



Notice of Funding Opportunity

Fiscal Year 2025

This is a special Notice of Funding Opportunity Announcement (NOFO) sponsored by the Air Force Office of Scientific Research (AFOSR), which will hereafter generally referred to as “we, us, our, or AFOSR”. AFOSR recognizes that future areas of research may not fall within its existing portfolio structure and has thus initiated the **IN**novations in **Q**ubit Science for Fault Tolerant Quantum Computing (INQS) Program, which is focused on the topic area of creative qubit approaches.

AFOSR anticipates making at least eight (8) awards of approximately \$150,000 to \$750,000 per year per award with period of performance of two (2) to five (5) years. All funding projects are based on the quality of the proposals and the availability of funds.

Proposers are encouraged to confer with the designated AFOSR Program Officer(s) prior to submitting a full proposal. We will evaluate proposals using an internal review panel. AFOSR reserves the right to select and fund all, some, or none of the proposals from any of the topics below. AFOSR provides no funding for direct reimbursement of proposal development costs. Technical and budget proposals (or any other material) submitted in response to this NOFO will not be returned. It is the policy of AFOSR to treat all white papers and proposals submitted under this NOFO as sensitive competitive information and to disclose their contents only for the purposes of evaluation.

White papers briefly summarizing the proposing institution’s ideas are encouraged but not required. Submit white papers to our whitepaper portal, which is linked below. The topic points of contact (POCs) will coordinate to provide feedback to white papers.

The proposals will need to include a data management plan, outlining how samples and data collected in the program will be stored and managed. This includes but is not restricted to issues such as: standards for data and metadata collection, content and format, data archiving, database management, and data sharing within, outside the awardee and beyond the lifetime of the grant. This precondition is modeled on the National Science Foundation Data Management Plan requirement (e.g., https://nsf.gov/eng/general/ENG_DMP_Policy.pdf).

IMPORTANT NOTE: Applicants should be alert for any amendments that may modify the announcement. Amendments to the original Notice of Funding Opportunity (NOFO) will be posted to the Grants.gov Webpage: <https://www.grants.gov/>.

Hyperlinks have been embedded within this document and appear as underlined, and or blue- colored words in the midst of paragraphs. The reader may “jump” to the linked section within this document by “clicking” (CTRL + CLICK or CLICK).

Table of Contents

A. BASIC INFORMATION	4
1. Federal Awarding Agency Name	4
2. Funding Opportunity Title	4
3. Announcement Type	4
4. Funding Opportunity Number	4
5. Assistance Listing Number	4
6. Funding Details	4
7. Key Dates	4
8. Executive Summary	5
9. Agency Contact Information	6
B. ELIGIBILITY	7
1. Eligible Applicants	7
2. Cost Sharing	7
3. Other	8
C. PROGRAM DESCRIPTION	9
D. APPLICATION CONTENT AND FORMAT	20
1. Pre-Proposal Inquiries and Questions	20
2. The Application as a Whole	20
3. Components Pieces of the Application	23
4. Information You Must Submit If Selected for Possible Award	32
E. SUBMISSION REQUIREMENTS AND DEADLINES	33
1. Address to Request Application Package	33

2.	Unique Entity Identifier and System for Award Management (SAM)	33
3.	Submission Instructions & Grants.gov Application Registration	34
4.	Application Submission and Receipt Procedures .Error! Bookmark not defined.	
5.	Submission Dates and Times.....Error! Bookmark not defined.	
6.	Intergovernmental Review	40
7.	Funding Restrictions.....	40
8.	Other Submission Requirements.....	41
F.	APPLICATION REVIEW INFORMATION.....	41
1.	Criteria.....	41
2.	Review and Selection process.....	42
3.	Disclosure of Administrative Processing by Contractor Personnel.....	43
4.	Security Risk Review	44
5.	No Guaranteed Award	47
G.	AWARD NOTICES.....	47
1.	Selection Notices.....	47
2.	Award Notices.....	47
H.	POST-AWARD REQUIREMENTS AND ADMINISTRATION ..Error! Bookmark not defined.	
1.	Administration and National Policy Requirements.....	47
2.	Reporting	50
I.	OTHER INFORMATION.....	52
1.	Ombudsman	52
2.	Grants and Contracting Officer Authority.....	53
3.	Funding Opportunities	53

A. BASIC INFORMATION

1. Federal Awarding Agency Name

Air Force Office of Scientific Research
875 North Randolph Street
Arlington, VA 22203

2. Funding Opportunity Title

Fiscal Year (FY) 2025 “INnovations in Qubit Science for Fault Tolerant Quantum Computing (INQS)”

3. Announcement Type

Initial Announcement. Note that although this is a one-time opportunity, it is anticipated that this could be a recurring funding opportunity.

4. Funding Opportunity Number

NOFOAFRLAFOSR20250004

5. Assistance Listing Number

12.800 Air Force Defense Research Sciences Program

6. Funding Details

AFOSR intends to fund a minimum of eight (8) awards, in the amount of **\$150,000 to \$750,000** per year, for a maximum of five (5) years. The expected value of each award is anticipated to be \$300,000 to \$3,750,000. The total amount of funding and the number of awards is pending on the quality of the proposals and the availability of funds.

7. Key Dates

Pre-proposal inquiries and questions, regarding white papers and the submission of those white papers, must be received in writing by electronic mail to the address(es) listed under section [A.9.a.](#) of this NOFO not later than **24 February 2025** at 11:59 PM **Eastern Time** to be considered. The Government will respond to any pre-proposal inquiries or questions via public posting, or individual responses, no later than COB on **03 March 2025**.

White papers must be received by submitting to <https://community.apan.org/wg/afosr/p/submitawhitepaper> by **17 March 2025** at 11:59 PM **Eastern Time** to be considered. White paper evaluation is meant to initially assess the capability of a proposed effort and is **NOT** a selection process. White papers must be

no more no more than five (5) pages in length. References and CV/bios will not count against the page limit. White papers should minimally articulate:

- a) An initial list of members of the proposed team with a short bio or CV for each (CVs and/or bios will not count against page limit)
- b) The main technical components of the proposed research and how it aligns with the goals of the solicitation.
- c) The specific proposed activities with a demonstrated understanding of the basic science needs.

Government will respond on white paper determination before COB on **04 April 2025**.

Pre-proposal inquiries and questions must be received in writing by electronic mail to the address(es) listed under section [A.9.a.](#) of this NOFO not later than **11 April 2025 at 11:59 PM Eastern Time** to be considered. The Government will respond to any pre-proposal inquiries or questions via public posting, or individual responses, no later than COB on **18 April 2025**.

Proposals must be received electronically through Grants.gov by **12 May 2025 at 11:59 PM Eastern Time** to be considered.

We anticipate that we will notify proposers of selection or non-selection for award no later than **02 June 2025**. We anticipate awards to be made by **28 July 2025**, barring delays.

8. Executive Summary

The **INQS** program is a collaboration between AFOSR and LPS, and we seek revolutionary qubit approaches to quantum computation that have the potential to significantly advance scalable **fault-tolerant quantum computing (FTQC)** beyond current state-of-the-art methods.

This NOFO invites proposals for basic research into solid-state qubits for quantum computing at various stages of maturity. Qubits of interest may support one or more of the required functions in a **FTQC system**. These functions may include, but are not limited to, data processing, memory storage, communication, spectator roles, or measurement.

9. Agency Contact Information

a) Technical Inquires and Questions

You should submit your questions in writing by electronic mail to the Program Officer responsible for your topic(s) of interest from [C. Program Description](#). You should include the NOFO number in the subject line.

The technical contact for this announcement is as follows:

SECTION	PROGRAM OFFICER(s)	EMAIL
C	Dr. Jiwei Lu, AFOSR/RTB	jiwei.lu@us.af.mil

If you submit a question via telephone call, fax message, or any other means, you may not receive a response.

b) General Inquires and Questions

You must send all general questions and inquiries about this announcement by email. Your questions will generally be consolidated with other questions and posted on grants.gov so everyone gets the same information. We may provide an individual response by email if your question does not apply to everyone else.

MS. ALEAH L. PARKER, AFOSR/RBKR1

GRANTS OFFICER

Email: aleah.parker@us.af.mil

B. ELIGIBILITY

1. Eligible Applicants

a) Qualified and Responsible United States and Foreign Educational & Non-Profit Institutions

You are eligible to submit an application if you are a qualified and responsible organization from academia, the non-profit sector, and industry. Academia includes educational institutions in the United States as defined at [10 U.S.C. 2194](#). Educational institution means a local educational agency, college, university, or any other nonprofit institution dedicated to improving science, mathematics, and engineering education. We review your application, proposal, and Office of Management and Budget (OMB) designated repositories of government-wide public and non-public data, including comments you have made, as required by [41 U.S.C. 2313](#) and described in [2 CFR 200.205](#) and [32 CFR 22.410](#) to assess risk posed by applicants, and confirm applicants are qualified, responsible, and eligible to receive an award.

b) HBCU/MI, Tribal College and University Applicants Encouraged

Historically Black Colleges and Universities and Minority Serving Institutions (HBCUs/MSIs) and Tribal Colleges and Universities are encouraged to submit research proposals and join others in submitting proposals. However, no funds under this announcement are reserved or otherwise set-aside for any specific entity type. The Air Force will only use the [F.1. Criteria](#) for proposal selection.

c) University Affiliated Research Centers (UARCs)

University Affiliated Research Centers (UARCs) are eligible to submit proposals under this announcement unless their Department of Defense UARC contract precludes the application.

d) Ineligible Entities

None of the following entity types are eligible to submit proposals as primary award recipients under this announcement

- (i)** Federally Funded Research and Development Centers (FFRDCs)
- (ii)** Individual persons or people
- (iii)** Federal agencies (to include Military Educational Institutions)

2. Cost Sharing

Cost sharing or cost matching is neither required nor an evaluation criterion for proposals under this announcement. You may propose voluntary committed or uncommitted cost sharing or matching, for example, additional support for students. Any voluntary committed cost sharing amount will be included in the total award value.

3. Other

a) Acknowledgment of Support and Disclaimer Requirements

You must include the [H.1.e.](#) Acknowledgment of Research Support on all materials created or produced under our awards. The [H.1.f.](#) Disclaimer Language must be included on materials as required. The award document may provide additional instructions about specific distribution statements to use when you provide research materials to us. You are not eligible to submit a proposal if you cannot accept these terms.

b) Expectation of Public Dissemination of Research Results

We expect research funded by this announcement will be fundamental. We expect public dissemination of research results if you receive an award. This is a basic requirement for unclassified research results. We intend, to the fullest extent possible, to make available to the public all unclassified, unlimited peer-reviewed scholarly publications and digitally formatted scientific data arising from research and programs funded wholly or in part by the DoD as described in the OUSD, AT&L Memorandum, [“Public Access to Department of Defense-Funded Research”](#) dated 09 Jul 2014.

We follow [DoD Instruction 5230.24](#) and [DoD Instruction 5230.27](#) policies and procedures to ensure broad dissemination of unclassified research results to the public and within the Government. [The DoD Instruction 5230.27](#) policy and procedures allowing publication and public presentation of unclassified fundamental research results will apply to all research proposed under this competition unless the Program Officer gives you an explicit, written exclusion to these policies with the Grants or Contracting Officer’s advice and consent. All exclusions must be authorized or required by law and must cite a valid legal authority.

You must provide a copy of all peer-reviewed publications developed or produced from research conducted with Air Force and Space Force funds to our Program Officer.

You are not eligible to submit a proposal if you cannot accept these terms.

c) Disclosure of Conflict of Commitment and Conflict of Interest

This announcement requires that all current and pending research support, as defined by Section 223 of the FY21 National Defense Authorization Act must be disclosed at the time of proposal, for all covered individuals. Such disclosure will be updated annually during the performance of any research project selected for funding, and whenever covered individual are added or identified as performing under this project. Covered Individuals are those who are listed as key personnel on proposals including but not restricted to the principal investigator or co-principal investigator.

