

BAA 07-28

Visible InGaN Injection Lasers (VIGIL)



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The Defense Advanced Research Projects Agency (DARPA) often selects its research efforts through the Broad Agency Announcement (BAA) process. The BAA will appear first on the FedBizOpps website, <http://www.fedbizopps.gov/> and Grants.gov website at <http://www.grants.gov/>. The following information is for those wishing to respond to the BAA.

DARPA is soliciting innovative research proposals to develop injection lasers based on InGaN/GaN system and operating at wavelengths equal to or longer than $\lambda=500$ nm. The **Visible InGaN Injection Lasers (VIGIL)** program will culminate in a demonstration of a high-power (≥ 1 W) injection laser operating continuous wave (CW) at room-temperature with good stability (>1000 hrs), and wallplug efficiency (30%). Wafer yield of 20% is expected in order to assure low cost of this laser.

High efficiency visible lasers would enable a wide variety of advanced military photonic systems. These range from monitoring water purity, providing effective pumps to mode-locked lasers with ultrashort pulse response, enabling compact and power efficient display engines, to detection systems based on differential absorption LIDAR. The effectiveness of such systems is a strong function of the capabilities of the laser source with regard to emission wavelength, power, efficiency, and cost. Successful attainment of the VIGIL program's objectives is anticipated to result in an enormous improvement in the size, weight, performance, and cost of future military systems.

Proposed research should investigate innovative approaches that enable revolutionary advances in materials science, epitaxial growth and device design. The research needed to achieve the goals of the VIGIL program may be carried out through collaborations between different participants. Specifically excluded is research that primarily results in evolutionary improvements to the existing state of practice.

BACKGROUND AND DESCRIPTION

Injection lasers based on InGaN/GaN with emission in the 400 nm spectral region have been developed for commercial applications, primarily information storage and retrieval. Development of epitaxial growth methods and substrates with reduced dislocation density, combined with sophisticated device design, has resulted in lasers operating at room temperature with CW powers of ~50 mW and excellent reliability. Power output of several hundred mW has been also shown, demonstrating good thermal stability and resistance to catastrophic facet damage. However, extension of the emission wavelength to the blue and green regions of the visible spectrum has turned out to be quite challenging. Lasers with emission wavelengths longer than 400 nm suffer from rapidly increasing threshold current densities and lower output powers. A related problem is the rapid decrease in the internal quantum efficiency of InGaN in InN rich alloys, from ~50% in the purple-emitting light emitting diodes to about 20% in the green-emitting devices. *The challenge to be addressed in this program is to achieve InGaN injection lasers of at least 500 nm with performance levels similar or superior to those already demonstrated at 400 nm.*

PROGRAM OBJECTIVES

The objective of the VIGIL program is to develop visible InGaN/GaN lasers. Specific minimum program goals include:

- Laser emission wavelength of 500 nm
- Room temperature CW output power of 1W
- Wallplug efficiency of 30%
- Demonstration of stable operation over a period of 1000 hr
- Wafer yield on 2" diameter substrates of 20%

The main technology development part of the VIGIL program will be conducted in three phases, each having definite and measurable milestones, the most critical of which will

be referred to as Go/No-Go (GNG) metrics. The length of each of these phases and specific measurable milestones for each phase will be proposed by bidders and will be factors considered as part of the source selection process (see below). In general, shorter phases are preferable, but each phase should clearly be adequate in duration to meet its objectives with reasonable risks and costs. Proposals should discuss plans for managing these factors.

DARPA may consider focused proposals addressing specific technical challenges in epitaxy, (e.g. development of non-polar substrates or templates with low defect density), device design, (e.g. demonstration of active layer structures with high internal efficiency), or characterization, (e.g. methods of measuring interfacial electric fields of radiative recombination lifetime of minority carriers), that may be necessary to meet the above program goals. Those offering such proposals should provide unambiguous physical arguments, based on data or simulations, leading to estimates of their importance in achieving operational targets of the envisioned VIGIL laser. Such proposals should also specify the period of performance for each of their phase(s) and identify measurable milestones by which performance could be monitored (see above).

PROGRAM SCOPE

The major technology development of the VIGIL program is envisioned to occur in three phases, as described below.

Phase I: Demonstration of 500 nm lasers. The objective of this Phase is to demonstrate room temperature 500 nm lasers and to validate the technical approach for device demonstrations of Phases II and III. The GNG metrics in this Phase are wallplug efficiency of 10%, output power of 30 mW, stable operation of 50 hrs, and a minimum wafer yield of 1%. Stable operation is defined as less than 1 dB change in the operating characteristics of the laser during the specified period. Yield is defined as the total number of lasers that meet the Phase I targeted performance divided by the total number of device sites on the wafer. Performers should specify the values of any dependent metrics needed to meet overall GNGs of this Phase.

As an important part of this effort, performers should develop and validate a design model that estimates performance characteristics through a design of experiments (DOE) program. Bidders should clearly outline their DOE plan in their proposals. Using this design model, performers should establish that a clear path exists by which the laser demonstrated in Phase I can be optimized in the subsequent Phase(s) to achieve stated performance targets.

Phase II: Optimization of 500 nm laser. The objective of this Phase is to scale the output power of the laser to at least 100 mW, achieve wallplug efficiency of 20%, stable operation of 500 hrs, and to demonstrate wafer yield of at least 10%. Performers should specify the values of any dependent metrics needed to meet overall GNGs of this Phase.

