



Broad Agency Announcement  
Next Generation Microelectronics Manufacturing (NGMM)  
Phase 0  
Microsystems Technology Office  
HR001122S0050  
August 5, 2022

**Amendment 01**  
**As amended August 30, 2022**

The purpose of this amendment is to extend the FAQ Submission Deadline and Full Proposal Due Date.

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ATTACHMENT 1: Cost Volume Proposer Checklist

ATTACHMENT 2: Proposal Summary Slide Template

ATTACHMENT 3: General MTO Controlled Unclassified Information Guide (CUIG)

ATTACHMENT 4: Other Transactions (OT) Certifications Template

## PART I: OVERVIEW INFORMATION

- **Federal Agency Name:** Defense Advanced Research Projects Agency (DARPA), Microsystems Technology Office (MTO)
- **Funding Opportunity Title:** Next Generation Microelectronics Manufacturing (NGMM), Phase 0
- **Announcement Type:** Initial Announcement
- **Funding Opportunity Number:** HR001122S0050
- **Catalog of Federal Domestic Assistance Numbers (CFDA):** Not applicable
- **Dates:** (All times listed herein are Eastern Time)
  - Posting Date: August 5, 2022
  - Proposers Day: August 17, 2022
  - FAQ Submission Deadline: September 15, 2022
  - Proposal Due Date: October 5, 2022
  - Estimated period of performance start: February 2023
- **Concise description of the funding opportunity:** The NGMM program will establish a domestic center for R&D and manufacturing 3DHI (3D heterogeneous integration) microsystems through a subsequent Program Solicitation. The NGMM program will consist of three phases. Phase 0 research for this program (solicited through this HR001122S0050 BAA) will inform planning for the 3DHI manufacturing center by defining exemplar 3DHI microsystems and identifying the equipment, process, and facility requirements for manufacturing these microsystems. The NGMM program plans to establish the 3DHI manufacturing center through a separate, future solicitation.
- **Anticipated Funding Available for Award:** Approximately \$20M of total funding is anticipated for awards made against this BAA.
- **Anticipated individual awards:** Multiple awards are anticipated.
- **Anticipated funding type:** 6.2
- **Types of instruments that may be awarded:** Procurement contracts, grants, cooperative agreements, Other Transactions
- **Agency contact:**
  - Dr. Carl McCants, Special Assistant to the DARPA Director
  - BAA Coordinator: HR001122S0050@darpa.mil
  - DARPA/MTO
  - ATTN: HR001122S0050
  - 675 North Randolph Street
  - 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 System for Award Management (SAM) website, under the Contract Opportunities (FBO) link, at <https://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 to inform planning for the Next Generation Microelectronics Manufacturing (NGMM) program. NGMM will work to establish, via a subsequent, future Program Solicitation, a domestic center for producing silicon-based and non-silicon-based 3D heterogeneously integrated (3DHI) prototypes (see definition in Section A below), by defining exemplar 3DHI microsystems and identifying the equipment, process, and facility requirements for manufacturing these microsystems. Proposed research should investigate innovative design and packaging of heterogeneous chip and wafer stacked components that enable revolutionary advances in science and technology for 3DHI manufacturing. Specifically excluded, is research that primarily results in evolutionary improvements to the existing state of practice for 3DHI microsystems.

**Establishing the prototyping center is not being solicited within this BAA.** A planned future Program Solicitation will establish the 3DHI manufacturing center, develop baseline process modules, qualify initial pilot-line processes, and implement the access model for R&D services.

#### **A. Background**

Microelectronics are essential to technology competition in both the economic and national security realms. Microelectronics are designated a critical technology for national security, and are also foundational for other critical and emerging dual-use technologies such as advanced computing, artificial intelligence, autonomous systems and robotics, communications and networking, and networked sensing.<sup>1</sup> Recent experience with supply chain disruptions from the COVID-19 pandemic and a rapidly shifting geopolitical order have led to a reassessment of domestic capabilities for manufacturing microelectronics for continued U.S. leadership.

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<sup>1</sup> Subcommittee on Critical and Emerging Technologies, National Science and Technology Council, “Critical and Emerging Technologies List Update,” February 2022.

While silicon transistor scaling will continue over the next decade, traditional technology scaling alone will provide diminishing cost and performance improvements and is unlikely to drive future long-term microelectronics innovation. Access to leading edge-silicon, while critical, must be regarded as one element of a longer-term view of advanced capabilities and supply chain security. This longer view needs to address the next wave of innovation that will overtake the role that complementary metal oxide semiconductor (CMOS) transistor scaling held until now. The next major wave of microelectronics innovation is expected to come from the ability to integrate heterogeneous materials, devices, and circuits through advanced packaging, producing a tightly coupled system that extends into the third dimension with performance that exceeds what is available from today's monolithic approach. This was echoed by a recent statement, "As we enter the advanced packaging era, these 2D (two-dimensional) and 3D *stacking technologies* give architects and designers the tools to further increase the number of transistors per device..."<sup>2</sup> While industry leaders such as Advanced Micro Devices (AMD), Intel, and Micron Technology in the U.S., Samsung and SK hynix in South Korea, and Taiwan Semiconductor Manufacturing Corporation (TSMC) in Taiwan have aggressively pursued advanced packaging for logic and memory, their advances may not widely benefit the U.S. domestic semiconductor industry without new strategies for pre-competitive collaboration and the development and adoption of 3DHI technologies and standards.

The 2019 Institute of Electrical and Electronics Engineers (IEEE) Heterogeneous Integration Roadmap states "Heterogeneous Integration refers to the integration of separately manufactured components into a higher-level assembly (System in Package – SiP) that, in the aggregate, provides enhanced functionality and improved operating characteristics."<sup>3</sup> The 3D part of 3DHI refers to stacking these components on each other within the same package. **In this solicitation, 3DHI refers to the stacking of separately manufactured components from different material systems, within a single package, to produce a microsystem that provides revolutionary improvements in functionality and performance.** Industry leaders currently use 3D integration of modestly dissimilar silicon digital technologies for a narrow range of commercial products, from stacked dynamic random access memory (DRAM) to CMOS imagers to high-performance computing. However, the opportunity to broadly impact *defense systems* relies on expanding the types of microelectronics that can be integrated and assembled. Today's mature integration techniques, even those often referred to as 3DHI, focus primarily on low-power, leading-edge CMOS, legacy CMOS, and silicon-based memory. Advancing digital integration requires increasing interconnect densities well beyond today's state-of-the-art. DARPA's expansion to heterogeneous integration also includes compound semiconductors for radio frequency (RF) and photonics for interconnect, novel memory devices for computing, and wide-bandgap and ultra-wide bandgap semiconductors for power electronics. For example,

*The 3D heterogeneous integration (3DHI) of high power and efficiency Gallium Nitride (GaN) power amplifiers (PAs) with functionally dense Si CMOS (complementary metal-oxide-semiconductor) logic will create a new class of*

<sup>2</sup> <https://www.intel.com/content/www/us/en/newsroom/opinion/moore-law-now-and-in-the-future.html#gs.6icfo2>

<sup>3</sup> <http://eps.ieee.org/hir>, Heterogeneous Integration Roadmap 2019 Edition, Chapter 1, p.4.

