

PROPOSERS' INFORMATION PAMPHLET (PIP)
BAA 04-02-MT
Quantum Information Sciences
(QIS)
11 August 2004

PROPOSER INFORMATION PAMPHLET

(PIP)

FOR THE

Quantum Information Sciences (QIS)

Broad Agency Announcement (BAA)

**Advanced Research and Development Activity
Fort George G. Meade, MD**

Order of Precedence: Where this Proposer's Information Pamphlet differs from the latest revision of the BAA Announcement, as found in the FedBizOps, the announcement takes precedence.

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GENERAL

The information provided in this pamphlet, in addition to that provided in the Federal Business Opportunities (FedBizOps) Announcement, BAA 04-02-MT, constitutes a Broad Agency Announcement (BAA) as contemplated in FAR 6.102 (d) (2) (i).

All administrative correspondence and questions concerning this BAA must be directed, in writing, to the administrative addresses, as follows:

Contracting Officer: Gloria Golden
Department of the Interior
National Business Center
Acquisition and Property Management Division,
Southwest Branch
PO Box 12924
ATTN: BAA 04-02-MT (G. Golden)
Fort Huachuca, Arizona 85670-2924
Voice: 520-538-0421
Fax: 520-533-1600
Email: Gloria_M_Golden@nbc.gov

Contracting Officers Representative: Mr. Lawrence H. Carter
Department of the Interior
National Business Center
Acquisition and Property Management Division,
Southwest Branch
PO Box 12924
ATTN: BAA 04-02-MT (L. Carter)
Fort Huachuca, Arizona 85670-2924
Voice: 520-533-1213
Fax: 520-533-1600
Email: Lawrence_H_Carter@nbc.gov

Internet Web Site: <http://www.nbc.gov/qisbaa.html>

The Department of the Interior, National Business Center, Acquisition and Property Management Division, Southwest Branch, Fort Huachuca intends to use electronic mail for most Technical and Management and administrative correspondence regarding this BAA. Technical and Management and contractual questions should include the originator's full name; return e-mail address, and telephone and facsimile number(s) in

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the text. Questions and answers will be posted to the solicitation home page, URL <http://www.nbc.gov/qisbaa.html>.

Written requests for information concerning this BAA may be sent by, as follows:

By facsimile:

520-533-1600, addressed to ATTN: BAA 04-02-MT INFORMATION (L. Carter)

By Email:

Email: Lawrence_H_Carter@nbc.gov

By surface mail (USPS):

Department of the Interior
National Business Center
Acquisition Services Division, Southwest Branch
PO Box 12924
ATTN: BAA 04-02-MT (BAA INFORMATION, L. Carter)
Fort Huachuca, Arizona 85670-2924

By overnight delivery service:

Department of the Interior
National Business Center
Acquisition Services Division, Southwest Branch
Building 22208, Auger Avenue
ATTN: BAA 04-02-MT (BAA INFORMATION, L. Carter)
Fort Huachuca, Arizona 85613-6000
520-533-1213

If e-mail is not available, please direct questions to one of the above addresses. These requests must include the name, address, telephone and facsimile numbers, and email address of a point of contact at the asking organization.

PROGRAM DESCRIPTION

1. INTRODUCTION

The Department of the Interior, National Business Center, Acquisition and Property Management Division, Southwest Branch at Fort Huachuca, Arizona, acting as the

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contracting agent for The Advanced Research and Development Activity (ARDA) is soliciting initial contact papers, white papers, and proposals for the Quantum Information Sciences (QIS) Program BAA.

ARDA (<http://www.ic-arda.org/>) is a research organization that was jointly established in December 1998 by the Department of Defense and the U.S. Intelligence Community (<http://www.intelligence.gov/>). ARDA's mission is to incubate revolutionary Research and Development (R&D) activities within the broad field of Information Technology. ARDA's individual research programs are organized around broad research topics called "Research Thrusts". One of these Research Thrusts is Quantum Information Sciences. In all cases, ARDA's Research Thrusts and Programs have been established and executed by ARDA for the shared benefit of the Intelligence Community. In order to satisfy this mission, ARDA, in close cooperation with its Intelligence Community partners, originates and manages advanced R&D programs that:

1. Will have fundamental impact on future Intelligence Community operational needs and strategies;
2. Demand substantial, long-term venture investment to spur risk-taking;
3. Progress measurably toward mid-term and final goals; and
4. Take many forms and employ many delivery vehicles.

This BAA for Quantum Information Sciences research has been developed under ARDA's guidance and direction by representatives from a number of Intelligence Community Agencies and other Government entities. The evaluation of submissions, the selection of awardees, the execution of the resulting contracts, and the overall management of the proposals awarded from this BAA will be accomplished under the guidance and direction of ARDA.

