



Broad Agency Announcement
Materials Architectures and Characterization for Hypersonics
(MACH)
Defense Sciences Office

HR001119S0022

January 28, 2019

Table of Contents

I. Funding Opportunity Description.....5

 A. Introduction.....5

 B. Background:.....5

 C. Program Description/Scope.....6

 D. Program Structure.....6

 E. Technical Area Descriptions.....7

 F. Schedule/Milestones.....9

 G. Deliverables.....11

 H. Other Program Objectives and Considerations.....11

II. Award Information.....12

 A. General Award Information.....12

 B. Fundamental Research.....13

III. Eligibility Information.....14

 A. Eligible Applicants.....14

 B. Organizational Conflicts of Interest.....15

 C. Cost Sharing/Matching.....16

 Other Eligibility Requirements.....16

 Ability to Support Classified Development.....16

IV. Application and Submission Information.....16

 A. Address to Request Application Package.....17

 B. Content and Form of Application Submission.....17

 C. Submission Dates and Times.....19

 D. Funding Restrictions.....20

 E. Other Submission Requirements.....20

V. Application Review Information.....23

 A. Evaluation Criteria.....23

 B. Review and Selection Process.....24

 C. Federal Awardee Performance and Integrity Information (FAPIIS).....25

VI. Award Administration Information.....25

 A. Selection Notices.....25

 B. Administrative and National Policy Requirements.....25

 C. Reporting.....29

VII. Agency Contacts.....30

VIII. Other Information.....30

 A. Frequently Asked Questions (FAQs).....30

 B. Collaborative Efforts/Teaming.....30

 C. Proposers Day.....31

BAA Attachments:

- Attachment A: ABSTRACT SUMMARY SLIDE TEMPLATE
- Attachment B: ABSTRACT TEMPLATE
- Attachment C: PROPOSAL SUMMARY SLIDE TEMPLATE
- Attachment D: PROPOSAL TEMPLATE VOLUME 1 TECHNICAL & MANAGEMENT VOLUME
- Attachment E: PROPOSAL TEMPLATE VOLUME 2 COST VOLUME
- Attachment F: PROPOSAL TEMPLATE VOLUME 2 COST SUMMARY SPREADSHEET
- Attachment F-2: PROPOSAL TEMPLATE VOLUME 2 COST BREAKDOWN TEMPLATE
- Attachment G: PROPOSAL TEMPLATE VOLUME 3 ADMINISTRATIVE & NATIONAL POLICY REQUIREMENTS VOLUME

PART I: OVERVIEW INFORMATION

- **Federal Agency Name:** Defense Advanced Research Projects Agency (DARPA), Defense Sciences Office (DSO)
- **Funding Opportunity Title:** Material Architectures and Characterizations for Hypersonics (MACH)
- **Announcement Type:** Initial Announcement
- **Funding Opportunity Number:** HR001119S0022
- **Catalog of Federal Domestic Assistance (CFDA) Number(s):** 12.910 Research and Technology Development
- **Dates** (All times listed herein are Eastern Time.)
 - Posting Date: January 28, 2019
 - Proposers Day: January 22, 2019. See Section VIII.C.
 - Abstract Due Date: February 11, 2019, 4:00 p.m.
 - FAQ Submission Deadline: April 1, 2019, 4:00 p.m. See Section VIII.A.
 - Full Proposal Due Date: April 11, 2019, 4:00 p.m.
- **Types of Instruments that May be Awarded:** Procurement contracts, cooperative agreements or other transactions
- **Agency contacts**
 - **Technical POC:** William (Bill) Carter, Program Manager, DARPA/DSO
 - **BAA Email:** MACH@darpa.mil
 - **BAA Mailing Address:**
DARPA/DSO
ATTN: HR001119S0022
675 North Randolph Street
Arlington, VA 22203-2114
 - **DARPA/DSO Opportunities Website:** <http://www.darpa.mil/work-with-us/opportunities>
- **Teaming Information:** See Section VIII.B for information on teaming opportunities.
- **Frequently Asked Questions (FAQ):** FAQs for this solicitation may be viewed on the DARPA/DSO Opportunities Website. See Section VIII.A for further information.

PART II: FULL TEXT OF ANNOUNCEMENT

I. Funding Opportunity Description

This Broad Agency Announcement (BAA) constitutes a public notice of a competitive funding opportunity as described in Federal Acquisition Regulation (FAR) 6.102(d)(2) and 35.016 as well as 2 CFR § 200.203. Any resultant negotiations and/or awards will follow all laws and regulations applicable to the specific award instrument(s) available under this BAA, e.g., FAR 15.4 for procurement contracts.

A. Introduction

The Defense Sciences Office (DSO) at the Defense Advanced Research Projects Agency (DARPA) is soliciting innovative research proposals in the area of high performance leading edges for hypersonic air platforms. The Materials Architectures and Characterization for Hypersonics (MACH) program seeks to demonstrate new thermal management designs and materials solutions for sharp, shape-stable leading edges for hypersonic vehicles.

B. Background:

Leading edges are an essential design feature of hypersonic aircraft. Operational hypersonic vehicle characteristics, to include range, velocity, and maneuverability, would be dramatically improved by leading edge technologies that can handle high heat fluxes ($>1000 \text{ W/cm}^2$) while remaining aerodynamically sharp ($\sim 1 \text{ mm}$ radius) and thin (<10 degree wedge angle). The MACH program seeks to develop new leading edge solutions with integrated cooling to enable vehicle performance well beyond that allowed by current carbon-carbon (C-C) composite-based leading edge systems.

C-C composites are the current thermo-structural materials of choice as C-C can intrinsically handle high temperatures $>2000^\circ\text{C}$ and extreme heat fluxes. However, C-C requires protection from oxidation to prevent material recession and subsequent shape change even at significantly lower temperatures and heat fluxes, limiting the geometry of an unprotected C-C leading edge to a relatively blunt radius of curvature. If protected by a coating from oxidation, sharp C-C composite leading edge geometries can be designed that withstand high temperatures and heat fluxes, but coating reliability still remains a significant risk for extended hypersonic flight durations.

