



Research Announcement (RA)
Young Faculty Award (YFA) 2027
Defense Sciences Office (DSO)

DARPARA2701

October 20, 2026

This Research Announcement (RA) constitutes a public notice of a competitive funding opportunity as described in 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 RA.

Overview Information:

- **Federal Agency Name** – Defense Advanced Research Projects Agency (DARPA), Defense Sciences Office (DSO)
- **Funding Opportunity Title** – Young Faculty Award (YFA)
- **Announcement Type** – Initial Announcement
- **Funding Opportunity Number** – DARPARA2701
- **Assistance Listing Number:** 12.910 Research and Technology Development
- **Dates/Time – All Times are Eastern Time Zone (ET)**
 - Posting Date: October 20, 2026
 - Executive Summary Due Date: November 5, 2026, 4:00 p.m.
 - Question Submittal Closed: January 5, 2027, 4:00 p.m.
 - Full Proposal Due Date: January 13, 2027, 4:00 p.m.
- **Anticipated Individual Awards** – Multiple awards are anticipated.
- **Anticipated Funding Available for Award:**
 - **24-month Base Period:** Up to \$500,000 (each 12-month interval of the base period shall not exceed \$250,000).
 - **12-month Director’s Fellowship option period:** Up to \$500,000 (contingent upon selection).
 - **United States (U.S.) Citizen Graduate Student option:** Up to \$225,000 (must run concurrently with the base period and not exceed 12 months).
 - In total, the maximum funding amount possible per award is \$1,225,000, inclusive of the base period, Director’s Fellowship option period, and the U.S. Citizen Graduate Student option.
- **Eligibility:** DARPA encourages proposals from Principal Investigators who have not previously proposed to a Government solicitation. All proposed personnel to include the Key Personnel (the Principal Investigator), Senior Personnel and all team members must be employed at a U.S. institution. **Citizens of China, Cuba, Iran, North Korea, Russia, and Venezuela are not eligible for inclusion on a YFA proposal as Key or Senior Personnel.** The proposed Principal Investigator (PI) must be in a current tenure track faculty position, a tenured faculty within 3 years of their tenure date, or an equivalent at a non-profit research institution within 12 years of the receipt of their doctorate. A proposed PI who has received funding greater than \$500,000 from DARPA or \$1,250,000 from all Department of War (DoW) sources combined as either a prime or subawardee is not eligible to apply for the YFA program. The following table lays out scenarios to assist in determining your eligibility based on received funding:

You were the sole PI with or without other co-PIs on a Prime-only effort	You were the PI for the Prime or subawardee; or there were only co-PIs
You should account for the total funded amount	You should account for the amount of funds allocated to your portion of effort

Additional eligibility information is available in Section IV: Special Considerations.

- **Executive Summaries:** Prior to submitting a full proposal, proposers are ***required*** to first submit an executive summary by the due date listed in the Overview Information.
- **Types of Instruments that May Be Awarded** – Cooperative Agreements
- **NAICS Code:** 541713, 541714, 541715, 541720
- **Agency Contact:** Contact the RA Coordinator at YFA2027@darpa.mil.

Section I: Funding Opportunity Description

A. Introduction

The Defense Advanced Research Projects Agency (DARPA) Young Faculty Award (YFA) program aims to identify and engage rising stars in junior research positions in academia and equivalent positions at non-profit research institutions, particularly those without prior DARPA funding, to expose them to Department of War (DoW) needs and DARPA's mission to create and prevent technological surprise for national security. The YFA program provides high-impact funding to researchers early in their careers to develop innovative new research that enables transformative DoW capabilities. Ultimately, the YFA program develops the next generation of researchers focused on national security issues.

Before preparing an executive summary or full proposal submission, proposers are encouraged to review the DARPA mission statement and current program descriptions at the DARPA website <https://www.darpa.mil> to familiarize themselves with examples of current DARPA investments. This is not meant as instruction to duplicate those efforts, but rather to illustrate that current programs are aimed at research that will substantially advance our capabilities in these areas. Once awards are made, each YFA program performer will be assigned a DARPA Program Manager (PM) with interests closely related to their research topic. The PM will act as project manager and mentor to the YFA award recipient.

Proposers should also familiarize themselves with the "Heilmeier Catechism." Details about the catechism and questions it seeks to answer can be found at <https://www.darpa.mil/work-with-us/heilmeier-catechism>.

Glossary of Key Terms

The following definitions apply to terms used throughout this announcement.

- **Eligibility Funding:** Funds that have been formally obligated (i.e., received under an executed base or option award outside of this RA) to the individual named as Key Personnel (i.e., the PI). See the table in the Overview section above for additional details. Note for eligibility: If additional funds are obligated after an executive summary is submitted to this solicitation, but prior to the full proposal submission date, the proposer should include those amounts when reassessing eligibility.
- **Key Personnel:** For this RA, "Key Personnel" refers solely to the Principal Investigator.
- **Prime:** The entity that submits the formal proposal to DARPA.
- **Principal Investigator (PI):** For purposes of this RA, the PI is the sole, named individual designated by the prime proposing organization to have the authority and responsibility for leading, directing, and managing the YFA research effort.
- **Senior Personnel:** All non-student personnel (e.g., faculty, post-docs, lab managers, subcontractors, consultants, etc.), excluding the PI, who will be directly supported by the award at the Prime or any subwardee organization. Senior Personnel are subject to the citizenship requirements for eligibility but not subject to tenure requirements or funding limitations.
- **Subawardee:** Any organization other than the Prime organization named on the YFA proposal to carry out part of the proposed research.

- **Team Member:** Any individuals other than Key or Senior Personnel either identified in the proposal or brought in to work on efforts post-proposal, to include graduate or undergraduate students, whether they are part of the Prime proposer or a proposed subawardee organization.
- **United States (U.S.) Citizen:** United States Citizen is defined as any individual who is a citizen of the United States by law, birth, or naturalization.
<https://www.irs.gov/individuals/international-taxpayers/foreign-persons>
- **U.S. Permanent Resident:** A non-U.S. citizen who has official legal authorization to live and work in the United States permanently.
- **Foreign National:** A person who is not a citizen or national of the country in which they are living or visiting.

B. Program Description/Scope

DARPA is soliciting innovative research proposals in the areas of interest to the following DARPA technical offices: Defense Sciences Office (DSO), Biological Technologies Office (BTO), Information Processing Techniques Office (IPTO), Multi X Office (MXO), and Strategic Technology Office (STO). Further detail regarding the specific technical areas of interest can be found under Section I.C “Topic Areas (TAs).” Proposed research should investigate innovative approaches that enable revolutionary advances in science, devices, or systems. Specifically excluded is research that primarily results in evolutionary improvements to the existing state of practice.

Submissions responding to a TA under this Research Announcement (RA) should clearly describe the relevance and impact of the proposed concept for addressing the national security challenges identified in the TA description; the current state-of-the-art technology; new insights to address the TA challenges; a credible research plan and schedule; and critical, quantitative milestones to be pursued over the research period.

This RA seeks cooperative agreement proposals for a research activity consisting of a 24-month base period that is composed of two 12-month intervals. Each interval of the base period shall not exceed \$250,000, for a maximum total funding of \$500,000. In addition to the base period, all proposals should include a Statement of Work (SOW) and associated cost proposal for the Director’s Fellowship option. If awarded, the Director’s Fellowship is an additional 12-month option period to occur after the base period has concluded, with a maximum total funding of \$500,000. Only a cooperative agreement award instrument will be issued under this RA.

