



Broad Agency Announcement  
Accelerated Molecular Discovery (AMD)  
Defense Sciences Office

HR001119S0003

October 19, 2018

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### BAA Attachments:

- Attachment A: ABSTRACT SUMMARY SLIDE TEMPLATE
- Attachment B: ABSTRACT TEMPLATE
- Attachment C: PROPOSAL SUMMARY SLIDE TEMPLATE
- Attachment D: PROPOSAL TEMPLATE VOLUME 1 TECHNICAL & MANAGEMENT VOLUME
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## PART I: OVERVIEW INFORMATION

- **Federal Agency Name:** Defense Advanced Research Projects Agency (DARPA), Defense Sciences Office (DSO)
- **Funding Opportunity Title:** Accelerated Molecular Discovery (AMD)
- **Announcement Type:** Initial Announcement
  - **Funding Opportunity Number:** HR001119S0003
- **Catalog of Federal Domestic Assistance (CFDA) Number(s):** 12.910 Research and Technology Development
- **Dates** (All times listed herein are Eastern Time.)
  - Posting Date: October 19, 2018
  - Proposers Day: October 18, 2018. See Section VIII.C.
  - Abstract Due Date: November 1, 2018, 4:00 p.m.
  - FAQ Submission Deadline: January 3, 2019, 4:00 p.m. See Section VIII.A.
  - Full Proposal Due Date: January 14, 2019, 4:00 p.m.
- **Types of Instruments that May be Awarded:** Procurement contracts, grants, cooperative agreements or Other Transactions
- **Agency contacts**
  - **Technical POC:** Anne Fischer, Program Manager, DARPA/DSO
  - **BAA Email:** AMD@darpa.mil
  - **BAA Mailing Address:**  
DARPA/DSO  
ATTN: HR001119S0003  
675 North Randolph Street  
Arlington, VA 22203-2114
  - **DARPA/DSO Opportunities Website:** <http://www.darpa.mil/work-with-us/opportunities>
- **Teaming Information:** See Section VIII.B for information on teaming opportunities.
- **Frequently Asked Questions (FAQ):** FAQs for this solicitation may be viewed on the DARPA/DSO Opportunities Website. See Section VIII.A for further information.

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

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

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

#### **A. Introduction**

The Defense Sciences Office (DSO) at the Defense Advanced Research Projects Agency (DARPA) is soliciting innovative research proposals in the area of autonomous molecular design to accelerate the discovery, validation, and optimization of new, high-performance molecules for Department of Defense (DoD) needs. DARPA seeks to develop new, systematic approaches to increase the pace of discovery and optimization of high-performance molecules through development of closed-loop systems that exploit, build and integrate tools for: 1) extracting existing data from databases and text; 2) executing autonomous experimental measurement and optimization; and 3) incorporating computational approaches to develop physics-based representations and predictive tools. Such methods will ultimately enable Artificial Intelligence (AI)-based design and discovery of completely new molecules that are optimized across multiple molecular properties for specific DoD needs. Proposed research should investigate innovative approaches that enable revolutionary advances in science, devices, and systems related to small organic molecules. Specifically excluded is research that primarily results in evolutionary improvements to the existing state of practice.

#### **B. Background**

Efficient discovery and production of new molecules is essential to realize capabilities across the DoD, from simulants and medicines essential to counter emerging threats, to coatings, dyes and specialty fuels needed for advanced performance. Current approaches to develop molecules for a given application are intuition-driven, mired in slow iterative design/test cycles, and ultimately limited by the specific molecular expertise of the chemist, bottlenecks in the synthesis of candidates, and the pace of by-hand validation and optimization of these candidates. Even in industries that exploit high-throughput screening (HTS) of millions of molecules per day, subsequent design, synthesis and testing of molecular analogs is a months-to-years-long process. Brute force HTS of a common (albeit large) library has yet to yield productivity benefits over chemical intuition and past precedent, which still boasts a success rate well beyond HTS methods. Ultimately then, it is not just the rate of experiments that matters, but the quality and efficiency of those experiments. Given a potential structure space of  $\sim 10^{60}$  for pharmacologically relevant molecules alone, with just over  $10^9$  molecules of any kind reported to date, the possibilities are seemingly endless, but our current approaches are considerably constraining.

Accelerated Molecular Discovery (AMD) will address these pace and performance shortcomings by creating fundamentally new closed-loop systems that enable rapid design, discovery and optimization of molecules with defined properties. Such systems will exploit, build and integrate tools for: 1) extracting existing data from databases and text; 2) executing autonomous

experimental measurement and optimization; and 3) incorporating computational approaches to develop physics-based representations and predictive tools. AMD systems will provide a comprehensive computational and experimental means to design, discover, validate, and optimize new molecules, iteratively and actively learning to more efficiently and effectively discover high-performance molecules relevant to national security.

Artificial Intelligence (AI) methods have recently been applied to various aspects of chemistry, including synthetic route design, property prediction, inverse design, and process optimization. Though some successes have been realized, a number of technical challenges continue to limit the potential of AI in the molecular sciences. The first relates to the data provided to the AI systems, in terms of both the content and accessibility of existing chemical data, and how we currently generate new chemical knowledge. The second centers on representation of this data to AI, or determining what features of a molecular system are necessary to embody chemical character and how to describe them in algorithmically accessible form.

#### Data:

As suggested above, the sheer volume of data produced by HTS and other methods in the molecular sciences has not been sufficient to provide comparable insights to an expert chemist. Indeed, the value of new data to an AI model is a function of data already seen by the model, the particular AI model being used, and the task the model is performing. Therefore, an essential question is how to efficiently acquire chemistry data that will prove most valuable to specific AI models and tasks. Existing data in chemistry, like many fields, is sparse, noisy and incomplete. For example, while we have access to databases containing reaction schemes for nearly 40 million molecules, less than a quarter of those include data on such a basic (and critical) parameter as reaction yield. Moreover, those databases that do report yield are highly biased to high-yield reactions, as chemists report primarily optimized processes in relatively algorithm-accessible reaction schemes. A closer look at the literature, however, reveals that valuable information about reaction failures, lower yield and optimization experiments is often included in algorithm inaccessible form (e.g., text, tables, and figures). Examples relevant to molecular properties that are the subject of this program abound as well, with critical data and metadata present in manuscripts, lab notebooks, etc. Existing tools such as named entity recognition (NER) and semantic role labeling (SRL) in Natural Language Processing (NLP) can identify mentions of terms of interest and relate them in meaningful ways. Tools in the computer vision (CV) community exist that could aid in extracting knowledge from molecular structure diagrams, chemical equations, tables, and figures. Yet, tools from these communities have been sparingly applied to chemistry to augment our chemical knowledge and exploit past experiments.