Incorporating cooling to extend the capability of hypersonic leading edges has been studied over the past 50 years but generally not demonstrated outside of lab-scale tests. DARPA believes that the complexity and risk associated with adding cooling to thin leading edges can be dramatically reduced by leveraging recent advances in thermal management, net-shape manufacturing, and integrated system modeling. In addition, the successful development of high performance cooled leading edges may also be extended to other sharp aerodynamic structures on the vehicle that are required to handle the ultrahigh heat fluxes experienced during hypersonic flight.

C. Program Description/Scope

The Materials Architectures and Characterization for Hypersonics (MACH) program will develop a new class of thermally-managed, shape-stable, sharp leading edge solutions for high lift-to-drag ratio hypersonic air vehicles that are capable of operating at high heat fluxes. These architected, thermally-managed non-eroding leading edges will enhance hypersonic operational capability, e.g. enable future platforms to fly faster and farther.

Proposed research should investigate innovative approaches that enable revolutionary advances in the materials design and implementation of shape-stable, high heat flux capable leading edge systems. The MACH program will focus on (1) integrated leading edge thermal management solutions that are broadly applicable across different US hypersonic configurations including boost-glide and air-breathing scramjet vehicles; and (2) next-generation materials research for hypersonic vehicle leading edges.

Specifically excluded is research that primarily results in evolutionary improvements to the existing state of practice without significant added cooling, including enhancements to composites composed principally of C-C (e.g. utilizing coatings to enable higher temperature operation), approaches that rely principally on ablation as a thermal management method (shape change is not acceptable), and techniques for enhancing heat transfer solely through solid conduction (e.g. utilizing highly conductive materials in C-C to increase emissive heat rejection).

D. Program Structure

The MACH program is a four year, two-phase effort. Proposals should be structured as a 27-month base Phase I with a 21-month optional Phase II. The Government anticipates performing Phase I ground tests at month 24 to inform the Government's Phase II award decisions.

The program is divided into two Technical Areas (TAs). TA1 will focus on developing and testing fully integrated thermal management systems for a scaled leading edge. TA2 will focus on next generation leading edge materials research that can enable leading edge capability well beyond TA1 performance metrics including new thermal management techniques, metals, ceramics, and coatings, as well as new computational capabilities required to develop these new techniques and materials. A detailed description of metrics required for each TA is provided in Section F of this BAA. A Government-led independent validation and verification team will monitor performer progress and help assess the potential impact of the leading edge solutions.

Phase I awardees will have a 27-month period of performance to develop representative leading edge components that culminates in a Government-sponsored ground test campaign at program month 24. Following an evaluation period (program months 25-27), selected performers may be awarded a Phase II effort to further mature leading edge technologies developed in Phase I. Phase II awardees will have a 21-month period of performance to scale up and validate performance through ground testing (at program months 39 and 45) and perform manufacturability studies to inform cost models developed by performers under Phase I. Should funding and the opportunity be available, select Phase II awardees may be candidates for a potential flight test campaign in Phase II, at which point a separate cost proposal to accommodate the flight test(s) will be requested. All proposals (TA1 and TA2) must conform to

the same schedule (detailed in Section F) to enable coordination of Government testing and uniform assessment of funded technologies.

E. Technical Area Descriptions

Proposers may submit to either or both TAs described below. If planning to submit to both TA1 and TA2, separate proposals must be written for each TA. Specific metrics and milestones against which each TA will be assessed are described in Section F.

TA1: Integrated thermal management system development and demonstration. The TA1 goal is to develop fully integrated leading edge solutions that are applicable for integration into near-term hypersonic platforms. Proposed solutions must be able to survive sustained operation in an oxidative environment (i.e. under arcjet conditions near atmospheric pressures as described in Section F) and be self-contained (i.e. not require power, fluids, gasses, thermal mass, or other system resources), including their capability to reject heat from the vehicle. For TA1 solutions with multi-scale architectures, proposals must detail the manufacturing method and integration strategy for each scale within the multi-scale architecture. The range of feasible dimensions of specific leading edge geometric features (minimum radius, sweep angle, wedge angle, min/max length and width, etc.) should be detailed, along with any limit to the performance of the proposed solution as those dimensions vary (e.g. heat flux limitations as radii of curvature are reduced). Preliminary parametric performance models are required, validated through relevant hardware testing, that describe performance as a function of design (i.e. size, external and internal geometrical features, constituent materials) and aerothermal operating conditions (altitude, velocity, angle of attack).

In Phase I, TA1 performers will develop scaled leading edge solutions that must survive a ground test campaign including multiple cycles of arcjet testing at or similar to the nominal conditions outlined in Table 1. All TA1 proposals must include detailed estimates of effective cooling performance in W/cm^2 and specifically address how the proposed solution will mitigate the extreme oxidative environments of arcjet testing. A parametric performance model for the leading edge should be developed that takes into account variations in geometry (leading edge radius, included wedge angle, span length) and aerothermal environment (free stream velocity and pressure) and aerodynamic considerations (angle of attack). Phase I should include a task to estimate the manufacturability (e.g. parametrically what radii of curvature, wedge angle, sweep angle, etc. can be made) and cost of the proposed technology.

In Phase II, full scale TA1 solutions selected to move forward must survive two or more cycles of arcjet testing at high heat flux as well as longer thermal soaks under a lower arcjet heat flux as outlined in Table 1. Solutions must also demonstrate manufacturability such that full scale leading edges can be readily integrated onto flight vehicles. The parametric performance and manufacturing/cost models developed in Phase I should be refined to include the effects of manufacturing variations on performance and operating margin. These test and modeling activities are intended to prove that components are flightworthy and also to provide evidence that scaling to higher performance and larger sizes is possible. Proposers should specifically include a task in Phase II to demonstrate

manufacturing scale up of a parametric full scale part to inform the cost model developed under Phase I. Uncertainty quantification for both the performance model and the manufacturing/cost model should be provided. Phase II solutions meeting proposed metrics may become candidates for potential flight testing during Phase II. DARPA anticipates MACH TA1 technologies to be matured to TRL/MRL 5 during the program.

All TA1 proposals must include modeling and model validation tasks that result in a component model capability to simulate response under the transient and steady state heat flux and structural loading conditions that might be experienced during flight (as exemplified by TA1 program metrics) including margin. Proposers may, at their discretion, provide interim metrics and milestones that can be used to measure performance and augment those provided in Table 1.