Any decision to accept a proposal for funding under this announcement will include full reliance on the applicant's statements. Failure to report fully and completely all sources of project support and outside positions and affiliations may be considered a materials statement within the meaning of the federal False Claims Act and constitute a violation of law.

The funding agency may conduct a pre-award conflict of interest/conflict of commitment review of any proposal selected for funding, as defined in the [National Security Strategy for United States Government-Supported Research and Development](#) (NSPM-33). Offerors are advised that any significant conflict of interest/conflict of commitment identified may be a basis for the rejection of an otherwise awardable proposal.

- (i) General Requirement for Disclosure: You and your organization must disclose any potential or actual scientific or non- scientific Conflict of Interest(s) to us. You must also disclose any potential or actual conflict(s) of interest for any subrecipient you include in your proposal.

You must provide enough information for us to evaluate your disclosure. We may have to ask you more questions if we need more information.

At our discretion, we may ask you for a conflict-of-interest mitigation plan after you submit your proposal. Your plan is subject to our approval.

- (ii) Scientific Conflict of Interest: Scientific collaborations on research and development projects are generally the result of close collaboration prior to the submission of applications for support. Accordingly, virtually all of these collaborations might be considered to include a potential conflict of interest. The potential conflict is mitigated by the disclosure of these collaborations, and the list of current and pending support you provide for senior and key researchers.

C. PROGRAM DESCRIPTION

The Air Force Office of Science and Research (AFOSR) in collaboration with the Laboratory for Physical Sciences (LPS) is soliciting for proposals for research under the Innovations in Qubit Science for Fault-Tolerant Quantum Computing (INQS) program. The topic areas that we seek to support with this NOFO are independent from those described in our open BAA entitled "Research Interests of the Air Force Office of Scientific Research" and do not fall

completely within any one research program. We seek to support multidisciplinary research efforts, creating synergies to speed DoD-relevant research and development.

Basic and applied research is defined in the DoD Financial Management Regulation:

Basic research is systematic study directed toward greater knowledge or understanding of the fundamental aspects of phenomena and of observable facts without specific applications towards processes or products in mind. It includes all scientific study and experimentation directed toward increasing fundamental knowledge and understanding in those fields of the physical, engineering, environmental, and life sciences related to long-term national security needs. It is farsighted high payoff research that provides the basis for technological progress ([DoD 7000.14-R, vol. 2B, chap. 5, para. 050201.B](#)).

Applied research is systematic study to understand the means to meet a recognized and specific need. It is a systematic expansion and application of knowledge to develop useful materials, devices, and systems or methods. It may be oriented, ultimately, toward the design, development, and improvement of prototypes and new processes to meet general mission area requirements. Applied research may translate promising basic research into solutions for broadly defined military needs, short of system development. This type of effort may vary from systematic mission-directed research beyond that in Budget Activity 1 to sophisticated breadboard hardware, study, programming and planning efforts that establish the initial feasibility and practicality of proposed solutions to technological challenges. It includes studies, investigations, and non-system specific technology efforts. The dominant characteristic is that applied research is directed toward general military needs with a view toward developing and evaluating the feasibility and practicality of proposed solutions and determining their parameters. Applied research precedes system specific technology investigations or development. Program control of the applied research program element is normally exercised by general level of effort. Program elements in this category involve pre-Milestone B efforts, also known as Concept and Technology Development phase tasks, such as concept exploration efforts and paper studies of alternative concepts for meeting a mission need ([DoD 7000.14-R, vol. 2B, chap. 5, para. 050201.C](#)).

Detailed descriptions and the government point(s) of contact can be found below. The descriptions are intended to provide the applicant a frame of reference and are not meant to be restrictive to the possible approaches and component solutions to achieving the goals of the topic and the program. Innovative ideas addressing these research topics are highly encouraged.

Proposals from an investigator team from multiple university departments and universities are warranted to assemble the expertise necessary to address the topics. Teams are also highly encouraged to leverage industry collaborations, where appropriate, to demonstrate an ability to develop solutions that can be eventually applied to a specific application. Proposals shall name one Principal Investigator (PI) as the responsible technical point of contact. Similarly, one institution shall be the primary awardee for the purpose of award execution. The PI shall

come from the primary institution. The relationship among participating institutions and their respective roles, as well as the apportionment of funds including sub-awards, if any, shall be described in both the proposal text and budget.

The schedule for this announcement is given in [A.7 Key Dates](#).

(i) **SYNOPSIS**

This program seeks revolutionary qubit approaches to quantum computation that have the potential to significantly advance scalable fault-tolerant quantum computing (FTQC) beyond current state-of-the-art methods.¹

This Notice of Funding Opportunity (NOFO) invites proposals for basic research into solid-state qubits for quantum computing at various stages of maturity. Qubits of interest may support one or more of the required functions in a **FTQC system**. These functions may include, but are not limited to, data processing, memory storage, communication, spectator roles, or measurement. Proposals should clearly address: (1) the function(s) the qubit is expected to serve, (2) how it can be integrated into a plausible **FTQC system**, and (3) its potential to advance toward qubits suitable for FTQC. Furthermore, proposals must align with one of the following themes:

Theme 1: New Qubits

This theme explores completely novel or underdeveloped qubits² that have both a credible research path toward utility in an **FTQC system** and promising advantages over current state-of-the-art methods.¹

Theme 2: Renew Qubits

This theme focuses on applying unconventional approaches—such as novel qubit operation techniques, fabrication methods, or designs—to significantly advance specific qubit functions in state-of-the-art quantum processors¹ for utility in plausible **FTQC systems**.

All proposing teams are required to submit an initial whitepaper to enable feedback from the program officer before full proposal development. Furthermore, proposers are highly encouraged to contact the Program Officer prior to developing this whitepaper to discuss the proposed research, the intended proposal type/theme, and any submission target dates. To initiate the discussion, submit via email a short research summary that describes the approach to be investigated. Following white paper submission and if funding is available, the submission of a full proposal may be either encouraged or discouraged.

Note: This NOFO focuses exclusively on circuit model fault-tolerant quantum computation.

¹ State-of-the-art qubit systems have already demonstrated high-fidelity two-qubit gates ($F > 99\%$), and met the DiVincenzo criteria, which include some superconducting qubit, spin qubit, and atomic systems.

² Underdeveloped qubits are not yet state-of-the-art and have yet to demonstrate high-fidelity multi-qubit operations.

(ii) BACKGROUND

A quantum processor requires quantum coherent elements that perform a range of functions. These functions may be carried out by a single type of qubit or by different types, each optimized for its specific role. Ultimately, the full set of quantum-coherent hardware used for universal quantum computation must collectively meet several key characteristics, known as the DiVincenzo criteria:³ These include scalability, initializability, stability, controllability, and measurability of the qubit system. While data qubits store quantum information, other qubit roles—such as ancilla qubits, memory qubits, and readout qubits—may also be needed to satisfy the DiVincenzo criteria. Though all functions of a quantum processor may be achieved with a single type of qubit, this is not required; a diverse set of qubit types, each adapted to specific functions, is also an option.

For a quantum processor to tolerate errors and be useful for quantum computation, i.e. to be a good candidate for FTQC, quantum error correction protocols are essential. Because these protocols use many physical qubits to encode a single logical qubit, the underlying, and possibly diverse, set of physical qubits must support scalable, and interconnected high-fidelity arrays of qubits. While there is an ever-growing set of quantum error correcting codes (QECs) and methods^{4,5,6} (for example: erasure error detection, bosonic codes, surface codes, etc), these protocols impose unique and stringent quantitative requirements, (e.g. error-correcting thresholds), to ensure reliable performance. **Hence, the underlying quantum hardware in a quantum processor must meet an essential—though not exhaustive—set of criteria necessary to achieve FTQC thresholds, which are:**

FTQC criteria

- *High qubit fidelities* (initialization, control and readout): QEC codes often impose stringent requirements on gate fidelities to achieve fault tolerance.
- *Connectivity*: Better connectivity facilitates a broader implementation of QECs.
- *Mid-circuit measurement*: The ability to measure a subset of qubits without impacting another subset is essential to detection and correction of error.
- *Low cross-talk*: Targeted qubit addressability during initialization, control and readout reduces operational complexity in a many-qubit system.
- *Reliable fabrication*: High probability that qubits will function as designed (predictable qubit parameters) after fabrication.

³ D. P. DiVincenzo, "The Physical Implementation of Quantum Computation", *Fortschritte der Physik*. 48 (9–11): 771–783, 2000

⁴ D. Aharonov, M. Ben-Or, "Fault-Tolerant Quantum Computation with Constant Error Rate". *SIAM Journal on Computing*. 38 (4): 1207–1282, 2008.

⁵ E. Knill, "Resilient Quantum Computation". *Science*. 279 (5349): 342–345, 1998.

⁶ A. Y. Kitaev, "Fault-tolerant quantum computation by anyons". *Annals of Physics*. 303 (1): 2–30, 2003.

- *Reliable and resilient qubits:* High probability that qubits will have stable lifetimes and control parameters, when subject to intrinsic or extrinsic noise.
- *Compatible with achievable environments:* Qubits must be operable in a realistic environment to include thermal environment, noise environment and radiative environment.

While several experimental quantum processors have met the minimal standards to perform basic quantum computing algorithms, implementing error-correcting codes where logical qubits outperform physical qubits for all operations remains elusive. One approach to exceed error-correcting thresholds is to concurrently target the above **FTQC criteria** by incrementally improving current state-of-the-art.¹ An alternative path is to seek a more revolutionary approach that involves pursuing underdeveloped qubit platforms or completely refactoring state-of-the-art methods¹ to target the improvement of one or more of the above **FTQC criteria**.

The goal of this NOFO is to support the latter revolutionary approach to FTQC. Specifically, to find or refactor approaches to quantum processor qubits that can offer substantial advantages over current state-of-the-art methods¹ with respect to one or more of the **FTQC criteria, while simultaneously leaving a path to satisfying the remaining criteria**. In particular, this NOFO is focused on the total functionality of a system of qubits that collectively satisfy the FTQC criteria, i.e. an **FTQC system**. Again, the qubits may be one or more types of qubits which are uniquely optimized to the set of functions required for an **FTQC system**, e.g. data qubits, ancilla qubits, readout qubits, etc.

(iii) **GUIDELINES FOR PROPOSALS**

Proposals submitted to this program must align with one of the following themes. The proposed objectives must be relevant to gate-based, fault-tolerant approaches to quantum computing. Proposals with scope across themes and/or levels will not be considered.

a. Theme 1 - New Qubits:

Proposers must focus on developing and exploring underdeveloped solid-state quantum systems for novel quantum computing modalities that can significantly enhance FTQC capabilities. Proposed platforms must present a distinct and measurable advantage over current state-of-the-art methods¹ in one or more of the **FTQC criteria** listed above by leveraging their unique qualities. Within this theme, proposals shall be submitted to one of three levels based on the maturity of the approach and scope of the research for exploring and developing new qubits. The three levels should be viewed as a means for research topics to progress from concept (**Imagine**) to early demonstration (**Glimpse**), to a level that seeks to rigorously validate a qubit modality (**Benchmark**). It is worth noting here, proposals shall target only one Level within one Theme, each year this NOFO is published. We emphasize that the goal of this theme is to foster novel qubits from theoretical conception to basic qubit benchmarking and multiqubit operation. Consequently, some research topics could mature through all three levels as three serially supported projects. Each of the levels are detailed below.