Perhaps an even greater challenge, however, is developing a means to rapidly generate new data through methods that more efficiently explore a search space, whether it be a query of structural variants to optimize a specific property or a process-level optimization across a series of experimental conditions. While not standard in conventional chemistry laboratories, automated approaches are emerging, including semi-automated analytical feedback systems for property optimization and design-of-experiments (DOE)-like approaches for hands-free optimization of experimental processes. Such approaches, if effectively coupled to AI models through active learning, reinforcement learning, or adversarial learning methods, could generate data that is uniquely valuable to the AI model and task at hand, in terms of both training and validation.

Moreover, the data generated by automated experimental systems would be objective and complete in a way that is possible only with direct experimental observation. The potential of multi-objective optimization, particularly of multiple properties in a single molecule, makes this nascent application of automation and AI to chemistry even more appealing.

#### Representation:

Chemists have long represented molecules using static, two-dimensional graphs, where the nodes are atoms and the edges are bonds. These same structure-based features are the dominant descriptors used for training statistical machine learning algorithms. Even when 100s to 1000s of structural features are incorporated into a representation of a molecule, such representations fail to capture known, critical property-dependent elements of a molecular system. Physics-based data, such as molecular dynamics, quantum mechanics, and mechanistic information, would be valuable, but the computation time traditionally required by simulation platforms to generate this data for new molecules hinders its application to AI in chemistry. Perhaps strategies such as machine learning approximations of such physics data could overcome this limitation. Developing AI-based tools to accelerate molecular design and discovery most certainly must incorporate these elements to robustly represent what matters most in molecule-based property prediction. However, the implications of what this means—exactly which physics should be represented, how this should be done, and to what degree it matters in the context of a particular molecular property or domain—is yet unknown.

Addressing these challenges in a meaningful way to provide practical software and hardware tools for molecular design requires development of a closed-loop system. With parallel development and real-time feedback of components for data extraction, data generation, and representations, AI models and optimization frameworks, components can be built, validated, and improved to evaluate their ultimate potential and fundamental limitations for applications in high-performance small molecule design and discovery.

### **C. Program Description/Scope**

AMD will increase the pace of molecular discovery and optimization, resulting in tools, techniques and closed-loop systems that design novel molecules with a desired set of properties. Performer teams will develop complete closed-loop systems that exploit, build, and integrate tools for 1) extracting existing data from databases and text; 2) executing autonomous experimental measurement and optimization; and 3) incorporating computational approaches to develop physics-based representations and predictive tools. Tools, models, data, and systems will be transferred to Government teams throughout the program, potentially beginning as early as midway through the base period, for independent validation and verification (IV&V). AMD will emphasize creating and leveraging open source technologies and architectures, making data sharing and collaboration among performers and with Government IV&V teams key aspects of this program. Intellectual property rights asserted by proposers are strongly encouraged to be aligned with open source regimes and be clearly defined in the proposal submission.

AMD is focused on developing closed-loop systems that can measure, model, and predict among a set of fundamental molecular properties that are relevant to molecular function and performance in a given application. Properties of interest include boiling point, vapor pressure, density (including liquids), solubility (e.g., water/lipid), spectral signature (e.g., infrared/Raman),

degradation products, toxicity, and viscosity. Proposers may choose to build systems to measure, model, predict and optimize additional properties, but should select four from this set. Proposals should identify one or more potential applications (e.g., medicines, dyes, agrochemicals, coatings, fuels, etc.) for which their selected set of properties are relevant, as this affects aspects such as available data, target molecular classes, etc. However, performers should focus on developing generalizable systems that enable design of molecules with specific properties that are informed, but not dictated by, an application. Importantly, in addition to tool, model and system validation, Government IV&V teams will assess the feasibility of extending and applying tools developed for one application area to another. Understanding the challenges inherent in transitioning these models and tools among application areas will be a critical aspect of the program.

AMD performers will develop the approaches, methods, and tools to build closed-loop systems. These systems are divided into three Focus Areas (FAs) that pertain to the technical challenges and development necessary to realize the AMD goals:

FA1: Data extraction from existing sources;

FA2: Data generation via automated experimental platforms; and

FA3: Representations, AI models, and optimization frameworks

Proposers must address all three FAs in their proposed approach, resulting in an integrated system that can extract and exploit existing data, generate new data, and develop and validate new molecular representations and optimization frameworks for realizing high fidelity AI models for molecular design and discovery. Given the interdisciplinary nature of the work, teams should be interdisciplinary with a composition including relevant fields such as chemistry, engineering, computer science, and mathematics. Expertise in automation, autonomy, and AI-based representation are highly encouraged. While ultimate scope and implementation of each FA will be dependent on the set of molecular properties and the performer-defined approach, an example implementation of the envisaged FA integration is as follows: FA3 methods identify the optimal data required to improve model performance, the FA1 and FA2 systems acquire or generate the required contextually rich data, this data is transformed into sufficiently descriptive representations accessible to the model, the model is updated based on this new data, and the new model is experimentally validated by FA2 systems and/or Government IV&V teams. This process is repeated, enabling continuous optimization, validation and updates of the model. This general example is not the only viable integration approach and proposers should define an anticipated closed-loop framework through which the developed system will be tested, validated, and improved.

The techniques, data, synthetic approaches, scale, and expertise required to demonstrate AMD goals will vary widely depending on the specific chemistries and proposed properties that will be addressed. In order to justify the selected properties and the applications to which they may be relevant, proposals must identify the need for innovation (i.e., state of the field), existing sources of relevant data, credible quantitative metrics for evaluation of progress (in addition to those specifically enumerated in this BAA), and also describe construction of an appropriate experimental platform relative to current capabilities, expertise, and equipment. Discussion of the generalizability of the selected property set to a broader set of potential applications (i.e., for

Government IV&V assessment), as well as a detailed discussion on the relevance of proposed measurements, models, and tools should also be included.

