Cyberinfrastructure for Sustained Scientific Innovation (CSSI)

Webinars: February 21, 2019

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Purpose of this Webinar

- Orient potential proposers
- Summarize the CSSI program and review criteria
- Answer questions
- Improve the quality of proposals

Webinar Outline

- CSSI program description
- Overview of solicitation (NSF 19-548)
- Questions from the community

NSF CSSI

- Program description
- Participating organizations
- Directorate specific priorities

CSSI Program

- Supports the development and deployment of robust, reliable and sustainable data and software cyberinfrastructure
- Brings innovative capabilities towards sustained scientific innovation and discovery
- Provides a cross-directorate opportunity to advance common approaches to sustain and innovate research cyberinfrastructures.
- Follows accepted data management and software development practices

Changes from 2018 CSSI

- The proposals do not have to include *software and data* as a prefix in their title.
- The articulation and delivery of cyberinfrastructure services and capabilities are emphasized and included in the solicitation specific review criteria.
- Quantitative metrics with targets for delivery and usage of cyberinfrastructure services and community creation are emphasized and included in the solicitation specific review criteria.
- The section summarizing priorities for the collaborating NSF directorates and divisions has been updated for 2019.
- 60 day notice for proposal submission

CSSI Program Guiding Principles

- ***Science-driven***: Promotes science excellence, enabling fundamentally new scientific advances; benefits science and engineering communities beyond initial participants.

- ***Innovative***: Emphasizes unique NSF contributions; builds the capability, capacity, and cohesiveness of a national CI ecosystem; considers both human and technical aspects of the CI.

- ***Collaborative***: Fosters partnerships and community development; actively engages CI experts, specialists and scientists working in concert with the domain scientists who are users of CI.

- ***Leveraged***: Builds on existing, recognized capabilities.

- ***Strategic***: Encourages measurement of progress and sharing of results.

- ***Sustained***: Provides benefits beyond the participants and the lifetime of the award.

The project must explicitly address these principles, which translate into solicitation-specific criteria

Participating NSF Organizations

Office of Advanced Cyberinfrastructure (OAC)
- Vipin Chaudhary
- Micah Beck
- Stefan Robila
- Amy Walton

Directorate for Biological Sciences (BIO)
- Division of Biological Infrastructure
  - Peter McCartney

Directorate for Computer & Information Science & Engineering (CISE)
- Division of Computing and Communication Foundations
  - Sol Greenspan
  - Almadena Chtchelkanova
- Division of Information and Intelligent Systems
  - Sylvia Spengler

Directorate for Education & Human Resources (EHR)
- Division of Research on Learning in Formal and Informal Settings
  - John C. Cherniavsky

Directorate for Engineering (ENG)
- Division of Chemical, Bioengineering, Environmental, and Transport Systems (CBET)
  - Ronald Joslin
  - Christina Payne
- Division of Civil, Mechanical and Manufacturing Innovation (CMMI)
  - Joanne D. Culbertson
- Division of Electrical, Communications and Cyber Systems (ECCS)
  - Jenshan Lin

Directorate for Geosciences (GEO)
- Division of Atmospheric & Geospace Sciences
  - Subhashree Mishra

Directorate for Mathematical & Physical Sciences (MPS)
- Division of Astronomy
  - Nigel Sharp
- Division of Chemistry
  - Evelyn Goldfield
  - Lin He
- Division of Materials Research
  - Daryl W. Hess
- Division of Mathematical Sciences
  - Christopher Stark
- Division of Physics
  - Vyacheslav (Slava) Lukin
  - Bogdan Mihaila

Directorate for Social, Behavioral & Economic Sciences (SBE)
- Division of Social and Economic Sciences
  - Cheryl Eavey

Specific Program Priorities - OAC

- Enable new science and engineering not previously possible
- Include innovation as an integral component of the project
- Build on existing community CI services, and leverage cyberinfrastructure from other OAC efforts
- Develop interdisciplinary and omni-disciplinary components

Directorate Specific Priorities

Please see the division-level descriptions in the solicitation for complete details of specific priorities across various directorates.

The NSF 19-548 Solicitation

- 2019 classes of investment
- PI eligibility
- Review criteria

CSSI Umbrella

NSF 19-548

Investment Class	Description
Elements	Small groups that will create and deploy robust capabilities for which there is a demonstrated need that will advance one or more significant areas of science and engineering.
Framework Implementations	Larger, interdisciplinary teams organized around the development and application of common infrastructure aimed at solving common research problems faced by NSF researchers in one or more areas of science and engineering, resulting in a sustainable community framework serving a diverse community or communities.
Planning Grants for Community Cyberinfrastructure	Focus on the establishment of long-term capabilities in cyberinfrastructure, which would serve a research community of substantial size and disciplinary breadth.
Community Cyberinfrastructure Implementations	Focus on the establishment of long-term hubs of excellence in cyberinfrastructure and technologies, which will serve a research community of substantial size and disciplinary breadth.