Phase III: High Performance 500 nm laser. The objective of this phase is to validate the phase II technology by demonstrating prototype VIGIL lasers capable of 1 W output power, wallplug efficiency of 30%, stable operation of 1000 hrs, and wafer yield (on 2” diameter wafers) of at least 20%. Performers should specify the values of any dependent metrics needed to meet overall GNGs of this Phase.

TECHNICAL AREAS OF INTEREST

While proposers may respond to any of the following technical areas of interest individually, the Government **strongly prefers** an integrated approach which includes concept formulation, experimental verification, and device optimization.

- I. *Growth and Fabrication of 500 nm Lasers:* The materials and structures required to achieve the performance goals of VIGIL will necessitate demonstration of new fabrication technologies. Examples include epitaxial growth of structures with high quantum efficiency, preferably independent of the InN content, on polar or non-polar substrates, insertion of electron barriers appropriate for improved radiative recombination, or introduction of self-assembled quantum dots with high quantum efficiency. Approaches developed under VIGIL should lead to practical lasers manufacturable at reasonable yield and capable of stable operation. A plan to achieve the required epitaxial growth, device design and fabrication, and characterization should be detailed.
- II. *Control of Defect Density:* Achieving the demanding laser requirements of the VIGIL program will require substrates with low defect density or epitaxial procedures reducing defect density in the laser stripe, or a combination of both. Possible approaches may include bulk growth of GaN, hydride growth of GaN or InGaN, or lateral epitaxial overgrowth (LEO). Approaches that can be implemented on both the c-plane and non-polar surfaces are of special interest.

DELIVERABLES

The Government expects to test devices in order to validate performance consistent with the GNG metrics. The bidders should describe a deliverable schedule consistent with this requirement. The exact population and details of the deliverable schedule are important aspects of the proposal.

TECHNOLOGY TRANSITION

DARPA is interested in the development of capabilities for producing VIGIL lasers that meet the objectives of a broad range of DoD systems and platforms. Evaluation of the technology transition plans, therefore, is an important part of the proposal selection process. A clear and credible plan by which the technology developed will be commercialized and made available to DoD contractors is an important element of the proposal.

PERIOD OF SOLICITATION

This BAA will remain open from 18 April 2007 through 18 April 2008. The due date for proposal submission is **4 June 2007 (1600 EST)**. Proposals submitted after 4 June 2007 will be accepted, but are not likely to be funded during the first round of program funding.

SUBMISSION GUIDELINES

Proposals should be submitted electronically using one of the following two submission methods. Note that neither dual submissions nor a paper copy are required.

1. DARPA/MTO will employ an electronic upload process, the Technical Financial Information Management System (T-FIMS) Proposal Submission System, for proposal submissions to this BAA. Proposals should be in Microsoft Word format or PDF and submitted via a web site interface: Web Site: <https://www.tfims.darpa.mil/baa>.
2. Proposals may also be submitted to this BAA via the Grants.gov web site, <http://www.grants.gov/>, by using the "Apply" function.

PROPOSER REGISTRATION

Organizations planning to submit proposals via T-FIMS must register at: <http://www.tfims.darpa.mil/baa>. Only the lead or prime organization should register. One registration per proposal should be submitted. This means that an organization wishing to submit to multiple technical topic areas should complete a single registration for each proposal. The proposer makes no commitment to submit by registering. Please note that it is recommended that proposers register on T-FIMS at least a week prior to the submission deadline to allow sufficient time for completing the registration process and uploading the submission. Please also note that proposers will receive a confirmation e-mail generated from the T-FIMS electronic system as receipt that their proposal has been received.

The T-FIMS Proposal Submission System supports the following file formats: Portable Document Format (PDF), Word Document (doc), Plain Text (txt), Comma-separated I-7 Values (CSV), PowerPoint Presentation (ppt), Excel Worksheet (xls), and Excel Workspace (xlw). Proposal submissions made through the T-FIMS Proposal Submission System must be no larger than 50 megabytes per file.

All material submitted electronically must be UNCLASSIFIED. Please DO NOT attempt to submit a CLASSIFIED material proposal through an electronic upload process as this is PROHIBITED. Offerors that intend to include classified, or potentially classified, information or data as part of their proposals shall submit an UNCLASSIFIED PROPOSAL referring to a classified annex. The offeror should contact the Technical POC for this BAA, or the Security POC cited below, for guidance on submitting the classified annex

SUBMISSION PROCESS

This Broad Agency Announcement BAA07-28 found on FedBizOpps and Grants.gov, constitutes the total BAA. No additional information is available, nor will a formal RFP or other solicitation regarding this announcement be issued. Requests for the same will be disregarded. The Government reserves the right to select for award all, some, or none of the proposals received and to award without discussions. All responsible sources capable of satisfying the Government's needs may submit a proposal which shall be considered by DARPA. Input on technical aspects of the proposals may be solicited by DARPA from non-Government consultants /experts who are bound by appropriate non-disclosure requirements. Non-Government technical consultants/experts will not have access to proposals that are labeled by their offerors as "Government Only." Historically Black Colleges and Universities (HBCUs), Minority Institutions (MIs), and Small and Small Disadvantaged Businesses are encouraged to submit proposals and join others in submitting proposals; however, no portion of this BAA will be set aside for these organizations' participation due to the impracticality of reserving discrete or severable areas of research in the subject technology area(s).