Proposers must address any restrictions or barriers to sharing tools, models, data, and/or systems with Government IV&V teams, and anything that would restrict or otherwise hinder an open and effective collaboration. DARPA expects all groups to work openly with Government IV&V teams as required and/or directed throughout the program, and proposals must include a specific task related to the collaboration effort. As mentioned above, intellectual property rights asserted by proposers are strongly encouraged to be aligned with open source regimes.

#### FA1: Data extraction from existing sources

Performers will apply techniques such as natural language processing and computer vision to extract and transform information from sources such as articles, manuscripts, and electronic lab notebooks into formats exploitable by AI models (FA3). Data extraction from both text and imagery sources is required, to include prose, figures, graphs, and tables, as well as directly from analytical instrumentation, as is correlation and fusion of this data across sources. DARPA encourages performers to exploit existing tools and approaches wherever possible. Development of novel methods is acceptable, if existing tools will not meet the performance metrics described in Section E, or are not compatible with other components of the proposed AMD closed-loop system. Proposals should fully describe the data sources that will be used during the AMD period of performance, and in particular, comment on existing formats and accessibility, to include if annotations and labels to enable evaluation as described in Section E are present or if such annotation will occur during the program. Performers should not rely on DARPA or Government IV&V teams to provide data for tool development, evaluation, validation, or system design. The data output of FA1 tools should complement that produced by automated experimental platforms (FA2) in developing and optimizing AI models (FA3).

#### FA2: Development of autonomous experimental platforms

Performers will develop and integrate the control software, reaction and robotics hardware, and instrumentation necessary to enable autonomous experimentation. It is expected that initially, some amount of human intervention may be required to execute experiments, but that the degree to which this is necessary will decline rapidly as the program progresses. Experimental platforms developed should be capable of executing experiments as directed and defined by the AI models (FA3), and in turn generate data of sufficient richness to inform and validate those models. Performers are encouraged to build on existing experimental systems and expertise, and leverage existing equipment where possible to adhere to the aggressive program schedule as well as to mitigate overall system cost.

#### FA3: Representations, AI models, and optimization frameworks

Performers will develop AI models and optimization frameworks that provide three capabilities: property prediction, process optimization, and inverse molecular design. In achieving these capabilities, it is expected that these models will 1) utilize techniques such as active learning, reinforcement learning, adversarial networks, and Bayesian optimization in order to identify the most informative data to be acquired by FA1 tools or FA2 experimental platforms to further increase the accuracy of the models; and 2) incorporate contextual and physics-based information (e.g., molecular dynamics and others) in their representation of data. It is expected that while FA1



and FA2 will be primary sources of such information, other means (e.g., simulation platforms or approximations thereof) will be utilized to augment and further enrich the data provided by FA1 and FA2. Proposals should fully describe the balance between experimental and virtual generation of data for AI models, and the scale and speed at which those data will be generated and integrated. Approaches that allow for the simultaneous optimization of multiple objectives (i.e., properties or process parameters) are required.

Government teams interested in participating in IV&V should *NOT* respond to this BAA, but rather indicate their interest in the AMD program via email at AMD@darpa.mil for further details.

#### **D. Program Structure**

AMD is a 48-month program divided into three Phases that are 14 month (Phase 1), 18 month (Phase 2) and 16 month (Phase 3) duration. Each phase will develop and enhance specific components of the overall system, as well as advance toward a fully integrated, autonomous closed-loop system by the end of the program. AMD performers will be expected to make specific, measurable progress in each Focus Area, however, the performance of the complete system and progress toward integration will be critically important.

Phase 1: Performers will adapt existing tools (e.g., NLP and CV) to chemistry data (focus on text and structure diagrams), develop hardware and control software for initial demonstrations of early-stage automated experimental systems, initiate transforms to extract data directly from proposed analytical instrumentation, and develop AI model architectures and active learning capabilities. Phase 1 integration will focus on ensuring FA1 and FA2 data is amenable to the representations being developed in FA3. In parallel, performers will begin engaging with Government IV&V teams.

Phase 2: Performers will adapt and develop tools for extracting data from complex sources such as lab notebooks, tables and graphs, demonstrate automated experimentation informed by models and refine molecular representations. Phase 2 integration will focus on ensuring FA2 data is of value to FA3 models, and FA3-defined experiments can be executed on FA2 platforms with a human intermediary. Performers will begin transition of data, tools, and algorithms to Government IV&V teams, and begin initial application-specific testing and validation.

Phase 3: Performers will develop methods to accurately correlate data across multiple sources, demonstrate fully autonomous, closed-loop feedback between experimental platforms and AI models, and identify domains of greatest applicability for their developed models and representations. Phase 3 integration will focus on autonomous, closed-loop feedback between all Focus Areas without humans in the loop. Performers and Government IV&V teams will further refine approaches towards application areas of interest and continue testing and validation.

Proposals must address all program requirements, metrics, and milestones during the full 48-month program. Performance will be evaluated throughout the program with respect to progress towards meeting the milestones indicated in Figure 1 that correspond to performance expectations as defined in Table 1. Proposers are also required to propose specific metrics and milestones that are relevant to the properties that will be the focus of their efforts. Performers will be expected to work openly and regularly with Government IV&V teams. Dedicated collaboration time will be

provided at program review meetings and performer-driven information exchange is expected. Proposals must include a task to reflect information and capability exchange for validation and testing; the details of the work arrangement will be defined as the program proceeds.