Budget by Investment Class, NSF 19-548

Investment Class	Budget
Elements	*Up to **$600K*** *Up to 3 years*
Framework Implementations	***$600K - $5M*** *($200K-$1M/yr)* *3-5 years*

Anticipated Number of Awards

Investment Class	Anticipated Awards
Elements	*Up to **25** awards, pending availability of funds*
Framework Implementations	*Up to **10** awards, pending availability of funds*

Anticipated Amount of Funding

Investment Class	Anticipated Funding
Elements	*Up to **$15M**, pending availability of funds*
Framework Implementations	*Up to **$31.5M**, pending availability of funds*

Schedule

- All proposals to NSF 19-548 ***have the same deadline - April 8, 2019*** (and Nov 1, 2019).

- **Schedule:**

Solicitation Issued:	February 2019
Proposals Due:	April 8, 2019
Review:	May-July 2019
Announcement of Awards:	Fall 2019

PI Eligibility

- **Proposals may only be submitted by:**
  - Universities and Colleges
  - Non-profit, non-academic organizations
  - NSF-sponsored federally funded research and development centers (FFRDCs) may apply, provided that that they are not including costs for which federal funds have already been awarded or are expected to be awarded.

- **Limit on Number of Proposals per PI/Co-PI/Senior Personnel: 1**
  - An individual may participate as Principal Investigator, co-Principal Investigator or other Senior Personnel in at most one full proposal across all categories of proposal for each deadline.
  - In the event that any individual exceeds this limit, any proposal submitted to this solicitation with this individual listed as PI, co-PI, or Senior Personnel after the first proposal is received at NSF will be returned without review. No exceptions will be made.

See solicitation for details

CSSI Cover Sheet

- **NSF Unit of Consideration (program):**
  - The proposals should choose “Software Institutes” as program.

- **Proposal Title**
  - Proposal titles should begin with “Element:” or “Framework:”.
  - Examples
    - Element::*MyProjectTitle*
    - Framework:*MyProjectTitle*

Supplementary Documents (1)

- **Data Management Plan**
  - Standard NSF requirement
  - The reviewers pay close attention to the Data Management Plan
- **Postdoctoral Trainee Mentoring Plan** (if project includes such trainees)
- **Management and Coordination Plan** (for Framework Implementation proposals as a 3-page limit) should include:
  - the specific roles of the PI, co-PIs, other senior personnel and paid consultants at all institutions involved
  - how the project will be managed across institutions and disciplines
  - identification of the specific coordination mechanisms that will enable cross-institution and/or cross-discipline scientific integration
  - pointers to the budget line items that support these management and coordination mechanisms
- **Letters of Collaboration**, if any (see details in solicitation)

Supplementary Documents (2)

- **Delivery Mechanism and Community Usage Metrics** (2-page limit)
  - Deliverables
    - Does the proposed project clearly articulate the services and capabilities to be delivered by the project, and how they are to be delivered?
    - NSF encourages exploration of various delivery mechanisms.
  - Metrics
    - Does the proposed project clearly articulate quantifiable metrics for development and delivery of the services and capabilities to be delivered by the project, and for the anticipated community adoption and usage?
    - Are quantitative metrics with targets identified for each year of the award? These should be simple but should also clearly show what the project will accomplish each year, the impact on science, and the breadth of the user community.

Supplementary Documents (3)

Project Personnel and Partner Institutions

- Provide current, accurate information for all personnel and institutions involved in the project
- The list must include all PIs, Co-PIs, Senior Personnel, Consultants, Collaborators, Sub-awardees, Postdocs, advisory committee members, and writers of letters of collaboration
- NSF staff will use this information in the merit review process to manage conflicts of interest
- See details in the solicitation

Single Copy Documents

Collaborators and Other Affiliations

- Provide information as specified in the NSF proposal guide
- A completed spreadsheet for each PI, co-PI, or senior personnel
  - spreadsheet template found at https://www.nsf.gov/cise/collab/
- NSF staff use this information in the merit review process to help manage reviewer selection
- Note the distinction between requirement on previous slide (on Additional Documents - 2)
- See details in the solicitation

NSF Review Criteria

Reviewers and review panel will address:

- Intellectual Merit,
- Broader Impacts, and

Standard NSF Review Criteria

- CSSI Specific Review Criteria

CSSI-Specific Review Criteria

in their reviews, panel discussions, and panel summaries

Standard NSF Review Criteria

When evaluating NSF proposals, reviewers will consider:

- What the proposers want to do?
- Why they want to do it?
- How they plan to do it?
- How they will know if they succeed?
- What benefits would accrue if the project is successful?

These issues apply both to the technical aspects of the proposal (intellectual merit) and the way in which the project may make broader contributions (broader impacts)

CSSI-Specific Review Criteria

- **Science Driven:** To what extent is the proposed project science-driven?
- **Innovation:** To what extent is the proposed project innovative?
- **Collaboration:** To what extent does the proposed project involve close collaborations among stakeholders?
- **Building on Capabilities:** To what extent does the proposed project build on existing, recognized capabilities?
- **Project Plans:** How well described are the project plans, and system and process architecture?
- **Deliverables: To what extent does the** project clearly articulate the services and capabilities to be delivered, and how they are to be delivered?
- **Metrics: To what extent** Does the proposed project clearly articulate quantifiable metrics for development and delivery of the services and capabilities to be delivered by the project, and for the anticipated community adoption and usage? Are quantitative metrics with targets identified for each year of the award?
- **Sustainability:** How well does the project address the achievement of sustained and sustainable impacts?