*compact, digitally enhanced RF integrated circuits (ICs) that will revolutionize radar and multifunction systems.*<sup>4</sup>

In order to address such a diversity of materials and functions, integration technologies will be challenged to improve thermal management, improve power conditioning, improve testing and electrical characterization for known good die, and improve the design tools for modeling and simulation of these new microsystems.

Barriers in the current U.S. ecosystem that limit or slow the progress in 3DHI R&D include:

- lack of centralized facilities to facilitate information sharing during development
- lack of common standards
- lack of access to affordable manufacturing capacity for low-volume products
  - very long iteration cycles at existing facilities
  - expensive fabrication equipment
- limitations of expensive and proprietary design tools for exploring new concepts.

**Presently, the U.S. has no open-access manufacturing center with comprehensive capacity for 3DHI research and development.** With very few exceptions, U.S. companies engaged in 3DHI research rely upon off-shore facilities, e.g., TSMC (Taiwan) and Interuniversity Microelectronics Center (IMEC, Belgium). An open-access national manufacturing center for 3DHI R&D would result in a more expansive wave of innovation, would promote shared learning, and would ensure that start-ups, academia, and the defense industrial base could engage in 3DHI R&D for low-volume products.

In the William M. (Mac) Thornberry National Defense Authorization Act (NDAA) for Fiscal Year (FY) 2021 (Public Law 116-283), Congress authorized multiple federal agencies to create public-private partnerships to promote domestic manufacturing research capacity in the microelectronics sector. Notably, Congress directed the Department of Commerce, in collaboration with the Department of Defense, to establish a National Semiconductor Technology Center to “conduct research and prototyping of advanced semiconductor technology to strengthen the economic competitiveness and security of the domestic supply chain,” and a National Advanced Packaging Manufacturing Program “to strengthen semiconductor advanced test, assembly, and packaging capability in the domestic ecosystem.”

While the scope of these activities is still being determined, it is expected that these efforts will prioritize conventional *silicon*-based technologies. The Department of Defense is also directed to establish a National Network for Microelectronics Research and Development (NNMRD) composed of United States research universities to enable the laboratory-to-fabrication transition of microelectronics innovations. This network, which will be established by the Under Secretary of Defense for Research & Engineering (USD(R&E)), is referred to as the “Microelectronics Commons” or “the Commons.” It is expected that the Commons will consist of multiple regional, university-focused U.S. innovation hubs to foster a pipeline of ideas and talent from university labs and small business teams across a wide range of device technologies and circuit

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<sup>4</sup> Raytheon Technology Today, Issue 2, May 2019.

architectures. While these new efforts will foster innovation broadly, neither specifically addresses the need for an open-access, national manufacturing center for 3DHI R&D.

Anticipating that the next major wave of microelectronics innovation will come from the ability to integrate heterogeneous materials, devices, and circuits through advanced packaging, DARPA is proposing to stand up a national accelerator specifically for next-generation 3DHI. This national accelerator would take the form of a pilot-line manufacturing capability that would allow users from across the country to assemble and test their R&D designs without the need for expensive investments in their own capability. This national accelerator would be distinguished from the other congressionally authorized efforts by its emphasis on the *heterogeneous* integration of multiple material systems, rather than prioritizing only silicon-based technologies. In addition, the accelerator will employ a holistic approach to specifically advance domestic 3DHI capabilities. This national accelerator would prioritize:

- centralized manufacturing resources;
- short turn-around manufacturing process cycle times; and
- cost-effectiveness from shared resources for design, packaging, assembly, and testing.

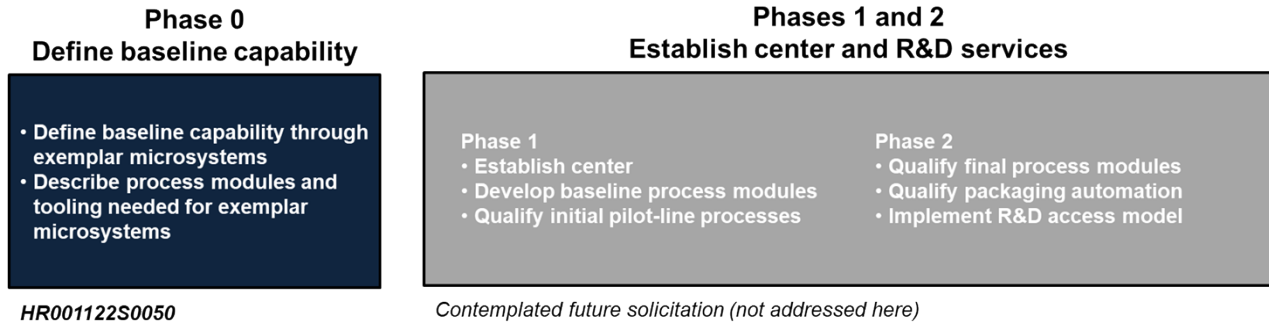
While investment in R&D for silicon-based 3DHI will undoubtedly accelerate in the commercial sector, the opportunity to accelerate innovation comes from enhancing collaboration across industry, defense, and academic partners. Investing now, before vendor-specific manufacturing approaches mature to a point where it becomes difficult to integrate intellectual property (IP) from multiple sources, will help ensure that the ecosystem has the foundation for future collaboration. As seen in many industries including microelectronics, insights gained from R&D in manufacturing enhance and accelerate the learning cycle that leads to product innovation. By leading in the creation of the next generation manufacturing techniques, the U.S. will secure broad and sustained leadership in microelectronics.

## **B. Program Description**

The Next-Generation Microelectronics Manufacturing (NGMM) program seeks to establish a holistic domestic capability for 3DHI R&D, developing key process modules for the design, packaging, assembly, and testing of 3DHI microsystems. If successful, the program will provide:

- an open-access manufacturing center to holistically address design, assembly, packaging, and testing;
- a pilot-line manufacturing capability;
- multi-project runs or dedicated taxi runs as a feature of the research service; and
- training and orientation for all users.