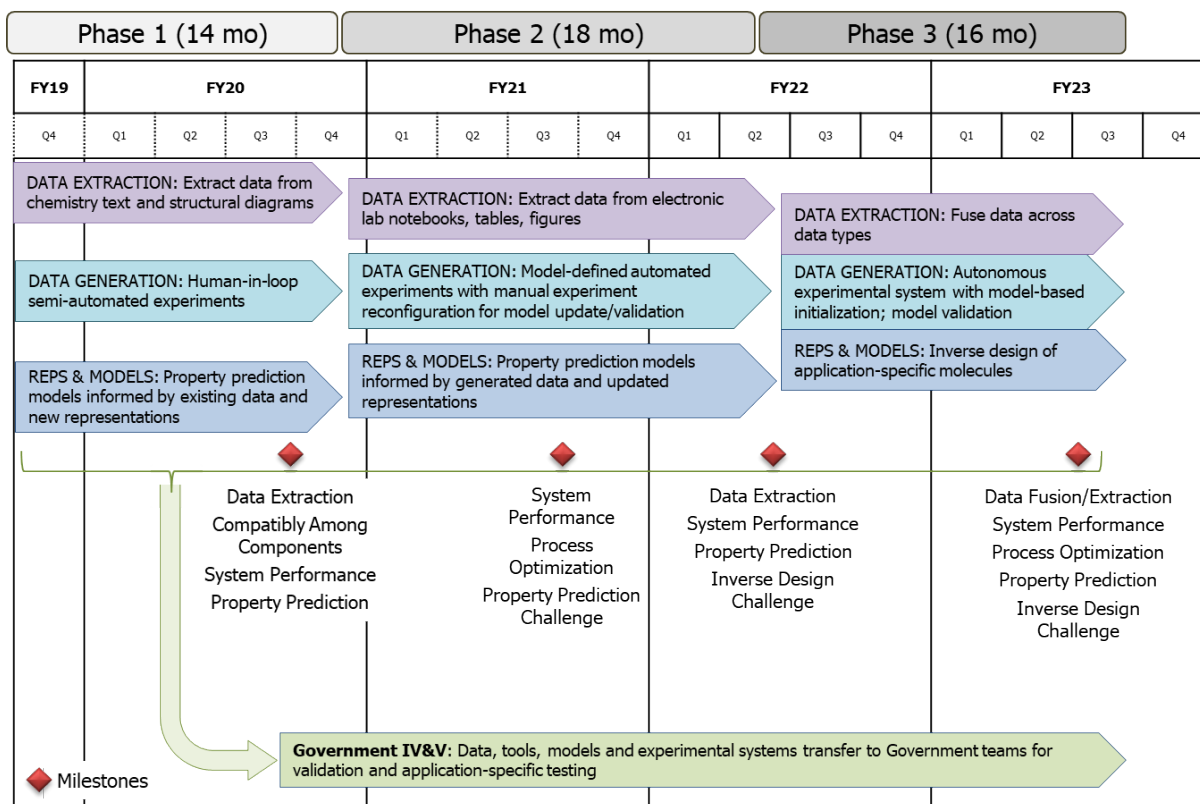


Figure 1: AMD Program Schedule

## E. Schedule/Milestones

Progression between phases and overall program success will be determined by performance on the AMD metrics defined below, as well as performer-defined, quantitative metrics that pertain to the specific properties, tools, data, and experimental systems that are proposed. Evaluation toward program goals will include Government IV&V assessment of tools, data, models, and experimental systems for measuring, modeling, and predicting among a set of fundamental molecular properties toward specific applications.

Proposals must include specific quantitative metrics for each program phase. DARPA anticipates a range of aggressive metrics that are specific to the given properties being modeled and systems being developed, given the variability in state-of-the-art measurement and experimental tools, models, and data across the anticipated property space that will be explored in the program. Metrics must enable both evaluation of progress within each phase, and evidence toward overall closed-loop integration and automation that ultimately enables AI-based design of molecules with a defined set of properties. Proposals must benchmark metrics with comparison to existing technologies, data sets, and models.

Details of AMD metrics and milestones are provided below in Table 1. Because these are dependent on existing tools, techniques, and methods for a given property or set of properties, performers must include justification for how these will be met and whether they can be surpassed. As noted above, these are in addition to the performer-defined metrics that also must be included in the proposal.

	Phase 1 (14 months)	Phase 2 (18 months)	Phase 3 (16 months)
DATA EXTRACTION	<ul style="list-style-type: none"> <li>Named entity recognition (NER) and semantic role labeling (SRL) &gt;0.85 F1 on chemistry text data sources</li> <li>CV &lt;10% error in structure classification</li> <li>Data extracted directly from analytical instrumentation</li> </ul>	<ul style="list-style-type: none"> <li>NER and SRL &gt;0.85 F1 on complex data sources (e.g. electronic lab notebooks, tables, graphs)</li> <li>CV &lt;5% error in structure classification</li> </ul>	<ul style="list-style-type: none"> <li>NER and SRL &gt;0.85 F1 correlating across 3+ data sources</li> <li>CV &lt;2% error in structure classification</li> </ul>
DATA GENERATION	<ul style="list-style-type: none"> <li>Semi-automated experimental system for <math>\geq 2</math> properties</li> <li>Transforms for experimental data into new representations</li> <li>Characterization of experimental system performance to identify and address error sources</li> </ul>	<ul style="list-style-type: none"> <li>Model-defined automated experiments with manual experimental reconfiguration for <math>\geq 3</math> properties</li> <li>Model-defined automated experiments with system optimization of 1 process parameter</li> <li>System availability &gt;0.5 (downtime, experimental setup, clean/rest time, etc. in 8 h day)</li> <li>System reliability &gt;0.8 (fraction of completed experiments)</li> </ul>	<ul style="list-style-type: none"> <li>Autonomous experimental system with model-defined experimental reconfiguration for <math>\geq 4</math> properties</li> <li>Autonomous experimental system with model-defined automated experiments for optimization of 3 process parameters</li> <li>System availability &gt;0.7 (downtime, experimental setup, clean/rest time, etc. in 8 h day)</li> <li>System reliability &gt;0.9 (fraction of completed experiments)</li> </ul>
REPS & MODELS	<ul style="list-style-type: none"> <li>Integrate new representations with property models</li> <li>Property predictions within 30% of measured value across <math>\geq 2</math> properties</li> <li>Active learning of property models using NLP/CV data</li> </ul>	<ul style="list-style-type: none"> <li>Measure impact of new representations on model performance across 3 properties</li> <li>Property predictions within 15% of measured value across <math>\geq 3</math> properties</li> <li>Active learning from new (cached) experimental data</li> <li>DARPA-defined inverse design challenge</li> </ul>	<ul style="list-style-type: none"> <li>Property predictions within 5% of measured value across <math>\geq 4</math> properties</li> <li>DARPA-defined inverse design challenge</li> </ul>
TRANSITION TO IV&V TEAMS	<ul style="list-style-type: none"> <li>Develop detailed plan for working with assigned IV&amp;V team(s)</li> <li>Initiate transfer of relevant data sets to IV&amp;V team(s)</li> </ul>	<ul style="list-style-type: none"> <li>Transition and update tools, models, data and/or experimental components to IV&amp;V team(s) as required</li> </ul>	<ul style="list-style-type: none"> <li>Transition and update tools, models, data and/or experimental components to IV&amp;V team(s) as required</li> </ul>

