Training-based Workforce Development for Advanced Cyberinfrastructure (CyberTraining)

NSF 19-524

Submission Deadline: Jan 20, 2021
(also see PAPPG, NSF 20-1)

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

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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 the educational ***curriculum/instructional 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 levels 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**
  - Alan Sussman, Mark Hurwitz
- **CISE/CCF** - Computing and Communication Foundations
  - Almadena Chtchelkanova
- **EHR/DGE** - Division of Graduate Education
  - Victor Piotrowski, Li Yang
- **ENG** - Directorate for Engineering
  - Joanne Culbertson, **CMMI**
  - Ronald Joslin; Shahab Shojaei-Zadeh, **CBET**
  - Anthony Kuh, **ECCS**
- **GEO** - Directorate for Geosciences
  - Eva Zanzerkia
- **MPS** - Directorate for Mathematical & Physical Sciences
  - Nigel A. Sharp, **AST**; Daryl W. Hess, **DMR**; Bogdan Mihaila, **PHY**
- **SBE** – Directorate for Social Behavioral and Economic Sciences
  - Joe Whitmeyer; Mark Hurwitz

- 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

Key solicitation provisions

- 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
- Must address one or more of the 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

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 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 for future CI Professionals
  - skill refinement and career development of current CI Professionals.
- CI Contributors: training/cross-training of computational and data scientists and engineers in topics such as
  - scalable modeling and simulation, and
  - advanced domain topics, including domain-specific CI tools
- CI Users: larger goal of preparing research workforce that is well-versed in basic CI and has CDS&E literacy
  - undergraduate students and graduate students across all disciplines
- Proposals with overlapping concerns with other OAC programs
  - e.g., BD Hubs; CC*; CSSI; and CICI

Programmatic Areas of Interest: ENG CMMI & CBET Focus

Supports activities that enable the CMMI and CBET communities to:

- Lead development of new CI that catalyzes major fundamental research advances in CMMI/CBET-related fields
- More effectively use CI to address fundamental knowledge gaps for topics supported by CMMI and CBET

FAQ

Q1. Is 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 of the solicitation deadline, and note this in a **Single Copy Document**.

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 Cyberinfrastructure
- Cybersecurity proposals must be relevant to the scientific research workflow
- This relevance will vary from undergrads, to grads, to CI professionals, and across disciplines.

FAQ

Q3. Must you already have a Small-size Implementation award before seeking a Medium-size Implementation, or a CyberTraining award before a Large Scale Project Conceptualization submission?

- No.

Thank you!

Questions: alasussm@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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Please ask your questions via the Zoom Q&A box