The NGMM program comprises three phases as depicted in Figure 1.



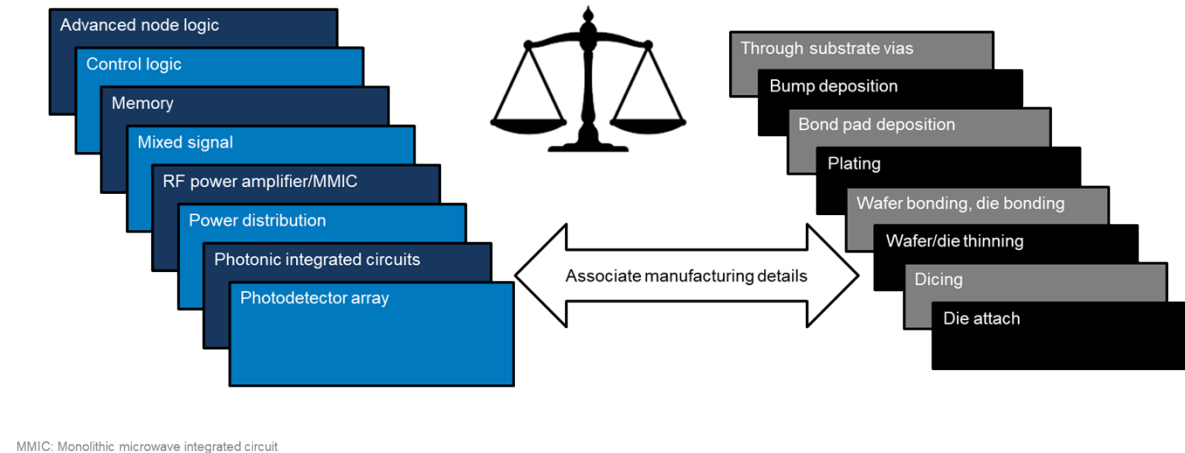
**Figure 1. NGMM Program Structure**

Phase 0 of this program, which is the focus of this BAA, will inform planning for the manufacturing center by defining exemplar 3DHI microsystems and identifying the equipment, processes, software tools, and facility requirements for manufacturing these microsystems. Proposers will provide a detailed analysis of an exemplar 3DHI microsystem (see the “Exemplar Microsystems and Process Modules” section below). In Phase 0, DARPA encourages proposers to form teams consisting of, but not limited to, microsystem designers, tooling manufacturers, and system integrators. In addition to the analysis of the exemplar 3DHI microsystem, proposers will provide specific recommendations for the software and hardware tools needed to manufacture their microsystem, including, but not limited to, electronic design automation (EDA) tools, packaging and assembly tools, and metrology and test tools and techniques.

The output of Phase 0 will be a detailed analytical report of exemplar 3DHI microsystems that could be fabricated in the 3DHI manufacturing center. In addition to providing a description of the layout, performance benefits, and applications, the report will describe the required equipment and process modules for manufacturing and testing the 3DHI microsystem.

Another goal of Phase 0 is to determine an operational balance in the diversity of the 3DHI processes that will be supported in the 3DHI manufacturing center. DARPA recognizes that too narrow a selection of processes may not prove useful to the targeted set of users (academia, defense industrial base, small businesses), while too broad a set may be prohibitively expensive and time-consuming to develop and sustain (Figure 2).

Widest range of types of heterogeneous circuits...      ...using the smallest set of process steps

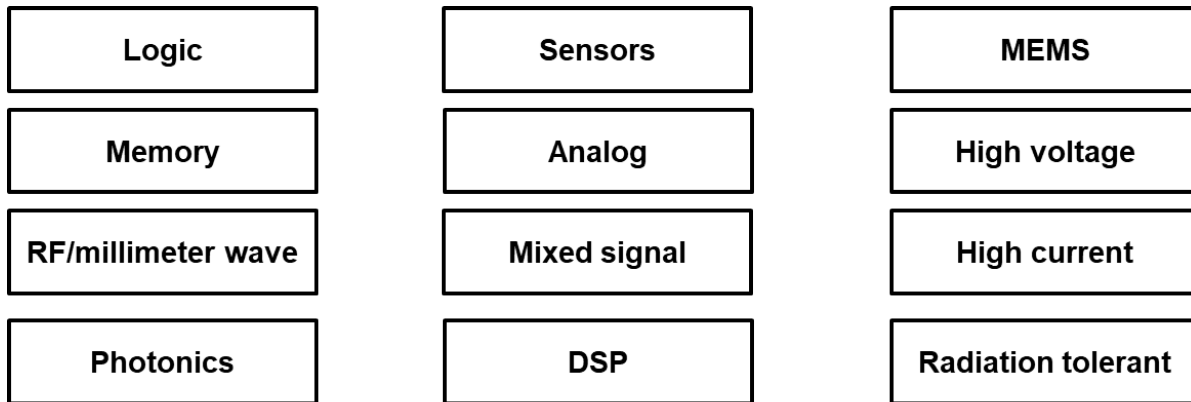


**Figure 2. Objective of Phase 0 Analyses**

The analyses from Phase 0 will be used to inform a separate solicitation for Phases 1 and 2 of NGMM, subject to DARPA's discretion and funding availability. In this separate solicitation, Phases 1 and 2 will focus on establishing the 3DHI manufacturing center, creating and finalizing baseline process modules, qualifying the pilot-line manufacturing process, and implementing the R&D access model for the center. DARPA does not anticipate that teams selected for Phase 0 would be identical to the teams proposing to the follow-on solicitation for Phases 1 and 2. Phase 0 relies on synthesizing the perspective of user needs with manufacturing capabilities, whereas Phases 1 and 2 will emphasize the expertise to create an operational manufacturing service for R&D. These phases rely on a different balance of expertise which, DARPA anticipates would naturally result in different teaming arrangements.

### **Exemplar Microsystems and Process Modules**

For this solicitation, NGMM aims to emphasize 3DHI microsystems that incorporate different material systems in the same package, such as photonics for interconnects, novel memory devices for computing, and wide-bandgap and ultra-wide bandgap semiconductors for power electronics, and additively manufactured passive components. Specifically, Phase 0 of NGMM seeks to define disruptive representative microsystems that integrate disparate wafers or chips into vertically stacked architectures.



RF: radio frequency  
 DSP: digital signal processing  
 MEMS: microelectromechanical systems

**Figure 3: Representative Building Blocks for Defining Exemplar 3DHI Microsystems**

Proposers should define their exemplar microsystem by incorporating at least two building blocks from Figure 3. Proposers should also identify specific components or applications that would demonstrate revolutionary performance improvements from the 3D integration in their exemplar microsystem. It is expected that the microsystems defined in this research study will reflect significant advances in the state-of-the-art for 3DHI performance and packaging by innovating in areas such as architecture, integration approach, novel materials, thermal and power management, and interconnect density.