Level 1 Imagine New Qubits (\leq 2-year efforts):

- **Focus:** Proposals shall focus on **theoretical** analysis, modeling and simulation to predict and propose new qubits.
- **Entrance criteria:** In order to be eligible for an **Imagine** proposal, the proposing team must already have identified discretized states in a microscopic or mesoscopic system which yields a novel property that could, in theory, lead to better qubits with the forementioned advantages with respect to the **FTQC criteria** outlined above whilst potentially remaining competitive with the error rates of state-of-the-art quantum gates. Successful proposals shall detail the analytical or numerical methods that will be employed to demonstrate (1) the function(s) the qubit is expected to serve, (2) how it can be integrated into a plausible **FTQC system**, and (3) its potential to advance toward qubits suitable for FTQC.
- **End goals:** **Imagine New Qubits** projects⁷ shall, by the end of two years, theoretically develop protocols for experimentally validating qubit operation and performance with respect to the function(s) the qubit serves. Moreover, they shall identify potential technical challenges and mitigation plans to experimentally realize single and multiqubit devices that align with the **FTQC criteria**. These technical challenges could be, for instance, dominant sources of noise or difficulties in fabrication. Furthermore, **Imagine** projects that demonstrate a path to overcoming these challenges may be encouraged to submit a **Level 2 Glimpse New Qubits** proposal to a future publication of this NOFO (assuming all **Entrance criteria** are sufficiently addressed).
- **Duration and Budget:** Proposal period-of-performance can be up to 2 years with a budget of approximately \$150,000 per year.

Level 2 Glimpse New Qubits (\leq 3-year efforts):

- **Focus:** Proposals shall focus on **experimental** demonstrations, supported by theoretical direction and analysis, to illustrate the advantages of a conceptualized quantum processor as well as basic demonstrations to illustrate a path to an **FTQC system**.
- **Entrance criteria:** To be eligible for a **Glimpse** proposal, the proposing team must already have theoretically or experimentally identified discretized states which enjoy some novel property that could lead to a better **quantum processor** in the sense of the **FTQC criteria**. Moreover, the proposing team must have theoretically developed protocols for experimentally validating qubit operation and performance with respect to the function(s) the **new qubit** serves. As an example, promising proposals with a strong theory and experimental team that capitalize on encouraging results from a **Level 1 Imagine New Qubits** project (or other similar effort), would be eligible for this support. Proposals must identify potential challenges and solutions towards implementing (1) the function(s) the qubit is expected to serve, (2) how it can be integrated into a plausible **FTQC system**, and (3) its potential to advance toward qubits suitable for FTQC.
- **End goals:** **Glimpse New Qubits** projects⁷ shall, by the end of three years, experimentally study the function(s) the proposed **new qubit** is expected to serve,

⁷ A *project* is defined as a proposal that is selected to, and, participates in the **INQS** program.

identify challenges, and demonstrate a path to overcoming those challenges. A stretch goal shall be to experimentally demonstrate, with high performance, the set of intended function(s) the **new qubit** serves. Furthermore, projects shall aim to extract the major contributing error rates with a plausible path to reduce quantum error rates (single and multi-qubit control, readout, and initialization) such that the envisioned qubit-system is compatible with QEC. By the end of the period-of-performance of a **Glimpse New Qubits** project, major experimental challenges may be identified. However, efforts that have a viable path to overcoming these issues supported by detailed error analysis, experimental and theoretical evidence, and in a manner compatible with satisfying the **FTQC criteria**, may be encouraged to submit a **Level 3 Benchmark New Qubits** proposal (assuming all **Level 3 Entrance criteria** are sufficiently addressed).

- **Duration and Budget:** Proposal period-of-performance can be up to 3 years with a budget of up to \$500,000 per year.

Level 3 Benchmark New Qubits (≤ 5-year efforts):

- **Focus:** Proposals shall **experimentally** demonstrate the function(s), error budgets, backed by theoretical modeling, and measure gate fidelity benchmarks in systems of two or more qubits through rigorous experiments and modeling, while simultaneously demonstrating the aforementioned advantageous properties of the **new qubit** with respect to the **FTQC criteria**.
- **Entrance criteria:** In order to be eligible for a **Benchmark** proposal, the proposing team must already have demonstrated experimental functionality in service to the **FTQC system** and an advantage(s) with respect to the **FTQC criteria** of novel qubits, though major challenges in a high fidelity multiqubit universal gates may still need to be overcome. However, a path to overcome those challenges shall be described in the proposal. As an example, promising proposals with a clear plan to overcome challenges observed in a completed or ongoing **Level 2 Glimpse** project (or other source/proposal), would be eligible for this support. Proposals must identify potential challenges and solutions towards (1) partial integration of the **new qubit** with qubits of complimentary functionality for a plausible **FTQC system** and (2) benchmarking multiqubit operation of the qubits functionality. For instance, if the **new qubit** is intended for memory, a successful proposal must plan to (1) integrate the **new qubit** with conventional data processing qubits and (2) benchmark the coherence time of the new memory qubit. It should be noted that a clear and credible path to a ten-qubit high fidelity device shall be presented in the proposal, however, demonstrations beyond two qubits are not required.
- **End goals:** By the end of five years a **Benchmark** project⁷ shall demonstrate multi-qubit coherent interactions and characterize the sources of errors and decoherence. Researchers must provide a detailed understanding of the error budgets and propose methods to improve these metrics. At the end of the period-of-performance, either the technology should be mature enough to transition to a program funding state-of-the-art qubits¹ with low error universal quantum gates and low error readout, or other lines of research will be encouraged.
- **Duration and Budget:** Proposals are expected to last up to 5 years with a budget of

up to \$750,000 per year.

Out of Scope for Theme 1: This theme is not intended to support proposals focusing on qubit modalities that have already demonstrated error rates for state-prep and measurement, as well as single and two-qubit gate error rates that are below 1%. Additionally, novel reconfigurations of existing technologies, such as re-designed conventional superconducting materials, will not be prioritized. Such efforts however may be suitable for theme 2 below, focused on “Renew Qubits”. Also out of scope for Theme 1 are approaches noted within the “FURTHER PROPOSAL GUIDANCE” section below.

b. Theme 2 - Renew Qubits:

The Renew qubits theme focuses on developing new fabrication techniques and materials, device redesigns or novel operation techniques for leading solid-state qubits and which could ultimately become standard best practices due to the enablement of certain advantages in the sense of the **FTQC criteria**. As an example, proposing teams to this theme could aim to disrupt current fabrication and design paradigms and either introduce significant improvements in state-of-the-art qubit resilience and performance (e.g. making qubits more resilient to specific sources of noise like cosmic rays or reducing dielectric loss by eliminating deleterious materials from the device stack targeting *high fidelity* and *low crosstalk*), or introduce new functionality (e.g. qubits optimized for communication or environmental sensing and adaptation). In this theme, there are again three levels for proposals, terraced by maturity; **Level 1 Reimagine Qubits** supports theoretical investigations into novel concepts; **Level 2 Glimpse Renewed Qubits** supports early proof-of-concept experimental investigations and **Level 3 Benchmark Enhanced Qubits** focuses on thorough refinement and detailed benchmarking of approaches which have already demonstrated some success.

Level 1 Reimagine Qubits (≤ 2-year efforts):

- **Focus:** Proposals shall focus on **theoretical** analysis, modeling and simulation to predict and propose qubit reimagining current state-of-the-art qubits.¹
- **Entrance criteria:** In order to be eligible for a Reimagine project, the proposing team must have identified the limitations of current state-of-the-art qubits¹ with-respect-to simultaneously satisfying all the above **FTQC criteria**. Successful proposals shall detail past theoretical or experimental analyses to understand these limitations, describe how their refactoring scheme could overcome them, and detail the theoretical methodologies by which they will analyze, model and/or simulate their idea. Furthermore, the proposal must explicitly state (1) the functionality of the **renewed qubit** in an **FTQC system**, (2) how it is expected to be integrated into an **FTQC system**, and (3) how, quantitatively, this **renewed qubit** is expected to improve state-of-the-art qubits.
- **End Goals:** By the end of two-years a **Reimagine Qubits** project⁷ shall have simulated or otherwise theoretically analyzed both the positive and negative impacts of the approach with-respect to satisfying the **FTQC criteria**. Projects in which the theoretical refactor of the **renewed qubit** are predicted to have the intended positive outcomes for a plausible **FTQC system** and there is a route to overcome any potential detrimental effects on the **FTQC criteria**, may be eligible to submit a **Level**

2 Glimpse Renewed Qubits proposal (assuming all **Level 2 Entrance criteria** are sufficiently addressed). If the detrimental effects to the qubit-system are insurmountable and outweigh the positive impacts, the researchers may be discouraged from a **Level 2 Glimpse Renewed Qubits** submission and thus a re-direction would be recommended.

- **Duration and Budget:** Re-imagine proposals can span up to 2 years with a maximum budget of \$150,000 per year.

Level 2 Glimpse Renewed Qubits (≤ 3-year efforts):

- **Focus:** Proposals shall focus on proof-of-concept **experimental** methods or techniques, supported by theoretical direction and analysis, to dramatically improve current state-of-the-art qubits systems¹ with respect to one or more of the **FTQC criteria**.
- **Entrance criteria:** In order to be eligible for a Glimpse proposal, the proposing team must already have reasonable confidence, based on theoretical modeling or data, that an experimental implementation of their **renewed qubit** would yield a qubit-system capable of holistically satisfying the **FTQC criteria**. As an example, promising **Level 1 Reimagine Qubits** projects would satisfy these criteria. Proposals must identify potential challenges on the path to a full implementation and include research plans to study and overcome these challenges. Moreover, proposals must identify potential challenges and solutions towards implementing (1) the function(s) the **renewed qubit** is expected to serve, (2) how it can be integrated into a plausible **FTQC system**, and (3) its potential to advance toward qubits suitable for FTQC.
- **End Goals:** The end goal of a **Glimpse Renewed Qubits** project⁷ is to have successfully, but likely in a proof-of-concept manner, implemented their **qubit** (albeit perhaps without optimizing for all the FTQC criteria simultaneously to-date), or to have discovered some challenges which appear insurmountable. Promising projects in the former category are eligible for **Level 3 Benchmark Enhanced Qubits** proposal while researchers who are part of proposals in the latter category may be encouraged to reformulate their approach.
- **Duration and Budget:** Glimpse proposals can span up to 3 years with a maximum budget of \$500,000 per year.

Level 3 Benchmark Enhanced Qubits (≤ 5 year efforts):

- **Focus:** Proposals shall **experimentally** refine and benchmark the proposed innovative methods or techniques in a state-of-the-art **qubit-system**¹ and in a manner that improves one-or-more of the **FTQC criteria** while simultaneously maintaining performance of the remaining **FTQC criteria**.
- **Entrance criteria:** In order to be eligible for a **Benchmark Enhanced Qubits** project, the proposing team must already have (1) theoretically demonstrated that their **renewed qubit** could improve the performance or functionality of current quantum processors with respect to one-or-more of the **FTQC criteria** and (2) shown an experimental proof-of-concept implementation in their system, albeit with some deleterious effects to-date, which based on previous theoretical analyses, could be overcome, e.g. promising proposals from **Level 2**. Proposals must identify potential

challenges and solutions towards (1) partial integration of the **renewed qubit** with qubits of complimentary functionality for a plausible **FTQC system** and (2) benchmarking multiqubit operation of the **renewed qubits** functionality. For instance, if the **renewed qubit** is intended for memory, a successful proposal must plan to (1) integrate the **renewed qubit** with conventional data processing qubits and (2) benchmark the coherence time of the new memory qubit.

- **End Goals:** The end goal of a **Benchmark Enhanced Qubits** project⁷ is to thoroughly characterize and optimize the **renewed qubit** with respect to the envisioned **FTQC system**, which includes the proposed methods to enhance one-or-more of the **FTQC criteria** (e.g. additional functionality) without making backwards progress on the remaining **FTQC criteria**. Thus, all **FTQC criteria** of a proposed plausible **FTQC system** are expected to be carefully characterized as part of a Benchmark proposal. Realistic modeling and simulation efforts should inform the direction of the proposed research, quantify the expected outcomes, and provide feedback for optimization of experimental results.
- **Duration and Budget:** Benchmark proposals can span up to 5 years with a budget of up to \$750,000 per year. The timeline should be justified based on the scope of the proposed research and its potential impact on qubit technology.

