

Special Notice N00014-16-R-SN02
Special Program Announcement for 2016 Office of Naval Research
Research Opportunity:
Undersea Technologies for Autonomous Detection and Communications

I. INTRODUCTION

This announcement describes the research thrust "Undersea Technologies for Autonomous Detection and Communications," to be launched under the BAA entitled, "Long Range Broad Agency Announcement (BAA) for Navy and Marine Corps Science and Technology" which can be found at <http://www.onr.navy.mil/Contracts-Grants/Funding-Opportunities/Broad-AgencyAnnouncements.aspx>.

The research opportunity described in this announcement currently falls under the following sections of FY16 Long Range BAA, N00014-16-R-BA01: Section I, entitled "General Information", sub-section F, entitled "Research Opportunity Description"; the "Ocean Battlespace Sensing (Code 32)" item, paragraph 1, both subparagraph a, entitled "Maritime Sensing", and subparagraph b, entitled "Ocean Engineering and Marine Systems."

The purpose of this announcement is to (1) focus attention of the scientific & technology community on the areas of interest, (2) encourage dialogue amongst those interested in these areas with ONR, and (3) provide a planned timetable for the submission of white papers and proposals.

II. TOPIC DESCRIPTION

The Office of Naval Research (ONR) is soliciting white papers and full proposals for technologies to enable advanced maritime surveillance and response capabilities. Work under this BAA will consist of applied research and advanced technology development, and it will be funded under Budget Activity 2 and 3 respectively (as defined in DoD Financial Management Regulation Vol. 2B, Ch. 5). The overall S&T effort is envisioned to be conducted at the TRL 2-6 stage.

Background and Objectives

The overall objective of this program is to conduct applied research and advanced technology development for an undersea system to autonomously detect targets and to communicate through both seawater and the air-sea interface. Its foci are 1) detection and classification of objects of interest with high confidence, and 2) transmission of these objects of interest in areas with tactical constraint.

- 1) Autonomous Detection, Tracking, Localization, and Identification. Under this thrust, both hardware and software products to detect, discriminate, and classify sources of interest will be investigated to optimize quality, speed of production, and level of production in autonomous employment.
- 2) Command, Control, and Communications (C3). This thrust will provide undersea data collection, storage, intra-nodal transfer, and/or exfiltration in real-time or in a "store-and-forward" capacity to remote sites.

The following subsections describe the technology thrusts in more detail. Some specific topics of interest are given below, but submissions within the general interest area are encouraged and will be considered.

The expected deliverables include hardware, firmware as needed to support hardware, software prototypes, algorithmic descriptions, and study findings as appropriate. Data rights for technologies developed or leveraged for this effort should be clearly stated in the White Paper and proposal; however, proposals should assume either government purpose rights (GPR) or unlimited rights. Justification provided for data rights more restrictive than GPR will be considered on a case-by-case basis.

1) Autonomous Detection, Tracking, Localization and Identification

The objective of the Autonomous Detection, Tracking, Localization and Identification thrust is to develop efficient hardware and computational methods using principled approaches which advance a tactical system's ability to autonomously detect, track, localize and identify a radiating source (in modalities including acoustic, magnetic, seismic, etc.) with high probability of correct classification, and low false alarm rate. The algorithms and methods developed in this thrust should perform in complex, realistic environments, i.e. cluttered open ocean/seabed and port/harbor areas. Specific research areas of interest include:

- a) Multi-modal sensor fusion
- b) Multi-modal, multi-node feature extraction
- c) Multi-modal, multi-node feature aggregation
- d) Detection, classification, and semantic inference
- e) Computational efficiency for employment within tactical network constraints (high latency, low bandwidth)

2) Command, Control, and Communications (C3)

C3 in the undersea domain has been a continuing challenge. This effort seeks to identify technologies, methods, and solutions for overcoming three challenges: (a) movement of information (command, control, or data) between tactical nodes and shore sites; (b) transition of information from the undersea space through the air-sea interface; and (c) autonomous optimization of C3. Specific interests within C3 include the following:

- a) Undersea networking technology including acoustic, electro-optical, or other means by which to communicate between multiple undersea nodes in real-time or near-real-time.
- b) Technology, methods, or specialized protocols enabling undersea, node-to-node communication for the purpose of field awareness, management, and convergence of field information
- c) Technology and/or solutions enabling remote, human interface and control of undersea nodes in real-time or near-real-time.
- d) Technologies enabling the exfiltration of relevant data types from undersea nodes including video and imagery to remote sites either directly or by use of a gateway (i.e., air-sea interface system).
- e) Technologies enabling the transfer of information from undersea nodes through the air-sea interface either directly or by use of a gateway.

- f) Technologies enabling autonomy of undersea nodes (whether static or mobile) to form a network.

For all focus areas a through f above, there is additional interest in the following areas of concern:

- a) Information Security (InfoSec) including both Data at Rest (DAR) and communications security
- b) Low power, high efficiency communications technology and solutions
- c) Small form factor communications and technology solutions
- d) Extended endurance communications and technology solutions
- e) Low Probability of Detection (LPD) communications and technology solutions

Technological solutions should consider (d) Size, Weight, and Power (SWaP) constraints, and seek to enable high endurance, high efficiency, and persistent operation.

