



Special Notice N00014-21-S-SN10
Special Announcement for
2021 Office of Naval Research (ONR) Global Research Opportunity:
Global-X Challenge

I. INTRODUCTION

This notice announces the 2021 ONR Global-X Challenge and describes new funding to be awarded under the authority of N00014-21-S-B001, Long Range Broad Agency Announcement for Navy and Marine Corps Science and Technology which can be found at the following link: <https://www.onr.navy.mil/work-with-us/funding-opportunities/announcements>.

The submission of white papers, proposals, their evaluation and the placement of research grants will be carried out as described in the above Long Range Broad Agency Announcement (BAA) and this special notice. The Office of Naval Research Global (ONR Global) expects to issue only research grants from this special notice.

ONR Global expects to have up to a total of \$500,000 available for the initial nine-month period of performance for grants awarded under the 2021 Global-X Challenge. Additional funding may be possible for an additional nine month optional research effort, following successful concept demonstration. 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 each of the three challenge areas described in this special notice below. The number of grants and amounts of funding for each grant will depend on proposals submitted. ONR Global expects successfully demonstrated concepts 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; (2) a Global-X Challenge Kick-off Webinar on 29 April 2021 at 0700 hours EDT; and (3) the planned timetable for the submission of white papers and full proposals.

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

II. CHALLENGE DESCRIPTIONS

Background:

The purpose of this Global-X Challenge is to discover, disrupt, and ultimately provide a catalyst through basic and applied research for later development and delivery of revolutionary capabilities 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 agile follow-on technology development efforts.

Joining ONR Global as members of the Global-X Challenge evaluation panel are experts from signatory nations of the International Cooperative Engagement Program for Polar Research (ICE-PPR). All Global-X Challenge evaluation panel members will be covered under a non-disclosure agreement and will certify no Personal or Organizational Conflicts of Interest exist. All ONR Global and other U.S. Federal employees are subject to Federal laws requiring the protection of trade secrets and proprietary information.

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 approaches that primarily result in evolutionary improvements to the existing state of practice, or are already funded by existing research programs.

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 demonstrate 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 team. Teams are responsible for establishing non-disclosure agreements among team members, if necessary.

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 broad 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. Alternate Navigation at High Latitude

Descriptive Attributes:

- Enables navigation in the air, on land, ice, sea surface, underwater or under ice, in latitudes above 60° where GPS signals are non-existent or intermittent at best
- Navigation does not rely on GPS, but has equal or better accuracy as GPS, and may incorporate multimodal, multi-frequency, distributed and cross-domain approaches, including on and off-board sensors and systems
- Navigation components should be adaptable/retrofitable to legacy navigation systems, be lightweight and small to enable man-portability, employ low power and be capable of operation at -55°C

Potential Enabling Technical Disciplines:

- Artificial Intelligence / Machine Learning
- Chemistry
- Physics
- Electromagnetic spectrum
- Quantum science
- Signal processing
- Oceanography
- Space science
- Earth science
- Synthetic biology
- Power and energy
- Microelectronics
- Neuromorphic sensors

2. 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° 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°C with no degradation in performance and employ low power
- May incorporate multimodal, distributed and cross-domain approaches

Potential Enabling Technical Disciplines:

- Artificial Intelligence / Machine Learning

- Chemistry
- Physics
- Electromagnetic spectrum
- Next generation networking
- Quantum science
- Signal processing
- Space science
- Earth science
- Power and energy
- Microelectronics
- Neuromorphic sensors
- Materials
- Logistics
- Oceanography

3. Persistent Polar Perception

Descriptive Attributes:

- Objects of any material (ferrous, non-ferrous, polymeric, organic, biological, ice, etc.) are detected; objects may be moving or stationary, on land, underwater or on the surface of the water, under ice or on the ice surface
- Scale of detected object may range from 1m to 100m
- Detection resolution and signal to noise ratio is sufficient to classify and identify the object; identification occurs at near real-time; detection range exceeds 100 nautical miles
- 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, incorporate remote and/or in-situ sensors and incorporate multimodal, multi-frequency, distributed and cross-domain approaches;
- Detection and identification components will be low cost and may harvest ambient energy to meet power demands; in-situ detection components are waterproof and can operate at temperatures below -55°C