All administrative correspondence and questions on this solicitation, including requests for information on how to submit a proposal to this BAA, should be directed to the administrative addresses below; e-mail or fax is preferred. DARPA intends to use electronic mail and fax for correspondence regarding BAA 07-28. Proposals may not be submitted by fax or e-mail; any so sent will be disregarded. DARPA encourages use of the WWW for retrieving the Broad Agency Announcement and any other related information that may subsequently be provided.

The administrative addresses for this BAA are:

Fax: (703) 696-2206 (Addressed to: DARPA/MTO, BAA 07-28),

Electronic Mail: BAA07-28@darpa.mil

Restrictive notices notwithstanding, proposals may be handled, for administrative purposes only, by a support contractor. This support contractor is prohibited from competition in DARPA technical research and is bound by appropriate nondisclosure requirements. Proposals and proposal abstracts may not be submitted by fax or e-mail; any so sent will be disregarded.

EVALUATION CRITERIA/EVALUATION AND FUNDING PROCESSES

Proposals will not be evaluated against each other since they are not submitted in accordance with a common work statement. DARPA's intent is to review proposals as soon as possible after they arrive; however, proposals may be reviewed periodically for administrative reasons.

For evaluation purposes, a proposal is the two-volume document described in PROPOSAL FORMAT (see below). Other supporting or background materials submitted with the

proposal will be considered for the reviewer's convenience only and not considered part of the proposal.

Evaluation of proposals will be accomplished through a technical review of each proposal using the following criteria, which are listed in descending order of relative importance: (1) Overall scientific and technical merit; (2) Potential contribution and relevance to the DARPA mission; (3) Relevance of intermediate milestones and GNG metrics; (4) Realism of the proposed schedule; (5) Plans and capability to accomplish technology transition; (6) Offeror's capabilities and related experience; and (7) Cost reasonableness and realism.

OVERALL SCIENTIFIC AND TECHNICAL MERIT

The proposed technical approach is feasible, achievable, complete and supported by a proposed technical team that has the expertise and experience to accomplish the proposed tasks. Task descriptions and associated technical elements provided are complete and in a logical sequence with all proposed deliverables clearly defined such that a final product that achieves the goal can be expected as a result of award. The proposal identifies major technical risks and planned mitigation efforts are clearly defined and feasible.

POTENTIAL CONTRIBUTION AND RELEVANCE TO THE DARPA MISSION

The potential contributions of the proposed effort with relevance to the national technology base will be evaluated. Specifically, DARPA's mission is to maintain the technological superiority of the U.S. military and prevent technological surprise from harming our national security by sponsoring revolutionary, high-payoff research that bridges the gap between fundamental discoveries and their military use.

RELEVANCE OF INTERMEDIATE MILESTONES AND GNG METRICS

The relevance and aggressiveness of the intermediate milestones and Go/No Go metrics proposed in the development schedule in an efficient time frame will be evaluated.

REALISM OF PROPOSED SCHEDULE

The proposer's abilities to aggressively pursue performance metrics in the shortest timeframe and to accurately account for that timeframe will be evaluated.

PLANS AND CAPABILITY TO ACCOMPLISH TECHNOLOGY TRANSITION

The capability to transition the technology to research, industrial, and operational military communities in such a way as to enhance U.S. defense, to include the extent to which IP being delivered with less than unlimited rights, if any, creates a barrier to technology transition.

PROPOSER'S CAPABILITIES AND/OR RELATED EXPERIENCE

The proposer's prior experience in similar efforts must clearly demonstrate an ability to deliver products that meet the proposed technical performance within the proposed budget and schedule. The proposed team has the expertise to manage the cost and schedule. Similar efforts completed/ongoing by the proposer in this area are fully described including identification of other Government sponsors.

COST REASONABLENESS AND REALISM

The objective of this criterion is to establish that the proposed costs are reasonable and realistic for the technical and management approach offered, as well as to determine the proposer's practical understanding of the effort. This will be principally measured by cost per labor-hour and number of labor-hours proposed. The evaluation criterion recognize that undue emphasis on cost may motivate proposers to offer low-risk ideas with minimum uncertainty and to staff the effort with junior personnel in order to be in a more competitive posture. DARPA discourages such cost strategies. Cost reduction approaches that will be received favorably include innovative management concepts that maximize direct funding for technology and limit diversion of funds into overhead.

Award(s) will be made to proposers whose proposals are determined to be the most advantageous to the Government, all factors considered, including the potential contributions of the proposed work to the overall research program and the availability of funding for the effort. Award(s) may be made to any proposer(s) whose proposal(s) is determined selectable regardless of its overall rating. The Government reserves the right to select for award all, some, or none of the proposals received and to make awards without discussions.

NOTE: PROPOSERS ARE CAUTIONED THAT EVALUATION SCORES MAY BE LOWERED AND/OR PROPOSALS REJECTED IF SUBMITTAL INSTRUCTIONS ARE NOT FOLLOWED.

As soon as the proposal evaluation is completed, the proposer will be notified of selectability or non-selectability. Selectable proposals will be considered for funding; non-selectable proposals will be destroyed. (One copy of non-selectable proposals may be retained for file purposes.)