The exemplar microsystems should have a minimum of three individual 2D chips vertically integrated together. In addition, they should contain a minimum of two disparate semiconductor material systems, such as Si, SiGe, GaAs, GaN, InP, HgCdTe, SiC, etc., rather than just two different Si CMOS technology nodes (e.g. 7 nm and 22 nm); however, deeply scaled CMOS as a part of the microsystem is not excluded.

**Table 1. Exemplar Microsystem Structure Objective Features**

Number of integrated 2D chips	Number of material systems
$\geq 3$	$\geq 2$

Proposers should include in their proposal the following details in their description of each exemplar microsystem:

- a high-level block diagram of the exemplar microsystem, including a description of the function of each block;
- a chip floorplan, with circuit blocks depicted in approximate proportional size;
- a summary of the anticipated applications for the exemplar microsystem; and
- figures of merit relevant to the exemplar microsystem.

If warranted, device-level schematics can be provided, but are not expected unless the unique nature of a design warrants inclusion to illustrate why that design would be considered exemplar.

### **3DHI Manufacturing Equipment and Tooling**

It is expected that the 3DHI microsystems fabricated within the 3DHI manufacturing center will comprise wafers, die, or chips that originate from multiple external foundries, laboratories, and process technologies, and are assembled using leading-edge packaging solutions. Incorporating diverse sets of die into a single, manufacturable package will require design standards to ensure successful integration. Proposers should address any needs for interface standards for chips that originate in different facilities and contain different semiconductors, metals, and dielectrics. For example, the integration of a GaN power amplifier with a silicon digital circuit may require reconciling dissimilarities in design and materials. Note that fabricating 2D die in a foundry or integrated device manufacturer is not in scope for this Phase 0 HR001122S0050 BAA or the NGMM 3DHI center, which will focus on integrating die from external foundries or integrated device manufacturers.

The research report should also describe the process modules required for each exemplar microsystem, which includes the design, manufacturing, and test capabilities that are needed to fabricate these devices. One aim of the NGMM 3DHI center is to create standard approaches that enable novel circuit architectures. Therefore, the Phase 0 report should address the use of a standard process flow that provides a baseline integration capability but also allows for flexibility of incorporating new device types or materials. Because of the diverse set of chips that will be supported by this fabrication capability, standardization will require a small number of process flows encompassing a broad range of circuits. Proposers should describe the methodology and framework for assessing how the process modules can be applied beyond the exemplar circuit to a wider group of circuits.

The process modules should describe the design support required, including access to EDA tools and the approach for developing, maintaining, and distributing 3D assembly design kits (3D-ADKs). The certification of the 3D-ADK and its support by chip manufacturers will be addressed in Phase 1 of NGMM, and not in Phase 0.

A detailed, step-by-step process flow is *not* expected for this research study. However, the report should encompass high level capabilities and novel manufacturing approaches in the following areas: through substrate vias, bump and bond pad formation, redistribution layers, wafer/chip/die bonding, backside processing (including wafer/die thinning), reconstituted wafers, dicing, and die attach. In addition, a description of required test, metrology, and reliability toolsets should be provided. The analysis should identify the key equipment necessary for accomplishing these processes, including an assessment of equipment availability. Finally, the process module discussion should outline the features that can be supported, including: substrate or chip sizes, semiconductor types, and materials (e.g. metals, oxide, polymers).

### **Intellectual Property**

DARPA is aware that IP concerns will need to be addressed during Phases 1 and 2 of NGMM. Successful collaboration within the 3DHI manufacturing center will require IP arrangements that accommodate a wide range of potential partners, such as academia, start-ups, the defense

industrial base, and commercial corporations. As the output of Phase 0 is a detailed analysis, DARPA expects that the analysis and exemplar microsystem may include propriety information. However, DARPA expects that a non-proprietary summary be available to share across teams within the program. DARPA anticipates that any IP concerns within a teaming arrangement will be addressed by that individual team.

DARPA expects proposers to leverage an existing IP model used in a similar semiconductor research center to identify barriers to collaboration that are specific to 3DHI, and recommend an IP model that could potentially reduce the identified barriers. Examples of existing IP models that may be used include the models used at one of the Manufacturing USA institutes or IMEC's Industrial Affiliation Program.<sup>5</sup> Other relevant IP models may be proposed.

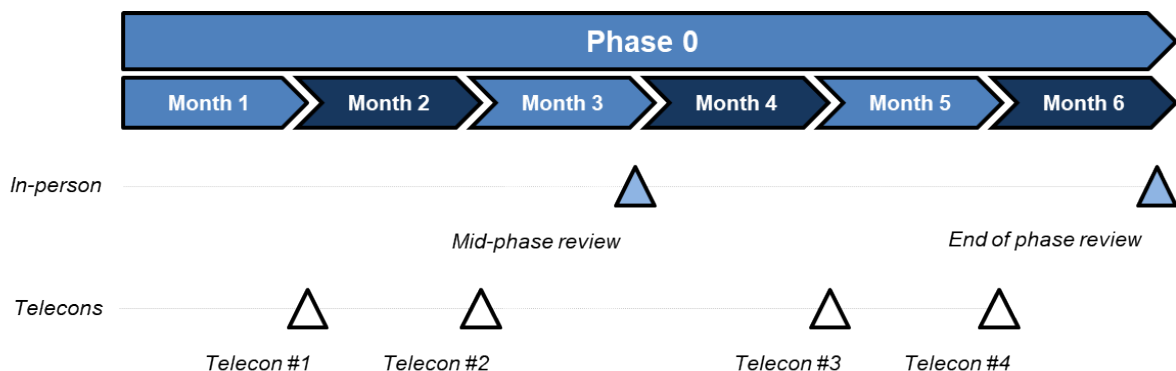
### C. Program Structure

Phase 0 of NGMM is a 6-month, single phase effort that seeks to provide a detailed analysis to define a 3DHI manufacturing center between the United States Government (USG), academia, and industry. This initial phase will emphasize defining the requirements and capabilities of a 3DHI R&D/prototyping ecosystem rather than solving a specific design challenge. DARPA expects that performers will leverage existing designs that would benefit from 3DHI architecture.

A separate, subsequent solicitation will be issued for establishing the center, subject to DARPA's discretion and available funding. Figure 1 depicts the relationship between Phase 0 and planned subsequent phases.