**Table 1: AMD Metrics**

In addition to the metrics defined above, DARPA will issue various challenges (i.e., custom-designed system capabilities assessments) throughout the program for which performers will be provided with details on specific datasets, properties, or experiments on which their systems will be evaluated. These challenges will occur in months 22, 32, and 42. Throughout the program, DARPA will assess the diversity of small molecule space that is addressed, both experimentally and computationally using measures such as the Tanimoto coefficient.

The following additional criteria should be included/considered in proposals:

- Proposers should provide a technical and programmatic strategy that conforms to the entire program schedule and presents an aggressive plan to fully address all program goals, metrics, milestones, and deliverables.
- The task structure must be consistent across the proposed schedule, Statement of Work, and cost volume.
- A target start date of July 2019 may be assumed for planning purposes.
- Schedules will be synchronized across performers, as required, and monitored/revised as necessary, throughout the program.

- All proposals must include the following meetings and travel in the proposed schedule and costs:
  - To foster collaboration between teams, and disseminate program developments, a two-day Principal Investigator (PI) meeting will be held approximately every six months in the Washington, DC area. For budgeting purposes, plan for eight (8) two-day meetings over the course of 48 months.
  - Regular teleconference meetings will be scheduled with the Government team for progress reporting as well as problem identification and mitigation. Proposers should also anticipate at least one site visit per phase by the DARPA Program Manager during which they will have the opportunity to demonstrate progress towards agreed-upon milestones.

## **F. Deliverables**

Performers will be expected to provide at a minimum the following deliverables:

- Comprehensive quarterly technical reports due within ten (10) calendar days of the end of the given quarter, describing progress made on the specific milestones as laid out in the Statement of Work (SOW).
- A phase completion report submitted within 30 calendar days of the end of each phase, summarizing the research done.
- Deliverables including, but not limited to data, models, tools, and experimental capabilities developed as part of the program will be transitioned to Government IV&V teams as requested.
- Other negotiated deliverables specific to the objectives of the individual efforts. These may include registered reports, experimental protocols, publications, data management plan, intermediate, and final versions of software libraries, code, and APIs, including documentation and user manuals, and/or a comprehensive assemblage of design documents, models, modeling data and results, and model validation data.
- Reporting as outlined in Section VI.C.

## **G. Government-furnished Property/Equipment/Information**

None

## **H. Other Program Objectives and Considerations**

### **1. Collaboration**

DARPA expects all performers to work collaboratively with Government IV&V teams to realize the program objectives outlined herein. Proposers should carefully review the goals for the entire program in order to fully understand the context of each program objective within the overall program structure. Furthermore, throughout development of program technologies, it will be necessary for all performers to share relevant information regarding their technology development to support the larger program goals. For example, Government IV&V teams will need access to the datasets, models, tools, and experimental systems developed by AMD performers. All proposals must clearly describe plans for interfacing and integrating their proposed technologies/approaches with other performers. *Proposals that fail to include interface and integration plans will be deemed non-conforming and removed from consideration for award.*

## **2. Intellectual Property**

As discussed above, there is an emphasis on creating and leveraging open source technologies and architectures, making data sharing and collaboration key aspects of this program. Therefore, intellectual property rights asserted by proposers are strongly encouraged to be aligned with open source regimes. See Section VI.B.4 for more information related to intellectual property.

## **II. Award Information**

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

DARPA anticipates multiple awards.

The level of funding for individual awards made under this BAA will depend on the quality of the proposals received and the availability of funds. Awards will be made to proposers<sup>1</sup> whose proposals are determined to be the most advantageous to the Government, all evaluation factors considered. See Section V for further information.

The Government reserves the right to:

- select for negotiation all, some, one, or none of the proposals received in response to this solicitation;
- make awards without discussions with proposers;
- conduct discussions with proposers if it is later determined to be necessary;
- segregate portions of resulting awards into pre-priced options;
- accept proposals in their entirety or to select only portions of proposals for award;
- fund awards in increments with options for continued work at the end of one or more phases;
- request additional documentation once the award instrument has been determined (e.g., representations and certifications); and
- remove proposers from award consideration should the parties fail to reach agreement on award terms within a reasonable time or the proposer fails to provide requested additional information in a timely manner.

Proposals identified for negotiation may result in a procurement contract, grant, cooperative agreement, or other transaction (OT), depending upon the nature of the work proposed, the required degree of interaction between parties, and other factors.

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

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

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

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

## **B. Fundamental Research**

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

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

As of the date of publication of this BAA, the Government expects that program goals as described herein may be met by proposers intending to perform fundamental research and does not anticipate applying publication restrictions of any kind to individual awards for fundamental research that may result from this BAA. Notwithstanding this statement of expectation, the Government is not prohibited from considering and selecting research proposals that, while perhaps not qualifying as fundamental research under the foregoing definition, still meet the BAA criteria for submissions. If proposals are selected for award that offer other than a fundamental research solution, the Government will either work with the proposer to modify the proposed statement of work to bring the research back into line with fundamental research or else the proposer will agree to restrictions in order to receive an award.

Proposers should indicate in their proposal whether they believe the scope of the research included in their proposal is fundamental or not. While proposers should clearly explain the intended results of their research, the Government shall have sole discretion to determine

whether the proposed research shall be considered fundamental. Appropriate clauses will be included in resultant awards for non-fundamental research to prescribe publication requirements and other restrictions, as appropriate. This clause can be found at [www.darpa.mil/work-with-us/additional-baa](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 restricted research, their sub awardee's effort may be fundamental research. In those cases, it is the awardee's responsibility to explain in their proposal why its sub awardee's effort is fundamental research.