Potential Enabling Technical Disciplines:

- Physics
- Electromagnetic spectrum
- Acoustics
- Quantum sensing / Quantum optics
- Signal processing
- Artificial Intelligence / Machine Learning
- Materials
- Oceanography
- Space science
- Earth science
- Synthetic biology

- Power and energy
- Microelectronics
- Neuromorphic sensors

III. GLOBAL-X CHALLENGE KICK-OFF WEBINAR

ONR Global held a Global-X Challenge Kick-off Webinar on 29 April 2021. A recording of the webinar may be viewed by navigating to https://goto.webcasts.com/starthere.jsp?ei=1456602&tp_key=b2ae9e815d and registering. There is no cost to register. A recording of the webinar will also be available for viewing on the Global-X website (<https://www.onr.navy.mil/global-x>). A Frequently Asked Questions (FAQ) document is posted on the Global-X website and grants.gov.

IV. 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. 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. Full proposals may be submitted by any applicant in response to this Special Notice, whether or not a white paper was submitted or evaluated by ONR Global.

White papers shall follow the format provided in this Special Notice (see special notice 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 ONRG.GrantProposals@mail.mil by **23:59 EDT on 28 May 2021**. White papers received after the deadline may not be considered. The subject line of the email shall read: “*N00014-21-S-SN10 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 will invite teams with the most promising and revolutionary concepts, on or before 11 June 2021, to submit a grant proposal. All teams submitting a full proposal must follow steps listed in section V below.

V. FULL PROPOSAL SUBMISSION AND AWARD INFORMATION

Full grant proposals must be submitted to the Department of the Navy at www.grants.gov under BAA number N00014-21-S-SN10 by **23:59 EDT on 9 July 2021**. ONR Global will not consider full proposals received after this date. See Appendix 1 of BAA N00014-21-S-B001 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 II (E) of BAA N00014-21-S-B001.

ONR Global will notify teams selected for award on or before 30 July 2021 and intends to award grants by 24 September 2021. The initial period of performance is nine months. Within nine months of grant award, ONR Global expects teams to demonstrate their concept will likely meet proposed objectives. Following a successful proof-of-concept demonstration, ONR Global may exercise the 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. 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 Special Notice does NOT imply any promise of award.

VI. SIGNIFICANT DATES AND TIMES

Event	Date	Time
White Paper Submission Date	28 May 2021	23:59 Eastern Daylight Time (EDT)
Notification of White Paper Valuation*	11 June 2021	17:00 EDT
Full Proposal Submission	9 July 2021	23:59 EDT
Notification of Selection: Full Proposals *	30 July 2021	17:00 EDT
Grant Awards *	24 September 2021	17:00 EDT

Note: * These are approximate dates.

VII. POINTS OF CONTACT

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

Technical Points of Contact:

- Challenge Statement 1: Alternate Navigation at High Latitude
 Dr. Charles Eddy, ONR Global Science Director, charles.r.eddy12.civ@mail.mil
 Dr. James McGee, ONR Global Science Advisor, james.a.mcgee@navy.mil

- Challenge Statement 2: High Latitude High Bandwidth Communications
Dr. Martina Siwek, ONR Global Science Director, martina.m.siwek.civ@mail.mil
Ms. JoAnne Pilcher, ONR Global Science Advisor, joanne.pilcher@navy.mil
- Challenge Statement 3: Persistent Polar Perception
Dr. Chris Konek, ONR Global Science Director, christopher.t.konek.civ@mail.mil
Dr. Chris Heagney, ONR Global Science Advisor, christopher.heagney@navy.mil

Business Point of Contact:

- ONR Global Grants Team, ONRG.GrantProposals@mail.mil

VIII. 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 Special Notice will be addressed in a Frequently Asked Questions (FAQ) document posted on the Global-X website.

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.