It is anticipated awards will be made either by the NBC or by other agencies associated with the administrative oversight or involvement in the Quantum Information Sciences program. In this latter case, these Agencies will each execute individual contracts within the larger Program and will use their internal Agency Contracting Officers (CO), Contracting Officer's Technical and Management Representatives (COTRs), and administrative procedures.

2. QUANTUM INFORMATION SCIENCE PROGRAM GOALS

Among other things, quantum mechanics provides the opportunity to perform highly non-classical operations resulting in tremendous speed-ups in computation or physically secure transmittal of information. This BAA seeks to understand, control, and exploit such non-classical phenomena for revolutionary advances in computation and secure

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communication, and to support ancillary technology pertaining to identified areas in such research.

The Quantum Information Science Roadmaps are published at <http://qist.lanl.gov/>. This includes the Quantum Communication Roadmap (to be posted soon) and the Quantum Computation Roadmap (version 2 posted now) providing background Technical and Management information and summarizing the main technology areas comprising the current programs. The Roadmaps also discuss the overall status of each technology area and some of the major strengths and weaknesses. In general, proposals must explicitly identify which of the milestone(s) of the Roadmap(s) are being addressed or have a compelling explanation for why they are not consistent with those milestones.

PROGRAM OBJECTIVES. There are four (4) major areas of interest within the program:

1. Quantum Computation. The long-term objective of quantum computing is to provide new and radically different computational capabilities going beyond classical computers. While quantum computing may ultimately entail the assembly and manipulation of large numbers of quantum bits (qubits), experimental demonstrations of quantum logic performed on several quantum bits operating simultaneously would currently represent a significant advance. Demonstrations of quantum feed back or error correction for multiple quantum bit systems are also of interest. In addition to physical implementations of quantum computing, there is strong interest in developing new quantum algorithms providing new methods for solving classically intractable problems or that greatly improve on existing classical algorithms (e.g., in speed of memory requirements.)

2. Quantum Communication. The ability to transmit information through quantum channels and especially to exploit entanglement between spatially separated entities has opened the possibility for a means of communication with security based on physical principles and laws, rather than mathematical algorithms. The objective here is two-fold: advanced quantum cryptography systems and communication of quantum information based on distributed entanglement, such as in quantum teleportation. Experimental demonstration of innovative entanglement-based quantum cryptography systems is of particular interest. Of further interest is the demonstration of long-range quantum entanglement, entanglement transfer among different quantum systems, and long-term quantum memory.

3. Supporting Fundamental Studies. One objective is to ascertain the limits of the ability to create, control and utilize quantum information in multiple quantum entities in the presence of noise. Experimental investigations of coherence properties, decoherence mechanisms, decoherence mitigation, entanglement, nondestructive

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measurement, complex quantum state manipulation, and quantum feedback are of interest. Of particular interest is demonstration of coherent quantum state manipulation on time scales much faster than decoherence e times, Physical systems promising scalability to many quantum bits and quantum operations will receive the greatest attention. Theoretical analyses of non-classical phenomena may also be of interest if the work is strongly coupled to a specific experimental investigation, as may proof-of-concept demonstrations in atomic, molecular, and optical systems or in solid-state systems. Only fundamental studies advancing the goals of objectives 1 and 2 (above) will be considered for funding under this BAA.

4. Supporting Ancillary Technology Efforts. Certain experimental investigations discussed in objectives 1 through 2 (above) may require special technologies or devices difficult to procure or not commercially available. For these cases, special efforts may be needed whose objective would be either to develop and demonstrate, or to design, procure, and possibly improve technology critical to any of ARDA's quantum information science programs. A web site will be set up to provide details and expand on the changing requirements (see example below). Only ancillary studies advancing the goals of objectives 1 and 2 above will be considered for funding under this BAA.

An example of what might be provided on the web site may help here. ARDA's Quantum Communications programs have particular interest in robust, high-speed (perhaps >100 KHz or >100 MHz) single photon and entangled photon-pair sources at visible to communications wavelengths. Similarly, single and number resolving photon detectors exhibiting high (>90%, or >99%) quantum efficiency, high speed (>100 KHz, or >100MHz), and relatively low dark count rates are of interest. Additional examples of interest to our quantum efforts might include low loss (<0.1%) optical components and fibers, e.g., low loss blue and 1.5 micron friendly optics and fibers, optical UV switches (>40dB isolation), stable high speed (GHz) lasers, solid state 200-400 nm sources, and photon storage constructions.

3. SCOPE

3.1. Eligibility

The Quantum Information Sciences Program is open to all research and development organizations whether located in the U.S. or not, including:

- Large and small businesses;
- Academic and eligible non-profit and not-for-profit institutions;
- Collaborative ventures from mixed sources; and

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- Federally Funded Research and Development Centers (FFRDCs), as allowed by applicable regulations

All participants must submit initial contact papers, white papers, and proposals, as described in the BAA, to be selected for award.

