technical Information (CTI) on Non-DoD Information Systems**

Further information on Controlled Unclassified Information identification, marking, protecting and control, to include processing on Non-DoD Information Systems, is incorporated herein and can be found at [www.darpa.mil/work-with-us/additional-baa](http://www.darpa.mil/work-with-us/additional-baa).

### **4. Representations and Certifications**

In accordance with FAR 4.1102 and 4.1201, proposers requesting a procurement contract must complete electronic annual representations and certifications at <https://www.sam.gov/>. In addition, all proposers are required to submit for all award instrument types (i.e., procurement contract, cooperative agreement, grant, and Other Transaction for Prototype) supplementary DARPA-specific representations and certifications at the time of proposal submission. See <http://www.darpa.mil/work-with-us/reps-certs> for further information on required representation and certification depending on your requested award instrument.

### **5. Terms and Conditions**

For terms and conditions specific to grants and/or cooperative agreements, see the DoD General Research Terms and Conditions (latest version) at <http://www.onr.navy.mil/Contracts-Grants/submit-proposal/grants-proposal/grants-terms-conditions> and the supplemental DARPA-specific terms and conditions at <http://www.darpa.mil/work-with-us/contract-management#GrantsCooperativeAgreements>.

## **C. Reporting**

The number and types of reports will be specified in the award document, but will include as a minimum quarterly technical and monthly financial status reports. The reports shall be prepared

and submitted in accordance with the procedures contained in the award document and mutually agreed on before award. Reports and briefing material will also be required as appropriate to document progress in accomplishing program metrics. A Final Report that summarizes the project and tasks will be required at the conclusion of the performance period for the award, notwithstanding the fact that the research may be continued under a follow-on vehicle.

#### **D. Electronic Systems**

##### **1. Wide Area Work Flow (WAWF)**

Unless using another means of invoicing, performers will be required to submit invoices for payment directly via to <https://wawf.eb.mil>. Registration in WAWF will be required prior to any award under this BAA.

##### **2. i-Edison**

The award document for each proposal selected for funding will contain a mandatory requirement for invention disclosures (and associated elections, confirmatory instruments, etc.) and patent reports to be submitted electronically through i-Edison (<https://public.era.nih.gov/iedison>).

##### **3. TFIMS**

The award document for each proposal selected for funding will contain a mandatory requirement for data deliverables (to include technical and status reports) to be submitted electronically through DARPA's TFIMS (or similar) web-based tool.

### **VII. Agency Contacts**

Administrative, technical or contractual questions should be sent via e-mail to HR001121S0019@darpa.mil. All requests must include the name, email address, and phone number of a point of contact.

The technical POC for this effort is:

Dr. Jason Woo  
DARPA/MTO  
ATTN: HR001121S0019  
675 North Randolph Street  
Arlington, VA 22203-2114  
Email: HR001121S0019@darpa.mil

### **VIII. Other Information**

#### **A. Proposers Day**

The LTLT Proposers Day will be webcast on March 16, 2021. Advance registration is required for both the physical meeting and the webcast. See DARPA-SN-21-16 posted at <https://beta.sam.gov> for all details. Attendance at the LTLT Proposers Day is not required to propose to this solicitation.

**B. Protesting**

For information concerning agency level protests see <http://www.darpa.mil/work-with-us/additional-baa#NPRPAC>.