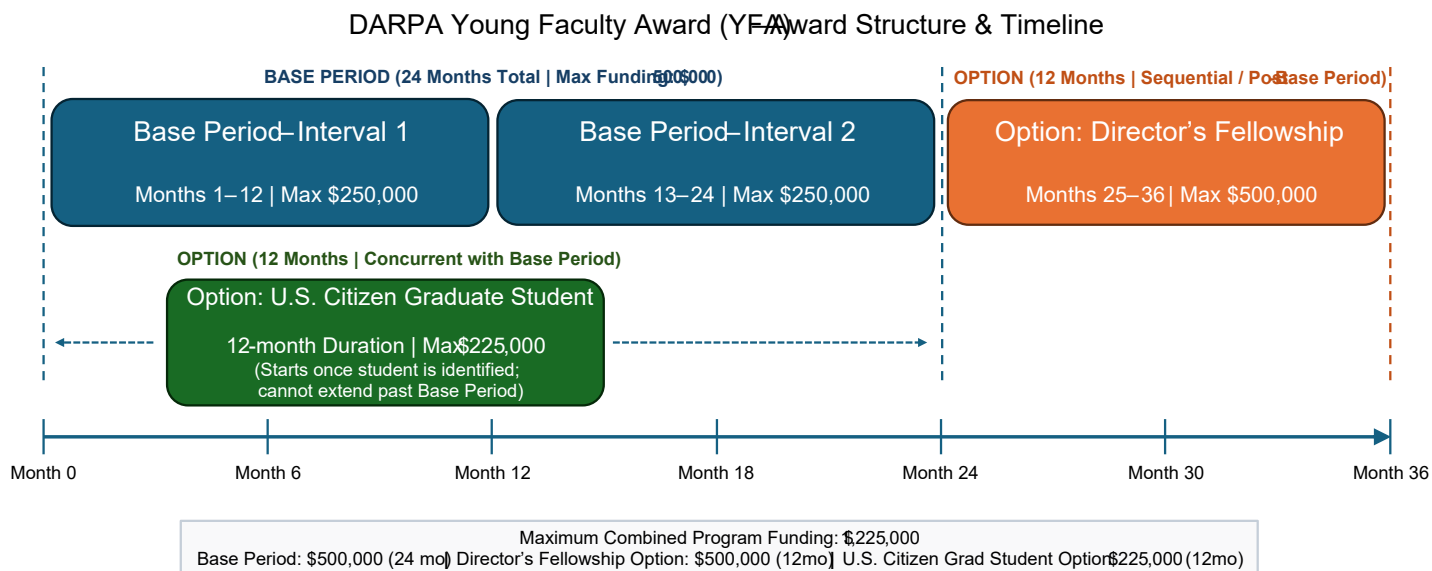
YFA also includes an option specifically reserved for graduate students who are U.S. citizens. YFA research regularly involves graduate students under the supervision of the PI. To encourage the participation of U.S. citizens on YFA, all proposers are encouraged to include the U.S. Citizen Graduate Student option in their proposals. This option has a 12-month duration and provides funding for one (1) U.S. citizen graduate student who will work in a supporting capacity during the base period. Interested proposers should include a SOW and associated cost proposal (covering costs such as salary/stipend, fringe, tuition and fees, indirect costs, and travel) for an optional effort to run concurrently with the 24-month base period. Additionally, the proposer's federally negotiated Facilities & Administrative (F&A) rate must be identified in the cost proposal. If the graduate student proposed is not employed by the Prime, the

graduate student's university would need to be included and proposed as a subawardee on the proposal.

Subject to the availability of funds, this option may be exercised once the PI identifies an eligible graduate student, and the DARPA PM mentor has concurred. The addition of this U.S. citizen graduate student option is an experiment as a way to build a clearable pipeline of talent for the defense ecosystem, and its continuation in subsequent YFA solicitations is partly dependent on the quality of the work and performance of these graduate students. DARPA understands that it may take time to identify an eligible graduate student. Proposers may structure the option in a manner appropriate to their project and institutional requirements, provided that the proposed Period of Performance (PoP) remains within the 24-month base period of the initial award. To give an example, this option may be structured such that the option's exercise date starts 3 months after the start of the base award. Proposers are encouraged to include travel costs in the option so the graduate student can fully participate in YFA engagement opportunities. The U.S. Citizen Graduate Student option has a maximum total funding of \$225,000.

A U.S. citizen graduate student assigned under this option can only be replaced by another U.S. citizen graduate student. If the U.S. citizen graduate student departs before the end of the option period, and no eligible replacement can be identified, the option effort will be de-scoped to reflect the work completed, and any remaining funds will be de-obligated and returned to DARPA. The replacement process must be executed in a timely manner to ensure continued progress with the option period and concluding within the base period.

The figure below illustrates the potential lifecycle and funding of a YFA award from initial award, through options, to completion:



C. Topic Areas

This RA solicits single PI proposals for research and development in the specific Topic Areas (TAs) of interest articulated below. Potential applicants are encouraged to carefully consider the descriptions of the TAs before submission. **Each submission (executive summary or full proposal) must specify ONE and only one TA to which it is applicable** and identify this TA on the submission's cover sheet. Executive summaries and full proposals that do not clearly address one specific TA may be deemed non-conforming and removed from consideration.

Prior to submitting a full proposal, proposers are ***required*** to first submit an executive summary. DARPA will respond to the PI with a statement either encouraging or discouraging a full proposal. Regardless of whether DARPA encourages or discourages a proposal, PIs are permitted to submit a full proposal expanding on their executive summary. A discouraged statement in response to an executive summary should be viewed as a strong indicator that DARPA is not interested in the proposed research.

PIs are limited to submitting **only one executive summary and only one full proposal** for YFA. Submissions must identify one of the TAs listed below. If a PI submits more than one executive summary or more than one full proposal DARPA will review the first time-stamped submission only and will reject the subsequent submission(s).

1. The Numerical Analysis of Iterative Prompt Engineering and Iterative Alignment

DARPA is interested in establishing mathematically grounded, rigorous frameworks that treat prompt engineering (i.e., as practiced in in-context learning) as formal numerical algorithms; to chart, understand, and ultimately rationally design the dynamics of these algorithms. While iterative prompt design and chain-of-thought reasoning have become primary interfaces for steering foundation models, current practices rely on brittle, practitioner-dependent empirical heuristics lacking theoretical guarantees. DARPA seeks to transition prompt design from an *ad-hoc* art to a quantitative computational science by modeling prompt-response trajectories as iterative solvers operating over high-dimensional latent spaces and discrete token manifolds.

Specifically important are formal mathematical foundations and algorithms that address:

Convergence and Fixed-Point Dynamics: Establishing rigorous convergence criteria, contraction mappings, and Lyapunov stability metrics to determine when iterative prompting sequences converge to provably valid solutions versus degenerating into limit cycles, chaotic oscillations, or divergent hallucinations. Conditioning and Initial State Sensitivity: Developing condition numbers, perturbation bounds, and sensitivity analysis techniques to quantify how slight variations in initial system prompts, preamble phrasing, or contextual framing dictate downstream prompt trajectory divergence.

Systematic Realignment and Drift Control: Formulating algorithmic control mechanisms, analogous to numerical preconditioning, adaptive damping or relaxation methods to systematically detect, bound, and correct semantic drift,

preventing models from "going rogue" or violating safety and task constraints during multi-step execution.

