NATIONAL SCIENCE FOUNDATION
2415 EISENHOWER AVENUE
ALEXANDRIA, VIRGINIA 22314

NSF 23-134

Dear Colleague Letter: Workshops to Identify Educational Requirements of the Future Ocean Technical Workforce

July 21, 2023

Dear Colleague:

Encourages proposals for workshops and conferences that will create partnerships between industry and academic institutions for the purpose of identifying requirements for curriculum and skill development in support of the next generation of the ocean technical workforce. Proposals should be submitted to the programs listed below.

ANNOUNCEMENT OF OPPORTUNITY

The National Science Foundation (NSF) anticipates increased investments in future ocean observing systems, ocean renewable energy systems, and other blue economy industries. Development of new instrumentation, maintenance of and improvements to equipment related to ocean-based systems, and data management efforts to ensure the quality and accuracy of the data and the analysis of large data sets generated by these systems all require a workforce with specialized training in ocean sciences, engineering, manufacturing, and data science. However, there are few academic programs that prepare students with the skills required for the expanding needs of the ocean technology workforce. Therefore, the NSF Directorate for Engineering (ENG), Division of Engineering Education and Centers (EEC) and Division of Civil, Mechanical and Manufacturing Innovation (CMMI); the Directorate for Technology, Innovation and Partnerships (TIP), Division of Innovation and Technology Ecosystems (ITE); the Directorate for Geosciences, Division of Ocean Sciences (OCE); and the Directorate for Education (EDU), Division of Undergraduate Education (DUE) are encouraging proposals for workshops that will engage industry and academia in discussions that identify skills needed and curriculum changes that are required to prepare students to participate in the current and future ocean technical workforce.

This Dear Colleague Letter (DCL) encourages conference proposals[1] – also referred to as workshop proposals – that will bring representatives of ocean and other blue economy industries together with academic faculty to discuss workforce and training needs. The goal of

the DCL is to expand technical capacity in the U.S. workforce in high-technology fields through planning that can lead to training programs for the next generation of ocean technicians, data scientists, engineers, and scientists. Proposal topics of high priority include training in ocean instrumentation design, manufacturing and maintenance of marine-related hardware, and ocean data science and data analytics, with an emphasis on the inclusion of researchers, engineers and students from groups that are underrepresented in the marine science, mariner communities, and related fields. Submissions are encouraged that target documented gaps in the U.S. ocean technical workforce in marine instrumentation and manufacturing sectors, including those related to renewable energy, such as wave, tide, wind, and solar energy systems.

Topics of interest for workshop discussion include, but are not limited to, the following:

- Skills and workforce requirements for ocean-based renewable energy platforms and instrumentation.
- Skills and workforce requirements for ocean observing and monitoring programs.
- Requirements for early undergraduate levels professional development in ocean data science, engineering, and science education.
- Strategies to educate the skilled technical workforce in response to industry needs and in partnership with industry.
- Strategies to support faculty, including faculty at Primarily Undergraduate Intuitions, to implement innovative teaching and training modules focused on experiential learning related to ocean technology.

The categories of proposers eligible to submit proposals described in this DCL are identified in the *NSF Proposal and Award Policies and Procedures Guide* (PAPPG) Chapter I.E.1 Proposals are especially encouraged from community colleges, Minority Serving Institutions, and/or institutions that serve veterans, first-generation students, students with different abilities, or other students from groups underrepresented in ocean sciences as well as institutions eligible for the Established Program to Stimulate Competitive Research (EPSCoR) program https://new.nsf.gov/funding/initiatives/epscor. The format for conference proposals is outlined in the PAPPG Chapter II.F.9. The conference organizing committee must include academic and non-academic members representing relevant constituent communities. Non-academic leaders may be from ocean industries, ocean monitoring organizations, small businesses, state or federal agencies, professional societies, labor organizations, or other non-academic groups. Letters of collaboration should be submitted for primary collaborators who are not listed as Principal Investigators. Conferences should include academic representatives from multiple institutions and represent state, regional or national level collaborations. Attendance of approximately 40-100 participants is anticipated, and results of the conference are expected to include a report on issues such as current hiring trends, necessary workforce skills and competencies, training gaps, credentialing, and

recommendations for academic curriculum requirements.

SUBMISSION OPTIONS

Eligible organizations can submit proposals to the following programs:

1. Ocean Technology Program
Proposals may be submitted to the Division of Ocean Sciences' (OCE) PD 98-1680 Ocean Technology Program at any time. The categories of proposers eligible to submit proposals to NSF are identified in Chapter I.E.1 of the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG). Proposers should follow the instructions for the preparation and submission of "Conference Proposals" contained in PAPPG Chapter II.F.9.

2. Advanced Technology Education (ATE) program
Proposals may be submitted to the Advanced Technology Education (ATE) program in the Directorate for Education and Human Resources. ATE supports the education of the skilled technical workforce. Proposals must be prepared in accordance with the guidance in the solicitation. The prospective PI should consult with a Program Officer to determine the correct program track for submission. Please see the ATE solicitation (NSF 21-598) for details.

3. Research in the Formation of Engineers (RFE) program
Proposals related to engineering and engineering technology education may be submitted to the Research in the Formation of Engineers (RFE) program at any time. The categories of proposers eligible to submit proposals to NSF are identified in PAPPG Chapter I.E.1. Proposers should follow the instructions for the preparation and submission of "Conference Proposals" contained in PAPPG Chapter II.F.9.

4. Dynamics, Control and Systems Diagnostics (DCSD)
Proposals related to the fundamental science and engineering of dynamic systems, including modeling, analysis, control, and integration of dynamic ocean instrumentation and marine-related energy-harvesting hardware can be submitted to PD 22-7569 per the guidance available on the CMMI website. The proposed conference/workshop activity can be co-located with another event or stand-alone. In either case, the proposed activity must have a distinct theme, require its own planning, have a separate attendance list from other events, etc. Prior to submitting a formal conference proposal, the PI(s) should send a draft of the proposal to a DCSD Program Officer at dcsd@nsf.gov for comments.

5. Experimental Learning for Novel and Emerging Technologies (ExLENT):
Proposals focused on supporting inclusive experiential learning opportunities designed to provide cohorts of diverse learners with the crucial skills needed to succeed in emerging technology fields through partnerships between organizations in emerging technology fields and those with expertise in workforce development may submit to the ExLENT program by the deadline specified in the ExLENT program solicitation. The categories of proposers

eligible to submit proposals to NSF are identified in PAPPG Chapter I.E.1. Proposers should follow the instructions for the preparation and submission of "Conference Proposals" contained in PAPPG Chapter II.F.9.

Dr. James L. Moore, III
Assistant Director
Directorate for STEM Education (EDU)

Dr. Susan S. Margulies
Assistant Director
Directorate for Engineering (ENG)

Dr. Alexandra R. Isern
Assistant Director
Directorate for Geosciences (GEO)

Dr. Erwin Gianchandani
Assistant Director
Directorate for Technology, Innovation and Partnerships (TIP)

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[1] NSF Proposal and Award Policies and Procedures Guide (PAPPG) Chapter II.F.9