(iv) **FURTHER PROPOSAL GUIDANCE**

- This NOFO is soliciting research proposals to enter INQS program at varied levels of maturity. It is not required for all approaches to enter this program as a **Level 1 (or 2)** project, however, the program is designed to allow promising approaches to incrementally graduate from a proof-of-concept **Level 1 (or 2)** project through to a **Level 3 Benchmark** project. In order to graduate from level to level, proposers must submit a new proposal, following the guidance provided in this document.
- Teams shall propose quantitative yearly milestones addressing the **FTQC criteria**.
- Proposals shall align with one **Level**, in one **Theme**. Proposals with scope across themes and/or levels will not be considered.
- Furthermore, proposals to INQS must roadmap how their approach results in a **FTQC system** specifically addressing the **set of quantum processor criteria required for FTQC** described in the Background section of this NOFO.

(v) **OUT-OF-SCOPE research topics**

- Approaches that are incompatible with the **set of quantum processor criteria required for FTQC** from the Background section of this NOFO.
- Approaches not compatible with gate-based quantum computing.
- Approaches with a known limit to scalability, unless this issue is solved with the proposed approach.
- Evolutionary refinements on mature qubit-system approaches.

(vi) **TECHNICAL DETAILS OF PROPOSED RESEARCH**

A strong proposal should outline, as specifically as possible, the technical details of the

proposed research. In addition, proposals should articulate how research goals align with the research topic being addressed. Because of the breadth of research that spans our challenge categories, it is anticipated that groups that submit proposals will include researchers of diverse technical perspectives and technical backgrounds. Finally, efforts integrating a variety of approaches, with a spectrum ranging from basic to applied, are preferred to those using a single approach, especially as these may provide increased opportunities for technology transfer.

A strong proposal should outline, as specifically as possible, the technical details of the proposed research. In addition, proposals should articulate how research goals align with the research topic being addressed. Because of the breadth of research that spans our challenge categories, it is anticipated that groups that submit proposals will include researchers of diverse technical perspectives and technical backgrounds. Finally, efforts integrating a variety of approaches, with a spectrum ranging from basic to applied, are preferred to those using a single approach, especially as these may provide increased opportunities for technology transfer.

a) Access to DoD Resources

Proposals may request access to AFRL facilities or DoD high performance computing resources in order to conduct the proposed research. Proposals should make this request in accordance with the instructions given in the D.3.d. Project Narrative section of this announcement. If authorized, there is no cost to the research for these resources. Applicants are advised that routine access of educational institution researchers to AFRL buildings and facilities is limited to U.S. citizens. Individuals eligible for access are subject to background checks.

(vii) FEDERAL AWARD INFORMATION

Typical annual funding per grant will range from \$150,000 to \$750,000 per year/per award. Any proposer wishing to submit a proposal outside of this range should discuss their research plan with the relevant Program Officer during the whitepaper phase of this NOFO. The total amount of funding and resources made available to fund a successful proposal may vary based on the quality of proposals received and funds availability.

The anticipated period of performance is 2 to 5 years. Each yearly period will be incrementally funded.

AFOSR reserves the right to select and fund for award all, some, part, or none of the proposals received. There is no guarantee of an award.

Awards are made under the authority of [10 U.S.C. 4001](#) in the form of grants, or cooperative agreements. We rely on discretionary appropriated funds for this program. We select what kind of award instrument we can use based on requirements in the Federal Grant and Cooperative

Agreement Act [31 U.S.C. 6301 – 31 U.S.C. 6308](#). We discuss regulations, terms, and conditions that generally apply to our awards in [Section F. Federal Award](#)

D. APPLICATION CONTENT AND FORMAT

1. Pre-Proposal Inquiries and Questions

You are encouraged to contact the Program Officer listed in section [A.9.a](#). Technical Inquires and Questions before you submit your proposal.

If you need help with general matters, you should contact the individual listed in [A.9.b](#). General Announcement Questions.

Your pre-proposal inquiries and questions should be submitted not later than **11:59 PM Eastern Time on 11 April 2025**. AFOSR may not be able to answer questions received later. This is discussed more in section [E.5.a](#). Submission Dates and Times. The Government will respond to any pre-proposal inquiries or questions, either directly, or via public posting no later than COB on **18 April 2025**.

The Program Officer does not have the authority to make commitments for the government. Grants and Contracting Officers acting within their warranted capacity are the only people authorized to make commitments for the Government.

2. The Application as a Whole

You must submit your proposal electronically through Grants.gov. AFOSR will not accept or evaluate any proposal submitted by any means other than through Grants.gov. AFOSR must receive your proposal before the [E.5.d](#). Proposal Submission Deadline.

You must use the electronic Standard Form (SF) 424 Research and Related (R&R) Form Family, OMB Number 4040-0001. The SF 424 (R&R) Application for Federal assistance form must be your cover page. No pages may precede the SF 424 (R&R).

You must mark your application with the announcement number.

A summary of what is required for a complete proposal is summarized below:

- The forms and attachments in bold text are required with all applications
- *Some applications* require the attachments in *italics*
- *More instructions are provided in D.3.a Component Pieces of the Application*

R&R FORM, OMB No. 4040-0001	FIELD	ATTACHMENT
SF-424 (R&R) Application for Federal Assistance, including an authorized signature	18.	If applicable, SF- LLL Disclosure of Lobbying Activities Per instructions in H.1.c.

R&R Other Project Information Form	7.	Project Summary / Abstract
	8.	Project Narrative
	9.	Bibliography & References Cited
	10.	Facilities and Other Resources
	11.	Equipment
	12.	Other Attachments
R&R Senior / Key Person Profile Form (Expanded)		Biographical Sketch
		Current & Pending Support
R&R Personal Data Form		None
R&R Budget Form		Budget Justification
R&R Subaward Budget Attachments Form		Subaward Budget
R&R Project / Performance Site Locations Form		None

The SF 424 (R&R) must include the signature of an authorized representative from your organization. The signature is affixed electronically by [Grants.gov](https://www.grants.gov) upon submission. You are still required to submit any documentation, including disclosure of any unpaid delinquent tax liability or a felony conviction under any Federal law (see FAR 52.209-11). This signature is considered the signature for the application as a whole.

a) Proposal Format

- (i) Paper Size – 8.5 x 11-inch paper
- (ii) Margins – 1 inch
- (iii) Spacing – Single, 1.5, or 2.0-line spacing
- (iv) Font – Times New Roman or Garamond, 12 point

- (v) Page Limitation – No more than twenty-five (25) single-sided pages. The cover page, table of contents, list of references, letters of support, curriculum vitae and list of on- going and pending research support are excluded from the page limitations. The pages of proposals exceeding the page limit may not be included in the evaluation.
- (vi) Attachments – Electronic Portable Document Format (PDF)
- (vii) Content – As described below

b) Proposal Length

No more than twenty-five (25) single-sided pages. This page count includes the following sections: Project Summary/Abstract, the Project Narrative, and the Bibliography & References. You must not include elaborate brochures, reprints, or presentations beyond those sufficient to present a complete and effective proposal.

AFOSR will not consider more than the maximum number of pages in its evaluation; however, not all pages are counted. This list below is intended to help you understand how to calculate your page count.

NOT INCLUDED IN PAGE COUNT

- SF-424 (R&R) Application for Federal Assistance and all attachments
- R&R Budget and Budget Justification attachments, R&R Other Project Information Form, and all attachments
- R&R Sub award and Budget Justification attachments, R&R Senior/Key Person Profile Form, and all attachments for the personnel
- Documents that support the budget or particular items of cost R&R Project/ Performance Site Locations Form
- Optional R&R Personal Data Form
- Budget related information is not included in the page count because AFOSR cannot make an award unless it can determine the cost of your proposal is reasonable and realistic and complies with [2 CFR 200 Subpart E - Cost Principles](#).
- Not having enough information in your proposal to understand if your costs are reasonable and realistic is the most common reason awards are delayed.

c) Marking Requirements for Confidential or Proprietary Information

You must not include confidential or proprietary information in your proposal. This was also discussed earlier in section C. Program Description. AFOSR will not consider your proposal if you include confidential or proprietary information or place restrictive markings on any part of your proposal. Because your proposal shouldn't include proprietary information, there shouldn't be a need for marking the proposal.

d) Application Form and Proposal Attachment

Your application and proposal attachments must be in electronic file formats. You should use the Portable Document Format (PDF) for your attachments.

DO NOT password protect any attachments.

The website [Adobe Software Compatibility | Grants.gov](#) offers a list of file converters available to convert your documents to the PDF format.

3. Components Pieces of the Application

a) SF-424 (R&R) Application for Federal Assistance Form

The SF 424 (R&R) Application for Federal assistance form must be your cover page. No pages may precede the SF 424 (R&R).

Complete all required fields in accordance with the “pop-up” instructions on the SF 424 (R&R) form. The completion of most fields is self-explanatory. You can turn on Grants.gov “Help Mode” to provide additional instructions for forms. “Help Mode” is turned on by the icon with the pointer and question mark at the top of the form.

Below are AFOSR special instructions for completion of several SF 424 (R&R) form fields in your application:

FIELD	INSTRUCTION
2.	You may leave “Applicant Identifier” blank
3.	You may leave “Date Received by State” and “State Application Identifier” blank
9.	You must list Air Force Office of Scientific Research as the Federal Agency if Grants.gov has not pre-populated this answer
16.	You should check “No.” and “Program is Not Covered by Executive Order 12372”

17.	<p>Select “I Agree” to:</p> <p>Certify that all statements in the proposal, your, and Internal Confidentiality Agreements are true, complete, and accurate to the best of your knowledge.</p> <p>See section H.1 Administrative and National Policy Requirements for more information and links to the full text of these items.</p>
18.	<p>You must attach the completed SF-LLL Disclosure of Lobbying Activities if your grant amount exceeds \$100,000 and have lobbying activity to disclose. See section H.1. Administrative and National Policy Requirements for more information.</p>

b) R&R Other Project Information Form

Complete this form as indicated. You must include all necessary attachments.

FIELD	INSTRUCTION
1, 1a.	You must address all prospective human subject involvement by answering these questions. Additional documentation pursuant to National Policy and U.S. Air Force and Space Force standards is required for all proposals with human use research or involvement.
2, 2a.	You must address all prospective animal research and/or recombinant deoxyribonucleic acid (rDNA) involvement by answering these questions. Additional documentation pursuant to National Policy and U.S. Air Force standards is required for all proposals with animal or rDNA research or involvement.
4a.	For any proposal that has an actual or potential impact on the environment, answer yes and provide the answers and attachments required for fields 4b, 4c, and 4d. Additional documentation in accordance with National Policy and U.S. Air Force and Space Force standards is required for any proposal with an actual or potential impact on the environment.
7.	Attach your D.3.c. Publicly Releasable Abstract
8.	Attach your D.3.d. Project Narrative

9.	Attach your D.3.e. Bibliography and References Cited
10.	Attach a Facilities and Other Resources description document here if you need to supplement your D.3.d.iv. Proposal Narrative facilities and resources section.
11.	You may supplement your D.3.h. Budget Justification by attaching an Equipment Justification here. Do not duplicate information included on your budget justification. If you attach an Equipment Justification, make sure you reference the attachment in your budget justification.
12.	<p>Attach the D.3.i R&R Subaward Budget Attachments Form if applicable and not attached elsewhere. You should have budgets for all subawards proposed attached within this form before attachment.</p> <p>Attach all D.3.j Subaward Budget Justifications as applicable Attach your D.3.i. Data Management Plan here if applicable</p> <p>You may supplement your D.3.h. Budget Justification by attaching quotes for materials and supplies, local travel, etc.</p>

c) Publicly Releasable Project Summary/Abstract

You must attach the Project Summary/Abstract to field 7 of the R&R Other Project Information form.