Proposals identified for funding may result in a procurement contract, grant, cooperative agreement, or other transaction depending upon the nature of the work proposed, the required degree of interaction between parties, and other factors. If warranted, portions of resulting awards may be segregated into pre-priced options.

The cost of preparing proposals in response to this announcement is not considered an allowable direct charge to any resulting contract or any other contract. Proposers are warned that only Contracting Officers are legally authorized to commit the Government.

TEAMING ARRANGEMENTS

Teaming arrangements should be explained clearly in the proposals. Teams composed of partners from industry, academia and national laboratories are encouraged. Preference will be given to integrated teams capable of addressing different technological and scientific aspects of the VIGIL program. Innovative proposals from small groups will be considered and a website (<http://www.davincinetbook.com/teams>) will be established to facilitate teaming between interested parties. Specific information content, communications, networking, and team formation are the sole responsibilities of the participants. Neither DARPA nor the Department of Defense (DoD) endorses the destination website or the information and organizations contained therein, nor does DARPA or the DoD exercise any responsibility at the destination. This website is provided consistent with the stated purpose of this BAA.

PROPOSER'S QUESTIONS

A "Proposer's Questions," website will be posted for BAA 07-28 on the DARPA, Microsystems Technology Office solicitations page (www.darpa.mil/baa/#eto). If you would like to have a question answered and posted on this site, please send your question to the following address: BAA07-28@darpa.mil.

POINT OF CONTACT

Dr. Henryk Temkin, DARPA Program Manager, MTO, Phone (571) 218-4618, Fax (703) 696-2206, Email Henryk.Temkin@darpa.mil

PROPOSAL FORMAT

All full proposals must be in the format given below. Nonconforming proposals may be rejected without review. Proposals shall consist of two volumes. All pages shall be printable on 8-1/2 by 11 inch paper with type not smaller than 12 point. **The page limitation for full proposals includes all figures, tables, and charts.** Volume I, Technical and Management Proposal, may include an attached bibliography of relevant technical papers or research notes (published and unpublished) which document the technical ideas and approach upon which the proposal is based. Copies of not more than three (3) relevant papers can be included with the submission. The bibliography and attached papers are not included in the page counts given below. Inclusion of a single Power Point slide illustrating the proposed concept is required. The submission of other supporting materials along with the proposal is strongly discouraged and will not be considered for review. Except for the attached bibliography, Volume I shall not exceed fifty (50) pages, not including Section IV. Maximum page lengths for each section are shown in braces { } below.

Volume I, Technical and Management Proposal

Section I. Administrative

- A. {1} **Cover sheet.** This should include: (1) BAA number; (2) Technical area; (3) Lead Organization Submitting proposal; (4) Type of business, selected among the following categories: "LARGE BUSINESS", "SMALL DISADVANTAGED BUSINESS", "OTHER SMALL BUSINESS", "HBCU", "MI", "OTHER EDUCATIONAL", or "OTHER NONPROFIT"; (5) Contractor's reference number (if any); (6) Other team members (if applicable) and type of business for each; (7) Proposal title; (8) Technical point of contact to include: salutation, last name, first name, street address, city, state, zip code, telephone, fax (if available), electronic mail (if available); (9) Administrative point of contact to include: salutation, last name, first name, street address, city, state, zip code, telephone, fax (if available), electronic mail (if available), total funds requested from DARPA, and the amount of cost-share (if any); (10) date proposal was prepared; and (11) proposal expiration date.
- B. {1} **Official transmittal letter.**

Section II. Summary of Proposal

- A. {2} **Executive Summary.** This should clearly and concisely summarize the following:
- The quantitative end-of-program performance goals and the milestones associated with each Phase of the development effort. The milestones and performance goals should be listed in a single table (see below for an example table).
 - An explanation of how the above goals and milestones compare to what has already been demonstrated.
 - A description of the unique approaches and technical solutions proposed.
 - An explanation of how and to what extent (being as quantitative as possible) the proposed work will benefit the Department of Defense.

Section III. Detailed Proposal Information

- A. {15} **Technical Rationale & Approach.** A concise section outlining the scientific and technical challenges, unique approaches, and potential anticipated technical solutions to the challenges that will be addressed. This statement should demonstrate that the proposer has a clear understanding of the state-of-the-art; and should provide sufficient technical details so as to permit complete evaluation of the feasibility of the idea. Proposers should specifically address the practical *and* fundamental performance limits in operational parameters of the envisioned VIGIL source. This discussion should be based on data, simulations, and/or calculations.
- B. {12 + 1 for table} **Program Plan & Risk Assessment.** A narrative explaining the explicit timelines, milestone achievements, and quantitative metrics by which progress toward the goals can be evaluated. This plan should include a specific and detailed test plan detailing how performance of milestones, particularly the GNG metrics, will be measured. The proposed period of performance of the overall program and specifically of each program phase and demonstration should be clearly stated. Milestones must be associated with demonstrable, quantitative measures of performance, and should be

summarized in a single table. **Measurable milestones should occur every six months after start of effort.** This section should also identify major technical risk elements specific to the proposed approach, estimate the risk magnitude for each such element, and describe specific plans to mitigate risk.