Proposers should indicate in their proposal whether they believe the scope of the research included in their proposal is fundamental or not. While proposers should clearly explain the intended results of their research, the Government shall have sole discretion to determine whether the proposed research shall be considered fundamental. Appropriate clauses will be included in resultant awards for non-fundamental research to prescribe publication requirements and other restrictions, as appropriate. This clause can be found at [www.darpa.mil/work-with-us/additional-baa](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 restricted research, their subawardee's effort may be fundamental research. In those cases, it is the awardee's responsibility to explain in their proposal why its subawardee's effort is fundamental research.

### **III. Eligibility Information**

#### **A. Eligible Applicants**

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

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

##### **a. FFRDCs**

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

##### **b. Government Entities**

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

### **c. Authority and Eligibility**

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

## **2. Foreign Participation**

Non-U.S. organizations and/or individuals may participate to the extent that such participants comply with any necessary nondisclosure agreements, security regulations, export control laws, and other governing statutes applicable under the circumstances. For classified submissions, this includes mitigating any Foreign Ownership Control and Influence (FOCI) issues prior to transmitting the submission to DARPA. Additional information on these subjects can be found at [http://www.dss.mil/isp/foci/foci\\_faqs.html](http://www.dss.mil/isp/foci/foci_faqs.html).

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

### FAR 9.5 Requirements

In accordance with FAR 9.5, proposers are required to identify and disclose all facts relevant to potential OCIs involving the proposer's organization and *any* proposed team member (subawardee, consultant). Under this Section, the proposer is responsible for providing this disclosure with each proposal submitted to the BAA. The disclosure must include the proposer's, and as applicable, proposed team member's OCI mitigation plan. The OCI mitigation plan must include a description of the actions the proposer has taken, or intends to take, to prevent the existence of conflicting roles that might bias the proposer's judgment and to prevent the proposer from having unfair competitive advantage. The OCI mitigation plan will specifically discuss the disclosed OCI in the context of each of the OCI limitations outlined in FAR 9.505-1 through FAR 9.505-4.

### Agency Supplemental OCI Policy

In addition, DARPA has a supplemental OCI policy that prohibits contractors/performers from concurrently providing Scientific Engineering Technical Assistance (SETA), Advisory and Assistance Services (A&AS) or similar support services and being a technical performer. Therefore, as part of the FAR 9.5 disclosure requirement above, a proposer must affirm whether the proposer or *any* proposed team member (subawardee, consultant) is providing SETA, A&AS,



or similar support to any DARPA office(s) under: (a) a current award or subaward; or (b) a past award or subaward that ended within one calendar year prior to the proposal's submission date.

If SETA, A&AS, or similar support is being or was provided to any DARPA office(s), the proposal must include:

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

#### Government Procedures

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

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

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

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

Cost sharing is not required; however, it will be carefully considered where there is an applicable statutory condition relating to the selected funding instrument (e.g., OTs under the authority of 10 U.S.C. § 2371).

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

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

Prior to submitting a full proposal, proposers are *strongly encouraged* to first submit an abstract as described below. This process allows a proposer to ascertain whether the proposed concept is: (1) applicable to the AMD BAA and (2) currently of interest. For the purposes of this BAA, applicability is defined as follows:

- The proposed concept is applicable to the technical areas described herein.
- The proposed concept investigates an innovative approach that enables revolutionary advances, i.e., will not primarily result in evolutionary improvements to the existing state of practice.

- The proposed work has not already been completed (i.e., the research element is complete but manufacturing/fabrication funds are required).
- The proposer has not already received funding or a positive funding decision for the proposed concept (whether from DARPA or another Government agency).

Abstracts and full proposals that are not found to be applicable to the Accelerated Molecular Discovery BAA as defined above may be deemed non-conforming<sup>2</sup> and removed from consideration. All abstracts and full proposals must provide sufficient information to assess the validity/feasibility of their claims as well as comply with the requirements outlined herein for submission formatting, content and transmission to DARPA. Abstracts and full proposals that fail to do so may be deemed non-conforming and removed from consideration. Proposers will be notified of non-conforming determinations via letter.

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

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

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

#### **1. Abstract Information**

As stated above, proposers are strongly encouraged to submit an abstract in advance of a full proposal to minimize effort and reduce the potential expense of preparing an out of scope proposal. The abstract provides a synopsis of the proposed project by briefly answering the following questions:

- What is the proposed work attempting to accomplish or do?
- How is it done today, and what are the limitations?
- Who will care and what will the impact be if the work is successful?
- How much will it cost, and how long will it take?

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

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

While it is DARPA policy to attempt to reply to abstracts within 30 calendar days, proposers to this solicitation may anticipate a response within approximately three weeks. These official notifications will be sent via email to the Technical POC and/or Administrative POC identified on the abstract coversheet.

#### **a. Abstract Format**

All proposers are required to use Attachment A: Abstract Summary Slide Template and Attachment B: Abstract Template provided to this solicitation on <http://www.fbo.gov> and <http://www.grants.gov>. Attachment A Abstract Summary Slide Template described herein must be in .ppt or .pptx format and should be attached as a separate file to this document.

## **2. Full Proposal Information**

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

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

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

- Attachment C
- Attachment D
- Attachment E
- Attachment F
- Attachment F-2 (optional)
- Attachment G

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

- Attachment C
- Attachment D
- Attachment F
- Attachment F-2 (optional)
- Attachment G

\*Note – Budget Justification should be provided as Section L of the SF 424 Research & Related Budget form provided via Grants.gov. The Budget Justification should include the following information for the recipient and all subawardees: (1) Direct Labor: Detail the total number of persons and their level of commitment for each position listed (in sections A and B), as well as which specific tasks (as described in

the SOW) they will support.(2) Equipment (section C): Provide an explanation for listed requested equipment exceeding \$5,000, properly justifying their need to meet the objectives of the program. (3) Travel (section D): Provide the purpose of the trip, number of trips, number of days per trip, departure and arrival destinations, number of people, etc. (4) Other Direct Costs (section F): Provide a justification for the items requested and an explanation of how the estimates were obtained.