TA2 Next-generation leading edge solutions and technologies: The TA2 goal is to identify and mature enabling leading edge solutions that greatly transcend TA1 requirements and develop foundational technologies applicable to future hypersonic platforms. TA2 seeks proposals in the areas of materials, coatings, extreme cooling architectures and computational tools. Successful TA2 approaches will explore new materials spaces (e.g. new metal alloys, ceramic compositions, or robust coatings with >2200 °C temperature capabilities under oxidative conditions) subcomponent technologies (e.g. novel approaches to achieve extreme cooling >1500 W/cm²), and modeling capabilities to accelerate mission-specific materials development (e.g. multiscale integrated computational approaches that drive material discovery through mission requirements). TA2 proposals do not need to comprise a fully-integrated and self-contained solution, and furthermore can require power, fluids, or other system resources. The enabling characteristics of TA2 solutions should be clearly articulated and describe how performance greatly in excess of MACH program metrics can be achieved. All proposed materials development should utilize an integrated computational materials engineering (ICME) framework both to enhance materials optimization as well as enable system-level performance projection. All material or coating approaches and enhanced cooling approaches must detail the strategy for mitigating the oxidative environment to retain shape stability as well as provide an estimate of effective cooling performance in W/cm². Specific leading edge geometric features (radius, sweep angle, wedge angle, min/max length and width, etc.) that either enable or limit the proposed solution must be detailed in the proposal. Advanced computational capabilities (e.g. for concurrent system and material design) can be proposed but must clearly support a specific material, coating and/or cooling strategy.

In Phase I, it is expected that an ICME-driven computational development approach will result in viable compositions for new materials that can be fabricated and tested under laboratory conditions. It is expected that initial performer –run laboratory tests will precede any Government provided test opportunities and show feasibility for success under the desired TA2 metrics. TA2 proposals focusing on the development of new metals, ceramics and/or coating solutions will be required to demonstrate manufacturability at subscale within Phase I. Proposals should describe feasibility for the

potential solution to reach full-scale (e.g. 10cm x 20cm) and estimate manufacturing rates and preliminary costs for full scale components.

Phase II will focus on maturation of the Phase I concept with material coupon or device demonstration at larger scale (>2.5 cm leading edge span size) meeting program metrics. A more mature modeling capability should be developed that projects performance of the resulting full-scale leading edge as a function of full-scale geometrical parameters, aerothermal and aerodynamic conditions, including uncertainty quantification. TA2 approaches may be considered for ground and flight test (if available) if they are sufficiently mature when Government testing is provided.

F. Schedule/Milestones

General guidance for TA1 and TA2 proposals:

- Proposers should provide a technical and programmatic strategy that conforms to the entire program schedule and presents an aggressive plan to fully address all program goals, metrics, milestones and deliverables, including specific TA1 and TA2 milestone events as detailed in Table 1.
- Proposals should clearly detail planned performer testing outside the Government provided tests.
- The task structure must be consistent across the proposed schedule, Statement of Work, and Cost Volume.
- A target start date of September 2019 may be assumed for planning and budgeting purposes.
- Government provided test opportunities
 - To accommodate common test opportunities (e.g. high temperature dynamic heating, high oxidative flux arcjet testing, high velocity wind tunnel testing, and potential flight-testing at Phase II end) schedules will be synchronized across all TA1 and TA2 performers, and monitored/revised as necessary throughout the program.
 - The Government anticipates providing ground testing with the following schedule (using sample sizes defined in table 1):
 - TA1
 - Phase I:
 - Month 12: Coupon sized part, 400 W/cm² at <0.1 atm air mixture (optional but encouraged)
 - Month 18: Subscale sample for manufacturing demo and thermal shock (optional but encouraged)
 - Month 24: Arcjet with subscale geometry, 1000W/cm² at ~0.5 atm air mixture
 - Phase II:
 - Month 33: Wind tunnel with full scale geometry at >MACH 6 (optional but encouraged)
 - Month 39: Arcjet with full scale geometry, 1000W/cm² at ~0.8 atm air mixture

- TA2

Phase I:

- Month 18: Coupon sample for thermal shock (optional but encouraged)
- Month 24: Coupon sized part, >1500 W/cm² at <0.1 atm air mixture

Phase II:

- Month 39: Arcjet with subscale geometry, >1500W/cm² at ~0.5 atm air mixture
- Month 45: Arcjet with full scale geometry, >1500W/cm² at ~0.8 atm air mixture (optional but encouraged)

- Proposers should align development schedules with these testing opportunities.
- All proposals must include the following meetings and travel in the proposed schedule and costs:
 - Proposals should budget for 6 two-day meetings over the course of the 48 month period of performance – three meetings in the Washington, D.C. area and three meetings in the San Francisco, CA area.
 - Regular monthly teleconference meetings will be scheduled with the Government team for progress reporting and the identification and mitigation of performance and schedule issues. Proposers should also anticipate at least one site visit per phase by the DARPA Program Manager during which they will have the opportunity to demonstrate progress towards agreed-upon milestones.
 - Budget for attending and presenting results at appropriate technical conferences is acceptable (one per phase, at conferences consistent with the information being disseminated); beyond this level of conference, attendance will need substantial justification.

Table 1: Program Metrics

		Phase I: 27 months		Phase II: 21 months	
		TA1	TA2	TA1	TA2
Metrics	Leading edge geometry	≤ 3 mm radius of curvature, ≤10° wedge angle		≤ 1 mm radius of curvature, ≤10° wedge angle	
	Survive [‡] transient heat flux in oxidative environment (≥2 cycles)	Subscale*, 30s, 1000 W/cm ² , 0.5 atm air mixture	Coupon**, 30s, >1500 W/cm ² , 0.02 atm air mixture	Full scale***, 120s, 1000 W/cm ² , 0.8 atm air mixture	Subscale*, 120s, >1500 W/cm ² , 0.5 atm air mixture
	Thermal shock resistance	Survive [‡] ≥ 500°C/sec		Survive [‡] ≥ 1000°C/sec	
	Survive sustained heat flux	≥500 W/cm ² , 0.5 atm air mixture for 600 sec		≥ 500 W/cm ² , 0.8 atm air mixture for 1200 sec	

Size	≥5 cm span, ≥10 cm chord	N/A	≥10 cm span, ≥20 cm chord	≥5 cm span, ≥5 cm chord
Scalability	Provide rate and cost model	N/A	Manufacturing demo validating model	Provide rate and cost model
High G operation	≥10 g		≥20 g	
Strength at maximum operating temperature	≥100 MPa		≥100 MPa	
Survivability	≥100 g shock		≥200 g shock	