- C. {3} **Teaming & Management Plan.** A management plan that describes how the different members of the team will collaborate to demonstrate viable solutions to the program challenges.
- D. {5} **Capabilities.** A section describing relevant prior work, the background, qualifications and relevant experience of key individuals to be assigned to the program and the facilities and equipment to be utilized. Please do not attach supporting material (CDs, movies, etc.) to the proposal, except as noted in Section IV below.
- E. {5} **Slide Summary.** PowerPoint-type slides (i.e., landscape formatted for presentation) that succinctly highlight the major aspects of the proposal, including proposer-defined measurable metrics, in a manner suitable for presentation to DARPA management.
- F. {5} **Technology Transition & Business Plan.** A discussion outlining how the technology to be developed in this program will be commercialized and made available to DoD contractors. See also “Intellectual Property.”
- G. {5} **Statement of Work (SOW).** A document written in plain English, outlining the scope of the effort (by Phase) and citing specific tasks to be performed, contractor requirements, and data and/or material deliverables.

Section IV. Additional Information {Optional}

- A. A brief bibliography of relevant technical papers and research notes (published and unpublished) which document the technical ideas upon which the proposal is based may be provided. Copies of not more than three (3) relevant papers can be included in the submission. This Section does not count towards the overall page limit for Volume I.

Volume II, Cost Proposal – {No page limit}

- A. Cover sheet to include: (1) BAA number; (2) Technical area; (3) Lead Organization Submitting proposal; (4) Type of business, selected among the following categories: "LARGE BUSINESS", "SMALL DISADVANTAGED BUSINESS", "OTHER SMALL BUSINESS", "HBCU", "MI", "OTHER EDUCATIONAL", or "OTHER NONPROFIT"; (5) Contractor's reference number (if any); (6) Other team members (if applicable) and type of business for each; (7) Proposal title; (8) Technical point of contact to include: salutation, last name, first name, street address, city, state, zip code, telephone, fax (if available), electronic mail (if available); (9) Administrative point of contact to include: salutation, last name, first name, street address, city, state, zip code, telephone, fax (if available), and electronic mail (if available); (10) Award instrument requested: cost-plus-fixed-fee (CPFF), cost-contract--no fee, cost sharing contract--no fee, or other type of procurement contract (specify), grant, cooperative agreement, or other transaction; (11) Place(s) and period(s) of performance; (12) Total proposed cost separated by basic award and option(s) (if any); (13) Name, address, and telephone number of the offeror's cognizant Defense Contract Management Agency (DCMA) administration office (if known); (14) Name, address, and telephone number of the

offeror's cognizant Defense Contract Audit Agency (DCAA) audit office (if known); (15) Date proposal was prepared; and (16) Proposal expiration date.

- B. Detailed cost breakdown to include: (1) total program cost broken down by major cost items (direct labor, subcontracts, materials, other direct costs, overhead charges, etc.) and further broken down by year; (2) major program tasks by year; (3) an itemization of major subcontracts¹ and equipment purchases; (4) an itemization of any information technology (IT)² purchases; (5) a summary of projected funding requirements by month; and (6) the source, nature, and amount of any industry cost-sharing. Where the effort consists of multiple portions which could reasonably be partitioned for purposes of funding, these should be identified as options with separate cost estimates for each.
- C. Supporting cost and pricing information in sufficient detail to substantiate the summary cost estimates in B. above. Include a description of the method used to estimate costs and supporting documentation. Note: "cost or pricing data" as defined in FAR Subpart 15.4 shall be required if the offeror is seeking a procurement contract award of \$650,000 or greater unless the offeror requests an exception from the requirement to submit cost or pricing data. "Cost or pricing data" are not required if the offeror proposes an award instrument other than a procurement contract (e.g., a grant, cooperative agreement, or other transaction). Please also provide any Forward Pricing Rate Agreement, other such Approved Rate Information (e.g., Rate Memo's, etc.), or such other documentation that may assist in expediting negotiations (if not available, state so). All proprietary subcontractor proposal documentation of which cannot be uploaded to TFIMS shall be made immediately available to the Government, upon request, under separate cover (i.e., mail, electronic/email, etc.), either by the Proposer or by the subcontractor organization.

INTELLECTUAL PROPERTY

The government will assess items of intellectual property that are proposed to be delivered with less than unlimited rights as part of the "plans and capability to accomplish technology transition" evaluation criteria.

¹ To include similar cost breakdown as required by the offeror (prime).

² IT is defined as "any equipment, or interconnected system(s) or subsystem(s) of equipment, that is used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information by the agency. (a) For purposes of this definition, equipment is used by an agency if the equipment is used by the agency directly or is used by a contractor under a contract with the agency which – (1) Requires the use of such equipment; or (2) Requires the use, to a significant extent, of such equipment in the performance of a service or the furnishing of a product. (b) The term "information technology" includes computers, ancillary, software, firmware and similar procedures, services (including support services), and related resources. (c) The term "information technology" does not include – (1) Any equipment that is acquired by a contractor incidental to a contract; or (2) Any equipment that contains imbedded information technology that is used as an integral part of the product, but the principal function of which is not the acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information. For example, HVAC (heating, ventilation, and air conditioning) equipment such as thermostats or temperature control devices, and medical equipment where information technology is integral to its operation, are not information technology."