Approaches should deliver algorithmic methods that (a) compute optimal, verifiable prompt sequential improvements, (b) provide formal stability bounds, and (c) demonstrate measurable enhancement of the reliability, predictability, and alignment of AI-driven workflows across complex, mission-critical modeling, planning, and decision-support tasks.

2. Plasma as a Dynamic Heterostructure Layer for Electron Emission

This topic targets research pursuing joint experimental and modeling methods to explore the limits of strong electron emission of tailored materials into a plasma. For many electronic interfaces, electronic band bending across thin layered heterostructures is amenable to first principles treatment, and these interfaces are encapsulated and precisely controlled in sealed semiconductor packages. By contrast, a low-temperature plasma over a surface is an open heterostructure: the sheath is a space-charge layer of Debye-length thickness, analogous to a depletion region, but flux-carrying, non-equilibrium, ion-inertial, and lattice-free. In the plasma interface, functionalization must survive contamination, environmental variation, and kinetic and chemical damage through stable terminations, coatings or barriers. The interface is also dynamic: the plasma sheath changes at plasma frequencies (MHz-GHz), it couples to the interface via electronic field emission, thermionic and ion-induced emission, and can provide ultraviolet/vacuum ultraviolet photoexcitation as well. This is rarely a materials design problem, surfaces are treated as fixed emission yields rather than engineered response surfaces. This leaves the potential for strong nonlinear surface/plasma coupling largely unexplored.

Hobbs and Wesson showed plasma sheaths over floating surfaces saturate in the limit of strong emission.¹ Historically only rare and fragile refractory materials (e.g., thoriated tungsten) flirted with these limits, but today the regime appears increasingly approachable. Does this regime lend itself to new possibilities, such as self-protective plasma-facing materials that emit strongly enough to maintain the sheath potential below sputtering threshold? And are the dynamics of such a system stable, or does the system run away? As critical emitted current density will scale with plasma density, model plasmas should be chosen such that proposed model material systems can reach it, and choose electron emission mechanisms to investigate plasma-surface feedback and interaction. For example, low-temperature plasma sheath field strengths $\sim 10^6$ V/m will require field enhancement $\beta \sim 10^3$ for field emission channels, while other emission channels (e.g., photoemission, ion-induced, thermionic, or joint methods) should similarly consider how to reach the critical flux. A potential model system is metal-oxygen-carbon terminated diamond, providing a stable negative electron affinity surface; another is charging thin dielectric layers under ion bombardment. Equally welcome are proposals identifying other mechanisms by which a designed electron emitting surface can strongly interact with a plasma sheath, possibly entering a

¹ G. D. Hobbs and J. A. Wesson, "Heat flow through a Langmuir sheath in the presence of electron emission," *Plasma Phys.*, vol. 9, no. 1, pp. 85–87, Jan. 1967, doi: 10.1088/0032-1028/9/1/410.

stabilizing regime, or with other material systems. Proposals identifying discriminating measurements paired with predictive modeling will be most strongly considered.

3. Fundamental Mechanisms to Drive Scalable Thermomechanical Resilience Across Materials, Devices and Systems

There are several emerging platform classes that require increased tolerance to thermomechanical impulses. Current approaches to improving damage tolerance in metals and ceramics rely on improving specific strength and mechanical toughness by utilizing boutique materials and processes via manufacturing techniques that have not been shown to scale.^{2,3} The landscape is dominated by technical approaches involving composites and focuses on materials and architecture attributes such as density and small-size effects. This combination of similar technical approaches and specialized fabrication techniques (with small build volumes) has hindered significant progress in developing scalable damage tolerant architectures and systems for higher temperature and vibration-heavy dynamic service environments.

DARPA seeks fundamental advances in identifying approaches that address not just initial system performance, but the system's ability to preserve the responding performance to thermomechanical shock. To drive significant increases in thermomechanical resilience it will be necessary to identify new mechanisms or physics-based levers to manage damage and failure in materials, architectures and systems. Technical approaches should detail how thermomechanical resilience is quantified and success will include the identification of new physics-based approaches that drive increases in this resilience coupled to an analytical or experimentally validated demonstration of resilience while concomitantly maintaining or improving overall system envelopes of volume, mass and manufacturability.

4. Numerical Stability Theory for Extreme Low-Precision Computing

DARPA is interested in exploring the numerical stability limits of spatio-temporal integration of discretized ordinary and/or partial differential equations in the limits of low floating-point precision. Current approaches, driven by the machine-learning community, aim to reduce the memory burden of GPU-accelerated operations by promoting low precision operations; this goal is facilitated by the non-differential nature of the matrix operators, making them less prone to numerical instabilities. Novel approaches should address theoretical considerations of numerical stability of differential equations to nonlinear perturbations due to large round-off errors, as well as the design of natively low-precision hardware architectures optimized for speed and control of round-off error accumulation. Approaches should demonstrate robustness of the proposed theoretical and hardware implementation approach on progressively increasing levels of nonlinearity, including single (e.g., linear advection diffusion, Schrodinger equation, Maxwell Equation), to double (e.g., Burgers' equation,

² Diliūnas, S.; Leišis, V.; Pilkaitė, T.; Skiedraitė, I. Hierarchical and Fractal-Inspired Mechanical Metamaterials: A Mechanics-Oriented Review of Multiscale Design, Strength, Deformation, and Energy Absorption. *Materials* 2026, 19, 3432. <https://doi.org/10.3390/ma19163432>.

³ Zhang, W., Li, Z., Gao, H. et al. Nanoporosity-driven deformation of additively manufactured nano-architected metals. *Nat Commun* 17, 3279 (2026). <https://doi.org/10.1038/s41467-026-69845-8>.

incompressible Navier-Stokes), and triple (e.g., compressible Euler equations) nonlinear equations.

5. Algorithms for Mixed-Precision Quantum Information Processing

Despite their closely related underlying principles, the development and maturation of “analog” quantum systems (e.g., quantum sensors, clocks, and many-body quantum emulators) has had relatively little overlap with the development of “digital” quantum architectures that have been traditionally associated with fault-tolerant quantum computing. However, recent work has highlighted the potential benefits of digital quantum circuit concepts and techniques to enable new capabilities in quantum sensors, quantum-enhanced position, timing, and navigation (PNT) architectures, and related analog quantum systems. Such benefits potentially include efficient preparation of metrologically or computationally relevant quantum states; emergent topology to protect or isolate such quantum states from environmental sources of decoherence in size, weight, and power (SWaP)-constrained architectures; and realizing analog quantum systems that can disrupt the sensitivity-dynamic range or performance-SWaP tradeoffs associated with conventional analog quantum sensor or PNT architectures.

This research effort seeks to develop algorithms that leverage concepts of quantum error correction, erasure conversion, measurement backaction, feed-forward techniques, and related “digital quantum” techniques for applications to quantum simulation, modeling of complex physical systems, and quantum-enhanced sensing and PNT. Of specific interest are algorithms that can enable resource-efficient preparation of quantum states of computational or metrological utility; non-adiabatic, non-unitary, and closed loop techniques for the realization of topologically protected, resilient, and low-SWaP quantum sensors capable of performance beyond the standard quantum limit; and mixed-precision quantum simulators for the modeling and computation of complex physical systems including correlated electronic materials and quantum magnetic phases.