‡ Survive is defined as <1mm recession and no visible spallation, delamination, cracking or other obvious failure

* Subscale is a wedge with notional dimensions of 5cm span, 10cm chord, and 10° wedge angle

** Coupon is a button with notional dimensions of 3cm diameter, 1cm thickness

*** Full scale is a wedge with notional dimensions of 10cm span, 20cm chord, and 10° wedge angle

G. Deliverables

- Quarterly technical reports due within ten days of the end of the given quarter, describing progress made on the specific milestones as laid out in the SOW.
- Monthly financial reports
- A phase completion report submitted within 30 days of the end of each phase, summarizing the research done.
- Phase I:
 - TA1: Two (2) 5 cm (span) x 10 cm (chord) structures capable of meeting phase I metrics (with accompanying models, validation and test data)
 - TA2: Laboratory test data and validated material/component model showing feasibility for exceeding phase I metrics
- Phase II:
 - TA1: Two (2) 10 cm (span) x 20 cm (chord) structures capable of meeting phase II metrics (with accompanying models, validation and test data). Manufacturing and cost models (with accompanying validation and test data).
 - TA2: Two (2) 5 cm (span) x 5 cm (chord) structures capable of greatly exceeding phase II metrics (with accompanying models, validation and test data). Preliminary performance, manufacturing and cost models.
- Other negotiated 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.
- Reporting as outlined in Section VI.C.

H. Other Program Objectives and Considerations

1. Intellectual Property

The evaluation criteria will include the ability to transition the technology to a government application. To assist with this assessment proposers shall identify in their proposal any pre-existing technical data or commercial/non-commercial software that they will deliver to the Government with less than unlimited rights. See Section VI.B.4 for more information related to intellectual property.

It is desired that all noncommercial software (including source code), software documentation, hardware designs and documentation, and technical data generated by the program be provided as deliverables to the Government, with a minimum of Government Purpose Rights (GPR), as lesser rights may adversely impact the lifecycle costs of affected items, components, or processes.

2. Collaboration

DARPA expects all performers to work collaboratively with the Government IV&V team to realize the program objectives outlined herein. Proposers should carefully review the goals for the entire program in order to fully understand the context of each program objective within the overall program structure. Furthermore, throughout development of program technologies, it will be necessary for all performers to share relevant information regarding their technology development to support the larger program goals. For example, the Government IV&V team will need access to the datasets, models, tools, and experimental systems developed by MACH performers.

II. Award Information

A. General Award Information

DARPA anticipates multiple awards.

The level of funding for individual awards made under this BAA will depend on the quality of the proposals received and the availability of funds. Awards will be made to proposers¹ whose proposals are determined to be the most advantageous to the Government, all evaluation factors considered. See Section V for further information.

The Government reserves the right to:

- select for negotiation all, some, one, or none of the proposals received in response to this solicitation;
- make awards without discussions with proposers;
- conduct discussions with proposers if it is later determined to be necessary;
- segregate portions of resulting awards into pre-priced options;
- accept proposals in their entirety or to select only portions of proposals for award;

¹ As used throughout this BAA, “proposer” refers to the lead organization on a submission to this BAA. The proposer is responsible for ensuring that all information required by a BAA—from all team members—is submitted in accordance with the BAA. “Awardee” refers to anyone who might receive a prime award from the Government, including recipients of procurement contracts, cooperative agreements, or Other Transactions. “Subawardee” refers to anyone who might receive a subaward from a prime awardee (e.g., subawardee, consultant, etc.).

- fund awards in increments with options for continued work at the end of one or more phases;
- request additional documentation once the award instrument has been determined (e.g., representations and certifications); and
- remove proposers from award consideration should the parties fail to reach agreement on award terms within a reasonable time or the proposer fails to provide requested additional information in a timely manner.

Proposals identified for negotiation may result in a procurement contract, cooperative agreement, or other transaction (OT), depending upon the nature of the work proposed, the required degree of interaction between parties, 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 BAA 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 BAA, the Government expects that program goals as described herein may be met by proposed efforts for (1) fundamental research, (2) non-fundamental research, and/or (3) research that 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. Appropriate clauses will be included in resultant awards for non-fundamental research to prescribe publication requirements and other restrictions, as appropriate. This clause can be found at 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 restricted research, their subawardee's effort may be fundamental research. In those cases, it is the awardee's responsibility to explain in their proposal why its subawardee's effort is fundamental research.

III. Eligibility Information

A. Eligible Applicants

All responsible sources capable of satisfying the Government's needs may submit a proposal for DARPA's consideration.

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 BAA 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 citing the specific authority establishing their eligibility to propose to Government solicitations and compete with industry, and their compliance with the associated FFRDC sponsor agreement's terms and conditions. This information is required 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. 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. Foreign Participation

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. For classified submissions, this includes mitigating any Foreign Ownership Control and Influence (FOCI) issues prior to transmitting the submission to DARPA. Additional information on these subjects can be found at http://www.dss.mil/isp/foci/foci_faqs.html.

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 BAA. 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 BAA 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 (e.g., OTs under the authority of 10 U.S.C. § 2371).

Other Eligibility Requirements

Ability to Support Classified Development

Parts of the MACH program will be classified up to collateral SECRET. A U//FOUO security class guide is being generated as part of the MACH program to clearly define cutpoints in the development of leading edge hypersonic technologies and will be provided at time of contract award. Personnel and facility clearances are not required to submit proposals to the MACH BAA. TA1 and TA2 awardees who will have access classified data and evaluation results for their applications must have personnel and access to facilities with a minimum classification level of SECRET.

IV. Application and Submission Information

Prior to submitting a full proposal, proposers are *strongly encouraged* to first submit an abstract as described below. This process allows a proposer to ascertain whether the proposed concept is applicable to the MACH BAA and currently of interest. Abstracts and full proposals that are not found to be applicable to the MACH BAA may be deemed non-conforming² and removed from consideration. All abstracts and full proposals must provide sufficient information to assess the validity/feasibility of their claims as well as comply with the requirements outlined herein for submission formatting, content and transmission to DARPA. Abstracts and full proposals that fail to do so may be deemed non-conforming and removed from consideration. Proposers will be notified of non-conforming determinations via email.