1. Procurement Contract Proposers

a. Noncommercial Items (Technical Data and Computer Software)

Proposers responding to this BAA requesting a procurement contract to be issued under the FAR/DFARS, shall identify all noncommercial technical data, and noncommercial computer software that it plans to generate, develop, and/or deliver under any proposed award instrument in which the Government will acquire less than unlimited rights, and to assert specific restrictions on those deliverables. Proposers shall follow the format under DFARS 252.227-7017 for this stated purpose. In the event that proposers do not submit the list, the Government will assume that it automatically has “unlimited rights” to all noncommercial technical data and noncommercial computer software generated, developed, and/or delivered under any award instrument, unless it is substantiated that development of the noncommercial technical data and noncommercial computer software occurred with mixed funding. If mixed funding is anticipated in the development of noncommercial technical data, and noncommercial computer software generated, developed, and/or delivered under any award instrument, then proposers should identify the data and software in question, as subject to Government Purpose Rights (GPR). In accordance with DFARS 252.227-7013 Rights in Technical Data - Noncommercial Items, and DFARS 252.227-7014 Rights in Noncommercial Computer Software and Noncommercial Computer Software Documentation, the Government will automatically assume that any such GPR restriction is limited to a period of five (5) years in accordance with the applicable DFARS clauses, at which time the Government will acquire “unlimited rights” unless the parties agree otherwise. Proposers are admonished that the Government may use the list during the source selection evaluation process to evaluate the impact of any identified restrictions, and may request additional information from the proposer, as may be necessary, to evaluate the proposer’s assertions. If no restrictions are intended, then the proposer should state “NONE.”

A sample list for complying with this request is as follows:

NONCOMMERCIAL			
Technical Data Computer Software To be Furnished With Restrictions	Basis for Assertion	Asserted Rights Category	Name of Person Asserting Restrictions
(LIST)	(LIST)	(LIST)	(LIST)

b. Commercial Items (Technical Data and Computer Software)

Proposers responding to this BAA requesting a procurement contract to be issued under the FAR/DFARS, shall identify all commercial technical data, and commercial computer software that may be embedded in any noncommercial deliverables contemplated under the research effort, along with any applicable restrictions on the Government’s use of such commercial technical data and/or commercial computer software. In the event that proposers

do not submit the list, the Government will assume that there are no restrictions on the Government’s use of such commercial items. The Government may use the list during the source selection evaluation process to evaluate the impact of any identified restrictions, and may request additional information from the proposer, as may be necessary, to evaluate the proposer’s assertions. If no restrictions are intended, then the proposer should state “NONE.”

A sample list for complying with this request is as follows:

COMMERCIAL			
Technical Data Computer Software To be Furnished With Restrictions	Basis for Assertion	Asserted Rights Category	Name of Person Asserting Restrictions
(LIST)	(LIST)	(LIST)	(LIST)

2. NonProcurement Contract Proposers - Noncommercial and Commercial Items
(Technical Data and Computer Software)

Proposers responding to this BAA requesting a Grant, Cooperative Agreement, Technology Investment Agreement, or Other Transaction for Prototype shall follow the applicable rules and regulations governing these various award instruments, but in all cases should appropriately identify any potential restrictions on the Governments use of any Intellectual Property contemplated under those award instruments in question. This includes both Noncommercial Items and Commercial Items. Although not required, proposers may use a format similar to that described in Paragraphs 1.a and 1.b above. The Government may use the list during the source selection evaluation process to evaluate the impact of any identified restrictions, and may request additional information from the proposer, as may be necessary, to evaluate the proposer’s assertions. If no restrictions are intended, then the proposer should state “NONE.”

3. All Proposers - Patents

Please include documentation proving your ownership of or possession of appropriate licensing rights to all patented inventions (or inventions for which a patent application has been filed) that will be utilized under your proposal for the DARPA program. If a patent application has been filed for an invention that your proposal utilizes, but the application has not yet been made publicly available and contains proprietary information, you may provide only the patent number, inventor name(s), assignee names (if any), filing date, filing date of any related provisional application, and a summary of the patent title, together with either: 1) a representation that you own the invention, or 2) proof of possession of appropriate licensing rights in the invention.

4. All Proposers - Intellectual Property Representations

Please provide a good faith representation that you either own or possess appropriate licensing rights to all other intellectual property that will be utilized under your proposal for the DARPA program.

GUIDANCE FOR CLASSIFIED INFORMATION AND DATA

The Government anticipates that proposals submitted under a BAA will be unclassified. In the event that a proposer chooses to submit a classified proposal or submit any documentation that may be classified, the following information is applicable. Security Classification guidance on DD Form 254 will not be provided at this time since DARPA is soliciting ideas only. After reviewing the incoming proposals, if a determination is made that the award instrument may result in access to classified information, a DD Form 254 will be issued and attached as part of the award. Proposers choosing to submit a classified proposal must first receive permission from the Original Classification Authority to use their information in applying to this BAA. An applicable classification guide should be submitted to ensure that the proposal is protected appropriately.