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

#### **a. Full Proposal Format**

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

### **3. Proprietary Information**

Proposers are responsible for clearly identifying proprietary information. Submissions containing proprietary information must have the cover page and each page containing such information clearly marked with a label such as “Proprietary” or “Company Proprietary.” NOTE: “Confidential” is a classification marking used to control the dissemination of U.S. Government National Security Information as dictated in Executive Order 13526 and should not be used to identify proprietary business information. See Section V.B.1 for additional information.

### **4. Security Information**

DARPA anticipates that submissions received under this BAA will be unclassified. However, should a proposer wish to submit classified information, an *unclassified* email must be sent to the BAA mailbox requesting submission instructions from the DARPA/DSO Program Security Officer (PSO).

Security classification guidance and direction via a Security Classification Guard (SCG) and/or DD Form 254, “DOD Contract Security Classification Specification,” will not be provided at this time, since DARPA is soliciting ideas only. If a determination is made that the award instrument may result in access to classified information, a SCG and/or DD Form 254 will be issued by DARPA and attached as part of the award.

### **C. Submission Dates and Times**

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

DARPA will acknowledge receipt of *complete* submissions via email and assign identifying numbers that should be used in all further correspondence regarding those submissions. If no

confirmation is received within two (2) business days, please contact the BAA Administrator at AMD@darpa.mil to verify receipt.

### **1. Abstracts**

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

### **2. Full Proposals**

Full proposal packages--full proposal (Volume 1: Technical and Management Volume; Volume 2: Cost Volume, and Volume 3: Administrative and National Policy Requirements) and, as applicable, proprietary sub awardee cost proposals, classified appendices to unclassified proposals-- must be submitted per the instructions outlined herein *and received by DARPA* no later than the due date and time listed in Part One: Overview Information. Proposals received after this time and date may not be reviewed.

### **D. Funding Restrictions**

Not applicable.

### **E. Other Submission Requirements**

#### **1. Unclassified Submission Instructions**

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

#### **a. Abstracts**

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

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

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

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

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

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

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

## **b. Proposals Requesting a Procurement Contract or Other Transaction**

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

### **i. Electronic Upload**

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

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

Proposers who already have an account on the DARPA BAA Submission website may simply log in at <https://baa.darpa.mil/>, select this solicitation from the list of open DARPA solicitations

and proceed with their proposal submission. *Note: proposers who have created a DARPA BAA Submission website account to submit to another DARPA Technical Office's solicitations do not need to create a new account to submit to this solicitation.*

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

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

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

#### **ii. Direct Mail/Hand-carry**

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

#### **c. Proposals Requesting a Grant or Cooperative Agreement**

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

To evaluate compliance with Title IX of the Education Amendments of 1972 {20 U.S.C. A§ 1681 Et. Seq.}, the Department of Defense is collecting certain demographic and career information to be able to assess the success rates of women who are proposed for key roles in applications in STEM disciplines. To enable this assessment, each application must include the two following forms completed as instructed: the Research and Related Senior/Key Person Profile (Expanded) form and the Research and Related Personal Data form. Both forms are provided with the application package in Grants.gov.

#### **i. Electronic Upload**

DARPA encourages grant and cooperative agreement proposers to submit their proposals via electronic upload at <http://www.grants.gov/web/grants/applicants/apply-for-grants.html>. Proposers electing to use this method must complete a one-time registration process on

Grants.gov before a proposal can be electronically submitted. *If proposers have not previously registered, this process can take up to four weeks so registration should be done in sufficient time to ensure it does not affect a proposer's ability to meet required submission deadlines.* Registration requirements and instructions are outlined at <http://www.grants.gov/web/grants/register.html>.

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

Once Grants.gov has received an uploaded proposal submission, Grants.gov will send two email messages to notify proposers that: (1) the proposal has been received by Grants.gov; and (2) the proposal has been either validated or rejected by the system. *It may take up to two (2) business days to receive these emails.* If the proposal is validated, then the proposer has successfully submitted their proposal. If the proposal is rejected, the submission must be corrected, resubmitted and revalidated before DARPA can retrieve it. If the solicitation is no longer open, the rejected proposal cannot be resubmitted. Once the proposal is retrieved by DARPA, Grants.gov will send a third email to notify the proposer. DARPA will send a final confirmation email as described in Section IV.C.

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

Technical support for Grants.gov submissions may be reached at 1-800-518-4726 or [support@grants.gov](mailto:support@grants.gov).

## **ii. Direct Mail/Hand-carry**

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

## **V. Application Review Information**

### **A. Evaluation Criteria**

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

- **Overall Scientific and Technical Merit**

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



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

- **Potential Contribution and Relevance to the DARPA Mission**

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

The proposed intellectual property restrictions (if any) will not significantly affect the Government's ability to transition the technology.

- **Cost Realism**

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

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

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

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

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

DARPA policy is to treat all submissions as source selection information (FAR 2.101 and 3.104), and to only disclose their contents to authorized personnel. Restrictive notices notwithstanding, submissions may be handled by support contractors for administrative purposes and/or to assist with technical evaluation. All DARPA support contractors performing this role are expressly prohibited from performing DARPA-sponsored technical research and are bound by appropriate nondisclosure agreements. Subject to the restrictions set forth in FAR 37.203(d), DARPA may also request input on technical aspects of the proposals from other non-Government consultants/experts who are strictly bound by the appropriate non-disclosure requirements.

Submissions will not be returned. The original of each submission received will be retained at DARPA and all other non-required copies destroyed. A certification of destruction may be requested via email to the BAA mailbox, provided the formal request is received within five (5) business days after being notified of submission status.

### **C. Federal Awardee Performance and Integrity Information (FAPIS)**

Following the review and selection process described above, but prior to making an award above the simplified acquisition threshold (FAR 2.101), DARPA is required<sup>3</sup> to review and consider any information available through the designated integrity and performance system (currently FAPIS). Selectees have the opportunity to comment on any information about themselves entered in the database. DARPA will consider any comments and other information in FAPIS or other systems prior to making an award.