A. Address to Request Application Package

This document contains all information required to submit a response to this solicitation. No additional forms, kits, or other materials are needed except as referenced herein. No request for proposal or additional solicitation regarding this opportunity will be issued, nor is additional information available except as provided at the Federal Business Opportunities website (<http://www.fbo.gov>), the Grants.gov website (<http://www.grants.gov/>), or referenced herein.

B. Content and Form of Application Submission

1. Abstract Information

As stated above, proposers are strongly encouraged to submit an abstract in advance of a full proposal to minimize effort and reduce the potential expense of preparing an out of scope proposal.

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.

Proposers should note that a favorable response to an abstract is not a guarantee that a proposal based on the abstract will ultimately be selected for award negotiation.

While it is DARPA policy to attempt to reply to abstracts within thirty calendar days, proposers to this solicitation may anticipate a response within approximately three weeks. These official notifications will be sent via email to the Technical POC and/or Administrative POC identified on the abstract coversheet.

a. Abstract Format

All proposers are required to use Attachment A: Abstract Summary Slide Template and Attachment B: Abstract Template provided to this solicitation on <http://www.fbo.gov> and

² "Conforming" is defined as having been submitted in accordance with the requirements outlined herein.

<http://www.grants.gov>. Attachment A Abstract Summary Slide Template described herein must be in .ppt or .pptx format and should be attached as a separate file to this document.

2. Full Proposal Information

Proposals consist of Volume 1: Technical and Management Volume, Volume 2: Cost Volume, and Volume 3: Administrative and National Policy Requirements Volume.

To assist in proposal development, various attachments have been provided along with the BAA posted on <http://www.fbo.gov> (Attachment C: Proposal Summary Slide Template; Attachment D: Proposal Template Volume 1 Technical & Management Volume; Attachment E: Proposal Template Volume 2 Cost Volume; Attachment F: Cost Summary Spreadsheet; Attachment F-2: Proposal Template Volume 2 Cost Breakdown Template; and Attachment G: Proposal Template Volume 3 Administrative & National Policy Requirements Volume).

Full proposals requesting a procurement contract or other transaction (OT) must use the following attachments:

- Attachment C
- Attachment D
- Attachment E
- Attachment F
- Attachment F-2
- Attachment G

Full proposals requesting a cooperative agreement must use the following attachments in addition to the Grants.gov application package:

- Attachment C
- Attachment D
- Attachment F
- Attachment F-2
- Attachment G

*Note – Budget Justification should be provided as Section L of the SF 424 Research & Related Budget form provided via Grants.gov. The Budget Justification should include the following information for the recipient and all subawardees: (1) Direct Labor: Detail the total number of persons and their level of commitment for each position listed (in Sections A and B), as well as which specific tasks (as described in the SOW) they will support.(2) Equipment (Section C) Provide an explanation for listed requested equipment exceeding \$5,000, properly justifying their need to meet the objectives of the program. (3) Travel (Section D) Provide the purpose of the trip, number of trips, number of days per trip, departure and arrival destinations, number of people, etc. (4) Other Direct Costs (Section F). Provide a justification for the items requested and an explanation of how the estimates were obtained.

Proposals not meeting the format prescribed herein may not be reviewed.

a. Full Proposal Format

All proposers are required to use the templates provided as attachments to this solicitation on <http://www.fbo.gov> and <http://www.grants.gov>. Formatting instructions are provided therein.

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. See Section V.B.1 for additional information.

4. Security Information

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 MACH@darpa.mil mailbox requesting submission instructions from the DARPA/DSO Program Security Officer (PSO).

Security classification guidance and direction via a U//FOUO Security Classification Guard (SCG) and/or DD Form 254, “DoD Contract Security Classification Specification,” will be provided at the time of award.

C. Submission Dates and Times

Proposers are warned that submission deadlines as outlined herein are in Eastern Time and will be strictly enforced. When planning a response to this solicitation, proposers should take into account that some parts of the submission process may take from one business day to one month to complete (e.g., registering for a Data Universal Numbering System (DUNS) number or Taxpayer Identification Number (TIN)).

DARPA will acknowledge receipt of *complete* submissions via email and assign identifying numbers that should be used in all further correspondence regarding those submissions. If no confirmation is received within two business days, please contact the BAA Administrator at MACH@darpa.mil to verify receipt.

1. Abstracts

Abstracts must be submitted per the instructions outlined herein *and received by DARPA* no later than the due date and time listed in Part One: Overview Information. Abstracts received after this time and date may not be reviewed.

2. Full Proposals

Full proposal packages--full proposal (Technical and Management Volume, Cost Volume, National and Administrative Requirements Volume) and, as applicable, proprietary subawardee

cost proposals, classified appendices to unclassified proposals-- must be submitted per the instructions outlined herein *and received by DARPA* no later than the due date and time listed in Part One: Overview Information. Proposals received after this time and date may not be reviewed.

D. Funding Restrictions

Not applicable.

E. Other Submission Requirements

1. Unclassified Submission Instructions

Proposers must submit all parts of their submission package using the same method; submissions cannot be sent in part by one method and in part by another method nor should duplicate submissions be sent by multiple methods. Email submissions will not be accepted. Failure to comply with the submission procedures outlined herein may result in the submission being deemed non-conforming and withdrawn from consideration.

a. Abstracts

DARPA/DSO will employ an electronic upload submission system (<https://baa.darpa.mil/>) for all UNCLASSIFIED abstracts sent in response to this solicitation. *Abstracts must not be submitted via Grants.gov.*

First time users of the DARPA BAA Submission website must complete a two-step account creation process. The first step consists of registering for an extranet account by going to the URL listed above and selecting the “Account Request” link. Upon completion of the online form, proposers will receive two separate emails; one will contain a user name and the second will provide a temporary password. Once both emails have been received, the second step requires proposers to go back to the submission website and log in using that user name and password. After accessing the extranet, proposers may then create a user account for the DARPA BAA Submission website by selecting the “Register your Organization” link at the top of the page. Once the user account is created, proposers will be able to see a list of solicitations open for submissions, view submission instructions, and upload/finalize their abstract.

Proposers who already have an account on the DARPA BAA Submission website may simply log in at <https://baa.darpa.mil/>, select this solicitation from the list of open DARPA solicitations and proceed with their abstract submission. Note: proposers who have created a DARPA BAA Submission website account to submit to another DARPA Technical Office’s solicitations do not need to create a new account to submit to this solicitation.