Classified submissions shall be in accordance with the following guidance:

Collateral Classified Data: Use classification and marking guidance provided by previously issued security classification guides, the Information Security Regulation (DoD 5200.1-R), and the National Industrial Security Program Operating Manual (DoD 5220.22-M) when marking and transmitting information previously classified by another original classification authority. Classified information at the Confidential and Secret level may only be mailed via U.S. Postal Service (USPS) Registered Mail or U.S. Postal Service Express Mail (USPS only; not DHL, UPS or FedEx). All classified information will be enclosed in opaque inner and outer covers and double wrapped. The inner envelope shall be sealed and plainly marked with the assigned classification and addresses of both sender and addressee. The inner envelope shall be addressed to:

Defense Advanced Research Projects Agency (DARPA)
ATTN: BAA07-28, DARPA/MTO, Dr. Henryk Temkin
3701 North Fairfax Drive, Suite 521
Arlington, VA 22203-1714

The outer envelope shall be sealed with no identification as to the classification of its contents and addressed to:

Defense Advanced Research Projects Agency (DARPA)
Security & Intelligence Directorate, Attn: CDR
3701 North Fairfax Drive, Suite 832
Arlington, VA 22203-1714

All Top Secret materials should be hand carried via an authorized, two-person courier team to the DARPA Classified Document Registry (CDR).

Special Access Program (SAP) Information: Contact the DARPA Program Security Support Center (PSSC) at 703-812-1962/1970 for further guidance and instructions prior to transmitting to DARPA. All Top Secret SAP, must be transmitted via approved methods for such material. Consult the DoD Overprint to the National Industrial Security Program Operating Manual for further guidance. It is strongly recommended that you coordinate the transmission of SAP material and information with the DARPA PSSC prior to transmission.

Sensitive Compartmented Information (SCI) Data: Contact the DARPA Special Security Contact Office (SSCO) at 703-812-1993/1994 for the correct SCI courier address and instructions. All SCI should be transmitted through your servicing Special Security Officer (SSO) / Special Security Contact Officer (SSCO). All SCI data must be transmitted through your servicing Special Security Officer (SSO) / Special Security Contact Officer (SSCO). All SCI data must be transmitted through SCI channels only (i.e., approved SCI Facility to SCI facility via secure fax).

Proprietary Data: All proposals containing proprietary data should have the cover page and each page containing proprietary data clearly marked as containing proprietary data. It is the proposer's responsibility to clearly define to the Government what is considered proprietary in nature.

Proposers must have existing and in-place prior to execution of an award, approved capabilities (personnel and facilities) to perform research and development at the classification level they propose.

HUMAN SUBJECT TESTING

Proposals selected for funding are required to comply with provisions of the Common Rule (32 CFR 219) on the protection of human subjects in research (<http://www.dtic.mil/biosys/downloads/32cfr219.pdf>) and the Department of Defense Directive 3216.2 (<http://www.dtic.mil/whs/directives/corres/html2/d32162x.htm>). All proposals that involve the use of human subjects are required to include documentation of their ability to follow Federal guidelines for the protection of human subjects. This includes, but is not limited to, protocol approval mechanisms, approved Institutional Review Boards (IRBs), and Federal Wide Assurances. These requirements are based on expected human use issues sometime during the entire length of the proposed effort. For proposals involving “greater than minimal risk” to human subjects within the first year of the project, performers must provide evidence of protocol submission to a federally approved IRB *at the time of final proposal submission to DARPA*. For proposals that are forecasted to involve “greater than minimal risk” after the first year, a discussion on how and when the proposer will comply with submission to a federally approved IRB needs to be provided in the submission. More information on applicable federal regulations can be found at the Department of Health and Human Services – Office of Human Research Protections website (<http://www.dhhs.gov/ohrp/>).

AWARD ADMINISTRATION INFORMATION

(1) Central Contractor Registration. Selected proposers not already registered in the Central Contractor Registry (CCR) will be required to register in CCR prior to any award under this BAA. Information on CCR registration is available at <http://www.ccr.gov>.

(2) Representations and Certifications. In accordance with Federal Acquisition Regulation 4.1201, prospective proposers shall complete electronic annual representations and certifications at <http://orca.bpn.gov>.

(3) Wide Area WorkFlow (WAWF). Unless using another approved electronic invoicing system, performers will be required to submit invoices for payment directly via the Internet/WAWAF at <http://wawf.eb.mil>. Registration to WAWF will be required prior to any award under this BAA.

PUBLIC RELEASE OR DISSEMINATION OF INFORMATION

The following provision will be incorporated into any resultant contract:

(a) There shall be no dissemination or publication, except within and between the Contractor and any subcontractors, of information developed under this contract or contained in the reports to be furnished pursuant to this contract without prior written approval of the Contracting Officer Representative (COR). All technical reports will be given proper review by appropriate authority to determine which Distribution Statement is to be applied prior to the initial distribution of these reports by the Contractor. Papers resulting from unclassified contracted fundamental research are exempt from prepublication controls and this review requirement, pursuant to DoD Instruction 5230.27 dated October 6, 1987.

(b) When submitting material for written approval for open publication as described in subparagraph (a) above, the Contractor must submit a request for public release request to the DARPA TIO and include the following information: 1) Document Information: document title, document author, short plain-language description of technology discussed in the material (approx 30 words), number of pages (or minutes of video) and document type (briefing, report, abstract, article, or paper); 2) Event Information: event type (conference, principle investigator meeting, article or paper), event date, desired date for DARPA's approval; 3) DARPA Sponsor: DARPA Program Manager, DARPA office, and contract number; and 4) Contractor's Information: POC name, e-mail and phone. Allow four weeks for processing; due dates under four weeks require a justification. Unusual electronic file formats may require additional processing time. Requests can be sent either via e-mail to tio@darpa.mil or via 3701 North Fairfax Drive, Arlington VA 22203-1714, telephone (571) 218-4235. Refer to www.darpa.mil/tio for information about DARPA's public release process.

