

Special Notice N00014-19-S-SN11
Special Program Announcement for 2019 Office of Naval Research
Basic and Applied Research Opportunity:
“Atomic and Quantum Science and Technology”

I. INTRODUCTION

This announcement describes a research thrust, entitled “Atomic and Quantum Science and Technology” to be launched under Fiscal Year (FY) 19 Long Range Broad Agency Announcement (BAA) for the Navy and Marine Corps Science and Technology, N00014-19-S-B001 (and any amendments), which can be found at <https://www.onr.navy.mil/en/work-with-us/funding-opportunities/announcements>. The submission and evaluation of proposals and the awarding of any grants and contracts for the research areas of interest described in this Special Notice will be made as described in the FY19 Long Range BAA. This Special Notice is not a solicitation.

The purpose of this Special Notice is to (1) focus attention of the scientific and technical community on specific areas of interest related to atomic, molecular and quantum physics and quantum information sciences, and (2) provide a timetable for the submission of white papers and proposals.

II. TOPIC DESCRIPTION

ONR is interested in receiving white papers and proposals in support of advancing atomic, molecular and quantum science and technology for future naval applications. Work under this program will consist of basic and applied research, and therefore projects would be funded under Budget Activities 1 & 2 (as defined in the DoD Financial Management Regulation Vol. 2B, Ch. 5). The overall S&T efforts will be conducted at the Technology Readiness Level (TRL) 1-4 stages.

Background:

The Office of Naval Research has a long history of funding quantum research and development, making seminal investments that led to the invention of the laser and atomic clocks as well as methods for cooling, trapping and Bose-condensing atoms and controlling and measuring individual quantum systems. It is the purpose of this program to identify novel research concepts that will lead to future generations of clocks, inertial sensors, materials, and communications and networking devices supporting current and future Navy and Marine Corps requirements.

Objective:

The Office of Naval Research (ONR) is interested in receiving white papers and proposals for basic and/or applied research in atomic and quantum science and technology. Specific focus areas are as follows:

- Protocols for efficient atom, ion or molecule cooling and trapping. Of particular interest are techniques that are compatible with the development of compact and low power sensors and clocks, such as methods to efficiently deliver light to the particles via integration with photonic circuits.
- Techniques for robust and/or high performance optical atomic clocks. Optical clocks have demonstrated orders of magnitude better performance than their microwave counterparts, but there is still room to improve their long term performance for geodesic applications. Protocols and systems enabling operation outside a laboratory environment are also of interest.
- Novel approaches to quantum inertial or electromagnetic field sensing and applications thereof that have the potential to significantly outperform the current state of the art. This includes electric and magnetic field sensors operating near the standard quantum limit.
- Innovative protocols for the preparation, readout, characterization and utilization of quantum correlated states for improved sensing and quantum information processing. This includes the development of protocols for enhancing multi-sensor performance via distributed entanglement.
- Protocols for enhancing coherence in quantum systems by engineering the environment (such as controlling dissipative channels or employing driving protocols) that are compatible with applications in quantum information processing.
- Novel approaches to quantum simulation of complex, correlated quantum systems and quantum algorithms for finding approximate solutions to hard problems with Navy relevance (e.g., large logistics problems) that may outperform all known classical techniques.
- Approaches to implementing quantum information processing tasks using phonons and phonon-based devices.

III. WHITE PAPER SUBMISSION

Although not required, white papers are strongly encouraged for all offerors seeking funding. Each white paper will be evaluated by the Government to determine whether the technology advancement proposed appears to be of particular value to the Department of the Navy. Initial Government evaluations and feedback will be issued via e-mail notification from the Technical Point of Contact. The initial white paper appraisal is intended to give entities a sense of whether their concepts are likely to be funded.

Detailed Full Proposal (Technical and Cost volumes) will be subsequently encouraged from those Offerors whose proposed technologies have been identified through the above referenced e-mail as being of “particular value” to the Government. However, any such encouragement does not assure a subsequent award. Full Proposals may also be submitted by any offeror whose

white paper was not identified as being of particular value to the Government or any offeror who did not submit a white paper.

For white papers that propose efforts that are considered of particular value to the Navy but either exceed available budgets or contain certain tasks or applications that are not desired by the Navy, ONR may suggest a full proposal with reduced effort to fit within expected available budgets or an effort that refocuses the tasks or application of the technology to maximize the benefit to the Navy.