All abstracts submitted electronically through the DARPA BAA Submission website must meet the following requirements: (1) uploaded as a zip file (.zip or .zipx extension); (2) only contain the document(s) requested herein; (3) only contain unclassified information; and (4) must not exceed 100 MB in size. Only one zip file will be accepted per abstract and abstracts not uploaded as zip files will be rejected by DARPA.

Technical support for the DARPA BAA Submission website is available during regular business hours, Monday – Friday, 9:00 a.m. – 5:00 p.m. Requests for technical support must be emailed to BAAT_Support@darpa.mil with a copy to MACH@darpa.mil. Questions regarding submission contents, format, deadlines, etc. should be emailed to MACH@darpa.mil. Questions/requests for support sent to any other email address may result in delayed/no response.

Since proposers may encounter heavy traffic on the web server, DARPA discourages waiting until the day abstracts are due to request an account and/or upload the submission.

Note: Proposers submitting an abstract via the DARPA BAA Submission site MUST (1) click the “Finalize” button in order for the submission to upload AND (2) do so with sufficient time for the upload to complete prior to the deadline. Failure to do so will result in a late submission.

b. Proposals Requesting a Procurement Contract or Other Transaction

Proposers requesting procurement contracts or other transactions may submit full proposals through ONE of the following methods: (1) electronic upload (DARPA-preferred); or (2) direct mail/hand-carry.

i. Electronic Upload

DARPA/DSO encourages proposers to submit UNCLASSIFIED proposals via the DARPA BAA Submission website at <https://baa.darpa.mil/>.

First time users of the DARPA BAA Submission website must complete a two-step account creation process. The first step consists of registering for an extranet account by going to the URL listed above and selecting the “Account Request” link. Upon completion of the online form, proposers will receive two separate emails; one will contain a user name and the second will provide a temporary password. Once both emails have been received, the second step requires proposers to go back to the submission website and log in using that user name and password. After accessing the extranet, proposers may then create a user account for the DARPA BAA Submission website by selecting the “Register your Organization” link at the top of the page. Once the user account is created, proposers will be able to see a list of solicitations open for submissions, view submission instructions, and upload/finalize their proposal.

Proposers who already have an account on the DARPA BAA Submission website may simply log in at <https://baa.darpa.mil/>, select this solicitation from the list of open DARPA solicitations and proceed with their proposal submission. *Note: proposers who have created a DARPA BAA Submission website account to submit to another DARPA Technical Office’s solicitations do not need to create a new account to submit to this solicitation.*

All full proposals submitted electronically through the DARPA BAA Submission website must meet the following requirements: (1) uploaded as a zip file (.zip or .zipx extension); (2) only contain the document(s) requested herein; (3) only contain unclassified information; and (4) must not exceed 100 MB in size. Only one zip file will be accepted per full proposal and full proposals not uploaded as zip files will be rejected by DARPA.

Technical support for the DARPA BAA Submission website is available during regular business

hours, Monday – Friday, 9:00 a.m. – 5:00 p.m. Requests for technical support must be emailed to BAAT_Support@darpa.mil with a copy to MACH@darpa.mil. Questions regarding submission contents, format, deadlines, etc. should be emailed to MACH@darpa.mil. Questions/requests for support sent to any other email address may result in delayed/no response.

Since proposers may encounter heavy traffic on the web server, DARPA discourages waiting until the day proposals are due to request an account and/or upload the submission. Note: Proposers submitting a proposal via the DARPA BAA Submission site MUST (1) click the “Finalize” button in order for the submission to upload AND (2) do so with sufficient time for the upload to complete prior to the deadline. Failure to do so will result in a late submission.

ii. Direct Mail/Hand-carry

Proposers electing to submit procurement contract or other transaction proposals via direct mail or hand-carried must provide one paper copy and one electronic copy on CD or DVD of the full proposal package. All parts of the proposal package must be mailed or hand-carried in a single delivery to the address noted in Section VII below.

c. Proposals Requesting a Cooperative Agreement

Proposers requesting cooperative agreements may only submit proposals through ONE of the following methods: (1) electronic upload at Grants.gov (DARPA-preferred); or (2) direct mail/hand-carry to DARPA.

To evaluate compliance with Title IX of the Education Amendments of 1972 {20 U.S.C. A§ 1681 Et. Seq.}, the Department of Defense 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 STEM disciplines. To enable this assessment, each application must include the two following forms completed as instructed: the Research and Related Senior/Key Person Profile (Expanded) form and the Research and Related Personal Data form. Both forms are provided with the application package in Grants.gov.

i. Electronic Upload

DARPA encourages cooperative agreement proposers to submit their proposals via electronic upload at <http://www.grants.gov/web/grants/applicants/apply-for-grants.html>. Proposers electing to use this method must complete a one-time registration process on Grants.gov before a proposal can be electronically submitted. *If proposers have not previously registered, this process can take up to four weeks so registration should be done in sufficient time to ensure it does not impact a proposer’s ability to meet required submission deadlines.* Registration requirements and instructions are outlined at <http://www.grants.gov/web/grants/register.html>.

Carefully follow the DARPA submission instructions provided with the solicitation application package on Grants.gov. Only the required forms listed therein (e.g., SF-424 and Attachments form) should be included in the submission. *Note: Grants.gov does not accept zipped or encrypted proposals.*

Once Grants.gov has received an uploaded proposal submission, Grants.gov will send two email messages to notify proposers that: (1) the proposal has been received by Grants.gov; and (2) the proposal has been either validated or rejected by the system. *It may take up to two business days to receive these emails.* If the proposal is validated, then the proposer has successfully submitted their proposal. If the proposal is rejected, the submission must be corrected, resubmitted and revalidated 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, Grants.gov will send a third email to notify the proposer. DARPA will send a final confirmation email as described in Section IV.C.

To avoid missing deadlines, Grants.gov recommends that proposers submit their proposals to Grants.gov 24-48 hours in advance of the proposal due date to provide sufficient time to complete the registration and submission process, receive email notifications and correct errors, as applicable.