3.2. Period of Performance

A base period of performance from 12 to 24 months will be standard with the possibility of option years including final reports and demonstrations.

3.3. Total Program Funding

Funding for the Quantum Information Sciences Program BAA will utilize funds from FY 2005-2007 and is currently anticipated to total up to \$8,000,000 over the first two years.

3.4. Individual Awards

The Government anticipates funding approximately 10 – 20 proposals at varying levels of effort. It is anticipated that any resultant contract(s) will be funded for up to two years, with each year's level approximately \$50K to \$500K. Please note that this is an approximation only and that the cost proposal should reflect the realistic cost of the proposed work.

4. RESEARCH GOALS

Offerors are referred to the Roadmaps on the <http://qist.lanl.gov/> site. Since further guidance will occasionally be needed to help potential offerors track our changing Technical and Management and program requirements, such further information will appear as a posting or link on the BAA web site. The scientific literature on QIS and related programs is often available first on <http://lanl.gov/form/quant-ph?MULTI=form+interface> and its "cond-mat" equivalent. The area of algorithms requires monitoring of the computer science and mathematics literature.

5 TECHNICAL AND MANAGEMENT CONSIDERATIONS

The main goal of the ARDA QIS program is to determine if a quantum computer can be built using any advanced technologies for creating qubits and manipulating them. The number of possible areas of technology the QIS BAA may support is large. To further help define areas that are current priorities, the on-line version of this PIP will be

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updated from time to time. These updates may include both long-term (untimed) interests and short notice interests (with deadlines specified).

6. ADMINISTRATIVE RESPONSIBILITIES

ALL Program participants are expected to assume responsibility for administration of their projects and comply with contractual as well as Program requirements for reporting, attendance at mandatory Program workshops and symposia and availability for site visits.

6.1 Program-level Workshops

ARDA may hold both Project level and Program-level Kickoffs (meetings or workshops) during the first months of the project or program. It then plans to hold Program-level Workshops or review meetings approximately every 12 months. These 3-5 day long Program Workshops are mandatory and will focus on Technical and Management aspects of the Program, on Program-level evaluation and progress issues, and on facilitating open Technical and Management exchanges, interaction and sharing between the various Program participants.

6.2 Project Status Accountability

ALL awardees will provide their Contracting Officer Representatives, Contracting Officer Technical and Management Representatives, and the Quantum Information Sciences program management staff with quarterly reports, providing an overview of the progress made during the ensuing period, issues encountered, financial status, and future plans.

Contracting Officer Representatives, Contracting Officer Technical Representatives, and the Quantum Information Sciences program management staff will conduct site visits, as required. Appropriate progress reports, details of successes and issues and contributions to the Program goals will be explored at such visits. It is anticipated that at least one site visit to each project will occur during each period between Program-level Workshops.

PROPOSAL PREPARATION INSTRUCTIONS

7. INTRODUCTION

This announcement is an expression of interest only and does not commit the Government to pay for proposal preparation costs. The cost of preparing proposals in response to this BAA is not considered an allowable direct charge to any resulting contract or to any other contract. However, it may be an allowable expense to normal

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bid and proposal indirect costs as specified in FAR 31.205-18. If a contract or subcontract(s) with a Federally Funded Research and Development Center (FFRDC) is proposed, Offerors are reminded of the limitations in their use (see FAR 35.017) and must provide documentation in their submission(s) that work is not otherwise available from the private sector.

Discussions with any of the points of contact shall not constitute a commitment by the Government to subsequently fund or award any proposed effort. Only Contracting Officers are legally authorized to commit the Government.

It is anticipated awards will be made either by NBC or by other agencies involved in the Quantum Information Sciences program. In this latter case, these agencies will each execute individual contracts within the larger Program and will use their internal Agency Contracting Officers (CO), Contracting Officer's Technical Representatives (COTRs), and administrative procedures. Some agencies may require additional clauses in their contracts, which may need to be negotiated at the time of contract award. These clauses will be Agency-specific but may include such items as "This Agency may prohibit non-U.S. citizens from all or certain aspects of the work to be performed under any resulting contract. The fact that the Offeror intends the use of non-U.S. citizens on any resulting contract will not necessarily disqualify the company from consideration nor may the non-U.S. citizens finally be prohibited from working on some or all aspects of any resultant contract. "

Offerors' submission may cover up to and include a 24-month effort. Offerors can provide option years and discuss a vision of what future research efforts might include after the 24-month period, but no submissions will be accepted which do not provide for a complete research effort during the maximum 24 month period of performance.