6. Multimodal Knowledge Completion Under Sparse Mission Data

DARPA is interested in foundational methods for inferring missing scientific relations in sparse, dynamic, multimodal knowledge representations for domains in which the available evidence is limited, heterogeneous, and often not text-centric. Link prediction on declarative scientific knowledge typically assumes rich, text-based public corpora. However, Department of War-relevant domains (e.g., materials under extreme conditions, radiation effects, and contested-environment physics) often contain few artifacts, and much of the available information exists in non-text formats (e.g., tables, figures, spectra, micrographs, simulation outputs, and instrument logs) embedded in reports. These represent procedural and conditional domain knowledge. Existing graph-completion methods either ignore these modalities or return confident links without a defensible basis. This topic seeks approaches that treat measurements and figures as first-class nodes rather than as captions, combine limited observations with physical constraints, cross-domain analogy, and structured priors, and attach calibrated confidence to each inferred link. Proposals should define what an inferred link represents, explicitly treating it as a hypothesis rather than a fact; explain how confidence is derived across modalities; and identify the cheapest experiment that could

refute the inferred relation. Text-only graph-based methods, or approaches that require corpora unavailable in mission domains, are not of interest. The goal is to enable usable declarative, conditional and procedural inference in the low-data, mixed-format regime that characterizes mission science and to provide a principled means of directing automated scientific methods and reasoning toward knowledge representation gaps (i.e., void fields) rather than toward regions of high text density.

7. Pioneering Non-Invasive Deep Tissue Modulation

DARPA is interested in understanding the fundamental challenges and opportunities to develop novel paradigms for the non-invasive electrical, mechanical, or energetic manipulation of deep tissues to enhance warfighter performance, recovery, and resilience. Traditionally, accessing and modulating deep anatomical structures requires invasive procedures or relies on bulk, stationary clinical equipment that cannot be integrated into a wearable form factor. Specifically important are foundational discoveries and novel mechanisms, spanning (but not limited to) bioelectronics, mechanobiology, and targeted energy transfer that enable precise delivery of modulatory signals from the body's surface.

Approaches should address the fundamental physical and biological challenges of signal attenuation, spatial resolution, and tissue heterogeneity when projecting energy through complex biological media, while maximizing the precision and efficacy of the intended biological response.

8. Programmable Biological Time

Biological developmental timescales vary significantly across species despite conserved underlying programs. Evidence shows these rates are malleable; for instance, mitochondrial metabolic perturbations can accelerate or decelerate neuronal maturation.⁴ These rates prompt whether biological time can be modeled, interrogated, and engineered. DARPA seeks to establish a foundational, multiscale computational framework to represent, reason over, and test mechanisms governing developmental speed across metabolism, gene regulation, protein turnover, signaling, and cell-state transitions. Rather than optimizing for a single pathway, the framework should provide a generalizable environment to evaluate competing hypotheses and intervention strategies.

A central objective is determining whether developmental trajectories can be compressed by up to three orders of magnitude while preserving target terminal states. The framework must support both trajectory acceleration (speeding underlying processes) and trajectory compression (bypassing rate-limiting intermediate states), while identifying temporal bottlenecks, failure modes, and coupled process desynchronization. Selected computational predictions will be experimentally validated to challenge and refine the framework.

Out of scope are purely experimental efforts, single-pathway or hypothesis-restricted models, and routine assay automation. Ultimately, this effort will establish a

⁴ <https://www.science.org/doi/10.1126/science.abn4705>.

foundational capability to determine how biological clocks interact, what interventions alter them, and what defines the speed limits of living systems.

9. Biosynthetic and Biomimetic Pathways to Advanced High-Performance Material Formulations

DARPA is interested in understanding the fundamental challenges and opportunities to leverage biological systems, synthetic biology, and biomimetic principles to advance the design, synthesis, and assembly of supporting formulation constituents and architectures for high-performance, multiphase composite systems. Traditionally, formulators rely on petroleum-derived polymer binders, plasticizers, stabilizers, and processing aids to formulate and stabilize high-performance materials. While reliable, these legacy material formulations often impose critical limitations on functional properties, including long-term stability, environmental durability, and structural sensitivity. Potential areas to consider include:

- **Biosynthetic Pathways:** Biological, biohybrid, or bioinspired synthetic routes for producing or transforming formulation molecules.
- **Biomimetic Structural Architectures:** Bioinspired or biologically compatible hierarchical material structures that provide controlled transport, chemical response, mechanical response, thermal response, or multifunctionality.
- **Bio-directed Assembly & Stabilization:** Biological, biohybrid, or chemically analogous mechanisms that direct nucleation, molecular assembly, microstructure, interfacial interactions, composition, and long-term stability in high-performance materials.

Proposed approaches must address the fundamental materials science challenges of interfacial compatibility, molecular adhesion, and processing of biological matrices with known high-energy compounds. To remain within the scope of unclassified basic research, proposals are limited to supporting formulation constituents and architectures. The design, synthesis, or alteration of the chemical identity of high-energy compounds is outside the scope of this topic.

10. Continuous Critical Care

Human physiology should be fundamentally understood to be the continuous, dynamic system it is; rather than the discrete system hospitals assume for treatment. Critically ill patients are sensed and treated at a cadence set by staffing and instrumentation, not biology. Fluid boluses, vasoactive agents, analgesia, and ventilator changes are delivered as coarse, discrete inputs, and their effects are read out minutes to hours later through sparse observation.

DARPA seeks foundational research characterizing physiologic response when sensing and perturbation are both moved toward continuous resolution for precise, individualized, closed-loop resuscitation in shock, using dense multimodal sensing in critical care settings. Paired with continuous, automated interventions DARPA seeks to discover the response dynamics, time constants, and coupling structure that current practice cannot resolve. Key outcomes include: novel modeling techniques that effectively capture the relationships between shock and utilized interventions on a continuous time basis; specific strategies for identifying a minimally viable sensor-

intervention approach that minimizes hardware during closed loop interventions; and at least animal data supporting the models.

11. A Pre-Columbian Approach to Understanding Sociopolitical Organization

DARPA is interested in exploring new approaches to modeling the evolution of sociopolitical systems. The United States Government's strategic planning would benefit from integrating political, economic, geographic, ecological, social, linguistic, and genetic perspectives, to form comprehensive forecasts amid varied, sparse, and noisy data.

Historical case studies offer the advantage of falsifiable forecasts, multigenerational longitudinal patterns, and variation of long-term resource and geographic factors. Pre-Columbian society, particularly, presents a rich network of competing and cooperating polities over varied geographic contexts, tractable scale to observe the emergence or entry of new groups, an accessible material record to provide ground truth, and direct insight into American cultural heritage. Approaches should involve development and/or deployment of quantitative models that assess patterns of human organization, offer falsifiable forecasts, and use probabilistic and/or causal reasoning to suggest the most cost-effective deployment of laboratory tests, remote sensing technology, and ground studies to improve the accuracy of the model.

12. Communicating Only Novel, Consequential Information via Semantic Encodings

Autonomous agents are increasingly operating as distributed teams. Effective coordination among these agents requires exchanging beliefs, plans, and intent. The information exchanged is often heterogeneous and multimodal, including imagery, radio-frequency observations, acoustic signals, telemetry, geospatial data, and natural language. Conventional approaches communicate raw sensor data, complete internal states, or verbose messages, creating substantial bandwidth, latency, computation, and energy demands. These limitations are particularly acute in environments characterized by intermittent connectivity, asymmetric links, heterogeneous sensors, and scarce communications resources.

DARPA is interested in advancing the science of multimodal semantic compression for multi-agent communication by exploiting prior knowledge shared among communicating agents (e.g., common world models, mission context, interaction histories, environmental structure, and predictions of one another's beliefs) to transmit only the information that is novel, uncertain, or operationally consequential. Rather than reproducing every source modality exactly, a receiving agent should reconstruct the decision-relevant meaning needed to maintain situational awareness, coordinate actions, and accomplish the mission.