### D. Schedule and Milestones

The Phase 0 NGMM program planned schedule is shown in Figure 4.



<sup>5</sup> A representative model may be found in Manufacturing USA's "Guidance on Intellectual Property Rights for the National Network for Manufacturing Innovation," October 2014. Available at <https://www.manufacturingusa.com/reports/guidance-intellectual-property-rights-national-network-manufacturing-innovation>

### Figure 4. NGMM Phase 0 Schedule

Phase 0 of this program is 6 months, with an anticipated start date in February 2023. Program kickoff, mid-point review, final review, and monthly review sessions will be held and represent an opportunity to interact with the Government on planned work, specifics of the technical approaches, and any technical or programmatic items of concern. In addition, 3DHI technical workshops may be held during the program in which performers may provide further insights on future technical paths for 3DHI and technical challenges that must be addressed. Monthly progress teleconferences will be scheduled with the Government team to review technical progress and identify risks to completing the analysis. Figure 5 shows the schedule for all planned phases of the program.

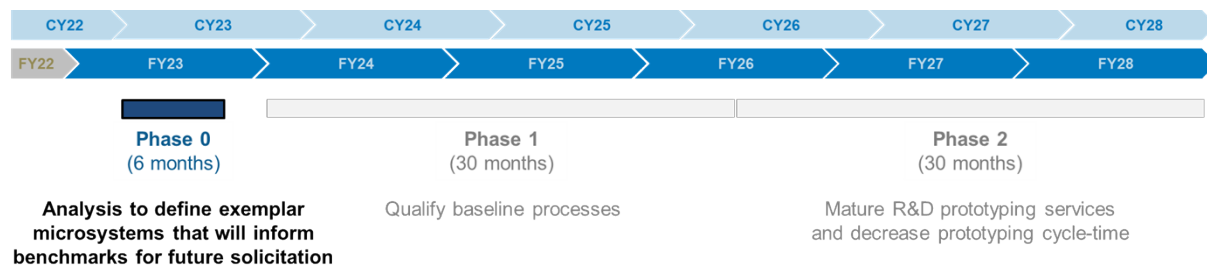


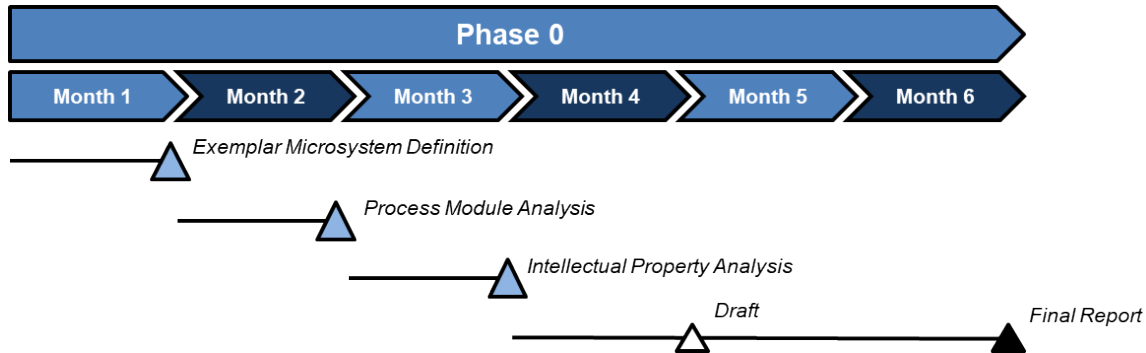
Figure 5. NGMM Program Planned Schedule

### E. Deliverables

At the end of Phase 0, performers should provide a detailed final report that includes:

- complete description of the exemplar microsystem to the device or component level, as appropriate;
- floorplan for each chip in the vertical stack;
- plan for functional simulation of each circuit design;
- performance metrics for each exemplar microsystem;
- hardware test plan that will validate the performance metrics; and
- list of milestones for design review over the course of Phase 0.

All performers shall deliver monthly technical reports, monthly financial reports including updated expenditures, and a final report at program completion. Performers shall prepare and submit briefing materials and participate in monthly progress reviews, either via teleconference or at the performer's site at the discretion of DARPA. Proposers should anticipate two in-person meetings with the Program Manager near Arlington, Virginia. To foster collaboration between teams and to disseminate program results, at least one of those meetings is planned to be a program-wide two-day Principal Investigator meeting. This program-wide meeting will be planned to be held at the mid-point of the six-month period of performance. Additional travel may be planned but the rationale should be explained within the proposal. These are shown in Figure 6.



**Figure 6. Example Schedule for Deliverables**

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

No Government furnished equipment, property, or information will be provided for the effort solicited in this BAA.

## **G. Intellectual Property**

Any use of proposer-defined intellectual property (patents, proprietary information, etc.) should be clearly marked as such within the proposal. Include all proprietary claims to the results, prototypes, intellectual property, or systems supporting the effort and/or necessary for the use of the research, results and/or prototype. If there are no proprietary claims, this should be stated. For forms to be completed regarding intellectual property, see Section IV.B.10 and Section IV.B.1, “Section III. Other TransactionRequest”, if applicable.

## **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. § 4022(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.

University or non-profit research institution performance under this solicitation may include effort categorized as fundamental research. In addition to Government support for free and open scientific exchanges and dissemination of research results in a broad and unrestricted manner, the academic or non-profit research performer or recipient, regardless of tier, acknowledges that such research may have implications that are important to U.S. national interests and must be protected against foreign influence and exploitation. As such, the academic or non-profit research performer or recipient agrees to comply with the following requirements:

- (a) The University or non-profit research institution performer or recipient must establish and maintain an internal process or procedure to address foreign talent programs, conflicts of commitment, conflicts of interest, and research integrity. The academic or non-profit research performer or recipient must also utilize due diligence to identify Foreign Components or participation by Senior/Key Personnel in Foreign Government Talent Recruitment Programs and agree to share such information with the Government upon request.
  - i. The above described information will be provided to the Government as part of the proposal response to the solicitation and will be reviewed and assessed prior to award. Generally, this information will be included in the Research and Related Senior/Key Personnel Profile (Expanded) form (SF-424) required as part the proposer's submission through Grants.gov.
    1. Instructions regarding how to fill out the SF-424 and its biographical sketch can be found through Grants.gov.
  - ii. In accordance with USD(R&E) direction to mitigate undue foreign influence in DoD-funded science and technology, DARPA will assess all Senior/Key Personnel proposed to support DARPA grants and cooperative agreements for potential undue foreign influence risk factors relating to professional and financial activities. This will be done by evaluating information provided via the SF-424, and any accompanying or referenced documents, in order to identify and assess any associations or affiliations the Senior/Key Personnel may have with foreign strategic competitors or countries that have a history of intellectual property theft, research misconduct, or history of targeting U.S. technology for unauthorized transfer. DARPA's evaluation takes into consideration the entirety of the Senior/Key Personnel's SF-424, current and pending support, and biographical sketch, placing the most weight on the Senior/Key Person's professional and financial activities over the last 4 years. The majority of foreign entities lists used to make these determinations are publicly available. The DARPA Countering

