7555-01-P

NATIONAL SCIENCE FOUNDATION

Request for Information: Undergraduate Training in Biology Mathematics and Computer Science (UBMC)

AGENCY: National Science Foundation.

ACTION: Request for Information.

SUMMARY: The National Science Foundation's (NSF) Division of Undergraduate Education (DUE), the Division of Biological Infrastructure (DBI), the Division of Mathematical Sciences (DMS) and the Division of Computer and Information Science and Engineering (CISE) request input from interested parties the value and need for an interdisciplinary program that trains undergraduate students at the intersections of biological science, mathematics and computer sciences. This RFI will help inform NSF as it considers programs for educating the workforce of tomorrow.

DATES: Interested persons are invited to submit comments on or before December 31, 2021.

ADDRESSES: Submit comments to Mary L. Crowe, mcrowe@nsf.gov. Submissions should include the "RFI Response: Undergraduate Training Program in Biological, Mathematical and Computer Science UBMC" in the subject line of the message. Phone calls can be made to Mary L. Crowe at the following number: 703-292-7177.

FOR FURTHER INFORMATION CONTACT: Suzanne H. Plimpton, Reports Clearance Officer, National Science Foundation, 2415 Eisenhower Avenue, Suite

W18200, Alexandria, Virginia 22314; telephone (703) 292–7556; or send email to *splimpto@nsf.gov.* Individuals who use a telecommunications device for the deaf (TDD) may call the Federal Information Relay Service (FIRS) at 1–800–877–8339, which is accessible 24 hours a day, 7 days a week, 365 days a year (including Federal holidays).

SUPPLEMENTARY INFORMATION:

Instructions: Response to this RFI is voluntary. Each individual or institution is requested to submit only one response. Responses should include the name of the person(s) or organization(s) filing the comment. Please include the number of the question or questions to which you are responding. Please limit your response to no more than six pages.

In accordance with FAR 15.202(3), responses to this notice are not offers and cannot be accepted by the Government to form a binding contract. Responders are solely responsible for all expenses associated with responding to this RFI.

Background Information: The National Science Foundation (NSF) plays a critical role in establishing U.S. leadership in science and engineering (S&E), creating innovations that drive the nation's economy and educating the next generation of scientists and engineers. The NSF 10 Big Ideas support this role through ideas such as the Future of Work at the Human Technology Frontier, Harnessing the Data Revolution, and others, that foster interdisciplinary science and engineering research and the requisite interdisciplinary education and workforce development.

A program that exemplified the integration of interdisciplinary training for undergraduates was the Interdisciplinary Training for Undergraduates in Biological and Mathematical Sciences (UBM), a program aimed to enhance

undergraduate education and training at the intersection of the biological and mathematical sciences to better prepare undergraduate students to pursue careers in fields that integrated the mathematical and biological sciences https://www.nsf.gov/pubs/2008/nsf08510/nsf08510.htm. Since the end of the UBM program, there has been an increasing amount of digital data that necessitates education and training in not just mathematics but also in computer science. We note here, for instance, the Data Science Corps program, https://www.nsf.gov/pubs/2021/nsf21523/nsf21523.htm, one of the components of the HDR ecosystem enabling education and workforce development by building capacity for harnessing the data revolution in the service of science and society.

NSF is interested in developing a new program that starts with the core of the UBM program and expands into computer science as well as well as emerging areas in biology and mathematics. This is in recognition of the explosion of knowledge in instrumentation, computational abilities, information systems, mathematical tools, and biological systems from the nano to the macro regimes. NSF is interested in input from a variety of stakeholders on the interdisciplinary areas proposed for this program. We envision stakeholders to be faculty from both 2-yr and 4-yr institutions as well as industry, NGOs, and others.

Response(s) to the question(s) below should focus on effective models with specific efforts in at least one of the following:

- Multiple entry and exit points along a career pathway.
- Use of technologies including virtual to enhance training
- Cohort development in cross-disciplinary research and/or course experiences.

- Workforce needs in converging areas considering the breadth from the skilled technical workforce to Ph.D. level scientists

Questions to address:

Respondents can answer any of the questions #1 - #8; responses to all questions are not required.

1. What are the biggest needs and challenges faced by institutions working to develop interdisciplinary courses/programs in the converging areas of biology, mathematics, and computer science?

2. What are the biggest needs and challenges faced by industries in these rapidly evolving and converging areas of STEM?

3. What topics might be included in an NSF program solicitation aimed at supporting these rapidly evolving converging areas?

4. Should a new program include the opportunity for research experiences for undergraduates in these converging areas? If so, what areas might be specifically targeted? Where (early, later, throughout) should these experiences be incorporated in a student's educational pathway and why? Is there a place for industry-based internships as well as institutional research experiences?

5. What are effective ways to promote interdisciplinary work within a broad range of institutions and disciplinary faculty? What might be challenges that a solicitation might address?

6. Whether you are currently part of a consortium-based model or would be interested in participating in one, describe the benefits and drawbacks of such a partnership. What type of consortium structure maximized the creation of effective and lasting relationships within distinct disciplinary areas of institutions and between institutions in regard to promoting interdisciplinary STEM

education? What would the role of the management entity look like, and what partners would be involved?

7. What efforts might support STEM participation by a diverse set of students, especially those from groups underrepresented in STEM, through the creation of accessible, inclusive STEM learning opportunities and promoting STEM careers in these converging areas?

8. What are effective ways in assessing program impact relative to topics mentioned above?

Requirement: All qualified, experienced, and capable sources are welcome to respond to this RFI. Large-scale and small-scale examples of programs are of equal interest. Your capabilities should cover any and all areas of focus delineated above. There is no target years of relevant experience provided a program has evidence-based effectiveness and proven results.

In addition, please provide the following Point of Contact information for all responses:

Company:

Address:

Point of Contact:

Phone Number:

Email Address:

Business Size:

Dated: October 21, 2021.

Suzanne H. Plimpton,

Reports Clearance Officer,

National Science Foundation

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