Approaches of particular interest include methods inspired by compressed sensing, sparse representation, predictive coding, and distributed source coding that identify and encode low-dimensional semantic novelty relative to an agent's prior knowledge. Theoretical methods that provide guarantees on semantic recoverability, task performance, or communication complexity are encouraged, as are architectures that detect and recover from mismatched priors, missing modalities, sensor degradation, distribution shift, or adversarial corruption. Proposals should define quantitative

measures of multimodal semantic communication efficiency and establish the relationship between message size and mission-level performance. Proposed methods should be demonstrated in DoW-relevant settings, such as coordination across autonomous vehicle teams; synchronization among satellites carrying diverse sensing payloads; distributed multimodal intelligence collection; or bandwidth-constrained tactical networks.

13. Preserving Programmatic Intent in Hardware Synthesis

While the DARPA SafeDocs program focused on tools to ensure software parsers faithfully implement programmatic intent, a related potential gap between implementation and intent exists in hardware logic. Modern Field-Programmable Gate Arrays (FPGAs) allow developers to program in native C, which synthesis tools then convert into hardware descriptions or FPGA bitstreams. However, there is currently no way to verify that this synthesized logic achieves the developer's original intent. This challenge is further complicated because hardware logic is spatial, highly concurrent, and governed by strict timing, fanout, and other requirements. DARPA is interested in research that explores software-to-hardware implementation correctness and quantifies verification bounds. Specifically, research should investigate the potential for hardware synthesis tools to produce checkable evidence that they faithfully represent the designer's intent, compose formal guarantees directly into the hardware descriptions, or identify methods to detect when such guarantees cannot be ensured.

14. Frugal Intelligence

DARPA seeks to develop the concept of Frugal Intelligence that treats sequential LLM querying as a resource-aware algorithmic process, analogous to efficient algorithms that minimize computational resources such as time, space, or energy over brute-force algorithms. By drawing inspiration from the optimal information-gathering strategy in the game of 20 Questions and George Pólya's problem-solving heuristics, Frugal Intelligence seeks to minimize total resource consumption, including tokens, energy, monetary cost, and latency, while maximizing progress toward a solution.^{5,6,7} At its core, it develops an adaptive meta-reasoning system that dynamically selects the next query or subproblem with the highest expected information gain per unit of resource, favoring cheap simplifications, analogies, uncertainty reduction, and lightweight verification over wasteful monolithic, verbose prompts.

15. Causal Unfolding of Stability Parameters

When complex systems approach phase transition, they show statistical early-warning signals: critical slowing down, rising variance, slower recovery, and spectral reddening.⁸ However, as a complex system approaches its tipping point, two fundamental questions remain unanswered: 1) Which measured variables are the true driving control variables and 2) Where does the transition lie? Thom's catastrophe

⁵ Twenty Questions. https://en.wikipedia.org/wiki/Twenty_questions.

⁶ Polya, G. (1945). *How to Solve It: A New Aspect of Mathematical Method*. Princeton University Press, Princeton, NJ.

⁷ Polya, G. (1954). *Mathematics and Plausible Reasoning*. Vol. I: Induction and Analogy in Mathematics; Vol. II: Patterns of Plausible Inference. Princeton University Press, Princeton, NJ.

⁸ Scheffer, Marten, et al. "Early-warning signals for critical transitions." *Nature* 461.7260 (2009): 53-59.

theory classifies elementary singularities (such as fold and cusp), and Prigogine's non-equilibrium work points us at bifurcation points and irreversibility.^{9,10} DARPA is interested in methodologies that combine physics-informed model discovery with catastrophe-theoretic approaches to characterize the shape of the transition surface (the bifurcation set) associated with fold and cusp singularities in cyber-physical systems and demonstrate initial predictive skill for when a system crosses a phase transition. Proposers may draw on any physics-informed or data-driven discovery methodologies capable of recovering an interpretable normal form from system telemetry. The discovered dynamics must resolve to one of Thom's elementary catastrophes. A related open question is which of a system's many measurable channels are the true control parameters driving the transition. Proposers are encouraged to use causal discovery or information-theoretic methodologies to suggest solutions to this problem.

16. Towards a Science of Deep Learning

DARPA is interested in establishing a rigorous, comprehensive scientific theory of deep learning to enable creating more efficient, robust, and capable super intelligence (SI) systems by characterizing, using rigorous well-established mathematical fields, important properties and statistics of the training process, hidden representations, final weights, and performance of neural networks. Current studies of SI capabilities tend to be done in an ad-hoc way, with evaluations taking place on benchmarks without a sense of a full theory capable of explaining or generalizing neural network performance. Of particular importance are approaches arising from well-established subfields of pure mathematics, such as geometry, dynamical systems, spectral theory, and harmonic analysis that connect ideas in the world of SI with deep mathematical theories. Approaches should address challenges arising in establishing a rigorous scientific theory of deep learning, such as mathematical laws for rigorously determining when, how, and why observed phenomena of SI systems arise.

17. Photonic Activation Function

Photonic circuit implementations of neural networks offer the possibility of rapid inference response and energy savings compared to more conventional perceptron-based digital artificial neural network implementations. Despite growing interest in applying photonic integrated circuit (PIC) technology to neural networks, the perceptron circuit's activation function remains a roadblock towards the notion of a full neural network on a PIC. This is because the activation function is inherently electronic in its operation, thereby requiring optical-to-electronic and electronic-to-optical interfaces at its input and output, respectively. The need for an electro-optic domain conversion slows inference and consumes excessive power and circuit area.

DARPA aims to break current practices in how the activation function is applied by establishing core research towards a fully photonic activation device that can be readily integrated into a neural network PIC. Of interest to DARPA are the physics, construction and materials of a device that can produce a photonic activation function

⁹ Thom, René. "Structural stability and morphogenesis; an outline of a general theory of models." (1975).

¹⁰ Prigogine, Ilya. "Time, structure, and fluctuations." *Science* 201.4358 (1978): 777-785.

response, such as Sigmoid function or proposer-proposed relevant activation functions, based on the light intensity, wavelength, phase and/or polarization of the input light. Such a device should be manufacturable using currently available photonic wafer processes, and integrable onto a PIC. Only waveguide-connected photonic inputs and outputs are permitted; DC bias and transfer function shape control can be provided via electrical interfaces to the device.

The investigator must show how the device can be readily integrated into common PIC technology. Models of the overall neural network's operation must be described when incorporating this new device as the network's activation function. The primary deliverable of this YFA topic: a physics-based model describing the operation of the device, and a working activation function device, demonstrable on a lab benchtop. DARPA does not seek the development of a full neural network PIC using such an activation device. Device requirements: transfer function of sigmoidal or similar response, size of < 100 sq micron area, less than 10 uW power consumption, and light input/output through on-chip photonic waveguides.

18. Emergent Communication Protocols for Distributed Systems

Conventional communication networks rely on human-specified addressing, algorithms (congestion control and routing), protocol semantics (TCP/IP), and interfaces (socket Application Programming Interface). Software-defined networking introduced programmability into network control, and AI-native networking increasingly uses learning and reasoning to adapt selected network functions (e.g., reinforcement learning-based congestion control). Yet these approaches generally optimize within pre-defined, general-purpose network architectures and allowable protocol behaviors, limiting the ability of environment-specific protocol behaviors to emerge natively from operational dynamics (e.g., bandwidth degradation), constraints, and mission objectives.