EXPORT LICENSES

The following provision will be incorporated into any resultant contract:

Should this project develop beyond fundamental research (basic and applied research ordinarily published and shared broadly within the scientific community) with military or dual-use applications the following apply:

(1) The contractor shall comply with all U. S. export control laws and regulations, including the International Traffic in Arms Regulations (ITAR), 22 CFR Parts 120 through 130, and the Export Administration Regulations (EAR), 15 CFR Parts 730 through 799, in the performance of this contract. In the absence of available license exemptions/exceptions, the Contractor shall be responsible for obtaining the appropriate licenses or other approvals, for obtaining the appropriate licenses or other approvals, if required, for exports of (including deemed exports) hardware, technical data, and software, or for the provision of technical assistance.

(2) The Contractor shall be responsible for obtaining export licenses, if required, before utilizing foreign persons in the performance of this contract, including instances where the work is to be performed on-site at any Government installation (whether in or outside the United States), where the foreign person will have access to export-controlled technical data or software.

(3) The Contractor shall be responsible for all regulatory record keeping requirements associated with the use of licenses and license exemptions/exceptions.

(4) The Contractor shall be responsible for ensuring that the provisions of this clause apply to its subcontractors.

SUBCONTRACTING

Pursuant to Section 8(d) of the Small Business Act (15 U.S.C. 637(d)), it is the policy of the Government to enable small business and small disadvantaged business concerns to be considered fairly as subcontractors to contractors performing work or rendering services as prime contractors or subcontractors under Government contracts, and to assure that prime contractors and subcontractors carry out this policy. Each proposer who submits a contract proposal and includes subcontractors is required to submit a subcontracting plan IAW FAR 19.702(a) (1) and (2) should do so with their proposal. The plan format is outlined in FAR 19.704.

CONFIDENTIALITY

It is the policy of DARPA to treat all proposals as competitive information and to disclose their contents only for the purpose of evaluation. No proposals will be returned. The original of each proposal received will be retained at DARPA and all other copies of non-selected proposals destroyed. Documentation related to the source selection process will be marked SOURCE SELECTION INFORMATION – SEE FAR 2.101 AND 3.104.

PROCUREMENT INTEGRITY, STANDARDS OF CONDUCT, ETHICAL CONSIDERATIONS, AND ORGANIZATIONAL CONFLICTS OF INTEREST (OCIs)

Certain post-employment restrictions on former federal officers and employees may exist, including special Government employees (including but not limited to Sections 207 and 208 of Title 18, United States Code, the Procurement Integrity Act, 41 U.S.C. 423, and FAR 3.104). Proposers should be aware the Program Manager responsible for this BAA is assigned under the IPA program from Texas Tech University and as such is highly likely to have a formal conflict of interest with Texas Tech University. The Program Manager is required to review and evaluate all proposals received under this BAA and be able to manage all selected efforts. If a conflict of interest exists with a proposer, the proposer must show a plan to mitigate the conflict in the proposal. In fact, it should be raised to the DARPA Contracting Officer before time and effort are expended in preparing a proposal. All proposers and proposed sub-contractors must therefore affirm whether they are providing scientific, engineering, and technical assistance (SETA) or similar support to any DARPA technical office(s) through an active contract or subcontract. All affirmations must state which office(s) the proposer supports and identify the prime contract numbers.

Affirmations shall be furnished at the time of proposal submission. All facts relevant to the existence or potential existence of organizational conflicts of interest (FAR 9.5.) must be disclosed. The disclosure shall include a description of the action the proposer has taken or proposes to take to avoid, neutralize, or mitigate such conflict. If the situation cannot be mitigated by the contractor, the proposal may be returned without technical evaluation and withdrawn from consideration for award under this BAA.

DEFENSE ADVANCED RESEARCH PROJECTS AGENCY/MICROSYSTEMS TECHNOLOGY OFFICE (DARPA/MTO)

The Defense Advanced Research Projects Agency (DARPA) is a separately organized agency within the Department of Defense (DoD) under a Director, appointed by the Secretary of Defense. The Agency engages in advanced basic and applied research and development projects essential to the DoD, and conducts prototype projects that embody technology that may be incorporated into joint programs, programs in support of deployed U.S. forces, or selected military department programs.

The Microsystems Technology Office (MTO) focuses on the heterogeneous microchip-scale integration of electronics, photonics, and microelectromechanical systems (MEMS) to produce a broad array of interface systems; sensors, sources, actuators, and displays; signal processors; and packaging and interconnect systems.

High risk technology development continues in the microsystems area in order to solve the national level problems of protection from biological and information attack and to enable affordable precision target kill, operational dominance for mobile distributed command and control, combined manned/unmanned warfare, and dynamic, adaptive military planning and execution.

Biochemical warfare is a major theme for the DARPA programs. MTO is concentrating on developing the microsystems for sensing and processing biological and chemical threats.

Additional detail can be found on the MTO office home page accessible from the WWW via URL <http://www.darpa.mil/>.