## **VI. Award Administration Information**

### **A. Selection Notices**

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

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

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

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

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

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

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

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

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

International entities can register in SAM by following the instructions in this link: [https://www.fsd.gov/fsd-gov/answer.do?sysparm\\_kbid=dbf8053adb119344d71272131f961946&sysparm\\_search=KB0013221](https://www.fsd.gov/fsd-gov/answer.do?sysparm_kbid=dbf8053adb119344d71272131f961946&sysparm_search=KB0013221).

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

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

## **3. Representations and Certifications**

In accordance with FAR 4.1102 and 4.1201, proposers requesting a procurement contract must complete electronic annual representations and certifications at [www.sam.gov/](http://www.sam.gov/). In addition, resultant procurement contracts will require supplementary DARPA-specific representations and certifications. See [www.darpa.mil/work-with-us/additional-baa](http://www.darpa.mil/work-with-us/additional-baa) for further information.

## **4. Intellectual Property**

Proposers should note that the Government does not own the intellectual property or technical data/computer software developed under Government contracts. The Government acquires the right to use the technical data/computer software. Regardless of the scope of the Government’s rights, awardees may freely use their same data/software for their own commercial purposes (unless restricted by U.S. export control laws or security classification). Therefore, technical data

and computer software developed under this solicitation will remain the property of the awardees, though DARPA will have, at a minimum, Government Purpose Rights (GPR) to technical data and computer software developed through DARPA sponsorship.

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

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

#### **a. Intellectual Property Representations**

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

#### **b. Patents**

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

#### **c. Procurement Contracts**

- **Noncommercial Items (Technical Data and Computer Software):** Proposers requesting a procurement contract must list all noncommercial technical data and computer software that it plans to generate, develop, and/or deliver, in which the Government will acquire less than unlimited rights and to assert specific restrictions on those deliverables. In the event a proposer does not submit the list, the Government will assume that it has unlimited rights to all noncommercial technical data and computer software generated, developed, and/or delivered, unless it is substantiated that development of the noncommercial technical data and computer software occurred with mixed funding. If mixed funding is anticipated in the development of

noncommercial technical data and computer software generated, developed, and/or delivered, proposers should identify the data and software in question as subject to GPR. In accordance with DFARS 252.227-7013, “Rights in Technical Data - Noncommercial Items,” and DFARS 252.227-7014, “Rights in Noncommercial Computer Software and Noncommercial Computer Software Documentation,” the Government will automatically assume that any such GPR restriction is limited to a period of 5 years, at which time the Government will acquire unlimited rights unless the parties agree otherwise. The Government may use the list during the evaluation process to evaluate the impact of any identified restrictions and may request additional information from the proposer, as may be necessary, to evaluate the proposer’s assertions. Failure to provide full information may result in a determination that the proposal is non-conforming. A template for complying with this request is provided in Section IV.B.2.

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

#### **d. Other Types of Awards**

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

### **5. Program-generated Data**

Data are increasingly the key product of research and engineering endeavors. To ensure the reproducibility of results and access to source data for future research, awardees will be required to maintain and deliver any data generated during award performance (“program-generated data”) that is needed to accomplish these goals. Awardees shall be expected to document both the proprietary and non-proprietary products of their research to ensure the retention and potential reusability of this information. This may include:

- Raw unprocessed data, software source code and executables, build scripts, process sequence, programmatic communication and other collaboration activities;
- Data sets: rarified, experimental, test and measurement data;
- Design of experiments and simulations;
- Models or simulations (computational or mathematical);
- Recordings of various physical phenomena (including images, videos, sensor data, etc.);
- Access to and use of institutional, organizational or scientific community repositories and archives

All program-generated data will reside in DARPA's data repository. When possible, DARPA may share some or all of the program-generated data with the broader research community as open data (with permission to access, reuse, and redistribute under appropriate licensing terms where required) to the extent permitted by applicable law and regulations (e.g., privacy, security, rights in data, and export control). DARPA plans to enable reproducibility of results through data sharing and to establish (or contribute to) digital collections that can advance this and other scientific fields.

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

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

#### **7. Controlled Unclassified Information (CUI) on Non-DoD Information Systems**

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

#### **8. Electronic Invoicing and Payments**

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

#### **9. Electronic and Information Technology**

All electronic and information technology acquired or created through this BAA must satisfy the accessibility requirements of Section 508 of the Rehabilitation Act (29 U.S.C. § 749d) and FAR 39.2.

#### **10. Publication of Grant Awards**

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.

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

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

DFARS 252.204-7000, “Disclosure of Information”

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

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

The full text of the above solicitation provision and contract clauses can be found at <http://www.darpa.mil/work-with-us/additional-baa#NPRPAC>.

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

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

### **C. Reporting**

#### **1. Technical and Financial Reports**

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

#### **2. Patent Reports and Notifications**

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

## VII. Agency Contacts

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

- **Technical POC:** Anne Fischer, Program Manager, DARPA/DSO
- **BAA Email:** AMD@darpa.mil
- **BAA Mailing Address:**  
DARPA/DSO  
ATTN: HR001119S0003  
675 North Randolph Street  
Arlington, VA 22203-2114
- **DARPA/DSO Opportunities Website:** <http://www.darpa.mil/work-with-us/opportunities>

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

## VIII. Other Information

### A. Frequently Asked Questions (FAQs)

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

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

### B. Collaborative Efforts/Teaming

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

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



All profiles must be emailed to [AMD@darpa.mil](mailto:AMD@darpa.mil) no later than 1:00 p.m. October 22, 2018. Following the deadline, the consolidated teaming profiles will be sent via email to the proposers who submitted a valid profile. Specific content, communications, networking, and team formation are the sole responsibility of the participants. Neither DARPA nor the DOD endorses the information and organizations contained in the consolidated teaming profile document, nor does DARPA or the DOD exercise any responsibility for improper dissemination of the teaming profiles. Teams need not be finalized at the time of abstract submission.

### **C. Proposers Day**

The AMD Proposers Day will be webcast on October 18, 2018 from 1 PM to 3 PM EST. Advance registration is required for both the physical meeting and the webcast. See DARPA-SN-19-02 posted at <http://www.fbo.gov> for all details. Attendance at the Program Proposers Day or viewing the webcast is voluntary and is not required to propose to this solicitation.