Technical support for Grants.gov submissions may be reached at 1-800-518-4726 or support@grants.gov.

ii. Direct Mail/Hand-carry

Proposers electing to submit cooperative agreement proposals via direct mail or hand-carried must provide one paper copy and one electronic copy on CD or DVD of the full proposal package. Proposers must complete the SF 424 R&R form (Application for Federal Assistance, Research and Related) provided at Grants.gov as part of the opportunity application package for this BAA and include it in the proposal submission. All parts of the proposal package must be mailed or hand-carried to the address noted in Section VII below.

V. Application Review Information

A. Evaluation Criteria

Proposals will be evaluated using the following criteria listed in descending order of importance: Overall Scientific and Technical Merit; Potential Contribution and Relevance to the DARPA Mission; and Cost Realism.

- **Overall Scientific and Technical Merit**

The proposed technical approach is innovative, feasible, achievable, and complete.

The proposed technical team has the expertise and experience to accomplish the proposed tasks. Task descriptions and associated technical elements provided are complete and in a logical sequence with all proposed deliverables clearly defined such that a final outcome that achieves the goal can be expected as a result of award. The proposal identifies major technical risks and planned mitigation efforts are clearly defined and feasible. The proposed schedule aggressively pursues performance metrics in an efficient time frame that accurately accounts for the anticipated workload.

- **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 proposed technology can be transitioned to research, industrial and operational military communities. The proposed intellectual property restrictions (if any) will not significantly impact the Government's ability to transition the technology.

- **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).

B. Review and Selection Process

DARPA will conduct a scientific/technical review of each conforming proposal. Conforming proposals comply with all requirements detailed in this BAA; 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.

The review process identifies proposals that meet the evaluation criteria described above and are, therefore, selectable for negotiation of awards by the Government. DARPA policy is to ensure impartial, equitable, comprehensive proposal evaluations and to select proposals that meet DARPA technical, policy, and programmatic goals. Proposals that are determined selectable will not necessarily receive awards (see Section II). Selections may be made at any time during the period of solicitation. For evaluation purposes, a proposal is defined to be the document and supporting materials as described in Section IV.

1. Handling of Source Selection Information

DARPA policy is to treat all submissions as source selection information (FAR 2.101 and 3.104), and to only disclose their contents to authorized personnel. Restrictive notices notwithstanding, 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), DARPA may also request input on technical aspects of the proposals from other non-Government consultants/experts who are strictly bound by the appropriate non-disclosure requirements.

Submissions will not be returned. The original of each submission received will be retained at

DARPA and all other non-required copies destroyed. A certification of destruction may be requested via email to the BAA mailbox, provided the formal request is received within 5 days after being notified of submission status.

C. Federal Awardee Performance and Integrity Information (FAPIS)

Following the review and selection process described above, but prior to making an award above the simplified acquisition threshold (FAR 2.101), DARPA is required³ to review and consider any information available through the designated integrity and performance system (currently FAPIS). Selectees have the opportunity to comment on any information about themselves entered in the database. DARPA will consider any comments and other information in FAPIS or other systems prior to making an award.

VI. Award Administration Information

A. Selection Notices

After proposal evaluations are complete, proposers will be notified as to whether their proposal was selected for award negotiation as a result of the review process. Notification will be sent by email to the Technical and Administrative POCs identified on the proposal cover sheet. If a proposal has been selected for award negotiation, the Government will initiate those negotiations following the notification.

B. Administrative and National Policy Requirements

1. Solicitation Provisions and Award Clauses, Terms and Conditions

Solicitation provisions relevant to DARPA BAAs are listed on the Additional BAA Content page on DARPA's website at www.darpa.mil/work-with-us/additional-baa. This page also lists award clauses that, depending on their applicability, may be included in the terms and conditions of awards resultant from DARPA solicitations. This list is not exhaustive and the clauses, terms and conditions included in a resultant award will depend on the nature of the research effort, the specific award instrument, the type of awardee, and any applicable security or publication restrictions.

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

The above information serves to put potential proposers and awardees on notice of proposal requirements and award terms and conditions to which they may have to adhere.

2. System for Award Management (SAM) and Universal Identifier Requirements

³ Per 41 U.S.C. 2313, as implemented by FAR 9.103 and 2 CFR § 200.205.

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 BAA. 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.

NOTE: new registrations can take an average of 7-10 business days to process in SAM. SAM registration requires the following information:

- DUNS number
- TIN
- Commercial and Government Entity (CAGE) Code. If a proposer does not already have a CAGE code, one will be assigned during SAM registration.
- Electronic Funds Transfer information (e.g., proposer’s bank account number, routing number, and bank phone or fax number).

3. 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 www.sam.gov/. In addition, resultant procurement contracts will require supplementary DARPA-specific representations and certifications. See www.darpa.mil/work-with-us/additional-baa for further information.

4. Intellectual Property

Proposers should note that the Government does not own the intellectual property or technical data/computer software developed under Government contracts. The Government acquires the right to use the technical data/computer software. Regardless of the scope of the Government’s rights, awardees may freely use their same data/software for their own commercial purposes (unless restricted by U.S. export control laws or security classification). Therefore, technical data and computer software developed under this solicitation will remain the property of the awardees, though DARPA will have, at a minimum, Government Purpose Rights (GPR) to technical data and computer software developed through DARPA sponsorship.

If proposers desire to use proprietary computer software or technical data or both as the basis of their proposed approach, in whole or in part, they should: (1) clearly identify such software/data and its proposed particular use(s); (2) explain how the Government will be able to reach its program goals (including transition) within the proprietary model offered; and (3) provide possible nonproprietary alternatives in any area that might present transition difficulties or increased risk or cost to the Government under the proposed proprietary solution. Proposers expecting to use, but not to deliver, commercial open source tools or other materials in implementing their approach may be required to indemnify the Government against legal

liability arising from such use.