Foreign Influence Program (CFIP) “Senior/Key Personnel Foreign Influence Risk Rubric” details the various risk ratings and factors. The rubric can be seen at the following link:

<https://www.darpa.mil/attachments/092021DARPACFIPRubric.pdf>

- iii. Examples of lists that DARPA leverages to assess potential undue foreign influence factors include, but are not limited to:
  1. Executive Order 13959 “Addressing the Threat From Securities Investments That Finance Communist Chinese Military Companies”: <https://www.govinfo.gov/content/pkg/FR-2020-11-17/pdf/2020-25459.pdf>
  2. The U.S. Department of Education’s College Foreign Gift and Contract Report: [College Foreign Gift Reporting \(ed.gov\)](https://www.ed.gov/collegeforeigngiftreport)
  3. The U.S. Department of Commerce, Bureau of Industry and Security, List of Parties of Concern: <https://www.bis.doc.gov/index.php/policy-guidance/lists-of-parties-of-concern>
  4. Georgetown University’s Center for Security and Emerging Technology (CSET) Chinese Talent Program Tracker: <https://chinatalenttracker.cset.tech>
  5. Director of National Intelligence (DNI) “World Wide Threat Assessment of the US Intelligence Community”: [2021 Annual Threat Assessment of the U.S. Intelligence Community \(dni.gov\)](https://www.dni.gov/2021-annual-threat-assessment-of-the-us-intelligence-community)
  6. Various Defense Counterintelligence and Security Agency (DCSA) products regarding targeting of US technologies, adversary targeting of academia, and the exploitation of academic experts: <https://www.dcsa.mil/>

DARPA’s analysis and assessment of affiliations and associations of Senior/Key Personnel is compliant with Title VI of the Civil Rights Act of 1964. Information regarding race, color, or national origin is not collected and does not have bearing in DARPA’s assessment.

University or non-profit research institutions with proposals selected for negotiation that have been assessed as having high or very high undue foreign influence risk, will be given an opportunity during the negotiation process to mitigate the risk. DARPA reserves the right to request any follow-up information needed to assess risk or mitigation strategies.

- iv. Upon conclusion of the negotiations, if DARPA determines, despite any proposed mitigation terms (e.g. mitigation plan, alternative research personnel), the participation of any Senior/Key Research Personnel still represents high risk to the program, or proposed mitigation affects the Government’s confidence in proposer’s capability to successfully complete the research (e.g., less qualified Senior/Key Research Personnel) the Government may determine not to award the proposed effort. Any decision not to award will be predicated upon reasonable disclosure of the pertinent facts and reasonable discussion of any possible alternatives while balancing program award timeline requirements.

(b) Failure of the academic or non-profit research performer or recipient to reasonably exercise due diligence to discover or ensure that neither it nor any of its Senior/Key Research Personnel involved in the subject award are participating in a Foreign Government Talent Program or have a Foreign Component with an a strategic competitor or country with a history of targeting U.S. technology for unauthorized transfer may result in the Government exercising remedies in accordance with federal law and regulation.

- i. If, at any time, during performance of this research award, the academic or non-profit research performer or recipient should learn that it, its Senior/Key Research Personnel, or applicable team members or subtier performers on this award are or are believed to be participants in a Foreign Government Talent Program or have Foreign Components with a strategic competitor or country with a history of targeting U.S. technology for unauthorized transfer , the performer or recipient will notify the Government Contracting Officer or Agreements Officer within 5 business days.
  1. This disclosure must include specific information as to the personnel involved and the nature of the situation and relationship. The Government will have 30 business days to review this information and conduct any necessary fact-finding or discussion with the performer or recipient.
  2. The Government's timely determination and response to this disclosure may range anywhere from acceptance, to mitigation, to termination of this award at the Government's discretion.
  3. If the University receives no response from the Government to its disclosure within 30 business days, it may presume that the Government has determined the disclosure does not represent a threat.
- ii. The performer or recipient must flow down this provision to any subtier contracts or agreements involving direct participation in the performance of the research.

(c) Definitions

- i. Senior/Key Research Personnel
  1. This definition would include the Principal Investigator or Program/Project Director and other individuals who contribute to the scientific development or execution of a project in a substantive, measurable way, whether or not they receive salaries or compensation under the award. These include individuals whose absence from the project would be expected to impact the approved scope of the project.
  2. Most often, these individuals will have a doctorate or other professional degrees, although other individuals may be included within this definition on occasion.
- ii. Foreign Associations/Affiliations
  1. Association is defined as collaboration, coordination or interrelation, professionally or personally, with a foreign government-connected entity where no direct monetary or non-monetary reward is involved.

2. Affiliation is defined as collaboration, coordination, or interrelation, professionally or personally, with a foreign government-connected entity where direct monetary or non-monetary reward is involved.
- iii. Foreign Government Talent Recruitment Programs
    1. In general, these programs will include any foreign-state-sponsored attempt to acquire U.S. scientific-funded research or technology through foreign government-run or funded recruitment programs that target scientists, engineers, academics, researchers, and entrepreneurs of all nationalities working and educated in the U.S.
    2. Distinguishing features of a Foreign Government Talent Recruitment Program may include:
      - a. Compensation, either monetary or in-kind, provided by the foreign state to the targeted individual in exchange for the individual transferring their knowledge and expertise to the foreign country.
      - b. In-kind compensation may include honorific titles, career advancement opportunities, promised future compensation or other types of remuneration or compensation.
      - c. Recruitment, in this context, refers to the foreign-state-sponsor's active engagement in attracting the targeted individual to join the foreign-sponsored program and transfer their knowledge and expertise to the foreign state. The targeted individual may be employed and located in the U.S. or in the foreign state.
      - d. Contracts for participation in some programs that create conflicts of commitment and/or conflicts of interest for researchers. These contracts include, but are not limited to, requirements to attribute awards, patents, and projects to the foreign institution, even if conducted under U.S. funding, to recruit or train other talent recruitment plan members, circumventing merit-based processes, and to replicate or transfer U.S.-funded work in another country.
      - e. Many, but not all, of these programs aim to incentivize the targeted individual to physically relocate to the foreign state. Of particular concern are those programs that allow for continued employment at U.S. research facilities or receipt of U.S. Government research funding while concurrently receiving compensation from the foreign state.
    3. Foreign Government Talent Recruitment Programs DO NOT include:
      - a. Research agreements between the University and a foreign entity, unless that agreement includes provisions that create situations of concern addressed elsewhere in this section,
      - b. Agreements for the provision of goods or services by commercial vendors, or