You must submit the “AFOSR Abstract” as an attachment with the proposal submission, this form is located on the “Related Documents” tab of grants.gov. You must provide a concise abstract of 300 words or less with your proposal (no more than 2000 characters). You must mark this abstract publicly releasable. Your abstract should use terms the public can understand to describe the research objective, technical approach, anticipated outcome, and potential impact of the specific research.

Enter the Project Summary/Abstract on the form as a single block of plain text. Do not use special formatting such as line breaks, tables, or superscript/subscript. Do not use special characters or symbols such as μ , λ , γ , π , &, :, /, \, , “, or ?.

Your abstract header should include the Program Officer's name and office symbol from section [A.9.a.](#) Technical Inquiries and Questions above.

If you receive an award, we must publish your abstract to a searchable

website available to the general public in accordance with Public Law 113-235. The website address is <https://discover.dtic.mil/submit-documents/>.

d) Project Narrative

You must attach the Project Narrative to field 8 of the R&R Other Project Information Form. The narrative must be complete and self-contained to qualify for review.

You must clearly describe your research, including your research objective and approach. Your project narrative will be evaluated using the section [F.1. Criteria](#). You should show strength in as many of the evaluation and selection areas as practicable to demonstrate maximum competitiveness.

You must describe any environmental impacts of your research outside the laboratory in any appropriate narrative section, including how you will ensure compliance with environmental statutes and regulations.

Your narrative should include the following elements:

(i) Statement of Objectives

You must summarize your proposed research on a single page titled “Statement of Objectives.” We may decide to incorporate your statement of objectives into the award as a description of the work instead of incorporating the whole technical proposal. You should use active verbs when you prepare the statement of objectives, e.g., “conduct” research in a subject area, “investigate” a problem, “determine” to test a hypothesis.

(ii) Research Effort

(a) You should describe the research you plan in detail. State the research objectives and approach, and the relationship and comparable objectives to research progress elsewhere. Describe your research team’s knowledge in the field and discuss the nature of the expected results.

(b) The adequacy of this information will influence the overall evaluation in accordance with the criteria and procedures specified in section E. Application Review Information below.

(iii) Principal Investigator (PI) and Senior Personnel Time

(a) You must provide estimate of time the principal investigator and other senior professional personnel will devote to the research. Your estimate must include information pertaining to the proportion of time anticipated devoted to this research, to other research, and to other commitments of time such as sabbatical, extended leave, and teaching duties.

(b) State the number of graduate students for whom each senior staff member is responsible.

(c) If your principal investigator or other key personnel have current, pending, or expected research supported by other sponsors or agencies during the period you seek our support, state the title of the other research, the proportion of time to be devoted to it, the amount of support, name of agency, dates, etc. You must attach a list of Current and Pending Support for each person listed on the D.3.f. R&R Senior / Key Person Profile (Expanded) Form. Each abstract should include research title, objectives, approach, and budget for both present and pending research projects. Send any changes as they become known.

(iv) Your Facilities

(a) Describe the facilities available for performing the proposed research, and any additional facilities or equipment the organization proposes to acquire at its own expense for the work.

(b) Indicate any government-owned facilities that will be used. Indicate any government-owned equipment possessed presently that will be used. The facilities contract number, or in absence of a facilities contract, the specifics of the facilities or equipment, and the number of the award under which they are accountable are required.

(v) Government Furnished Equipment

You may list any special Government-owned property or test equipment required to complete the research. When possible and practicable, give a description or title for each item, the current location, and an estimated cost as applicable. If you do not have information about individual items, group items you require by class and provide an estimate of values.

(vi) High Performance Computing Requirements

You may be eligible to use DoD high performance computing resources at no cost to your research. You should address utilization of this program if you need high performance computing cycles to meet the needs of your research. This program provides access to a range of state-of-the-art high performance computing assets and user training opportunities that can be used in some of our awards; special terms and conditions apply. You can review the details, capabilities, and requirements of the program at www.hpc.mil. Our Program Officers will help you establish an account if your proposal is selected for an award and can answer questions before you submit your proposal.

e) Bibliography & References

You must attach your narrative Bibliography and References to field 9 of the R&R Other Project Information Form.

f) R&R Senior/Key Person Profile (Expanded) Form

You must attach a short biographical sketch and list of significant publications (vitae) for each Senior/Key Person. You must also attach a list of current and pending support as discussed in Principal Investigator (PI) and Senior Personnel Time.

You must list all key persons proposed for the research on the R&R Senior/Key Person Profile (Expanded) Form. Key persons are generally the PI, any Co-PIs, and senior staff. We use this information to evaluate the qualifications of you and your research team.

To evaluate compliance with Title IX of the Education Amendments of 1972 (20 U.S.C. A subsection 1681 Et. Seq.), the DoD is collecting certain demographic and career information to be able to assess the success rates of women who are proposed for key roles in applications in STEM disciplines. To enable this assessment, each applicant must include this form completed as indicated.

The Credential, e.g., agency login field will be used by DoD to track ORCID for each researcher. In addition to the required fields on the form, applicants must complete this field for all individuals that are identified on the form.

The Degree Type and Degree Year Fields will be used by DoD as the source for career information. In addition to the required fields on the form, applicants must complete these two fields for all individuals that are identified as having the project role of PD/PI or Co- PD/PI on the form. Additional senior/key persons can be added by selecting the “Next Person” button.

g) R&R Budget Form

You must provide all information requested. You must estimate the total research project cost. You must categorize funds by year and provide separate annual budgets for projects lasting more than one year. A budget justification must be included.

You must include enough budget related information in your proposal to support your costs as reasonable and realistic, and in compliance with 2 CFR 200 Subpart E - Cost Principles.

Not having enough information in your proposal to understand if your costs are reasonable and realistic is the most common reason awards are delayed.

h) R&R Budget Justification

You must provide a detailed budget justification for each year that clearly explains the need for each item.

The entire budget justification and supporting documentation must be combined into a single file and attached to field L of the R&R Budget Form. The budget narrative submitted with the application must match the dollar amounts on all required forms.

Please explain each calculation and provide a narrative that supports each budget category. This detailed budget justification must match the proposed budget categories. Each year of the budget justification narrative must stand alone; lump sum budget justifications are not allowed. If options are proposed, option detailed budget justifications must stand alone as well, no lump sum justifications allowed.

- (i) You must itemize travel. Estimate the cost and purpose of each trip proposed, the number of trips, the number of travelers, the destination, the duration, and the basis for calculating costs such as airlines and hotels.

Below is a sample of the travel portion:

TRAVEL	Unit	Trips	Travelers	Nights	Days	Unit Cost	Total Travel
Airfare	roundtrip	1	1			\$900.00	\$900.00
Lodging	day	1	1	3		\$75.00	\$225.00
Per Diem	day	1	1		3	\$40.00	\$120.00
Automobile Rental	day	1	1		3	\$45.00	\$135.00
Subtotal Travel		4	4	3		\$1,060	\$1,380.00

- (ii) You must itemize materials/supplies. List all material/equipment by type and kind with associated costs. Indicate what your costs are based on, such as vendor quotes, historical data and/or engineering estimates. You should include vendor quotes and/or catalog pricing data.
- (iii) Proposals including request to purchase equipment must include equipment quotes or vendor agreements. "Equipment" is nonexpendable, tangible personal property with a unit cost of \$10,000 or more having a useful life of more than 1 year, unless determined otherwise by recipient's internal policy. Items that do not meet the "equipment" definition can be included under supplies. List each piece of equipment to be purchased and provide description of how it will be used in the project. Budget narrative should explain why the equipment is necessary for successful completion of the project. Provide quotes in English Language (US Dollars) if available or indicate the basis of equipment cost. If you have any subaward(s), you should describe how you determined subaward costs were determined fair and reasonable. Your business office usually makes this determination.

- (iv) DHHS/ONR Rate Agreement: If you use a government rate agreement to propose indirect cost rates, fringe benefit rates, and/or tuition remission rates, you must attach a signed DHHS or ONR copy of the agreement you used to not delay the negotiation process.
- (v) Helpful Cost Principle Reference Information
 - (a) 2 CFR 200, Subpart E – Cost Principles
 - (b) General Provisions for Selected Items of Cost in 2 CFR 200.420 through 2 CFR 200.475
- i) R&R Subaward Budget Attachment Form**
 You must attach all subaward budgets to field 12 of the R&R Other Project Information Form.
 You must provide a budget at the same level of detail as your D.3.g. Prime budget for each proposed subaward. A subaward budget justification must be attached.
- j) Subaward Budget Justification**
 You must attach all subaward budget justifications to field 12 of the R&R Other Project Information Form.
 You must provide a subaward budget justification at the same level of detail as your D.3.h. prime budget justification for each proposed subaward.
- k) R&R Project/Performance Site Locations Form**
 You must complete all information as requested. You must include the ZIP+4 for each performance location you list.
- l) Data Management Plan**
 A data management plan is a document that describes which data generated through the course of the proposed research will be shared and preserved and how this will be done, explains why data sharing or preservation is not possible or scientifically appropriate, or why the costs of sharing or preservation are incommensurate with the value of doing so. See also: [DoD Instruction 3200.12](#). Your Data Management Plan should be attached to field 12 of the R&R Other Project Information Form.
 Your “Data Management Plan” should be two (2) pages or less in length and discuss:
 - (i) The types of data, software, and other materials to be produced in the course of the project and include a notation marking items that are publicly releasable.
 - (ii) How the data will be acquired.
 - (iii) Time and location of data acquisition if they are scientifically pertinent.

- (iv) How the data will be processed.
- (v) The file formats and the naming conventions that will be used.
- (vi) A description of the quality assurance and quality control measures during collection, analysis, and processing.
- (vii) If existing data are to be used, a description of their origins.
- (viii) A description of the standards to be used for data and metadata format and content.
- (ix) Plans and justifications for archiving the data.
- (x) The timeframe for preservation.
- (xi) If for legitimate reasons the data cannot be preserved, the plan must include a justification citing such reasons.

m) R&R Personal Data Form

To evaluate compliance with Title IX of the Education Amendments of 1972 (20 U.S.C. A subsection 1681 Et. Seq.), The DoD is collecting certain demographic and career information to be able to assess the success rates of women who are proposed for key roles in applications in STEM disciplines. To enable this assessment, each applicant must include this form completed as indicated.

This form will be used by DoD as the source of demographic information, such as gender, race, ethnicity, and disability information for the Project Director/Principal Investigator and all other persons identified as Co-Project Director(s)/Co-Principal Investigator(s). Each application must include this form with the name fields of the Project Director/Principal Investigator and any Co-Project Director(s)/Co-Principal Investigator(s) completed; however, provisions of the demographic information in the form is voluntary. If completing the form for multiple individuals, each Co-Project Director/Co-Principal Investigator can be added by selecting the “Next Person” button. The demographic information, if provided, will be used for statistical purposes only and will not be made available to merit reviewers. Applicants who do not wish to provide some or all this information should check or select the “Do not wish to provide” option.

4. Information You Must Submit If Selected for Possible Award

We may request additional necessary information from you during negotiations, or as required for award considerations. ***You must respond promptly.***

If you do not fully comply with our information requests by the time we are ready to make an award, we may determine that you are not qualified to

receive an award and use that determination as a basis for making an award to another applicant.

If your proposal includes human, animal, or rDNA research or involvement you must submit all documentation requested during negotiations or you may not receive an award.

Foreign recipients must complete a payment information form to receive wire transfer payments. This form will be requested if selected for award.