All references to "Unlimited Rights" or "Government Purpose Rights" are intended to refer to the definitions of those terms as set forth in the Defense Federal Acquisition Regulation Supplement (DFARS) 227.

a. Intellectual Property Representations

All proposers must provide a good faith representation of either ownership or possession of appropriate licensing rights to all other intellectual property to be used for the proposed project. Proposers must provide a short summary for each item asserted with less than unlimited rights that describes the nature of the restriction and the intended use of the intellectual property in the conduct of the proposed research.

b. Patents

All proposers must include documentation proving ownership or possession of appropriate licensing rights to all patented inventions to be used for the proposed project. If a patent application has been filed for an invention, but it includes proprietary information and is not publicly available, a proposer must provide documentation that includes: the patent number, inventor name(s), assignee names (if any), filing date, filing date of any related provisional application, and summary of the patent title, with either: (1) a representation of invention ownership; or (2) proof of possession of appropriate licensing rights in the invention (i.e., an agreement from the owner of the patent granting license to the proposer)..

c. Procurement Contracts

- **Noncommercial Items (Technical Data and Computer Software):** Proposers requesting a procurement contract must list all noncommercial technical data and computer software that it plans to generate, develop, and/or deliver, in which the Government will acquire less than unlimited rights and to assert specific restrictions on those deliverables. In the event a proposer does not submit the list, the Government will assume that it has unlimited rights to all noncommercial technical data and computer software generated, developed, and/or delivered, unless it is substantiated that development of the noncommercial technical data and computer software occurred with mixed funding. If mixed funding is anticipated in the development of noncommercial technical data and computer software generated, developed, and/or delivered, proposers should identify the data and software in question as subject to GPR. In accordance with DFARS 252.227-7013, "Rights in Technical Data - Noncommercial Items," and DFARS 252.227-7014, "Rights in Noncommercial Computer Software and Noncommercial Computer Software Documentation," the Government will automatically assume that any such GPR restriction is limited to a period of 5 years, at which time the Government will acquire unlimited rights unless the parties agree otherwise. The Government may use the list during the evaluation process to evaluate the impact of any identified restrictions and may request additional information from the proposer, as may be necessary, to evaluate the proposer's assertions. Failure to provide full information may result in a determination that the proposal is non-conforming. A template for complying with this request is provided in Section IV.B.2.

- **Commercial Items (Technical Data and Computer Software):** Proposers requesting a procurement contract must list all commercial technical data and commercial computer software that may be included in any noncommercial deliverables contemplated under the research project, and assert any applicable restrictions on the Government's use of such commercial technical data and/or computer software. In the event a proposer does not submit the list, the Government will assume there are no restrictions on the Government's use of such commercial items. The Government may use the list during the evaluation process to evaluate the impact of any identified restrictions and may request additional information from the proposer to evaluate the proposer's assertions. Failure to provide full information may result in a determination that the proposal is non-conforming. A template for complying with this request is provided in Section IV.B.2.

d. Other Types of Awards

Proposers requesting an award instrument other than a procurement contract shall follow the applicable rules and regulations governing those award instruments, but in all cases should appropriately identify any potential restrictions on the Government's use of any intellectual property contemplated under those award instruments. This includes both noncommercial items and commercial items. The Government may use the list as part of the evaluation process to assess the impact of any identified restrictions, and may request additional information from the proposer, to evaluate the proposer's assertions. Failure to provide full information may result in a determination that the proposal is non-conforming. A template for complying with this request is provided in Section IV.B.2.c.

5. 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 www.darpa.mil/work-with-us/additional-baa, to include providing the information specified therein as required for proposal submission.

6. Controlled Unclassified Information (CUI) on Non-DoD Information Systems

All proposers and awardees will be subject to the DARPA requirements related to Controlled Unclassified Information on Non-DoD Information Systems as detailed at www.darpa.mil/work-with-us/additional-baa.

7. Electronic Invoicing and Payments

Awardees will be required to submit invoices for payment electronically via Wide Area Work Flow (WAWF) at <https://wawf.eb.mil>, unless an exception applies. Registration in WAWF is required prior to any award under this BAA.

8. Electronic and Information Technology

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. § 749d) and FAR 39.2.

9. 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>) that are in effect at the time the BAA 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.

C. Reporting

1. Technical and Financial Reports

The number and types of technical and financial reports required under the contracted project will be specified in the award document, and will include, as a minimum, monthly financial status reports, quarterly technical reports and a yearly status summary. A final report that summarizes the project and tasks will be required at the conclusion of the performance period for the award. The reports shall be prepared and submitted in accordance with the procedures contained in the award document.

2. Patent Reports and Notifications

All resultant awards will contain a mandatory requirement for patent reports and notifications to be submitted electronically through i-Edison (<https://public.era.nih.gov/iedison>).

VII. Agency Contacts

DARPA will use email for all technical and administrative correspondence regarding this solicitation.

- **Technical POC:** William (Bill) Carter, Program Manager, DARPA/DSO
- **BAA Email:** MACH@darpa.mil
- **BAA Mailing Address:**
DARPA/DSO
ATTN: HR001119S0022
675 North Randolph Street
Arlington, VA 22203-2114
- **DARPA/DSO Opportunities Website:** <http://www.darpa.mil/work-with-us/opportunities>

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

VIII. Other Information

A. Frequently Asked Questions (FAQs)

Administrative, technical, and contractual questions should be emailed to MACH@darpa.mil. All questions must be in English and must include the name, email address, and the telephone number of a point of contact.

DARPA will attempt to answer questions in a timely manner; however, questions submitted within 10 days of the proposal due date may not be answered. DARPA will post an FAQ list at: <http://www.darpa.mil/work-with-us/opportunities>. The list will be updated on an ongoing basis until the BAA expiration date as stated in Part I.

B. Collaborative Efforts/Teaming

DARPA highly encourages teaming before proposal submission and, as such, will facilitate the formation of teams with the necessary expertise. Interested parties should submit a one-page profile including the following information:

- Contact information to include name, organization, email, telephone number, mailing address, organization website (if applicable).
- A brief description of the proposer's technical competencies.
- Desired expertise from other teams, if applicable.

All profiles must be emailed to MACH@darpa.mil no later than 4:00 p.m. February 18, 2019. Following the deadline, the consolidated teaming profiles will be sent via email to the proposers

who submitted a valid profile. Specific content, communications, networking, and team formation are the sole responsibility of the participants. Neither DARPA nor the DoD endorses the information and organizations contained in the consolidated teaming profile document, nor does DARPA or the DoD exercise any responsibility for improper dissemination of the teaming profiles. Teams need not be finalized at the time of abstract submission.

C. Proposers Day

The Program Proposers Day was held on January 22, 2019 in Arlington, VA. See DARPA-SN-19-18 posted at <http://www.fbo.gov> for all details. Attendance at the MACH Proposers Day or viewing the webcast was voluntary and is not required to propose to this solicitation.