DARPA is interested in a more fundamental question: under what conditions can machine-to-machine communication protocols emerge from interactions among distributed systems, that is, decentralized autonomous and semi-autonomous systems that semi-learn, their objectives, and their environment? Allowing protocols to emerge directly from these interactions creates protocols that are tailored to their environment, channel state, and capabilities allowing a much more efficient and useful protocol than today's general-purpose protocols.

The research will establish the principles, limits, and scaling properties of emergent communication protocols for distributed systems. It will investigate whether a minimal invariant communications substrate (a network microkernel) can support emerging richer protocol behaviors, and determine the minimum primitives required. This research is open to exploring all layers of the OSI model.

Key questions include: how independently learning systems converge on mutually intelligible protocols; how this protocol-consensus problem scales from two systems to N systems; how topology, bandwidth, latency, loss, mobility, and task objectives shape emergent protocols; whether learned protocols generalize to new environments and systems; and how performance should be measured and evolves with experience.

DARPA seeks to understand how protocols can emerge, when protocol emergence works, how well it scales, and when fixed protocol structure is still necessary.

D. Program Structure

This RA seeks cooperative agreement proposals for a research activity consisting of a 24-month base period, a 12-month Director's Fellowship option period, and up-to a 12-month U.S. Citizen Graduate Student option to run concurrent with the base period.

No award type other than cooperative agreements will be issued under this RA. Each 12-month interval of the base period shall not exceed \$250,000. The Director's Fellowship option, a 12-month period that follows the base period, shall not exceed \$500,000. The U.S. Citizen Graduate Student option has up-to a 12-month option period that runs concurrent with the base period and a maximum funding level of \$225,000. YFA recipients may request one No-Cost Extension (NCE) to the base PoP, which will also apply to the U.S. Citizen Graduate Student option, if awarded. These NCEs are not to exceed 12-months and may not extend into the Director's Fellowship option PoP.

The Director's Fellowship is reserved for a limited number of awardees who demonstrate exceptional YFA project performance over the 24-month base period. YFA PIs will be nominated by their PM mentors based on measurable progress towards project objectives and well-managed expenditure levels during the base period. Nomination for Director's Fellowship may be delayed until sufficient progress and expenditure levels have been achieved however the option must be exercised by the end of month 36 of the effort (maximum allowable base PoP, assuming one 12-month NCE). DARPA will take into account the time it takes to execute contractual actions when deciding whether to award a Director's Fellowship option. Director's Fellowship recipients may request one NCE for the Director's Fellowship option PoP, not to exceed 12 months.

A target start date of August 2027 may be assumed for planning purposes. For budgeting purposes, please plan for two 2-day meetings in the Washington, D.C. area and one 2-day meeting in the San Diego, California area over the course of the 24-month base period and one additional two-day meeting in the Washington, D.C. area over the course of the 12-month Director's Fellowship option period. Travel for the U.S. Citizen Graduate Student option should also be included in budgeting. Travel proposed for non-DoW sponsored activities and events is highly discouraged; please see the FAQ document for more information.

Section II: Evaluation Criteria

- Proposals will be evaluated using the following criteria listed in **descending order of importance**.
 - **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 bolster the national security technology base and support DARPA's mission to make pivotal early technology investments that create or prevent technological surprise. The proposed intellectual property restrictions (if any) will not significantly impact the Government's ability to transition the technology.
- **Cost Realism:**
The proposed costs are realistic for the technical and management approach and accurately reflect the technical goals and objectives of the announcement. All proposed labor, material, and travel costs are necessary to achieve the program metrics, consistent with the proposer's SOW 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).
- For additional information on how DARPA reviews and evaluates proposals through the Scientific Review Process, please see "Proposer Instructions: General Terms and Conditions." in Section III: Submission Information.

Section III: Submission Information

- All awards under this announcement will be Cooperative Agreements. Please review the following link for additional information regarding award instrument information:
Assistance Agreement Awards (Grants and Cooperative Agreements): [Proposer Instructions: Grants/Cooperative Agreements](#).
- This announcement contains a required executive summary phase. If DARPA deems the executive summary non-conforming and a proposal is submitted against Agency recommendations, that subsequent proposal submission will be removed from consideration. DARPA will respond to the PI with a statement either encouraging or discouraging a full proposal submission. Regardless of whether DARPA encourages or discourages a full proposal submission, Primes are permitted to submit a full proposal expanding on their executive summary. A discouraged statement in response to an executive summary should be viewed as a strong indicator that DARPA is not interested in the proposed research.
- DARPA intends to conduct a blind review of submitted executive summaries. Institution and Key Personnel identifying information must be present on only the Executive Summary Cover Sheet, which will be separated from the remaining text prior to DARPA conducting its review. If Institution or Key Personnel identifying information is found after the Executive Summary Cover Sheet, the executive summary may be deemed non-conforming and removed from consideration.
- Executive summaries submitted in response to this announcement should anticipate a response within approximately 45 calendar days. These notifications will be sent via email to the Technical POC and/or Administrative POC identified on the Executive Summary Cover Sheet.

- Proposers must include the DARPA letter received in response to the executive summary phase as Attachment E with their full proposal as confirmation of the conformity of the submission.
- DARPA will review all conforming full proposals using the published evaluation criteria (Section II) and without regard to any comments resulting from the review of an executive summary. Proposers should note that a favorable response to an executive summary is not a guarantee the proposal will be selected for award negotiation.
- **Alignment**: In addition to the conformity requirements above, an executive summary or full proposal may be deemed non-conforming if it is found to be out of alignment with this RA. Alignment is defined as follows:
 - The proposed concept aligns with a single TA described herein.
 - The proposed work has not been completed (i.e., the research element is complete, but manufacturing/fabrication funds are required).
 - The proposer has not received funding or a positive funding decision for the proposed concept from DARPA or any other Government agency.
- Please see the Overview section for the Executive Summary due date. Potential proposers are required to submit a conforming executive summary in order to be eligible to submit a full proposal. Additional instructions for executive summary submission are contained within **Attachment A**. All executive summaries must be submitted through the Broad Agency Announcement Tool (BAAT). Each TA will have a separate announcement listing in BAAT (e.g. DARPARA2701-01, DARPARA2701-02, etc.) BAAT submission details are provided below in “Proposer Instructions: General Terms and Conditions.”
- Please see the Overview section for the Full Proposal due date. All proposals must be submitted through Grants.gov. Grants.gov submission details are provided at this link: [Proposer Instructions: Grants/Cooperative Agreements](#).
- **Attachments B, C and D** contain specific instructions and templates.
 - 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:
 - **Direct Labor (sections A and B)** - Detail the total number of persons and their level of commitment for each position listed as well as which specific tasks (as described in the SOW) they will support.
 - **Equipment (section C)** - Provide an explanation for listed requested equipment exceeding \$5,000, properly justifying why it is required to meet the objectives of the program.
 - **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.
 - **Other Direct Costs (section F)** - Provide a justification for the items requested and explain how the estimates were obtained.
 - **Participant/Trainee Support Costs (section E)** - Provide details on Tuition/Fees/ Health Insurance, Stipends, Travel, and Subsistence costs.

