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 effectively 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: E*xploratory 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 Implement ation* projects must address items 1-5,
- *Medium Impleme ntation* 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 its 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/

- Sushil K Prasad, Program Director, CISE/OAC
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