7.1. General

There is a 3 Step Submission Process for this BAA. The submission process is as follows:

Step 1--Initial Contact: An informal initial contact paper is required in which the desired outcome and duration of the proposed research is succinctly stated, and which contains a single overall approximate budget figure (i.e. a "rough order of magnitude" budget) for the research. The one page initial contact papers must be written in English and submitted as a letter sized page (8.5" x 11.5" sheet with margins no smaller than .75") in a single PDF or Microsoft Word formatted file with a font and pitch of Times New Roman 10. These are submitted to the following e-mail address: Lawrence_H_Carter@nbc.gov. The email subject line will contain the following: ARDA-QIS BAA 04-02-MT, Initial Contact Paper. Initial contact papers will be contain two

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sections, the first section will be a standard cover sheet, found at Attachment 1 of the PIP, containing pertinent administrative information and the second section being a one page project summary described above. Initial contact papers exceeding one page (not including the standard cover sheet) and/or not containing all the required information **WILL NOT** be considered. ARDA uses this initial contact submission to minimize unnecessary paperwork on the part of the submitter, to select the Program Manager and identify the Thrust(s) the idea best fits, and determine the interest for and value of the proposed effort to the applicable programs. ARDA will generally respond to initial contact papers within one month of their receipt.

Evaluation Factors for Initial Contact Papers

1. Potential contribution of the research to quantum computing and quantum communication, fundamental studies or ancillary technologies missions as specified by the proposed objective/outcome, the linkage to specific efforts supported, and the linkage to the roadmaps found at <http://qist.lanl.gov> and
2. The realism and reasonableness of cost and schedule.

Step 2 – White Paper: A more detailed white paper may be submitted **ONLY** if requested as a result of the submission and favorable evaluation of an initial contact paper. White papers will be no more than ten pages in length and outline the proposed project, give a summary of investigator qualifications, list meaningful proposed milestones and their relationship to the relevant Roadmap milestones, and contain a budget estimate. They must be received within the time period specified in the response to the initial contact (commonly one month). White papers must be transmitted to the email address given in the initial contact response, with the subject line as follows: **ARDA-QIS BAA 04-02-MT, White Paper**. White papers should follow the format described for the full proposal. White papers must be written in English and submitted in a single PDF or Microsoft Word formatted file using letter sized pages (8.5" x 11.5" sheets with margins no smaller than .75", and with a font and pitch of Times New Roman 10, double-spaced. Each white paper shall contain a single title page containing an executive summary, a single budget page outlining expected expenditures and justifications, and a single page containing curriculum vitae sketches. This leaves a maximum of seven pages for the technical portion of the white paper, including all references and figures. Not considered as part of the ten page maximum length is the required cover sheet found at Attachment 1 of the PIP. Proposers must specify in the title whether a white paper is to be considered a Quantum Computing, Quantum Communication, Fundamental Study, or Ancillary Technology white paper.

Feedback on the white papers will be e-mailed directly to the proposed Principal Investigators, generally within one month of receipt of the white paper. It is possible

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ARDA will ask the proposal be submitted to an agency other than ARDA. Such guidance will be provided in the feedback e-mailed to the Principal Investigators, and will include a submission deadline, if necessary.

Evaluation Factors for White Papers

1. Scientific and technical merits of the proposed research; and
2. Potential contribution of the research to quantum computing and quantum communication, fundamental studies or ancillary technologies missions as specified by the proposed objective/outcome, the proposal's annual milestones, the linkage to specific efforts supported, and the linkage to the Roadmaps found at <http://qist.lanl.gov/>; and
3. Experience and qualifications of the principal investigator, other key personnel, and the proven capability of the institution sponsoring the proposal; and
4. The realism and reasonableness of cost and schedule.

Step 3—Proposal: Each separate proposal must be the result of following the Contact Paper-White Paper chain detailed in this section or the result of ARDA redirecting proposals from other BAAs to this one. Proposals may be submitted on or before the date specified in the response to the white paper or redirection form another BAA, to the Department of the Interior, National Business Center, Acquisition and Property Management Services Division, Southwest Branch, Fort Huachuca, Arizona. Information or data contained in a full proposal deemed proprietary by the offeror should be clearly marked.

Proposals shall consist of two volumes: 1) Technical and Management and 2) Cost. The page format shall be 12 point or larger type, single-spaced, one-inch margins, single sided, 8.5 by 11 inch pages. Proposals must be written in English. Further details are below.

The page limitation for the Technical and Management volume includes all technical information (i.e., indices, photographs, foldouts, appendices, and technical attachments, but does not include the key personnel and their resumes, etc.). Unnecessarily elaborate resumes, brochures, or presentations beyond that sufficient to present a complete and effective proposal are not desired. The maximum total length of Volume I is twenty (20) pages.