- c. Invitations to attend or present at conferences.
- iv. Conflict of Interest
  1. A situation in which an individual, or the individual's spouse or dependent children, has a financial interest or financial relationship that could directly and significantly affect the design, conduct, reporting, or funding of research.
- v. Conflict of Commitment
  1. A situation in which an individual accepts or incurs conflicting obligations between or among multiple employers or other entities.
  2. Common conflicts of commitment involve conflicting commitments of time and effort, including obligations to dedicate time in excess of institutional or funding agency policies or commitments. Other types of conflicting obligations, including obligations to improperly share information with, or withhold information from, an employer or funding agency, can also threaten research security and integrity and are an element of a broader concept of conflicts of commitment.
- vi. Foreign Component
  1. Performance of any significant scientific element or segment of a program or project outside of the U.S., either by the University or by a researcher employed by a foreign organization, whether or not U.S. government funds are expended.
  2. Activities that would meet this definition include, but are not limited to:
    - a. Involvement of human subjects or animals;
    - b. Extensive foreign travel by University research program or project staff for the purpose of data collection, surveying, sampling, and similar activities;
    - c. Collaborations with investigators at a foreign site anticipated to result in co-authorship;
    - d. Use of facilities or instrumentation at a foreign site;
    - e. Receipt of financial support or resources from a foreign entity; or
    - f. Any activity of the University that may have an impact on U.S. foreign policy through involvement in the affairs or environment of a foreign country.
  3. Foreign travel is not considered a Foreign Component.
- vii. Strategic Competitor
  1. A nation, or nation-state, that engages in diplomatic, economic or technological rivalry with the United States where the fundamental strategic interests of the U.S are under threat.

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. § 4892 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 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 and/or teaming is 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 full proposal submissions 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.

#### **1. 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 20 pages. 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 (HR001122S0050);
- (2) Lead Organization submitting proposal;
- (3) Type of organization, selected among the following categories:  
Large Organization, Small Disadvantaged Organization, Other Small Organization, HBCU, MI, Other Educational, Other Nonprofit;
- (4) Proposer's internal reference number (if any);
- (5) Other team members (if applicable) and type of organization for each;
- (6) Proposal title;
- (7) Technical point of contact to include:  
Salutation, last name, first name, street address, city, state, zip code (+4), telephone, fax (if available), electronic mail;
- (8) Administrative point of contact to include:  
Salutation, last name, first name, street address, city, state, zip code (+4), telephone, fax (if available), electronic mail;
- (9) Total funds requested from DARPA, and the amount of cost share (if any); AND
- (10) 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 Phase 0 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. 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.

The technical approach for Phase 0 must:

- Provide a plan and assumptions for defining the 3DHI microsystems that will be evaluated in the Phase 0 study.
- Describe how the process modules will be identified and assessed for 3DHI exemplar microsystem manufacture.

## 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. Define all deliverables (reporting, data, reports, software, etc.) to be provided to the Government in support of the proposed research tasks/activities; AND
6. Clearly identify any tasks/subtasks (prime or subcontracted) that will be accomplished on-campus at a university, if applicable.

*Note: Only Phase 0 is being solicited under this BAA and only Phase 0 should be 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 program goals 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.10, "Intellectual Property." If there are no proprietary claims, this should be stated.

**F. Risk Analysis and Mitigation Plan**

Identify the areas of risk to completing this study, such as limited access to data that would be necessary to provide a comprehensive and systematic analysis. Provide a narrative assessment of the source of the risks and potential mitigation for those risks.

**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 provide data and expertise to complete the proposed effort.

**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 listed 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**

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 (HR001122S0050);
- (2) Lead Organization submitting proposal;
- (3) Type of organization, selected among the following categories:  
Large Organization, Small Disadvantaged Organization, Other Small Organization, HBCU, MI, Other Educational, Other Nonprofit;
- (4) Proposer's internal reference number (if any);
- (5) Other team members (if applicable) and type of organization for each;
- (6) Proposal title;
- (7) 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);
- (8) 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);
- (9) 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;
- (10) Place(s) and period(s) of performance;
- (11) Total proposed cost separated by basic award and option(s), if any, by calendar year and by government fiscal year;

- (12) Name, address, and telephone number of the proposer's cognizant Defense Contract Management Agency (DCMA) administration office (*if known*);
- (13) Name, address, and telephone number of the proposer's cognizant Defense Contract Audit Agency (DCAA) audit office (*if known*);
- (14) Date proposal was prepared;
- (15) Unique Entity ID (UEI) number;
- (16) TIN number;
- (17) CAGE Code;
- (18) Subcontractor Information;
- (19) Proposal validity period (120 days is recommended); AND
- (20) 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 performer fiscal year, and a "Detailed Cost Breakdown" by 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**

Proposers should anticipate two in-person meetings with the Program Manager near Arlington, Virginia. To foster collaboration between teams and to disseminate program results, at least one of those meetings is planned to be a program-wide two-day Principal Investigator meeting. This program-wide meeting will be planned to be held at the mid-point of the six-month period of performance. Additional travel may be planned but the rationale should be explained within the proposal. For each trip, provide the purpose of the trip, number of trips, number of days per trip, departure and arrival destinations, and the number of people.

**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.

(b) Per DFARS 215.408(5), DFARS 252.215-7009, Proposal Adequacy Checklist, applies to all proposers/proposals seeking a FAR-based award (contract).

(c) 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).

(d) Per Section 873 of the FY2016 National Defense Authorization Act (Pub L. 114-92), "Pilot Program For Streamlining Awards For Innovative Technology Projects," as modified by Sections 896 of the NDAA for FY 2017 (Pub. L. 114-328) and 832 of the NDAA for FY 2021 (Pub. L. 116-283), 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 § 3014, 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 (to include embedding documents or supporting cost information otherwise to be included in the Volume 2 written document). Submission of the spreadsheet alone does not make for a complete Volume 2 submission. Please see proposal preparation instructions above.

### **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.

## **2. 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.

### **3. 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 is detailed in the General MTO Controlled Unclassified Information Guide (CUIG) and is provided as Attachment 3 to the BAA.