- DARPA’s Fundamental Research Risk-Based Security Review (FRRBS) Process documents are required. [See here](#) for DARPA’s definition of “Fundamental Research.” For more information on the FRRBS Process, see [Proposer Instructions: Grants/Cooperative Agreements](#), and Section IV below. (Note – proposers should disregard the “Proposers Requesting a Grant or Cooperative Agreement” section of this webpage, and instead include the Biographical Sketch and Current & Pending support forms as attachments to their SF424 RESEARCH & RELATED Senior/Key Person Profile (Expanded) form in Grants.gov.)
- **RA Attachments:**
 - **(required) Attachment A:** Executive Summary Template
 - **(required) Attachment B:** Proposal Summary Slide Template
 - **(required) Attachment C:** Proposal Instructions and Volume I Template (Technical and Management)
 - **(required) Attachment D:** Proposal Instructions and Volume II Template (Administrative and National Policy Requirements)
 - **(required) Attachment E:** Letter received from DARPA in response to Executive Summary submission
 - **(required if proposing the U.S. Citizen Graduate Student Option) Attachment F:** U.S. Citizen Graduate Student Option Template
 - **(reference) Attachment G:** Model Cooperative Agreement
- **Proposer Instructions: General Terms and Conditions**
 - **System for Award Management (SAM) Registration and Universal Identifier Requirements**
All proposers must be registered in SAM unless exempt per Federal Acquisition Regulation (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 RA and have a valid Unique Entity ID to receive an award. All proposers must maintain an active and current SAM registration at all times throughout the award process, should they be selected. All proposers are to provide their Unique Entity ID in each proposal they submit. Click [HERE](#) to register in SAM.
 - **Content and Form of Application Submission**
All submissions must be written in English with type not smaller than 12-point font. Smaller font may be used for figures, tables, and charts. All documents submitted must be clearly labeled with the DARPA RA number, proposer organization, and proposal title/proposal short title. All monetary references in the proposal shall be in U.S. Dollars.
 - **Electronic Invoicing and Payments**
Awardees will be required to submit invoices for payment electronically via Wide Area Work Flow (WAWF), accessed through the [Procurement Integrated Enterprise Environment](#), unless an exception applies. Registration in WAWF is required prior to any award.
 - **Electronic and Information Technology**

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

○ **Patent Reports and Notifications**

All resultant awards will contain a mandatory requirement for patent reports and notifications to be submitted electronically through [i-Edison](#).

○ **Review of Proposals**

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

Award(s) will be made to proposers whose proposals are determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria specified in the RA herein, and availability of funding.

○ **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.

○ **Award Information**

DARPA anticipates multiple awards. The level of funding for individual awards made under this RA will align with the descriptions provided herein, and subject to 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 announcement
- Make awards without negotiations with proposers
- Conduct negotiations 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 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 to support negotiations (e.g., representations and certifications)
- 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

In all cases, the Government GO shall have sole discretion to negotiate all instrument terms and conditions with selectees. DARPA will not award efforts under YFA that present a high likelihood of disclosing performance characteristics of military systems or manufacturing technologies that are unique and critical to defense.

DARPA aims to continuously improve the YFA program. To support this effort, DARPA may use surveys to collect information on YFA award recipients' accomplishments, long-term benefits of the mentorship program, and the career trajectories of award recipients through survey research with former, current, and incoming YFA awardees. Upon receipt of a survey, the awardee may choose not to participate and opt out at any time. The awardee's decision to participate or not to participate in surveys will not affect the decision for funding, or other relationship with DARPA.

○ **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.

○ **Organizational Conflicts of Interest (OCI)**

Proposers shall identify and disclose all facts relevant to potential OCI, involving the proposer's organization, and any proposed team member (subawardee, consultant) in accordance with FAR 9.5. The proposer is responsible for providing this disclosure with each proposal submitted to the announcement. 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

- 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. If the Government determines to grant a waiver, it will be processed after careful review of the mitigation plan. The Government will only evaluate OCI mitigation plans for proposals that are determined selectable under the announcement 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.
- **Agency Level Protests & Ombudsman Information**
 For information concerning agency level protests, please contact CMO_Protests@darpa.mil. Please ensure to copy the mailbox address referenced in the announcement related to the effort you are inquiring about. For any Agency Ombudsman related inquiries, please reach out to DARPA_Ombudsman@darpa.mil.
- **Unclassified Submission Instructions**
 Failure to comply with the submission procedures outlined herein may result in the submission being deemed non-conforming and withdrawn from consideration.

 DARPA requires proposers to submit UNCLASSIFIED executive summaries via [DARPA's Broad Agency Announcement Tool \(BAAT\)](#). If an account has recently been created for the DARPA BAAT, 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 BAAT, visit the website to complete the two-step registration process. Submitters will need to register for an Extranet account (by clicking "Create New Account" at the URL listed above) and wait for two separate e-mails containing a username and temporary password. After accessing the Extranet, submitters may then create an account for the DARPA BAAT (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 executive summaries submitted electronically through [BAAT](#) 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.

Proposers using BAAT may encounter heavy traffic on the submission deadline date; proposers should start this process as early as possible. Technical support for the DARPA RA Submission website is available during regular business hours, Monday – Friday, 9:00 a.m. – 5:00 p.m. Eastern Time. Requests for technical support must be emailed to BAAT_Support@darpa.mil with a copy to the RA email address identified in the RA. Questions regarding submission contents, format, deadlines, etc., should be emailed to the RA email address identified in the RA. Questions/requests for support sent to any other email address may result in delayed/no response.

- **Subawardee Proposals**

The awardee is responsible for compiling and providing all subawardee proposals for the GO, as applicable. Subawardee proposals should include Interdivisional Work Transfer Agreements (IWTA) or similar arrangements. 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 for each. All proprietary subawardee proposal documentation, prepared at the same level of detail as that required of the awardee's proposal and which cannot be uploaded with the proposed awardee's proposal, shall be provided to the Government either by the awardee or by the subawardee organization when the proposal is submitted. Subawardee Senior or Key Personnel must meet the eligibility requirements for YFA listed in Section IV: Special Considerations.

- **Frequently Asked Questions**

Administrative, technical, and contractual questions should be emailed to YFA2027@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 post an FAQ list on the DARPA webpage.

Section IV: Special Considerations

- This announcement, stated attachments, and websites incorporated by reference constitute the entire solicitation. In the event of a discrepancy between the announcement, attachments, or websites, the announcement takes precedence.
- Non-U.S. organizations cannot participate in this announcement. All other responsible sources capable of satisfying the Government's needs may submit a proposal that shall be considered by DARPA. Historically Black Colleges and Universities, Small Businesses, Small Disadvantaged Businesses, and Minority Institutions are encouraged to submit proposals and join others in submitting proposals; however, no portion of this announcement will be set aside for these organizations' participation due to the impracticality of reserving discrete or severable areas of this research for exclusive competition among these entities.
- As of the time of publication of this announcement, all proposal submissions are anticipated to be unclassified.
- As of the date of publication of this announcement, 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 on research results (i.e., papers, journal articles, etc.) to individual awards for fundamental research that may result

from this announcement.¹¹ DARPA will not select proposals for negotiation of an award if the proposal is deemed to be Applied Research, or otherwise requires Controlled Unclassified Information (CUI) restrictions. Inclusion of publication costs is highly discouraged, proposed costs should focus on program goals and objectives. For additional information on fundamental research, please visit [Proposer Instructions: General Terms and Conditions](#).

- DARPA's Fundamental Research Risk-Based Security Review Process (FRRBS) 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. DARPA will create risk assessments of all proposed Senior/Key Personnel selected for negotiation of a fundamental research cooperative agreement award. The DARPA risk assessment process will be conducted separately from the DARPA scientific review process and adjudicated prior to final award. For additional information on this process, please visit [Proposer Instructions: Grants/Cooperative Agreements](#).
- Proposals could potentially include Human Subjects Research (HSR) and/or Animal Use. Proposers that anticipate involving human subjects or animals in the proposed research must comply with the approval procedures detailed at <https://www.darpa.mil/work-with-us/humanresearch> to include providing the information specified therein as required for proposal submission.
- Participation is open to individuals who are U.S. Citizens, U.S. Permanent Residents, and Foreign Nationals who meet the eligibility criteria listed below.