The Cost volume is limited to five (5) pages.

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Offerors shall submit proposals electronically by email or CD-ROM. This submission must include an official copy of each proposal volume) in PDF or Microsoft Word (Microsoft Excel for any spreadsheet submissions). It may be submitted electronically or on a single PC CD-ROM disc containing two files, one for the Technical and Management Volume and one for the Management and Cost Volume. Either file may be formatted as either an MS-Office (2000 through XP; MS-Word and MS-Excel) compatible file, or as an Adobe PDF file. The message or CD-ROM may also include a formal submission letter (in either format), if the submitting organization requires it.

Proposals exceeding the maximum total length **WILL NOT** be considered.

Electronic Proposal Format: CDs shall be clearly labeled, referencing BAA 04-02-MT, marked with the Offeror's organization and proposal title (short title recommended). Hard copy and electronic media must be submitted together. If using Microsoft Word or Excel, embed any fonts and Microsoft PowerPoint graphics used. Microsoft Word documents, with graphics as separate files, are **NOT** acceptable. Volumes 1 and 2 must each be contained within a single electronic file, i.e., a single file containing all of Volume I and a second single file containing all of Volume II. All electronic media must be verified virus-free by using up-to-date, reputable virus detection utility, such as Norton or McAfee anti-virus software, and so noted on the disk label.

Number of Copies: No original paper copy of any proposal shall be submitted (the submission may contain a copy of a submission letter if the offeror requires that it contain original signatures) and a single electronic copy of the Volumes 1, and 2 files.

Information or data contained in a full proposal deemed proprietary by the Offeror should be clearly marked. The Offeror must mark the proposal with a protective legend in accordance with FAR Part 15.6, Use and Disclosure of Data, (modified to permit release to outside evaluators retained by either ARDA or the Department of the Interior, National Business Center, Acquisition and Property Management Division, Southwest Branch, Fort Huachuca) if protection is desired for proprietary or confidential information.

7.2. Volume 1 – Technical and Management Details

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7.2.1. Cover Sheet

The Cover Sheet shall identify the BAA number, lead organization submitting the proposal, type of business (large, small, educational institution, other not-for-profit, etc.), offeror's CAGE code, DUNS/CEC, CCR number (if any), and TIN codes, other team members (if applicable) and their types of business, proposal title, technical and administrative points of contact. Points of contact must include voice and facsimile telephone numbers, electronic mail addresses, and Internet web site addresses, if any. An example of the cover sheet may be found at Attachment 1, in the Proposers Information Pamphlet.

7.2.2. Length

Volume I shall be no longer than 20 pages in length. This page limitation includes all information (i.e., figures, tables, graphics, charts, indices, photographs, foldouts, and technical appendices), but does not include lists of key personnel or resumes, the Cover Sheets, provided that they contain no substantive text. Foldouts will be counted as a single page and must be no larger than 11 x 17 inches. Offerors are encouraged to submit concise, but descriptive, resumes and technical proposals.

7.2.3. Content

The content of Volume 1 shall consist of two parts: namely, Part 1: Summary of Proposal and Part 2: Detailed Proposal Information.

7.2.3.1. Part I: Summary of Proposal

This section shall provide an overview of the proposed work, as well as introduce associated technical and management issues. This section shall provide a technical description of the project in sufficient detail to provide clear, quantifiable technical objectives and a technical approach with a project schedule showing definite decision points and endpoints. In a manner of the offeror's choosing, this Part should provide a succinct description of the uniqueness and benefits of the proposed project. Offerors must address:

A. Innovative claims for the proposed effort. (Include in this part all proprietary claims to results, prototypes, intellectual property, or systems supporting and/or necessary for the use of the research, results, and/or prototype. If there are no proprietary claims, this must be stated.)

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B. Deliverables, which should include all reports, papers, studies, demonstrations, hardware and software associated with the proposed research, and any plans and capabilities to accomplish technology transition and commercialization.

C. Schedule and milestones for the proposed effort, including overall estimates of cost for each task.

D. Technical Rationale, technical approach, and constructive plans for accomplishment of technical goals.

E. General discussion of other research or development in this area, with differences between the proposed effort and current state-of-the-art clearly stated.