##### **ii. CUI Submission Requirements**

Unclassified submissions containing CUI may be submitted via DARPA’s BAA Website (<https://baa.darpa.mil>) in accordance with Section IV.C.2. 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



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 HR001122S0050, 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: HR001122S0050  
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**

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 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.

## **4. 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://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.800-171r2.pdf>) 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.

## **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 <http://www.darpa.mil/work-with-us/additional-baa>, to include providing the information specified therein as required for proposal submission.

## **6. 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)).

## **7. 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.

## **8. 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.

## **9. 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 large 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 \$750,000 (total contract amount including options).

## 10. 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.”

## 11. 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.

## 12. 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/sys\\_attachment.do?sys\\_id=c08b64ab1b4434109ac5ddb6bc4bcbb8](https://www.fsd.gov/sys_attachment.do?sys_id=c08b64ab1b4434109ac5ddb6bc4bcbb8).

### **13. 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 HR001122S0050. 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 a full proposal to this BAA should be directed to [HR001122S0050@darpa.mil](mailto:HR001122S0050@darpa.mil). DARPA intends to use electronic mail for correspondence regarding HR001122S0050. Proposals 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**

##### **a. Full Proposal Date**

Full proposals must be submitted to DARPA/MTO on or before 5:00 PM, Eastern Time, **05 October 2022**, in order to be considered during the single round of selections. Proposals received after this deadline will not be reviewed.

##### **b. 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 HR001122S0050 summary will be a link to the FAQ. Submit your question/s by e-mail to [HR001122S0050@darpa.mil](mailto:HR001122S0050@darpa.mil). In order to receive a response sufficiently in advance of the proposal due date, send your question/s on or before 5:00 PM, Eastern Time, **15 September 2022**.

## 2. 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: 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\\_3\\_0-V3.0.pdf](https://apply07.grants.gov/apply/forms/sample/RR_KeyPersonExpanded_3_0-V3.0.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. The form includes 3 parts: the main form administrative information, including the Project Role, Degree Type and Degree Year; the biographical sketch; and the current and pending support. The biographical sketch and current and pending support are to be provided as attachments:

- Biographical Sketch: Mandatory for Project Directors (PD) and Principal Investigators (PI), optional, but desired, for all other Senior/Key Personnel. The biographical sketch should include information pertaining to the researchers:
  - Education and Training.
  - Research and Professional Experience.
  - Collaborations and Affiliations (for conflict of interest).
  - Publications and Synergistic Activities.
- Current and Pending Support: Mandatory for all Senior/Key Personnel including the PD/PI. This attachment should include the following information:
  - 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. § 4021 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\\_3\\_0-V3.0.pdf](https://apply07.grants.gov/apply/forms/sample/RR_KeyPersonExpanded_3_0-V3.0.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. The form includes 3 parts: the main form administrative information, including the Project Role, Degree Type and Degree Year; the biographical sketch; and the current and pending support. The biographical sketch and current and pending support are to be provided as attachments:

- Biographical Sketch: Mandatory for Project Directors (PD) and Principal Investigators (PI), optional, but desired, for all other Senior/Key Personnel. The biographical sketch should include information pertaining to the researchers:
  - Education and Training.
  - Research and Professional Experience.
  - Collaborations and Affiliations (for conflict of interest).

- Publications and Synergistic Activities.
- Current and Pending Support: Mandatory for all Senior/Key Personnel including the PD/PI. This attachment should include the following information:
  - 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 unclassified proposals via DARPA's BAA Website (<https://baa.darpa.mil>). Note: If an account has recently been created for the DARPA BAA Website, this account may be reused. Accounts are typically disabled and eventually deleted following 75-90 days of inactivity – if you are unsure when the account was last used, it is recommended that you create a new account. 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. The “Password Reset” option at the URL listed above can be used if the password is not received in a timely fashion. 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. Note: Even if a submitter's organization has an existing registration, each user submitting a proposal must create their own Organization Registration.

All unclassified full proposals submitted electronically through the DARPA BAA website must be uploaded as zip archives (i.e., files with a .zip or .zipx extension). The final zip archive should be no greater than 100 MB in size. Only one zip archive will be accepted per submission – subsequent uploads for the same submission will overwrite previous uploads, and submissions not uploaded as zip archives 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/>.

Proposers using the DARPA BAA Website may encounter heavy traffic on the submission deadline date; proposers should start this process as early as possible. 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 Eastern Time).

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

See Section IV.B.3, “Security Information,” for guidance on submitting classified proposals.

### **3. 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 an understanding of the ecosystem that supports the transition of 3DHI manufacturing technology to the research, industrial, and/or operational military communities in such a way as to enhance U.S. defense. In addition, the evaluation will take into consideration the extent to which the proposed intellectual property rights structure will impact the Government's ability to transition the deliverable information to subsequent phases of the NGMM program.

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 and proposer's expertise 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.

Awards 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 (FAPIS)**

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 FAPIS). 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 FAPIS or other systems prior to making an award.

## **4. Countering Foreign Influence Program (CFIP)**

DARPA's CFIP is an adaptive risk management security program designed to help protect the critical technology and performer intellectual property associated with DARPA's research projects by identifying the possible vectors of undue foreign influence. The CFIP team will create risk assessments of all proposed Senior/Key Personnel selected for negotiation of a fundamental research grant or cooperative agreement award. The CFIP risk assessment process

will be conducted separately from the DARPA scientific review process and adjudicated prior to final award.

## **VI. Award Administration Information**

### **A. Selection Notices**

#### **1. 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 one 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 supplementary DARPA-specific representations and certifications at the time of proposal submission. See <http://www.darpa.mil/work-with-us/rep-certs> for further information on required representation and certification depending on your requested award instrument.

Proposers requesting an Other Transaction are required to complete the Other Transaction Certifications document provided as Attachment 4 to the BAA.

## **5. Terms and Conditions (for grants and cooperative agreements only)**

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 monthly technical and 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 draft final report that summarizes the status of the recommended 3D microsystems and process modules will be due by the end of month 4. 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. Vault**

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

## **VII. Agency Contacts**

Administrative, technical or contractual questions should be sent via e-mail to HR001122S0050@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. Carl McCants  
DARPA/MTO  
ATTN: HR001122S0050  
675 North Randolph Street  
Arlington, VA 22203-2114  
BAA Email: HR001122S0050@darpa.mil

## **VIII. Other Information**

### **A. Proposers Day**

The NGMM Proposers Day will be held virtually on August 17, 2022. Advance registration is required for the virtual meeting. See DARPA-SN-22-50 posted at <https://sam.gov> for all details. Attendance at the NGMM 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>.