White papers should not exceed 5 single-sided pages, exclusive of cover page and resume of principal investigator, and should be in 12-point Times New Roman font with margins not less than one inch. White papers shall be in Adobe PDF format (preferred) or in Microsoft Word format compatible with MS Office 2016.

The cover page shall be labeled “WHITE PAPER” and include the current open Long Range BAA Solicitation Number, Special Notice Number N00014-19-S-SN11, proposed title, technical points of contact, telephone number, facsimile number (if available), and email address.

The 5-page body of the white paper shall include the following information:

1. Principal Investigator(s);
2. Relevance of the proposed effort to the research areas described in Section II; relationship of the proposed work to current state-of-the-art.
3. Technical objective of the proposed effort;
4. Technical approach that will be pursued to meet the objective;
5. A summary of recent relevant technical breakthroughs; and
6. A funding plan showing requested funding per fiscal year.

Resume(s) of the principal investigator(s), not to exceed one (1) page per principal investigator, shall also be included after the 5-page body of the White Paper.

White Papers shall otherwise comply with requirements of the ONR Long Range BAA, N00014-19-S-B001, or the successor open Long Range BAA, whichever is applicable at the time of submission.

To ensure full, timely consideration for funding, white papers should be submitted **no later than 20 September 2019**. White papers received after that date will be considered as time and availability of funding permit.

The planned date for completing the review of white papers is **15 OCTOBER 2019**.

IV. FULL PROPOSAL SUBMISSION AND AWARD INFORMATION

Full proposals should be submitted under the FY 19 Long Range BAA, N00014-19-S-B001, or the successor open ONR Long Range BAA, by **15 November 2019**. Full Proposals received after that date will be considered as time and availability of funding permit. Full proposals shall be submitted in accordance with the requirements of the then-current ONR Long Range BAA.

ONR anticipates that grants, contracts or Other Transaction Agreements will be issued for this effort.

Full proposals for contracts shall be submitted in accordance with the instructions of the ONR Long Range BAA that is open at the time of submission.

Full proposals for grants shall be submitted via Grants.gov. The following information must be completed as follows in the SF-424 to ensure that the application is directed to the correct individual for review: Block 4a, Federal Identifier: Enter N00014; Block 4b, Agency Routing Number: Enter the three (3) digit Program Office Code and the Program Officer's name: The relevant Program Officer will be the first Topic Chief for a topic. All attachments to the application should also include this identifier to ensure the proposal and its attachments are received by the appropriate Program Office.

The period of performance for projects may be from one to three years.

Although ONR expects the above described program plan to be executed, ONR reserves the right to make changes.

Funding decisions should be made by 06 December 2019. Selected projects will have an estimated award date of 01 April 2020.

V. SIGNIFICANT DATES AND TIMES

Event	Date	Time
White Paper Submission*	20 September 2019	1400 Eastern Local Time
Notification of White Paper Valuation*	15 October 2019	
Full Proposal Submission	15 November 2019	1400 Eastern Local Time
Full Proposal Selection *	06 December 2019	
Awards *	01 April 2020	

Note: * These are approximate dates.

VI. POINTS OF CONTACT

The points of contact for this announcement are listed below:

Technical Points of Contact:

Dr. Roberto Diener
Program Officer, ONR Code 312
roberto.diener@navy.mil

Business Point of Contact:

Stephen Hughes
Contracting Officer, ONR Code 251
stephen.t.hughes@navy.mil

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VII. SUBMISSION OF QUESTIONS

Any questions regarding this announcement must be provided to the Technical Points of Contact and/or the Business Point of Contact listed above. All questions shall be submitted in writing by electronic mail.

Answers to questions submitted in response to this Special Notice will be addressed in the form of an Amendment and will be posted to the following web pages:

- Federal Business Opportunities (FEDBIZOPPS) Webpage
<https://www.fbo.gov/>
- ONR Special Notice Webpage
<https://www.onr.navy.mil/en/Contracts-Grants/Funding-Opportunities/Special-Notices>

Questions regarding **White Papers or Full Proposals** should be submitted NLT two weeks before the dates recommended for submission of White Papers and/or Full Proposals. Questions after this date may not be answered.