F. A clearly defined organization chart for the program team with brief biographical sketches of key personnel.

G. Teaming relationships, if any, to include the programmatic relationship of team members; the unique capabilities of team members; the task responsibilities of team members; the teaming strategy among the team members; the key personnel along with the amount of effort to be expended by each person during each year. A chart, such as the following is suggested:

Participants	Org	Role	Year 1	Year 2
John Doe	ABC University	Key Personnel / PI	25%	35%
Mary Smith	ABC University	Significant Contributor	50%	50%
Doctoral Candidate 1	ABC University	Contributor	25%	25%
Graduate Assistant 1	ABC University	Contributor	50%	50%
Abigail Stone	XYZ Co.	Key Personnel	25%	25%
Ronald Johnson	XYZ Co.	Significant Contributor	40%	50%
Graduate Assistant 1	XYZ Co.	Contributor	25%	50%

7.2.3.2. Part II: Detailed Proposal Information

This part shall provide the detailed, in-depth discussion of the proposed research. Specific attention must be given to addressing both the risks and payoffs of the proposed research making it desirable to pursue. This Part shall provide:

A. Innovative claims for the proposed research. This is the centerpiece of the proposal and should succinctly describe the unique proposed contribution.

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B. Detailed technical rationale. The technical rationale should clearly show why the proposed technical approach is expected to achieve the stated purpose within the proposed cost and time schedule. The rationale shall also describe the rationale for the claims and deliverable products outlined elsewhere in the proposal and show how past and/or current performance justifies an award in this technical area.

C. Statement of Work (SOW), describing the effort's scope, the specific tasks to be performed and their associated schedules and relationship to the technical topic and associated thrust areas, described above. At a minimum, the statement of work shall consist of the following sections:

Scope – A statement as to what the SOW covers: objectives and goals and major milestones for the effort. Key elements are task development and deliverables.

Task/Technical Requirements – A description of tasks, representing the work to be performed, developed in an orderly progression and in enough detail to establish the feasibility of accomplishing the overall program goals. The overall effort should be grouped into major tasks and identified in a work breakdown structure (WBS)-like numbering system. Proposed costs shall have a one-to-one correlation to this reporting structure, which shall be depicted in the cost volume.

D. Description of the results, products, transferable technology, and expected technology transfer path(s) must be included.

E. Comparison with other ongoing research or development highlighting the uniqueness of the proposed effort and approach. Differences between the proposed effort and current state-of-the-art should be clearly stated. Identify the advantages and disadvantages of the proposed work with respect to potential alternative approaches.

F. Discussion of Offeror's previous accomplishments and/or work in this or closely related research areas

G. Description of the facilities that would be used for the proposed effort.

H. If any portion of the research is based on the use of the Government-owned resources of any type, the Offeror shall specifically identify the property or other resource required, the date the property or resource is required, the duration of the requirement, the source from which the resource will be obtained, if known, and the impact on the research if the resource cannot be provided. If no Government-furnished property is required for conduct of the proposed research, this section shall consist of a statement to that effect.

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I. Detailed description of the support, including formal teaming agreements, required to execute the offeror's proposal. Discussion of teaming relationships should include the programmatic relationship of team members; the unique capabilities and relevant accomplishments and concise summary of qualifications of all team members (key personnel and significant contributors), with information about their major sources of support and commitments of their time; the task responsibilities of team members; the teaming strategy among the team members; and the management approach for the team. Full resumes and/or curriculum vitae of key personnel and significant contributors should be included in Volume 1, in a section called "Additional Reference Information" of the proposal. ARDA encourages limiting these data to the minimum required to make a succinct proposal.

J. A summary of any proprietary claims to results, prototypes, or systems. The Offeror shall submit a separate list of all technical data or computer software that will be furnished to the Government with other than limited rights in accordance with DFARS 252.227-7017, Identification and Assertion of Use, Release or Disclosure Restrictions.

K. Description of how progress toward completion of their research goals will be measured, including a description of the evaluations to be performed, a schedule of implementation and type of report to be prepared.

L. Identification and description of anticipated data sources to be utilized in pursuit of the project research goals.

7.3. Volume 2: Cost. Volume II, the Cost Proposal will be limited to five (5) pages, not including the Cover Sheet and Proposal Pricing Sheet. The content of Volume II shall consist of three parts: namely, Part 1: Cover Sheet, Part 2: Detailed Cost Breakdown, and Part 3: Supporting Cost and Pricing Information.

Part 1: Cover Sheet. The Volume II Cover Sheet shall be the same as the described for Volume I, Technical and Management Details and found at Attachment 1 of this document. The Proposal Pricing Sheet at Attachment 2 shall be completed and submitted with each offer immediately following the cover sheet.

Part 2: Detailed Cost Breakdown. Offeror shall provide all cost estimates associated with the proposed project, to include:

A. Total program cost, broken down by major cost items (direct labor, subcontracts, materials, other direct costs, overhead charges, etc.);

B. Major program task costs;

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- C. An itemization of major subcontracts;
- D. A summary of projected funding requirements by month;
- E. A description of cost estimating methods; and

F. The source, nature, and amount of any industry cost-sharing. No proposed expenditures for equipment, hardware, software, etc., will be allowable, unless specifically requested in the previously submitted white paper and approved in the response to that white paper.

