Funding Opportunity Announcement (FOA) N0001424SBC06
For Office of Naval Research (ONR) Global Research Opportunity:
Global-X Challenge 2024

CHANGE OVERVIEW: The significant dates and times have been adjusted as shown in section I below and highlighted throughout the FOA. Of particular note, the ONR Global team is still processing white paper submissions and is working to have responses to all white paper submittors sent out by **29 April**. The In-Person Teaming Workshop is scheduled for **16-17 May**. Attendance at this event is by invite only.

This FOA announces the ONR Global-X Challenge 2024 and describes new funding to be awarded under authority of N0001424SB001, Long Range Broad Agency Announcement (BAA) for Navy and Marine Corps Science and Technology. This BAA may be found at the following link: https://www.nre.navy.mil/work-with-us/funding-opportunities.

The Assistance Listing Number for this announcement is 12.300.

I. SIGNIFICANT DATES AND TIMES

Event	Date	Time
Kick-off Webinar	22 February 2024	08:00 Eastern Daylight Time (EDT)
White Paper Submission Date	3 April 2024	23:59 EDT
Notification of White Paper Valuation*	29 April 2024	17:00 EDT
In-Person Teaming Workshop**	16-17 May 2024	
Full Proposal Submission	3 June 2024	23:59 EDT
Notification of Selection: Full Proposals *	21 June 2024	17:00 EDT
Grant Awards *	14 August 2024	17:00 EDT

Note: * These are approximate dates. ** **By invitation**

II. INTRODUCTION

The submission of white papers, proposals, their evaluation and the placement of research grants will be carried out as described in this FOA and the Long Range BAA. ONR Global expects to issue only research grants from this FOA.

ONR Global expects to award up to a total of $750,000 for an initial nine-month period of performance for proposals selected under the Global-X Challenge 2024. Additional funding, not

to exceed $250,000, may be possible for an additional nine-month optional research effort, following successful proof of concept. Total grant award values, including the initial and additional optional research period, will not exceed $1,000,000. ONR Global may award one grant or multiple grants, addressing a single challenge area or multiple grants addressing two or three challenge areas described below. The number of grants and amounts of funding for each grant will depend on proposals submitted. ONR Global expects a successful proof of concept will attract additional funding from other sources for potential follow-on accelerated research efforts under a separate agile acquisition mechanism; however, this does not imply the promise of additional funding.

The purpose of this announcement is to focus the attention of the international scientific community on (1) the challenge areas of interest; and (2) the schedule of key events and deadlines, including the Global-X Challenge Kick-off Webinar, the in-person Teaming Workshop, and the submission of white papers and full proposals.

Recordings of the Kick-off Webinar, supplementary information such as Global-X Challenge Guidelines, templates, and Frequently Asked Questions (FAQs) will be available on https://www.nre.navy.mil/organization/onr-global.

III. CHALLENGE DESCRIPTIONS

Background:

The purpose of this Global-X Challenge is to discover, and ultimately provide a catalyst through a research grant, for subsequent development and delivery of revolutionary capability to the U.S. Navy and Marine Corps, the commercial marketplace, and the public. The expected outcomes of this Global-X Challenge are promising, potentially game-changing, concepts whose technology maturity may be accelerated under separate follow-on technology development efforts.

Objective:

ONR Global is interested in promising concepts to achieve revolutionary capability advances with both military and commercial value in the multidisciplinary technology challenge areas described below. Specifically excluded are existing commercial systems or products, technical approaches already funded by existing research programs, or research that provides evolutionary improvements to existing technology.

ONR Global recognizes that international scientists and engineers conduct creative and novel research. This Global-X Challenge provides an opportunity for these international researchers to collaborate, generate revolutionary ideas and show proof of concept these ideas will succeed. ONR Global invites outstanding international researchers to form multi-national, multidisciplinary teams to address one or more of these capability challenges. Individual researchers may participate on more than one research team. Teams are responsible for establishing non-disclosure agreements among team members, if necessary.

Non-federal entity researchers from academia and industry may participate. ONR Global expects, but does not require, that multi-national teams will consist of at least two research entities outside of the U.S., whether from academia, industry and/or the broader research community. Researchers from U.S. research entities may also participate, but are not required. As stated above, this Global-X Challenge is an opportunity specifically directed toward international researchers; therefore, ONR Global expects the majority of team members will be outside of the U.S. Each team shall designate a lead Principal Investigator (PI) whose research organization outside of the U.S. will submit the white paper or proposal, and will distribute funding to co-PIs and other sub-recipients. For a given project team, one award is made to the PI's institution. Only the PI's institution will be the prime awardee, and that institution is responsible for all aspects of the grant, including conditions on the use of funds and other terms and conditions of the grant.

Research organizations and individuals that are not subject to U.S. sanctions, or are not otherwise excluded from doing business with the U.S. Government, may participate. Please note the grant applicant is responsible for complying with any applicable sanctions, export controls, and similar limitations.