Proposed Key or Senior Personnel who are citizens of China, Cuba, Iran, North Korea, Russia, and Venezuela are not eligible for inclusion on a YFA proposal. The submitting institution must certify they are not citizens of these countries.

The PI must be from the Prime proposer's organization and must be identified as the sole Key Personnel in the proposal. The Key Personnel PI is subject to all eligibility requirements and funding limitations listed in this RA. Proposals must identify all other non-student personnel (e.g., faculty, post-docs, lab managers, subcontractors, etc.) who will be directly supported by the award as "Senior Personnel." Senior Personnel are subject to the citizenship requirements above but not subject to tenure requirements or funding limitations. If proposing the U.S. Citizen Graduate Student option, an eligible student must be identified once they are known, and the Institution must certify their citizenship using **Attachment F** before the option can be exercised. If that student departs the institution prior to completion of the option, the institution may replace them with another eligible student by submitting a new **Attachment F** and certifying their citizenship prior to them commencing work.

Eligibility requirements for proposed YFA personnel:

¹¹ Press Releases announcing awards or previewing the publishing of fundamental research results are not considered to be the results of fundamental research and are subject to publication restrictions.

- Proposed Key Personnel (the PI) must be one of the following (excluding any personal leaves of absence) by the full proposal submission deadline listed in Part One: Overview Information:
 - Current Tenure-Track Assistant/Associate Professors
 - Current Tenured faculty within 3 years of their Tenure date
 - An equivalent at a non-profit research institution within 12 years of the receipt of their Ph.D.
- All Key and Senior Personnel and team members (for both prime and subawardees) must be employed at a U.S. institution, which includes those in U.S. states and territories. Proposals from outside these regions will not be accepted.
- Individuals who have received formally obligated (i.e., received under an executed base or option award) funding greater than \$500,000 from DARPA or \$1,250,000 from all DoW sources combined as either a prime or subawardee PI or co-PI as of the full proposal submission deadline are not eligible to be Key Personnel (the PI) under the YFA program, but may serve as Senior Personnel. See the table in the Overview section for additional information on determining whether funds were attributable to the proposing PI.
- Individuals who have previously received a YFA Award as a PI are not eligible to be a PI for this or any future YFA program but may serve as Senior Personnel.
- Former and current DARPA PMs are not eligible to serve under this program in any capacity.
- Researchers working at Federally Funded Research and Development Centers, University Affiliated Research Centers, National Laboratories, or other Government entities are not eligible to serve under this program in any capacity.
- Except for the U.S. Citizen Graduate Student Option, foreign nationals employed by U.S. institutions may participate to the extent that such participants comply with the citizenship and eligibility requirements under this RA, any necessary nondisclosure agreements, security regulations, export control laws, and other governing statutes applicable under the circumstances.

U.S. Permanent Resident and Foreign National Participation in DARPA Programs and Related Events

Definitions

Foreign National (FN): A person who is not a citizen or national of the country in which they are living or visiting.

U.S. Permanent Resident (USPR): A non-U.S. citizen who has official legal authorization to live and work in the United States permanently.

Official Foreign National Visitor: An individual serving as an official military or civilian representative of their nation's government conducting government, diplomatic, or other official business. These are official military or civilian representatives of their respective nations' government. (Note – these individuals are exempt from this process and must

instead obtain a Visit Request through the U.S. State Department's Foreign Visit System. For an official visit to DARPA, contact DARPA International Cooperation to facilitate the visit.)

Requirements

All non-official FNs and USPRs working on DARPA programs are subject to screening requirements established under this solicitation, including the Principal Investigator (PI). If selected for award negotiation, the Notification Letter will provide instructions and a link for FNs and USPRs to register through DARPA. In addition to the PI and Senior Personnel, the requirements apply to employees, research assistants, postdoctoral researchers, graduate students, and undergraduate students who will directly support the YFA program no matter when they are brought into the effort. The requirements must flow down to all subcontractors and apply to any other individuals ("affiliated personnel") who will perform work under the award.

The PI will:

1. Ensure all FNs and USPRs supporting the program use the link provided in the Notification Letter to register.
2. Maintain current records identifying all FNs and USPRs supporting the program, including affiliated personnel, and make such records available upon a written request from the Contracting Officer or Agreements Officer.
 - a. Monthly reports identifying the current status of all FNs and USPRs supporting the program must be delivered in conjunction with the performer's regular monthly status report as required by the agreement or contract awarded.
3. Notify the DARPA Program Manager, Agreements Officer, and the DARPA Program Security Representative, in writing, within five (5) business days of any of the following events:
 - A USPR or FN (official or otherwise) joins or departs the program;
 - The residency or citizenship status of a USPR or FN (official or otherwise) changes; or
 - Information previously submitted during a registration for a USPR, or non-official FN regarding their citizenship status materially changes.

The information submitted through the pre-award registration process will establish the initial baseline for identifying USPR or FN personnel supporting the program. This baseline will be used to track and report subsequent personnel additions, departures, and material changes during program performance.

Additional Resources

- The APEX Accelerators program, formerly known as the Procurement Technical Assistance Program (PTAP), focuses on building strong, sustainable, and resilient U.S. supply chains by assisting a wide range of businesses that pursue and perform under contracts with the DoW, other federal agencies, state and local governments, and with government prime contractors. See <https://www.apexaccelerators.us/> for more information. APEX Accelerators helps businesses:

- Complete registration with a wide range of databases necessary for them to participate in the government marketplace (e.g., SAM).
 - Identify which agencies and offices may need their products or services and how to connect with buying agencies and offices.
 - Determine whether they are ready for government opportunities and how to position themselves to succeed.
 - Navigate solicitations and potential funding opportunities.
 - Receive notifications of government contract opportunities on a regular basis.
 - Network with buying officers, prime contractors, and other businesses.
 - Resolve performance issues and prepare for audit, only if the service is needed, after receiving an award.
- Project Spectrum is a nonprofit effort funded by the DoW Office of Small Business Programs to help educate the Defense Industrial Base (DIB) on compliance. Project Spectrum is vendor-neutral and available to assist businesses with their cybersecurity and compliance needs. Their mission is to improve cybersecurity readiness, resilience, and compliance for small/medium-sized businesses and the federal manufacturing supply chain. Project Spectrum events and programs will enhance awareness of cybersecurity threats within the manufacturing, research and development, as well as knowledge-based services sectors of the industrial base. Project Spectrum will leverage strategic partnerships within and outside of the DoW to accelerate the overall cybersecurity compliance of the DIB. www.projectspectrum.io is a web portal that will provide resources such as individualized dashboards, a marketplace, and Pilot Program to help accelerate cybersecurity compliance.
 - DARPAConnect offers free resources to potential performers to help them navigate DARPA, including “Fueling Innovation: Applying for the DARPA Young Faculty Award,” “Understanding DARPA Award Vehicles and Solicitations,” “Making the Most of Proposers Days,” and “Tips for DARPA Proposal Success.” Join DARPAConnect at www.DARPAConnect.us to leverage on-demand learning and networking resources.
 - DSO is seeking feedback regarding our proposal submission process. Please consider completing the survey at this link: <https://events.sa-meetings.com/esurvey/126974>