Training-based Workforce Development for Advanced Cyberinfrastructure (CyberTraining)

NSF 19-524
(replaced NSF 18-516)

Submission Deadline: Feb 6, 2019

https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505342

Sushil K Prasad, Program Director, CISE/OAC
sprasad@nsf.gov

Jo Culbertson, Program Director, ENG/CMMI

Christina Payne, Program Director, ENG/CBET

Bogdan Mihaila, Program Director, MPS/PHY
Solicitation Goals

• CyberTraining program seeks to prepare, nurture and grow scientific research workforce.

• Twin Goals:
  1. ensure broad adoption of CI tools, methods, and resources, Or
  2. integrate skills into educational curriculum/instructional material fabric in
     • advanced cyberinfrastructure (CI) +
     • computational and data science and engineering (CDS&E)
     • spanning undergraduate and graduate courses.

• Innovative, scalable training, education, and curricular programs addressing
  – targeting one or both of the solicitation goals
  – Emerging needs and Unresolved bottlenecks
  – Undergrads, grad students, instructors, faculty, research CI professionals
Additional Goals

• Broadening CI access and adoption to
  • Enable increasing use of advanced cyberinfrastructures by varied institutions and scientific communities with lower-level of CI-adoption, and
  • Harness the capabilities of larger segments of diverse underrepresented groups

• Short Term Goal
  – either catalyze research with training and educational activities, or
  – result in curriculum/instructional material that is integrated into courses, serving as templates

• Long Term Goal
  – An educational ecosystem enabling Computational and Data-driven Science for All Scientists and Engineers
NSF-wide Participation

- **CISE/OAC** - Office of Advanced Cyberinfrastructure – **lead**
  - Sushil K Prasad
  (Includes BD Hub)
- **CISE/CCF** Computing and Communication Foundation
  - Almadena Chtchelkanova
- **EHR/DGE** - Division of Graduate Education
  - Victor Piotrowski; Chun-Hsi (Vincent) Huang
- **ENG** - Directorates of Engineering
  - Joanne Culbertson, ENG/CMMI
  - Ronald Joslin; Christina Payne, ENG/CBET
  - Anthony Kuh, ENG/EECS
- **GEO** - Directorate for Geosciences
  - Eva Zanzerkia
- **MPS** - Directorate for Mathematical & Physical Sciences
  - Nigel A. Sharp, MPS/AST; Daryl W. Hess, MPS/DMR; Bogdan Mihaila, MPS/PHY
- **SBE** - Social Behavioral and Economic Sciences
  - Sara Kiesler and Kenneth C. Land

**Intent:** stimulate co-funding between OAC and one or more domains

**Consult OAC + other Cognizant Program Officers**
- At least one month in advance of the submission deadline
Scientific Communities

• **CI Contributors:**
  • community of computational and data scientists and engineers who **develop new CI capabilities**

• **CI Users:**
  • community of domain scientists and engineers who **exploit advanced CI capabilities**

• **CI Professionals:**
  • community of research CI and professional staff who **support effective use of research CI**
Summary of Revisions for 2019

• Three project classes:
  • Pilot: Exploratory activities, $300K, 2 yrs
  • Implementation: Broadly accessible to community
    • Small: $500K, 4 yrs
    • Medium: foster a community, $1M, 4 yrs
  • Large-scale Project Conceptualization:
    • Planning grants for potential future institute-like CyberTraining projects, $500k, 2 yrs

• No separate tracks, still 3 communities of concerns
  • CI Professionals, CI Contributors, and CI Users

• PI Limit
  • PI/co-PI for max 1 Pilot or Implementation proposal
  • Large-scale Project Conceptualization projects not in this limit
Revised Solicitation-specific Review Criteria

1. Challenges for Research Workforce Development;
2. Solicitation Goal(s) Targeted
   (at least one for Pilot and Implementation; both for Large-scale Project Conceptualization):
   (a) Broadening Adoption of Advanced CI; or
   (b) Integration of CI Skills into Curriculum/Instructional Material Fabric;
3. Scalability and Sustainability;
4. Recruitment and Evaluation;
5. “Collective Impact” Strategy
   (or an alternative strategy);
6. Fostering Community;
7. Information Hub and Repository Infrastructure;
8. Support for other projects and the community.

   • Pilot projects must address items 1 and 2.
   • Small Implementation projects must address items 1-5,
   • Medium Implementation projects: items 1-6.
   • Large-scale Project Conceptualization projects must address all 8 items, and both solicitation goals.
Programmatic Areas of Interest: OAC Focus

• Concerned about all the three communities of CI Professionals, CI Contributors, and CI Users
  – both current and future generations.

• CI Professionals
  – technical/research CI professional skills of future CI Professionals
  – skill refinement and career development of current CI Professionals.

• CI Contributors: training/cross-training of the computational and data scientists and engineers in topics such as
  – scalable modeling and simulation, and
  – advanced domain topics such as domain-specific tools

• CI Users: larger goal of preparing research workforce - well-versed in basic CI and CDS&E literacy
  – undergraduate students and graduate students across all disciplines

• Proposals with overlapping concerns with other OAC programs
  – BD Hubs; CC*; CSSI; and CICI
Programmatic Areas of Interest: CMMI Focus

- Jo Culbertson

Supports activities that enable the CMMI community to:

• Lead development of new CI that catalyzes major fundamental research advances in CMMI-related fields

• More effectively use CI to address fundamental knowledge gaps for topics supported by CMMI
Programmatic Areas of Interest: MPS
- Bogdan Mihaila

MPS is not highlighting *specific* areas in the context of this solicitation.

- Support workshops and summer schools focused on training students and postdocs in computational methods on advanced computing architectures.
- High-performance computing and data analytics methods introduced in the context of specific scientific applications relevant to MPS communities.
- Lectures accompanied by problem sessions and hands-on activities on actual hardware.
- Online sharing of workshop materials and recorded presentations on dedicated websites.
FAQ

Q1. Is the consultation with a Cognizant Program Officer required?

– No. But it is strongly encouraged that you consult with me (with OAC leading this solicitation) and any other Cognizant Program Officer at least a month in advance, and mention this in a **Single Copy Document** (Not in Project Summary – unlike previous years).
FAQ

Q2. Can my project primarily train/re-train for jobs in the IT industry?

– No, all proposals, including cybersecurity proposals, must be relevant to
  • Scientific Research Workforce Development, and
  • Advanced Cyberinfrastructures

– Cybersecurity proposals must be relevant to scientific research workflow

– This relevance will vary from undergrads, to grads, to CI professionals, and across disciplines.
FAQ

Q3. Do you need Small-size Implementation award before seeking Medium-size Implementation, or a CyberTraining award before a Large Scale Project Conceptualization submission?
   – No.
Thank you!

Questions: sprasad@nsf.gov

These slides, an audio recording, and a script of this webinar will be available at http://www.nsf.gov/events/

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