

Special Notice N00014-21-S-SN03
Special Program Announcement for Office of Naval Research
Research Opportunity:
Immersive Sciences for Training, Education,
Mission Rehearsal, and Operations

I. INTRODUCTION

This announcement describes the technology area entitled, “Manpower, Personnel and Training Information Sciences,” under the N00014-21-S-B001, Long Range Broad Agency Announcement for Navy and Marine Corps Science and Technology which can be found at <https://www.onr.navy.mil/work-with-us/funding-opportunities/announcements>. The submission of proposals, their evaluation and the placement of research grants will be carried out as described in the above Long Range Broad Agency Announcement.

The purpose of this announcement is to focus attention of the scientific community on (1) the area to be studied, (2) the planned timetable for the submission of white papers and full proposals.

ONR anticipates only grants will be issued for this effort.

II. TOPIC DESCRIPTION

Objective:

The Office of Naval Research is soliciting white papers and proposals for basic research in immersive sciences. The Navy and Marine Corps seeks to use mixed reality technologies to improve training and operations for infantry combat personnel, with a specific focus on small unit leaders (e.g., Squad Leader). This includes a range of applications, including: augmented training environments that can simulate environments and assets, and heads-up displays that overlay useful virtual information onto the real-world environment. While the Navy and Marine Corps have envisioned these applications, this research opportunity is focused on the development of the underlying scientific disciplines.

In support of this goal, the Immersive Sciences research program seeks to address basic research challenges in automated methods for generating content for use in mixed reality technologies, and novel methods for visualization and interaction in Augmented Reality that are connected to underlying human factors principles, guidelines, and scientific evidence.

1) The first area involves automated methods for generating content for immersive environments. Current methods of content generation are slow (e.g., manual creation), expensive, or require specialized equipment (e.g., LIDAR scanners) or expertise. The goal of this research is to develop tools and techniques for more rapidly and automatically collecting, processing, storing, distributing, and consuming 3D geospatial content from non-traditional, off-

the-shelf sources. This content should include terrain, roads, buildings, people, vehicles, and other relevant environmental features necessary to create immersive environments that reflect the intricacies of future operating environments (e.g., Expeditionary Advanced Base Operations). There is a need for:

1. First-person quality geo-specific environments (photogrammetric and LIDAR data is inherently waxy and rarely usable for dismounted, high-density operations)
2. Meshing & texturing of point clouds

Proposals describing new and innovative techniques are welcome, as are proposals that seek to improve currently-existing techniques.

2) The second area involves understanding how visualizations in augmented reality may improve performance through increased situational awareness or enhance human perception. These visualizations should be designed according to well-understood human factors principles, including maximizing legibility, minimizing clutter, and following the proximity compatibility principles. However, in many cases, these principles may conflict. For example, similar display elements should be placed close together, but that creates clutter and may reduce legibility. As another example, there are benefits to fully overlaying information (i.e., from an infrared camera) onto the environment, but that may lead to increased cognitive load with interpreting the additional information. An open research question is how to reconcile these conflicts. We seek research that blends experimental psychology, cognitive modeling, and computer science to provide general model/framework/guidance for optimal AR display design.

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, references, 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 at least Microsoft Word 2016.

The Cover Page can be found at

<https://www.onr.navy.mil/work-with-us/how-to-apply/submit-grant-application> for grant submissions.

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

- Technical Concept: A description of the technology innovation and technical risk areas.
- Future Naval Relevance (where applicable) – A description of potential Naval relevance and contributions of the effort to the agency’s specific mission.
- Operational Naval Concept (where applicable) – A description of the project objectives, the concept of operation for the new capabilities to be delivered, and the expected operational performance improvements.
- Operational Utility Assessment Plan (where applicable) – A plan for demonstrating and evaluating the operational effectiveness of the Offeror’s proposed products or processes in field experiments and/or tests in a simulated environment.
- Rough Order of Magnitude (ROM) cost estimate: A description of the rough order of magnitude cost showing requested funding per year, total cost, and suggested spending priorities. Break requested cost down into categories of salaries and benefits, materials and supplies, travel, cost associated with student participation (tuition and fees) and indirect costs

A resume of the principal investigator, not to exceed 3 pages, should also be included after the 5-page body of the white paper.

White papers must be submitted through Fedconnect at www.fedconnect.net in accordance with Section D. Application and Submission Information, Section 2. Content and Form of Application Submission, paragraph d. White Paper Requirements, ii. White Paper Submission in N00014-21-S-B001.

To ensure full, timely consideration for funding, white papers should be submitted **no later than 11:59 PM Local Eastern Time on Monday, January 18, 2021**. 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 and sending notifications via e-mail is on or about Wednesday, February 17, 2021.

V. FULL PROPOSAL SUBMISSION AND AWARD INFORMATION

Full proposals should be submitted under N00014-21-S-B001 by **11:59 PM EST on March 9, 2021**. Proposals received after the published deadline will not be considered.

Full proposals for grants should be submitted in accordance with the instructions at BAA Section IV, Application and Submission Information, item 5, Submission of Grant Proposals through Grants.gov. All full proposals for grants must be submitted through www.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 (341) and the Program Officer's name, last name first, in brackets (Green). All attachments to the application should also include this identifier to ensure the proposal and its attachments are received by the appropriate Program Office.

ONR plans to fund 3-5 individual awards with a value of \$1M using research funds. However, lower and higher cost proposals will be considered.

The period of performance for projects may be from 2-3 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 April 9, 2021. Selected projects will have an estimated award date of July 2, 2021.

You are responsible for making sure your application is submitted, received, and validated by Grants.gov before the application deadline. If your application package is submitted late, your application will be ineligible for consideration.

After the final proposal evaluation process is completed, applicants will be notified via email of their project's selection or non-selection. For a full list of events, see Section VI. Significant Dates and Times.

Proposals submitted under this FOA shall be unclassified and for unclassified basic research. Proposal submissions will be protected from unauthorized disclosure in accordance with applicable laws and DoD regulations.

IMPORTANT NOTE: Titles given to the Proposals should be descriptive of the work they cover and not be merely a copy of the title of this announcement.

VI. SIGNIFICANT DATES AND TIMES

| Event | Date | Time |
|--|-----------|----------|
| White Paper Submission Date(optional) | 1/18/2021 | 11:59 PM |
| Notification of White Paper Valuation* | 2/17/2021 | 11:59 PM |
| Full Proposal Submission | 3/9/2021 | 11:59 PM |
| Notification of Selection: Awards * | 4/9/2021 | |
| Awards * | 7/02/2021 | |
| | | |

Note: * These are approximate dates.

VII. POINTS OF CONTACT

In addition to the points of contact listed in N00014-21-S-B0001, the specific points of contact for this announcement are listed below:

Technical Points of Contact:

Dr. Peter Squire, Program Officer, Peter.Squire@navy.mil

Business Point of Contact:

Anastasia Lenfest, Grants Specialist, Anastasia.Lenfest@navy.mil

VIII. 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:

- Grants.gov Webpage – <http://www.grants.gov/>
- ONR Special Notice Webpage - <http://www.onr.navy.mil/Contracts-Grants/Funding-Opportunities/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 this date may not be answered.