Part 3: Supporting Cost and Pricing Information. This part shall include supporting cost and pricing information in sufficient detail to substantiate the summary cost estimates in Part 2 above. Costs for subcontracts having 20% or more of the total value of the work must be substantiated to the same level of detail as the costs of the offeror.

7.5. Handling of Proposals; Use of Consultants

All proposals shall be handled as competitive information; contents will be disclosed only for the purposes of evaluation and only to members of the source selection panel.

The Government intends to use consultants and/or contractors to assist in handling, managing, and evaluating the proposals. These personnel will have signed, and will be subject to, the terms and conditions of non-disclosure agreements. By submission of its proposal, an Offeror agrees that its proposal information may be disclosed to the aforementioned personnel for the limited purposes stated above. However, only the Government will make final award determinations under this BAA.

7.6. Proposal Submission

Proposers may submit multiple proposals, but each separate proposal must be the result of following the Initial Contact and White Paper chain detailed above and the published announcement. Proposals may cover individual or multiply technical topic areas. Proposals are due on or the date specified in the white paper response.

Proposals must be submitted in accordance with the requirements and procedures identified in the BAA and this PIP. For overnight package delivery, proposals should be addressed to the Department of the Interior, National Business Center, Acquisition and Property Management Division, Southwest Branch, ATTN: BAA 04-02-MT (G. Golden), Bldg. 22208 Auger St, Fort Huachuca, Arizona 85613-6000. **Proposals submitted by fax are not acceptable and WILL NOT BE CONSIDERED. Proposals and/or proposal modifications received after the proposal submission closing date and time identified in the white paper response will be handled IAW FAR 15.208. Proposals not adhering to the form and format required by this BAA WILL NOT**

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BE CONSIDERED. The Government anticipates completing the evaluation process within one month after the receiving the individual proposals.

7.7 Proposal Selection Criteria

Submissions will be selected through a technical / scientific / business decision process with technical and scientific considerations being most important. Submissions, including the initial contact paper, white papers, and proposals, will not be evaluated against each other since they are not submitted in accordance with a common work statement. Proposals unresponsive to the technical and research areas addressed in the BAA will not be fully evaluated and will not be considered for award. For all evaluations, all evaluation factors other than cost or price when combined are significantly more important than cost or price. Evaluations will be performed using the following criteria.

7.7.1. Evaluation Factors for Initial Contact Papers

Potential contribution of the research to quantum computing and quantum communication, fundamental studies or ancillary technologies missions as specified by the proposed objective/outcome, the linkage to specific efforts supported, and the linkage to the roadmaps found at <http://qist.lanl.gov>.

Realism and reasonableness of cost and schedule.

7.7.2. Evaluation Factors for White Papers

Scientific and technical merits of the proposed research.

Potential contribution of the research to quantum computing and quantum communication, fundamental studies or ancillary technologies missions as specified by the proposed objective/outcome, the proposal's annual milestones, the linkage to specific efforts supported, and the linkage to the roadmaps found at <http://qist.lanl.gov/>.

Experience and qualifications of the principal investigator, other key personnel, and the proven capability of the institution sponsoring the proposal.

The realism and reasonableness of cost and schedule.

7.7.3. Evaluation Factors for Proposals: Proposals will be evaluated in accordance with the following evaluation criteria in descending order of importance:

Scientific and technical merits of the proposed research

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Potential contribution of the research to quantum computing and quantum communication, fundamental studies, or ancillary technologies missions as specified by the proposed objective/outcome, the proposal's annual milestones, their linkage to specific efforts supported, and their linkage to the roadmaps found at <http://qist.lanl.gov>.

Experience and qualifications of the principal investigator, other key personnel, and the proven capability of the institution sponsoring the proposal.

Realism and reasonableness of cost and schedule.

7.8. Award Selection and Notification

As soon as the submission evaluation process is complete, the Offeror will be notified if their proposal is recommended for award. Submissions not recommended for the next submission or award will be notified. Oral debriefings of non-selected submissions may be requested by the offerors upon notification of non-selection.

Awards under this BAA will be made to responsible Offerors on the basis of the evaluation criteria above and a BEST VALUE approach to the Government. The Government reserves the right to select for award all, some, or none of the proposals received and to fund incrementally any award instrument. The Government also reserves the right to fund all or any part of a proposal evaluated as eligible for award. Awards are subject to the availability of Government funds and will be made in the form of a contract.

If additional funds become available at a later date the Government reserves the right to fund any selectable proposal up to 12-months after the proposal submission date. Such funding of selectable proposals may require the Government to request specific modifications to the Technical and Management proposal and to enter into negotiations to resolve any issues and related adjustments to the cost proposals.

