Training-based Workforce Development for Advanced Cyberinfrastructure (CyberTraining)

NSF 22-574

Submission Deadline: May 16, 2022
(also see PAPPG, NSF 22-1)

https://beta.nsf.gov/funding/opportunities/training-based-workforce-development-advanced-cyberinfrastructure

Alan Sussman, alasussm@nsf.gov
Juan (Jenny) Li, jjli@nsf.gov
Ashok Srinivasan, asriniva@nsf.gov
Program Directors, CISE/OAC

Solicitation Goals

- **CyberTraining program** seeks to *prepare, nurture and grow* scientific ***research*** workforce.
- **Three Goals:**
  1. ensure ***broad adoption*** of CI tools, methods, and resources, Or
  2. *integrate skills* into educational ***curriculum/instructional materials*** in
     - advanced cyberinfrastructure (CI) +
     - computational and data science and engineering (CDS&E)
     - spanning undergraduate and graduate courses.
  3. **build communities** of research CI professional staff and establish career paths for those staff
- ***Innovative***, ***scalable training, education, and curricular*** programs, and ***building communities to support effective use of research CI***
  - Targeting one or more of the solicitation goals
  - Addressing emerging needs and unresolved bottlenecks
  - From students (undergrad and grad), to instructors and faculty, to 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 Goals**
  - catalyze research with training and educational activities, or
  - curriculum/instructional materials that are integrated into courses, serving as templates, or
  - stronger communities of CI professionals
- **Long Term Goal**
  - A research ecosystem enabling *Computational and Data-driven Science for All Scientists and Engineers*

NSF-wide Participation

- **CISE/OAC** - Office of Advanced Cyberinfrastructure **– lead**
  - Alan Sussman, Juan (Jenny) Li, Ashok Srinivasan
- **CISE/CCF/CNS/IIS** – all divisions in CISE
  - Almadena Chtchelkanova, **CCF**
  - Deep Mehdi, **CNS**
  - Wei Ding, **IIS**
- **EHR/DGE** - Division of Graduate Education
  - Victor Piotrowski, Li Yang, **DGE**
- **ENG** - Directorate for Engineering
  - Reha Uzsoy, **CMMI**
  - Ronald Joslin, Shahab Shojaei-Zadeh, **CBET**
- **GEO** - Directorate for Geosciences
  - Eva Zanzerkia, **EAR**
  - Allen Pope, **OPP**
- **MPS** - Directorate for Mathematical & Physical Sciences
  - Nigel A. Sharp, **AST**
  - Daryl W. Hess, **DMR**
  - Bogdan Mihaila, **PHY**
  - Richard Dawes, **CHE**
- **SBE** – Directorate for Social Behavioral and Economic Sciences
  - Joe Whitmeyer, **SES**

- Intent: stimulate cooperation between OAC and one or more other 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
  - *CI Professionals (CIP):*
    - up to two FTEs per institution and four FTEs total, 5 years
- 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
  - *CIP* projects not in this limit for PIs, but an institution is limited to 1 *CIP* proposal

CI Professionals (CIP) Projects

- Key goals and features of the new project class for CI Professionals
  - **Embed** CI Professionals into the research enterprise at one or more institutions
    - Project teams can be based on geography, scientific/engineering discipline, etc.
  - **Promote** professional development, **establish** career paths, **incentivize** coordination, **address** sustainability
  - **Establish**, foster and nurture a community
  - **Incentivize/support** the development of necessary academic structures and career paths within and across institutions, and within and across disciplines

Solicitation-specific Review Criteria

1. **Challenges** for Research Workforce Development;
2. **Solicitation Goal**(s) Targeted
   (a) Broadening Adoption of Advanced CI; or
   (b) Integration of CI Skills into Curriculum/Instructional Materials; or
   (c) Building a community of CI Professionals;
3. **Scalability** and **Sustainability**;
4. **Recruitment** and **Evaluation**;
5. **"Collective Impact"** Strategy: Coordination network and Backbone organization (or an alternative strategy);
6. **Fostering Community**;
7. **Integration** with the Computational Science Support Network (**CSSN**)

- *Pilot* projects must address items 1 and 2.
- *Small Implementation* projects must address items 1-5.
- *Medium Implementation* projects: items 1-6.
- *CIP* projects must address all 7 items, and the last solicitation goal.

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
  - incorporating CI professionals into the research enterprise
- 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: Across all Directorates and Many NSF Divisions

- Common theme is research and education-related projects in the science/engineering domain;
- And more effective use of CI to catalyze research advances and address fundamental knowledge gaps
- See the solicitation for descriptions of each directorate/division priorities and interests

FAQ

Q1. Is consultation with a Cognizant Program Officer required?

- No. But it is strongly encouraged that you consult with us (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 award?

- No

Thank you!

Questions: alasussm@nsf.gov, jjli@nsf.gov, asriniva@nsf.gov

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

Alan Sussman, Juan (Jenny) Li, Ashok Srinivasan,
Program Directors, CISE/OAC
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Please ask your questions via the Zoom Q&A box