Challenge Problem Statements:

1. **Subsea Object Detection and Identification (Underwater and Seabed)**
   Descriptive Attributes:
   - Detect objects of any material (ferrous, non-ferrous, polymeric, organic, biological, etc.) and scale (10^{-3}m to 10^{2}m); objects may be moving or stationary, wholly immersed within the water or seabed, or at the interface between two media (e.g. on the seabed surface).
   - Detection resolution and signal to noise ratio is sufficient to classify and identify the object; identification will occur at near real-time.
   - Operates in all salinity (e.g. fresh and salt water) and in minimum visibility conditions (high turbidity) with no degradation in performance
   - Power demand and size of detection and identification components meet mobile host platform constraints and availability.
   - Detection and identification components may be active and/or passive and incorporate multimodal, distributed and cross-domain approaches.
   - Detection and identification components are low cost.

   Potential Enabling Technical Disciplines:
   - Physics
   - Electromagnetic spectrum
   - Acoustics / Infrasound
   - Quantum sensing / Quantum optics / Orbital Angular Momentum optics
   - Signal processing
   - Artificial intelligence / Machine learning
   - Materials
   - Oceanography
   - Meteorology

- Remote sensing / Satellite altimetry
- Space science
- Earth science
- Synthetic biology
- Power and energy
- Microelectronics
- Neuromorphic imaging

2. Personal Expeditionary Power and Energy

Descriptive Attributes:

- Power density >1000 W/kg and Energy density >=5000 Wh/kg
- May be weight bearing and incorporated into structures
- Conformable to non-traditional, 3-dimensional architectures
- Long-life, quick charge, reusable and recyclable
- Lightweight and man-portable
- Low hazard (no risk of thermal runaway)

Potential Enabling Technical Disciplines:

- Microbiology / Synthetic biology
- Chemistry
- Physics / nuclear physics
- Quantum science
- Power and energy
- Materials Science
- Advanced manufacturing

3. High Latitude High Bandwidth Communications

Descriptive Attributes:

- Enables voice and data communications in the air, on land, ice, and sea surface in latitudes above 60^{o} in locations with limited satellite communications
- Communication range is greater than 25 km with minimum data rates of 5 MBPS and in minimum visibility conditions
- Communication components operate at temperatures below -55^{o}C with no degradation in performance and employ low power
- May incorporate multimodal, distributed and cross-domain transmission approaches
- May employ low probability of detection and interference resistant waveforms

Potential Enabling Technical Disciplines:

- Artificial Intelligence / Machine Learning
- Chemistry
- Physics
- Electromagnetic spectrum
- Next generation networking

- Autonomous self-healing mobile networks
- Quantum science
- Signal processing
- Space science
- Earth science
- Meteorology
- Remote sensing / Satellite altimetry
- Power and energy / long-duration resilient power
- Microelectronics
- Neuromorphic sensors
- Materials
- Logistics
- Oceanography

IV. GLOBAL-X CHALLENGE KICK-OFF WEBINAR

ONR Global will hold a Global-X Challenge Kick-off Webinar on 22 February 2024 at 0800 EDT. This webinar is open to any interested researchers and may be viewed by navigating to https://onr-navy-mil.zoomgov.com/j/1603218599. There is no fee for participating in the webinar. Subsequent to the live webinar broadcast, a recording of the webinar will be available for viewing on https://www.nre.navy.mil/organization/onr-global, as well as on grants.gov. You do not need to participate in the webinar to submit a white paper or proposal.

V. WHITE PAPER SUBMISSION

White papers are highly encouraged for all applicants seeking funding from this Global-X Challenge. The Global-X Challenge evaluation panel will assess how well each white paper submitted achieves the revolutionary capability described in the technology challenge areas above. ONR Global will invite those teams submitting white papers with the most promising concepts to submit a full proposal or to participate in an In-Person Teaming Workshop (see section VI below). Invitations to propose and feedback will be issued via e-mail notification to the team PI from the Technical Point(s) of Contact or their designee(s). However, any such invitation does not assure a subsequent award. Similarly, invitations to participate in the In-Personal Teaming Workshop will be issued via e-mail notification to the team PI. Full proposals may be submitted by any applicant in response to this FOA, whether or not a white paper was submitted or evaluated by ONR Global.

White papers shall follow the format provided in this FOA (see FOA attachments 1-3); this format will meet mandatory ONRG Cover Page requirements. White papers shall be 12 point Times New Roman font and not exceed five single-sided pages. Figures, charts and tables should be legible, but may use a smaller font size. White papers must include an additional one-page quad chart and a spreadsheet, which are not part of the white paper page limitation. The five page white papers should be submitted in Adobe PDF format (preferred) or in Microsoft Word. The quad chart may be submitted in Adobe PDF (preferred) or in Microsoft PowerPoint format. The spreadsheet should be submitted in Microsoft Excel (or compatible) format and

should indicate the principal Challenge Statement the white paper addresses. The format of the spreadsheet should remain unchanged; please do not alter the order or add additional columns.