E. SUBMISSION REQUIREMENTS AND DEADLINES

1. Address to Request Application Package

All the application forms you need are available electronically on Grants.gov. From the “View Grant Opportunity” page, you can click on the “Application Package” tab to download the application package.

You can find the electronic application package on Grants.gov by searching for the announcement number shown on page one. Paper copies of this announcement will not be issued.

Please contact us at afosr.baa@us.af.mil to request a reasonable accommodation for any accessibility requirements you may have.

2. Unique Entity Identifier and System for Award Management (SAM)

a) SAM Registration Required

As required in [2 CFR 25.110](#) all applicants, unless exempted, must:

- (i) Be registered in [SAM.gov](#) before submitting its application.
- (ii) Provide a valid UEI; and
- (iii) Continue to maintain an active SAM registration with current information at all times any Federal award is active, or any application is under consideration by a federal awarding agency.

A Commercial and Government Entity (CAGE) code is obtained or specified as part of the SAM registration process. A CAGE code is required.

b) SAM Exemption or Exceptions Not Available Under This Announcement

We will not issue an Agency level exemption to SAM registration under [2 CFR 25.110\(a\)\(1\)](#) for applicants under this announcement. You must comply with SAM registration requirements and include a UEI and CAGE code on your application or we cannot make an award.

Questions about SAM Registrations and Updates

You can get questions about SAM registration and entity updates answered by live chat at https://www.fsd.gov/gsafsd_sp and telephone at (866) 606-8220.

c) Consequences of Non-Compliance with SAM Registration Requirements

We cannot make an award to you unless you comply with SAM requirements. If you are non-compliant, we may determine you are not qualified to receive an award and use that determination to make an award to someone else as authorized by [2 CFR 25.205\(b\)](#). You cannot receive payments without an active SAM record and CAGE.

3. Submission Instructions & Grants.gov Application Registration

This section provides the application submission and receipt instructions for AFOSR program applications. Please read the following instructions carefully and completely.

a) Electronic Delivery

AFOSR is participating in the Grants.gov initiative to provide the grant community with a single site to find and apply for grant funding opportunities. AFOSR encourages applicants to submit their applications online through Grants.gov.

b) How to Register to Apply through Grants.gov

Instructions: Read the instructions below about registering to apply for AFOSR funds. Applicants should read the registration instructions carefully and prepare the information requested before beginning the registration process. Reviewing and assembling the required information before beginning the registration process will alleviate last-minute searches for required information.

The registration process can take up to four weeks to complete. Therefore, registration should be done in sufficient time to ensure it does not impact your ability to meet required application submission deadlines.

If individual applicants are eligible to apply for this grant funding opportunity, refer to: <https://www.grants.gov/applicants/applicant-registration>

Organization applicants can find complete instructions here:

<https://grants.gov/applicants/applicant-registration/>

- (i) ***Obtain an ORCID for all key personnel.*** All individuals listed on the Senior/Key Person form must have an Open Researcher and Contributor ID (ORCID).

As of September of 2024, the DoD is requiring all proposers to include a digital persistent identifier (DPI) for each senior or key person listed in a proposal. The DoD will require proposers to include the ORCID number for each senior or key person listed in a proposal for an assistance award for R&D. ORCID numbers will be used since ORCID is currently the only

DPI provider that meets the requirements for DPI common or core standards in the NSTC NSPM-33 implementation guidance. For more detailed instructions for obtaining an ORCID number, refer to: How do I register for an ORCID ID? – ORCID

- (ii) **Obtain a UEI Number:** All entities applying for funding, including renewal funding, must have a Unique Entity Identifier (UEI). As of April of 2022, the federal government stopped using the DUNS number to uniquely identify entities registered in the System for Award Management (SAM). At that point, entities doing business with the federal government will use a Unique Entity Identifier (UEI) created in SAM.gov. They will no longer have to go to a third-party website to obtain their identifier. Active registrants will have their UEI assigned and viewable within SAM.gov; there is no action for registered entities to take at this time. This transition allows Federal Agencies to streamline the entity identification and validation process, making it easier and less burdensome for entities to do business with the federal government.

For more detailed instructions for obtaining a UEI number, refer to:
<https://sam.gov/content/entity-registration>.

- (iii) **Register with SAM:** In addition to having a UEI number, organizations applying online through Grants.gov must register with the System for Award Management (SAM). All organizations must register with SAM in order to apply online. Failure to register with SAM will prevent your organization from applying through Grants.gov.

For more detailed instructions for registering with SAM, refer to:
<https://sam.gov/content/entity-registration>

- (iv) **Create a Grants.gov Account:** The next step in the registration process is to create an account with Grants.gov. Applicants must know their organization's UEI number to complete this process. Completing this process automatically triggers an email request for applicant roles to the organization's E-Business Point of Contact (EBiz POC) for review. The EBiz POC is a representative from your organization who is the contact listed for SAM. To apply for grants on behalf of your organization, you will need the Authorized Organizational Representative (AOR) role. For more detailed instructions about creating a profile on Grants.gov, refer to: <https://grants.gov/applicants/workspace-overview>

- (v) **Authorize Grants.gov Roles:** After creating an account on Grants.gov, the EBiz POC receives an email notifying them of your registration and request for roles. The EBiz POC will then log in to Grants.gov and authorize the appropriate roles, which may include the AOR role, thereby giving you permission to complete and submit applications on behalf of the organization. You will be able to submit your application online any time after you have been approved as an AOR.

For more detailed instructions about creating a profile on Grants.gov, refer to: <https://grants.gov/applicants/workspace-overview>

Track Role Status: To track your role request, refer to: <https://grants.gov/applicants/applicant-registration/track-profile-role-status>

- (vi) **Electronic Signature:** When applications are submitted through Grants.gov, the name of the organization's AOR that submitted the application is inserted into the signature line of the application, serving as the electronic signature. The EBiz POC must authorize individuals who are able to make legally binding commitments on behalf of the organization as an AOR; **this step is often missed, and it is crucial for valid and timely submissions.**

4. Application Submission and Receipt Procedures

This section provides the application submission and receipt instructions for AFOSR program applications. Please read the following instructions carefully and completely.

a) How to Submit an Application to AFOSR via Grants.gov

Grants.gov applicants can apply online using Workspace. Workspace is a shared, online environment where members of a grant team may simultaneously access and edit different web forms within an application. For each funding notice of opportunity announcement (NOFO), you can create individual instances of a workspace.

Below is an overview of applying on Grants.gov. For access to complete instructions on how to apply for opportunities, refer to: [Submit Application | Grants.gov](#)

b) Create a Workspace

Creating a workspace allows you to complete it online and route it through your organization for review before submitting.

c) Complete a Workspace

Add participants to the workspace, complete all the required forms, and check for errors before submission.

- 1) Adobe Reader: If you decide not to apply by filling out web forms you can download individual PDF forms in Workspace so that they will appear similar to other Standard or administering agency forms. The individual PDF forms can be downloaded and saved to your local device storage, network drive(s), or external drives, then accessed through Adobe Reader.

NOTE: Visit the Adobe Software Compatibility page on Grants.gov to download the appropriate version of the software at: [Adobe Software Compatibility | Grants.gov](#)

- 2) Mandatory Fields in Forms: In the forms, you will note fields marked with an asterisk and a different background color. These fields are mandatory fields that must be completed to successfully submit your application.
- 3) Complete SF-424 Fields First: The forms are designed to fill in common required fields across other forms, such as the applicant name, address, and UEI number. To trigger this feature, an applicant must complete the SF-424 information first. Once it is completed, the information will transfer to the other forms.

d) Submit a Workspace

An application may be submitted through workspace by clicking the Sign and Submit button on the Manage Workspace page, under the Forms tab. Grants.gov recommends submitting your application package at least 24-48 hours prior to the close date to provide you with time to correct any potential technical issues that may disrupt the application submission.

e) Track a Workspace

After successfully submitting a workspace package, a Grants.gov Tracking Number (GRANTXXXXXXXX) is automatically assigned to the package. The number will be listed on the Confirmation page that is generated after submission.

For additional training resources, including video tutorials, refer to:

<https://www.grants.gov/applicants/applicant-training.html>

Applicant Support: Grants.gov provides applicants 24/7 support via the toll-free number 1- 800-518-4726 and email at support@grants.gov. For questions related to the specific grant opportunity, contact the number listed

in the application package of the grant you are applying for.

If you are experiencing difficulties with your submission, it is best to call the Grants.gov Support Center and get a ticket number. The Support Center ticket number will assist the administering agency with tracking your issue and understanding background information on the issue.

5. Submission Dates and Times

- a) Pre-Proposal Inquiries and Question Deadline:** You must submit all white papers pre-proposal inquiries and questions not later than **24 February 2025** at 11:59 PM Daylight Time. Responses will be emailed by **03 March 2025** at 11:59 PM. You should submit your questions in writing by electronic mail. You should include the announcement number in the subject line.

Our replies will be provided as soon as practicable. We estimate all our answers will be provided not later than **03 March 2025**.

If there are other pre-proposal inquiries or questions, that do not pertain to white papers, those should be submitted, by electronic mail, no later than **11 April 2025** at 11:59 Eastern Time. Responses will be provided publicly, via Grants.gov, by **18 April 2025**. The purpose of providing the response publicly is so everyone has the same information. If the particular inquiry or questions requires a specific response, it will be provided by **18 April 2025**, by close of business.

b) How Pre-Proposal Inquires and Question Time is Determined

AFOSR uses the date and time stamp on your email to determine when you submitted pre- proposal correspondence. These emails should be directed to the contact listed at the end of this NOFO for general inquiries and questions (aleah.parker@us.af.mil)

c) Effect of Missing Pre-Proposal Inquiries and Questions Deadline

AFOSR will not provide responses or answers to late inquires or questions.

d) Proposal Submission Deadline

AFOSR must receive your white paper by **17 March 2025 at 11:59 PM Eastern** time for it to be considered.

AFOSR must receive your validated proposal electronically through Grants.gov not later than **12 May 2025 at 11:59 PM Eastern time** to be considered for selection. This is the final due date. AFOSR recommends that you submit applications early.

You are responsible for making sure your application is submitted, received, and validated by Grants.gov before the application deadline. If you submit your application late, your proposal is not eligible for consideration.

Timely Receipt Requirements and Proof of Timely Submission

Online Submission: All applications must be **validated** by Grants.gov by **12 May 2025 at 11:59 PM Eastern Time**. Proof of timely submission is automatically recorded by Grants.gov. The applicant AOR will receive an acknowledgement of receipt and a tracking number (GRANTXXXXXXXX) from Grants.gov with the successful transmission of their application. Applicant AORs will also receive the official date/time stamp and Grants.gov tracking number in an email.

A second confirmation is provided by email when your application has passed Grants.gov validation and the status is updated from received to validated. **Your application is not complete until you receive the validation confirmation.** Your submission must be validated before the submission deadline.

When the administering agency successfully retrieves the application from Grants.gov, and acknowledges the download of submissions, Grants.gov will provide an electronic acknowledgement of receipt of the application to the email address of the applicant with the AOR role.

Applications received by Grants.gov after the established due date will be counted as late and will not be considered for funding by the administering agency.

Applicants using slow internet, such as dial-up connections, should be aware that transmission can take some time before Grants.gov receives your application. Again, Grants.gov will provide either an error or a successfully received transmission in the form of an email sent to the applicant with the AOR role. The Grants.gov Support Center reports that some applicants end the transmission because they think that nothing is occurring during the transmission process. Please be patient and give the system time to process the application.

e) How Proposal Submission Time is Determined

AFOSR uses the system-generated Grants.gov time stamp to determine when you submitted your successfully validated proposal. Grants.gov policies and procedures for application submission and processing apply. ***AFOSR will only accept applications submitted electronically through Grants.gov.***

f) Grants.gov Tracking Number is Application Receipt

Grant.gov generates a confirmation page when you submit your application. A second confirmation is provided by email when your application has passed Grants.gov validations and the status is updated from received to validated.