A Competitive CSSI Proposal Will:

- Identify science and engineering challenges where the proposed cyberinfrastructure enables fundamental new science advances, and describe how the proposed project fosters partnerships and community development that will have a significant impact on science and engineering research

- Indicate how the proposed cyberinfrastructure builds capability, capacity and cohesiveness of a national CI ecosystem; and

- Provide a compelling discussion of the cyberinfrastructure's potential use by a wider audience and its contribution to a national cyberinfrastructure.

Questions?

Questions and Answers (1)

- If I am the PI, co-PI or Senior Personnel on a proposal to NSF 19-548:
  - Can I be the PI on any other proposal to NSF 19-548? NO
  - Can I be a co-PI on any other proposal to NSF 19-548? NO
  - Can I be Senior Personnel on any other proposal to NSF 19-548? NO

An individual may participate as PI, co-PI, or other Senior Personnel on at most one proposal across the Elements and Framework Implementations for this solicitation.

In the event that any individual exceeds this limit, any proposal submitted to this solicitation with this individual listed as PI, co-PI, or Senior Personnel after the first proposal is received at NSF <u>will be returned without review</u>.

- If I am the PI, co-PI or Senior Personnel on a proposal to NSF 19-548 submitted under the April 8, 2019 deadline, can I submit another proposal as PI, co-PI or Senior Personnel under the Nov 1, 2019 deadline?

  - Yes, the deadlines of April 8, 2019 and November 1, 2019 fall into two different fiscal years for NSF and you are eligible to participate in both those as per criteria above.

Questions and Answers (2)

- When are proposals due?
  - ***April 8, 2019***.
  - Proposals must be received by **5 p.m. submitter's local time**.
  - Failure to submit by 5 p.m. submitter's local time will result in the proposal not being accepted.

- How do I submit a proposal to this program?
  - Please carefully read and follow the instructions provided in the solicitation itself (https://www.nsf.gov/pubs/2019/nsf19548/nsf19548.htm)and the NSF *Proposal & Award Policies & Procedures Guide (PAPPG)* available at (https://www.nsf.gov/pubs/policydocs/pappg19_1/index.jsp). If you need additional help preparing and submitting your proposal, we recommend that you contact your institution's Sponsored Projects Office.

- Do I need to use Grants.gov or Fastlane to apply?
  - You may use either Grants.gov or Fastlane.

Questions and Answers (3)

- ***What types of organizations are allowed to submit proposals?***
  - ***Universities and Colleges*** - Universities and two- and four-year colleges (including community colleges) accredited in, and having a campus located in, the US acting on behalf of their faculty members. Such organizations also are referred to as academic institutions.
  - ***Non-profit, non-academic organizations***: Independent museums, observatories, research labs, professional societies and similar organizations in the U.S. associated with educational or research activities.
  - ***NSF-sponsored federally funded research and development centers (FFRDCs)***, provided that they are not including costs for which federal funds have already been awarded or are expected to be awarded.

- ***How can other organizations (e.g., industry, international partners) participate?***
  - Organizations eligible to serve as subawardees are all organizations eligible under the guidelines of the NSF *Proposal & Award Policies & Procedures Guide (PAPPG)*.

Questions and Answers (4)

- ***How can a proposal integrate industry collaboration into the project?***
  - Industry participants may be included as a subaward within the proposal.
  - Industry investigators may serve as co-PIs or senior personnel on a proposal. (See PAPPG, Part I, E.3).
  - Industry participants may be (unfunded) collaborators.
  - Industry participation should be integrated through the management plan.

- **Can a foreign organization submit a proposal?**
  - NSF rarely provides support to foreign organizations. NSF will consider proposals for cooperative projects involving US and foreign organizations, provided support is requested only for the US portion of the collaborative effort.

Questions and Answers (5)

- **How do CSSI proposals differ from Computational and Data-Enabled Science and Engineering (CDS&E) and OAC core proposals?**
  - CDS&E and OAC core emphasizes research in, rather than the development of, cyberinfrastructure systems.
  - CSSI focuses upon development of data and software systems that support research.

- **How are data proposals to CSSI different from Harnessing Data Revolution (HDR) proposals?**
  - HDR will conduct new research into data intensive approaches while CSSI will develop innovative mechanisms to deliver these approaches to the community in a robust way.
  - HDR PI may develop prototypes for testing their methods but in CSSI it has to go beyond prototype and has to serve the community with clear metrics and goals for delivery, usage and community development.

On behalf of the National Science Foundation and the CSSI team

THANK YOU!

Questions?

- Now
- CSSIQueries@nsf.gov

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