The PI for each team shall be the primary point of contact throughout the application process; they are responsible for submitting white papers describing their concept and approach to usn.ncr.onrghq.list.grantsproposals@us.navy.mil by **23:59 EDT on 3 April 2024**. White papers received after the deadline may not be considered. The subject line of the email shall read: "*N0001424SBC06 Global-X Challenge White Paper Submission*". Do not send ZIP files or provide links to "Dropbox" type applications as they will not be reviewed. Password protected files are discouraged.

The Global-X Challenge evaluation panel will review submitted white papers and may invite teams with the most promising and revolutionary concepts, on or before 29 April 2024, to submit a grant proposal or to participate in the In-Person Teaming Workshop. All teams submitting a full proposal must follow steps listed in section VII below.

VI. IN-PERSON TEAMING WORKSHOP

Revolutionary technology development typically results from multidisciplinary teams working in an environment that fosters and leverages serendipitous discovery. ONR Global acknowledges that researchers may already have colleagues with whom they wish to collaborate on research teams. Nevertheless, to help expand a researcher's network of colleagues, ONR Global invites all to collaborate using online platforms such as Slack (https://2024global-xchallenge.slack.com). ONR Global encourages researchers to participate in multiple research teams to develop a wide range of approaches to address one or more of the Global-X Challenge topics. Furthermore, ONR Global may recommend specific researchers connect, form a team and submit a white paper.

As described above in Section V, ONR Global may invite those teams submitting white papers with the most promising concepts to participate in an In-Person Teaming Workshop that will be held 16-17 May 2024. The intent of the two-day workshop is to facilitate teaming among experts with a range of technical expertise, and who submitted white papers. Details of the workshop will be provided to those invited to participate. ONR Global reiterates full proposals may be submitted by any applicant in response to this FOA, whether or not individuals participated in the In-Person Workshop or a white paper was submitted or evaluated by ONR Global.

VII. FULL PROPOSAL SUBMISSION AND AWARD INFORMATION

Full grant proposals, inclusive of any options, must be submitted to the Department of the Navy at www.grants.gov under FOA number N0001424SBC06 by **23:59 EDT on 3 June 2024**. ONR Global will not consider full proposals received after this date. See Appendix 1 of BAA N0001424SB001 for instructions on submitting grant proposals via grants.gov. Please note SAM registration is required to submit proposals on grants.gov and may require significant time to complete for new SAM registrants. The Global-X Challenge evaluation panel will evaluate

Full Proposals in accordance with Section E.2 Review and Selection Process within BAA N0001424SB001.

ONR Global will notify teams selected for award on or before 21 June 2024 and intends to award grants by 14 August 2024. The initial period of performance is nine months. Within nine months of grant award, ONR Global expects teams to show proof their concept will likely meet proposed objectives. Following a successful proof-of-concept demonstration, ONR Global may exercise an optional research effort for up to an additional nine months to continue concept development and testing. A final research progress report is required in accordance with the terms and conditions of the grant. The terms and conditions applicable to assistance instruments as referenced in BAA N0001424SB001 will apply to grants awarded under this FOA. Financial and patent reports will also be required.

Although ONR Global expects the above plan to be executed, ONR Global reserves the exclusive right to make changes or cancel this Global-X Challenge, as necessary. This Notice does NOT imply any promise of award.

VIII. POINTS OF CONTACT

The specific points of contact for this announcement are listed below:

Technical Points of Contact:

- Challenge Statement 1: Subsea Object Detection and Identification
  Kyle Gustafson, ONR Global Science Director, kyle.b.gustafson.civ@us.navy.mil
  Tony Bausas, ONR Global Science Advisor, anthony.v.bausas.civ@us.navy.mil

- Challenge Statement 2: Personal Expeditionary Power
  Clint Novotny, ONR Global Science Director, clint.j.novotny.civ@us.navy.mil
  Mr. Justin Helton, ONR Global Science Advisor, justin.helton@usmc.mil

- Challenge Statement 3: High Latitude High Bandwidth Communications
  Joel Goodman, ONR Global Science Director, joel.i.goodman.civ@us.navy.mil
  Chad Gardner, ONR Global Science Advisor, chad.m.gardner4.civ@us.navy.mil

Business Point of Contact:

- ONR Global Grants Team, usn.ncr.onrghq.list.grantsproposals@us.navy.mil

IX. SUBMISSION OF QUESTIONS

Any questions regarding this announcement must be provided to the Business Point of Contact listed above. Please submit all questions in writing by electronic mail.

Answers to questions submitted in response to this Notice will be addressed in a Frequently Asked Questions (FAQ) document posted on https://www.nre.navy.mil/organization/onr-global and grants.gov.

Questions regarding **White Papers or Full Proposals** should be submitted no later than five working days before the dates recommended for receipt of White Papers and/or Full Proposals. Questions received after this date may not be answered.