The confirmation page includes a system-generated Grants.gov tracking number; this serves as your receipt. You should keep a copy of all confirmations.

You can verify the submission time and application status with your tracking number through Grants.gov at [Track My Application | Grants.gov](#).

g) Effect of Missing the Proposal Submission Deadline

Grants.gov will not accept your proposal after the submission deadline. AFOSR will not accept proposals submitted other than electronically through Grants.gov.

6. Intergovernmental Review

N/A - This program is excluded from coverage under Executive Order (E.O.) 12372.

7. Funding Restrictions

a) Proposal Preparation Costs

Your proposal or application preparation costs are not considered an allowable direct charge to any award under this announcement. Your costs are, however, an allowable expense to the normal bid and proposal indirect cost as specified in [2 CFR 200.460 Proposal costs](#).

b) Pre-Award Costs

You must request our prior approval if you need more than ninety (90) days pre-award cost authorization as described in [2 CFR 200.308\(e\)\(1\)](#) and [2 CFR 200.458](#). **Your business office must provide this request in writing.**

You must document why pre-award costs are necessary and essential for the research in the request and identify a specific date for our Grants Officer to consider. We will only consider approval of a specific date of more than ninety (90) days pre-award costs before an award is made.

Our grants include up to ninety (90) calendar days pre-award costs; however, the actual date costs become allowable is not final until an award is made and an effective date established. We recommend you ask for a specific date as described above to prevent misunderstandings.

All costs incurred before a grant or cooperative agreement award are at the recipient's risk as described in [2 CFR 200.308\(e\)\(2\)](#). We are under no obligation to reimburse your costs if for any reason you do not receive an award, or if your award is less than anticipated and inadequate to cover your

pre-award costs.

c) Air Force Office of Scientific Research No-Cost Extension (NCE) Policy

We require prior written approval to extend the period of performance, whether with or without additional funds, beyond the expiration date of the grant. We only grant no-cost extensions when they are truly warranted and properly documented. For an extension to be granted, all NCE requests must be received at least thirty (30) days prior to the expiration of the grant's period of performance.

All Principal Investigators (PIs) business offices must submit NCE requests through the following website:

https://community.apan.org/wg/afosr/p/nce_request. AFOSR will no longer accept NCE requests via email. All requests that are submitted through other avenues will have to be re-routed through the above website.

The NCE request must include:

- (i) Request letter from the business office on University's or Institute's letterhead.
- (ii) Compelling reason(s) for the extension beyond using unexpended balances.
- (iii) Original end date and requested extension length.
- (iv) SF-425 Federal Financial report showing the unexpended funds remaining or the most recent SF-270 Request for Advance or Reimbursement
- (v) Statement indicating all required previous annual reports have been provided to AFOSR.

In no event will the period of performance be extended merely for the purpose of using unexpended balances. Every effort should be made to ensure work is completed on time.

8. Other Submission Requirements

If Grants.gov rejects your electronic application submission for any reason, you must correct all errors and resubmit your application before the [E.5.d](#). Proposal submission deadline.

F. APPLICATION REVIEW INFORMATION

1. Criteria

You should show strength in as many of the evaluation and selection areas as practicable to demonstrate maximum competitiveness.

a) Principal Evaluation and Selection Criteria

The two (2) principal selection criteria are specified in 32 CFR 22.315(c). The principal selection criteria are of equal importance to each other. The combined

principal selection criteria are more important than the additional evaluation and selection criterion. The principal selection criteria are:

- The technical merits of the proposed research.
- Potential relationship of the proposed research and development to Department of Defense missions. This will be assessed based on the merits of the proposed collaboration plan and the potential for transition to AFRL development efforts.

b) Additional Evaluation and Selection Criteria

An additional evaluation criterion is shown below. This criterion is less important than the combined principal selection criteria.

The applicant, principal investigator, team leader, and key personnel qualifications, capabilities, related experience, facilities, and research techniques considered individually and in combination that are integral to achieving DoD objectives for this program.

No further criteria or criterion will be used for proposal selection.

Notwithstanding this, an otherwise awardable proposal may still be rejected due to conflicts of interest or conflicts of commitment, as described in Section B. of this NOFO relating to Eligibility.

2. Review and Selection Process

a) Merit based, Competitive Procedures

Proposals will be subjected to a peer or programmatic review. The peer review will use internal and/or external reviewers to assess technical merit and Air Force relevance of the proposal.

The programmatic review assesses the technical quality of the proposal, relevance of the proposed research to the portfolio descriptions in this NOFO, relevance of the work to Air Force and DoD needs, and the potential of the research balanced against the available funding resources of a given portfolio. Selection for award consideration will be made based on the outcome of these reviews.

AFOSR anticipates selecting proposals for possible funding on a competitive basis according to 10 USC 2361, and 10 USC 2374 using the merit-based, competitive procedures described in 32 CFR 22.315, incorporated here by reference.

You should show strength in as many of the evaluation and selection areas as practicable to demonstrate maximum competitiveness.

b) Cost Analysis for Reasonableness and Realism

If your proposal is selected for possible award, AFOSR will analyze the cost of the work for realism and reasonableness. The cost of your proposal is considered but is not an evaluation factor or criterion.

AFOSR must make sure the costs you propose are reasonable, realistic, and allocable to this work before AFOSR can make an award. All costs must be allowable to be reasonable. AFOSR may analyze your technical and cost information at the same time.

3. Disclosure of Administrative Processing by Contractor Personnel

AFOSR use support contractor personnel to help it with administrative proposal processing. The contractor personnel are employees of commercial firms that have a contract with AFOSR. AFOSR makes sure all of its support contracts include nondisclosure agreements that prohibit disclosure of any information you submit to other parties.

4. Security Risk Review

a) Security Risk Review

Each proposal submission will be subject to a Security Risk Review prior to selection for award. The Security Risk Review is applied to federally funded research designed to help protect Department of the Air Force Science and Technology (S&T) by identifying possible vectors of undue foreign influence. AFRL will follow all policy and procedures outlined in Air Force Research Laboratory (AFRL) Instruction AFRLI 61-113, Science and Technology Protection for the Air Force Research Laboratory and Department of the Air Force Instruction DAFI 63-101/20-101, Integrated Lifecycle Management.

b) Security risk review for these subject proposals will be developed for all proposed Senior/Key personnel and “Covered Individuals”

These risk reviews will be based on information disclosed in a Research and Related Senior and Key Person Profile and Security Questionnaire. In addition, any accompanying or referenced documents, publicly available information, and information contained in internal U.S. Government databases will be utilized in risk reviews. Nationality or citizenship is not a factor in the security risk reviews.

c) External Engagements

When considering all external engagements, AFRL incorporates a holistic decision-making process that encompasses technical and security factors. The security review method implemented by AFRL measures risk factors to identify the appropriate Risk Acceptance Level (RAL) within the organization. The objective analysis of the security risk factors is conducted to empower AFRL’s S&T leaders to make risk-informed decisions. The review process generally looks at five factors, or risk areas, but with authority for expanded review as noted in OSD R&E Memorandum dated 6 Jun 2023. The potential security risk factors are set forth below:

Potential security risk factors:

(1) Foreign Talent Program	(2) Funding	(3) Foreign Institutions	(4) Denied Entities	(5) U.S. Government Systems
Indicators of active and past participation or sponsorship in a strategic competitor Foreign Talent Program with history of targeting U.S. research or technology.	Indicators of active, historical, or pattern of conflict of interest, conflict of commitment, or pattern of direct funding from a strategic competitor or country with history of targeting U.S. research or technology.	Indicators of active, historical, or pattern of association with direct affiliation, collaboration with a foreign institution, person, or entity associated with a strategic competitor or country with history of targeting U.S. research or technology.	Indicators of an active affiliation or past affiliation or present association with an entity on the U.S. Gov’t denied entity or person list or EO 13959 or subsequent similar issuances	Indicators that may reside in safeguarded U.S. government environments, according to its ascribed classification and not releasable for public consumption.

d) Actions Required by Applicants/Recipients at Proposal Submission

- (i) In accordance with AFRLI 61-113, S&T Protection, Applicants/Recipients are required to submit the following documentation with their proposal:
 - a) Standard Form 424, “Research and Related Senior and Key Person Profile (Expanded) (See Appendix 1), AND;
 - b) Security Program Questionnaire (See Appendix 2), AND;

- c) “Privacy Act Statement” consent form for each Covered Individual that is also signed by the Applicants/Recipients as the Individual’s Sponsors (See “Covered Individual” section below and Appendix 4)
- (ii) In the event a security risk is identified, and the Government has determined the security risk exceeds the acceptable threshold, the Applicant/Recipient will be notified and informed of the decline of award. **The Government will only provide a general statement of the reasoning due to Government OPSEC measures.**
- (iii) By submission of the Research and Related Senior Key Person Profile and Security Program Questionnaire, the Applicant/Recipient agrees to comply with the following:
 - a) To certify that each covered individual who is listed on the application has been made aware: 1) of all relevant disclosure requirements, including the requirements of 42 U.S.C. § 6605; and 2) that false representations may be subject to prosecution and liability pursuant to, but not limited to, 18 U.S.C. §§287, 1001, 1031 and 31 U.S.C. §§ 3729-3733 and 3802. See National Science and Technology Council Guidance for Implementing National Security Presidential Memorandum 33 (NSPM-33) on National Security Strategy for United States Government-Supported Research and Development (January 2022).
 - b) To establish and maintain an internal process or procedure to address foreign talent programs, conflicts of commitment, conflicts of interest, and research integrity.
 - c) To exercise due diligence to identify Foreign Components or participation by Senior/Key Personnel in Foreign Government Talent Recruitment Programs and agree to share such information with the Government upon request.
- e) **Actions Required by Covered Individuals.**
 - (i) Covered Individual. An individual who contributes to a substantive, meaningful way to the scientific development or execution of a research and development project proposed to be carried out with a research and development award from a federal research agency; and is designated as a covered individual by the federal research agency concerned. See 42 U.S.C. § 6605, Definitions. (Note: For purposes of a Notice of Funding Opportunity (NOFO) solicitation, “covered individuals” are all Senior/Key Personnel.)
 - (ii) Federal law requires that all current and pending research support, as defined by 42 U.S.C. §6605, must be disclosed at the time of proposal submission, for all covered individuals. The Government may require an updated disclosure during the performance of any research project selected for funding. The Government will require an updated disclosure whenever covered individuals are added or identified as performing under the funded project.
 - (iii) Covered Individuals are also required to sign the “Privacy Act Statement” and

provide such signed statement to the Applicant/Recipient for submission with the proposal. (See Appendix 4).

- (iv) Any decision to accept a proposal for funding under this announcement will include full reliance on the individual's statements. Failure to report fully and completely all sources of project support and outside positions and affiliations may be considered a material statement within the meaning of the False Claims Act, 31 U.S.C. 3729, and constitute a violation of Federal law.

f) Actions Required by Applicants/Recipients During Period of Performance

- (i) Applicant/Recipient will be required to re-submit the Research and Related Senior and Key Person Profile as an annual requirement. In addition, whenever a new covered individual(s) is to be added or identified as performing under the funded project, a new Research and Related Senior and Key Person Profile will be required prior to continued performance.
- (ii) If, at any time, during performance of this award, the Applicant/Recipient learns that its Senior/Key Research Personnel (including any sub awardee personnel who receive this designation) are or are believed to be participants in a Foreign Government Talent Program or have Foreign Components with a strategic competitor or country with a history of targeting U.S. technology for unauthorized transfer, the Applicant/Recipient will notify the Contracting/Grants/Agreements Officer within five (5) business days of awareness.
- (iii) This disclosure must include specific information as to the personnel involved and the nature of the situation and relationship. The Government will review this information and conduct any necessary fact-finding or discussion with the Applicant/Recipient. The Government's determination on disclosure may include acceptance, mitigation, or termination of the award.
- (iv) Failure of the Applicant/Recipient to reasonably exercise due diligence to discover or ensure that neither it nor any of its Senior/Key Research Personnel involved in the subject award are participating in a Foreign Government Talent Program or have a Foreign Component with a strategic competitor or country with a history of targeting U.S. technology for unauthorized transfer may result in the Government exercising remedies in accordance with federal law and regulation.
- (v) The Applicant/Recipient will be required to flow down this provision to all sub awardees who have personnel designated as Senior/Key Research Personnel as a result of their involvement in the performance of the research.