III. WHITE PAPER SUBMISSION

There are multiple thrusts for this research opportunity; for the purposes of this announcement, two areas are of primary interest. Interested parties are welcome to propose against one or both thrusts; however, separate proposals are required for each.

White Papers 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 or not their concepts are of interest to this program and will result in either encouragement or discouragement of a Full Proposal submission. It should be noted that encouragement of a Full Proposal is simply an indication of interest and does not guarantee a subsequent award. White papers should not exceed 8 single-sided pages, exclusive of cover page, references, and resume(s) of principal investigator(s), 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 2010.

Respondents proposing to tasks outlined in this special notice may require access to classified information and software. Potential respondents who lack the ability to work with classified information may still submit white papers in support of the tasks outlined here. White papers should indicate facilities and personnel to support classified work. At a minimum, all performers should be able to receive and handle controlled UNCLASSIFIED, FOR OFFICIAL USE ONLY (FOUO) data.

For white papers proposing 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.

The cover page should be labeled "Undersea Technologies for Autonomous Detection and Communications" and include the following information: title of the proposed effort, technical point of contact, telephone number, and email address.

The 8-page body of the white paper should include the following information:

- (1) Principal Investigator(s);
- (2) Relevance of the proposed effort to the research areas described in Section II;
- (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 1 page per principal investigator, should also be included after the 8-page body of the white paper.

White papers shall be submitted via email to ONR.NCR.321OE.list.OceanEngineering-and-MarineSy@navy.mil, citing the specific Special Notice number in the subject heading. If the submission exceeds 10Mb in size, please submit via upload to the secure site: <https://onroutside.onr.navy.mil/ASPPProcessor/annual321oe/>. In either case, it is the responsibility of the submitting individual to ensure he/she receives an email confirming receipt from the Technical Point of Contact (listed below).

White Papers should be submitted in accordance with the schedule in Section VI. White papers received after the submittal date may not receive adequate consideration. Please note: respondents are not required to submit a White Paper and may submit only a Full Proposal. However, White Paper submission is strongly encouraged as it affords ONR an opportunity to provide constructive feedback prior to the Full Proposal formulation process.

V. FULL PROPOSAL SUBMISSION AND AWARD INFORMATION

Full Proposals should be submitted to the ONR Long Range BAA N00014-16-R-BA01 in accordance with the schedule in Section VI. Full Proposals received after the submittal date will not be considered.

ONR anticipates that grants and/or contracts will be issued for this effort.

Full proposals should be submitted in accordance with the requirements of the FY16 Long Range BAA, N00014-16-R-BA01 and prepared using the templates and guidance posted on the ONR website. The Technical Content shall be single spaced and not exceed 20 pages. The cover page, resumes, bibliographies, project schedule, and table of contents are excluded in the page count. All proposals will be evaluated in accordance with ONR BAA N00014-16-R-BA01.

Submissions for contracts should be submitted via email to ONR.NCR.321OE.list.OceanEngineering-and-MarineSy@navy.mil, citing the specific Special Notice number in the subject heading. If the submission exceeds 10Mb in size, please submit via upload to the secure site: <https://onroutside.onr.navy.mil/ASPPProcessor/annual321oe/>. In either case, it is the responsibility of the submitting individual to ensure he/she receives an email confirming receipt from the Technical Point of Contact (listed below).

Submissions for grants should be submitted via grants.gov (as instructed in the aforementioned Long Range BAA). For SF424 preparation, the following shall be used:

Block 4a, Federal Identifier: N00014
Block 4b, Agency Routing Number: Emily Medina, Code 32

ONR plans to fund multiple awards. A typical Award for a given Topic is \$1M for an entire 2.5 year period; however, Awards for each Topic that are as small as \$75K per year or as large as \$700K per year are acceptable.

VI. SIGNIFICANT DATES AND TIMES

Event	Date	Time
White Paper Submission Deadline	8 JAN 2016	1400 Eastern Time
White Paper Evaluation Feedback *	5 FEB 2016	
Full Proposal Submission Deadline	22 MAR 2016	1400 Eastern Time
Full Proposal Selection Notification *	1 APR 2016	
Notional Award Date *	30 AUG 2016	

* Note: These are approximate dates.

VII. POINTS OF CONTACT

Technical Point of Contact:
Emily Medina
Program Officer
Mine Warfare & Ocean Engineering Programs
emily.medina@navy.mil

Business Point of Contact:
Alan Kesten
Contract Specialist, Code 253
alan.kesten@navy.mil

VIII. SUBMISSION OF QUESTIONS

Any questions regarding this announcement must be provided to the Technical Point of Contact and/or the Business Point of Contact listed in Section VII 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/>
- Grants.gov Webpage- <http://www.grants.gov/>
- ONR Special Notice Webpage- <http://www.onr.navy.mil/Contracts-Grants/FundingOpportunities/Special-Notices.aspx>

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