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Quantum Information Sciences (QIS)
BROAD AGENCY ANNOUNCEMENT (BAA)
BAA 04-02-MT
PROPOSAL COVER SHEETS
For
VOLUME 1 - Technical and Management
And
VOLUME 2 – Cost

ATTACHMENT 1

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FOR Govt Use Only [Proposal Number]
_____ _____

Quantum Information Sciences (QIS)
Broad Agency Announcement
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(Choose One)

VOLUME 1 - Technical and Management
or
VOLUME 2 – Cost

Organization / Company	
CAGE Code	
DUNS / CEC Number	
TIN Number	
Type of Business	
Proposal Title	
Program Objective Category (Check ONLY ONE Box)	<input type="checkbox"/> 1. Quantum Computation <input type="checkbox"/> 2. Quantum Communication <input type="checkbox"/> 3. Supporting Fundamental Studies <input type="checkbox"/> 4. Supporting Ancillary Technology Studies
Team Members / Type of Business	

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Principal Investigator(s) Name(s)	
Mail Address	
Phone Number	
Fax Number	
E-mail Address	
Administrative Contact Name	
Mail Address	
Phone Number	
Fax Number	
E-mail Address	

Proposal Duration	
Cost - Year 1	\$
Cost - Year 2	\$
Total Cost	\$

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PROPOSAL PRICING SHEET

ATTACHMENT 2

PROPOSERS' INFORMATION PAMPHLET (PIP)
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FOR Govt Use Only [Proposal Number]
_____ _____

Quantum Information Sciences (QIS)
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VOLUME 2 – Cost Information

1. Company / Agency Information:

 (Company / Agency Name)

 (First Line of Address)

 (Street Address)

 (City)

 (State)

 (Zip Code)

2. Company / Agency Point of Contact Information:

 (POC Name)

 (POC Title)

 (POC Telephone and FAX Nos. (Include Area Code))

 (POC e-mail)

3. Type Of Contract (Check One):

FFP CPFF CPAF

FPI CPIF Other (Specify)

4. Proposed Cost (A + B = C):

	4.a. Cost	4.b. Profit / Fee	4.c. Total
Year 1	_____	_____	_____
Year 2	_____	_____	_____

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5. Performance:

5.a. Place (1) _____ 5.b. Period (1) _____
 (2) _____ (2) _____

6. Line Item Costs (List and reference the identification, quantity and total price proposed for each contract line item. A line item cost breakdown supporting this recap is required unless otherwise specified by the Contracting Officer. Continue on reverse, and then on plain paper, if necessary. Use same headings.)

6.a. Line No.	6.b. Identification	6.c. Quantity	6.d. Price	6.e. Prop. Pg. No.
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

7. Provide the Following (If available):

(Name of Contract Administration Office)	(Name of Audit Office)
(City) (State) (Zip Code)	(City) (State) (Zip Code)
(Telephone (Include Area Code))	(Telephone (Include Area Code))

8. Will you require the use of any Government property in the performance of this work? Yes No

9. Do you require Government contract financing to perform this proposed contract? Yes No
 Type of financing (Check One) Advanced Payments Progress Payments Guaranteed Loans

10. Have you been awarded any contracts or subcontracts for the same or similar items within the past 3 years?
 Yes No (If "Yes," identify items(s), customer(s) and contract number(s) on reverse of form.)

11. Is this proposal consistent with your established estimating and accounting practices and procedures and FAR Part 31, Cost Principles? Yes No (If "No," explain on reverse of form.)

12. Cost Accounting Standards Board (CASB) Data (Public Law 91-379 as amended and FAR Part 30)

12.a. Will this contract action be subject to CASB regulations? Yes No
 (If "No," explain on reverse of form.)

12.b. Have you submitted a CASB disclosure statement (CASB DS-1 or 2)? Yes No
 (If "yes," specify in proposal the office to which submitted and if determined to be accurate.)

12.c. Have you been notified that you are or may be in compliance with your disclosure statement or cost accounting standards? Yes No (If "Yes," explain in proposal.)

12.d. Is any aspect of this proposal inconsistent with your disclosed practices or applicable cost accounting standards? Yes No (If "Yes," explain in proposal.)

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This proposal is submitted in response to BAA 04-02-MT and reflects our estimates and/or actual costs as of this date and conforms to the instructions in FAR15.804-6(b)(1), and Table 15-2. By submitting this proposal, the Offeror, if selected for negotiation, grants the contracting officer and authorized representatives(s) the right to examine, at any time before award, those records which include books, documents, accounting procedures and practices, and other data regardless of type and regardless of whether such items are in written form, in the form of computer data, or whether such supporting information is specifically referenced or included in the proposal as the basis for pricing, that will permit an adequate evaluation of the proposed price.

13. Name (Typed)

14. Title

15. Company / Agency Name

16. Signature

Date