5. No Guaranteed Award

AFOSR does not guarantee that any award will be made under this competition.

G. AWARD NOTICES

1. Selection Notices

a) Electronic Notification

If your proposal is selected for possible award, an email will be sent to the principal investigator.

b) Selection for Possible Award Does Not Authorize Work

Our selection notice is not an authorization to start work and is not an award guarantee. AFOSR will contact your business office to get answers to any questions it has about your proposal and negotiate specific award terms. Negotiations may result in funding levels that are less than those in the proposal.

2. Award Notices

a) Federal Award Document

A grant or contract signed by a warranted Grants or Contracting Officer is the only official notice that an award has been made.

b) Electronic Federal Award Distribution

AFOSR sends award documents to your business office by email. This is called award distribution. AFOSR always ask your business office to forward the award to the Principal Investigator indicated on the award document.

H. POST-AWARD REQUIREMENTS AND ADMINISTRATION

1. Administration and National Policy Requirements

a) Reporting of Matters Related to Recipient Integrity and Performance

You must report recipient integrity and performance information as required by Appendix XII to [2 CFR Part 200– Award Term and Condition for Recipient Integrity and Performance Matters](#), incorporated here by reference. You should read the full text of this award term now using the link above to make sure you understand our requirements. You can also find this term at <http://www.ecfr.gov>.

b) Agency Review of Applicant's Risk

(i) AFOSR must review information available about you and entities included in your proposal through the Office of Management and Budget (OMB) designated repositories of government- wide eligibility qualification and financial integrity information. Our risk review is required by [41 U.S.C. 2313](#) and includes both public and non-public information. You must be qualified as described at [32 CFR 22.415 Standards](#) to receive an award.

- (ii) AFOSR must consider the non-public segment of the Federal Awardee Performance and Integrity Information System (FAPIIS) for all awards exceeding the current simplified acquisition threshold of \$250,000.
- (iii) At a minimum, the information in the system for a prior Federal award recipient must demonstrate a satisfactory record of executing programs or activities under Federal grants, cooperative agreements, or procurement awards, and integrity and business ethics. We will consider any comments you provide, in addition to the other information in the designated integrity and performance system, when making our risk judgment about your integrity, business ethics, and record of performance under Federal awards.

AFOSR may make an award to a recipient who does not fully meet our standards as described at [2 CFR 200.205\(a\)\(2\)](#) if it is determined that the information is not relevant to the current Federal award under consideration or there are specific conditions that can appropriately mitigate the effects of the non-Federal entity's risk in accordance with [2 CFR 200.208 Specific conditions](#).

- (iv) AFOSR must comply with the guidelines on government-wide suspension and debarment described in [2 CFR 200.213](#) and must require you to comply with these provisions for all work AFOSR funds. These provisions restrict Federal awards, sub-awards and contracts with certain parties that are debarred, suspended or otherwise excluded from or ineligible for participation in Federal programs or activities.

c) Certification of Lobbying Activity

By checking "I Agree" on the SF-424 (R&R) block 17 you agree to fully comply with the Lobbying Disclosure Act of 1995, 2 U.S.C. § 1601 et seq. If your grant amount exceeds \$100,000 you are certifying that you do not have lobbying activity to disclose. If you have lobbying activity that you must disclose under 31 U.S.C. 1352 as implemented by the DoD in 32 CFR Part 2 you must attach the completed SF-LLL Disclosure of Lobbying Activities. You can find instructions for completing this form at <https://grants.gov/forms/forms-repository/post-award-reporting-forms>.

d) Cross-cutting National Policy Requirements

You must comply with all applicable national policy requirements as a condition of award. Key national policy requirements may be found in the DoD Research and Development General Terms and Conditions (DoD T&C); and [Appendix B to 32 CFR Part 22 – Suggested Award Provisions for National Policy Requirements that Often Apply](#), incorporated here by reference.

e) Acknowledgement of Research Support

You must acknowledge support provided by the Government in all materials based on or developed under our awards. The requirement extends to copyrighted and non- copyrighted materials published or displayed in any medium.

The following language must be used unless the award document provides different instructions:

“This material is based upon work supported by the Air Force Office of Scientific Research under award number FAXXXX-XX-X-XXXX”.

You must require any sub-recipients or subcontractors under your award to include this acknowledgment, too.

f) Disclaimer Language for Research Materials and Publications

Some materials based on or developed under our awards must include special disclaimer language. You must include this language in all materials except scientific articles or papers published in scientific journals unless your award document provides different instructions:

“Any opinions, findings and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the U.S. Department of Defense.”

g) Uniform Administrative Requirements, Cost Principles, and Audit Requirements

Our grants are governed by the guidance in Title 2, Code of Federal Regulations (CFR) Part 200, “Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards” as modified and supplemented by the Department of Defense’s (DoD) interim implementation in 2 CFR Part 1103 [79 FR 76047, December 19, 2014] and 2 CFR Part 1125. Provisions of Chapter 1, Subchapter C of Title 32, CFR, “DoD Grant and Agreement Regulations” other than parts 32 and 33 continue to be in effect and apply as stated. These regulations are incorporated by reference into this announcement.

h) DoD Research and Development General Terms and Conditions

Our domestic grants are subject to the current (at time of award) “DoD Research and Development General Terms and Conditions” (DoD T&C) found at DoD Research and Development General Terms and Conditions.

These terms and conditions are incorporated by reference into this announcement. We can provide a generic model grant or cooperative agreement upon request.

If we publish updated terms and conditions, the updated terms and conditions may apply to any grant made under this announcement.

Our foreign grants and cooperative agreements are governed by award-specific terms and conditions that implement and supplement the section 2 CFR Part 200, “Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards. We can provide a generic model grant or cooperative agreement upon request.

i) Conditions of Award for Recipients Other Than Individuals

You must agree to comply with the requirements at [2 CFR Part 182, Subpart B](#) “Requirements for Recipients Other Than Individuals” as a condition of award.

j) Minimum Record Retention Requirements

You must keep records related to our awards for at least three (3) years after completion and the final Federal Financial Report is submitted. This requirement is described further in [2 CFR 200.334](#), incorporated here by reference.

Sometimes records must be retained for more than three years.

2. Reporting

a) Monitoring and Reporting Program Performance

All of our awards require at least annual and final technical performance reports as required in [2 CFR 200.329](#). The DoD T&C REP Article I. Performance reporting will apply to grant or cooperative agreement awards. Some of our awards require more frequent technical reports.

You must provide your reports on time. Our awards include a schedule specifying the latest date for submission of each required report. Failure to provide required reports, or providing reports after required due dates, could lead to being considered ineligible for future awards.

b) Technical Performance Report Format

(i) Federal-wide Research Progress Performance Report (RPPR) Format (All grant awards). We now use the Federal-wide Research Progress Performance Report (RPPR) for annual and final research performance reports. The reporting requirements will be detailed in the grant award documents.

(ii) ANSI Standard Z39.18-2005 (all non-grant awards). Use the AFRL Scientific & Technical Reports – Preparation, Presentation and Preservations Format Guidelines (June 2010) for your final report unless your award states different requirements. You can download the AFRL standard guide from the Related Documents tab in Grants.gov for this announcement.

c) Department of Defense (DD) Form 882 Report of Inventions and Subcontracts

(i) Invention Reports

(a) You must provide at least a final invention report on DD Form 882. We may ask for annual reports. Our award documents specify the due date.

You can get the form at

<https://www.esd.whs.mil/Portals/54/Documents/DD/forms/dd/dd0882.pdf>.

(b) You **must** submit invention reports even if you do not have a patent to report.

(ii) Sub-Award and Subcontract Reporting

You must use the DD Form 882 to tell us about any subawards or subcontracts. Your award will provide specific instructions. You can get the form at

<https://www.esd.whs.mil/Portals/54/Documents/DD/forms/dd/dd0882.pdf>.

d) Standard Form (SF)-425 Federal Financial Report

Our awards require a final SF-425 Federal Financial Report. You can get the form at <https://www.grants.gov/forms/forms-repository/post-award-reporting-forms>. If you request any advance payment(s) under your award, you must submit quarterly SF-425 reports for the life of the grant. Our awards include specific instructions. You do not have to submit quarterly SF-425 reports if you only request payments by reimbursement.

e) Electronic Payment Requests and Electronic Payment

You must register to use Wide Area Work Flow (WAWF) for payment. Payment requests shall be made electronically using an SF-270 through the WAWF application in the Procurement Integrated Enterprise Environment (PIEE) e-Business Suite at <https://piee.eb.mil/>. The website includes registration instructions. All payments must be made using the electronic funds transfer (EFT) method.

f) Property Reports

If AFOSR furnishes any property owned by the Government under an award, you must submit periodic property status reports as described in [2 CFR 200.329](#) and further implemented by the DoD T&C REP Article III. Reporting on Property.

g) Other Reports

Our Program Officers may ask for informal technical reports as needed. AFOSR uses these informal reports for program purposes, such as preparation for meetings and other technical purposes. AFOSR highly recommends you provide this information in a timely manner by electronic mail directly to the Program Officer.

h) Electronic Submission of Reports

You must plan on submitting reports electronically. You must submit most reports through the internet application detailed in the grant award document. Some reports must be sent using electronic mail. Our award documents provide specific instructions that you must follow.

I. OTHER INFORMATION

1. Ombudsman

- a) An ombudsman has been appointed to hear and facilitate the resolution of concerns from offerors, potential offerors, and others for this acquisition. When requested, the ombudsman will maintain strict confidentiality as to the source of the concern. The existence of the ombudsman does not affect the authority of the program officer, grants officer, contracting officer, or source selection official. Further, the ombudsman does not participate in the evaluation of proposals, the source selection process, or the adjudication of protests or formal grant or contract disputes. The ombudsman may refer the party to another official who can resolve the concern.
- b) Before consulting with an ombudsman, interested parties must first address their concerns, issues, disagreements, and/or recommendations to the grants or contracting officer for resolution. Consulting an ombudsman does not alter or postpone the timelines for any other processes (e.g., agency level bid protests, GAO bid protests, requests for debriefings, employee-employer actions, contests of OMB Circular A-76 competition performance decisions).
- c) If resolution cannot be made by the GO, concerned parties may contact the AFRL Ombudsman, Director of Contracting, HQ AFRL/PK. The AFRL Alternate Ombudsman is the Deputy Director of Contracting, HQ AFRL/PK. Please send an email to afrl.pk.workflow@us.af.mil with the subject of "Ombudsman".
- d) The ombudsman has no authority to render a decision that binds the agency.
- e) Do not contact the ombudsman to request copies of the solicitation, verify offer due date, or clarify technical requirements. Such inquiries shall be directed to the grants or contracting officer.

2. Grants and Contracting Officer Authority

- a) Grants and Contracting Officers acting within their warranted capacity are the only individuals legally authorized to make commitments or bind the Government.
- b) No other individuals are authorized to make commitments or otherwise bind us.

3. Funding Opportunities

We post new funding opportunities throughout the year looking for today's breakthrough science for tomorrow's Air Force and Space Force. You can find more information about Air Force Office of Scientific Research interests and funding opportunities on our website at <https://www.afrl.af.mil/afosr/>.