



National Science Foundation
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CISE Computing Research Infrastructure (CRI) Program FAQ Site

The Directorate for Computer and Information Science and Engineering (CISE) of the National Science Foundation recently released a revised solicitation for the *CISE Computing Research Infrastructure (CRI) Program*. The CRI solicitation (NSF 08-570) can be found at: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf08570

Frequently asked questions about the following topics are answered below.

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Why have the scope and funding levels of the CRI program been changed?

The CRI solicitation was revised to accomplish the following goals:

- Ensure that CISE researchers have adequate infrastructures to carry out their research goals.
- Provide a logical, phased-pathway for the development or procurement of deployable, community-serving infrastructures that support CISE research.
- Ensure that CISE-funded infrastructures contribute to building research

capacity and provide acceptable **quality** of service to users of those systems.

- Improve the long-term sustainability and availability of existing, worthwhile CISE-related infrastructures (whether originally funded by NSF or by other sources).
- Leverage existing infrastructure investments by: Extending and expanding the infrastructures to support new research directions; Making infrastructures available to a broader user community.
- Broaden the population of users who can benefit from past investments in infrastructure, making them regionally available to colleges and pre-colleges for educational purposes.

The CRI program is committed to maintaining a broad portfolio of projects that support research and education across a diverse population and lessens the digital divide. The program encourages proposals from minority and minority-serving institutions or from teams that include such institutions.

Four institutions in my geographical area are willing to cooperate to build a shared lab for robotics research. Should we apply for an Institutional Infrastructure grant or a Community Infrastructure grant?

If your intent is to create a dedicated infrastructure, share it informally, and possibly collaborate on your research efforts, then your project more closely fits the scope of the CRI Institutional Infrastructure (II) type of project. If, however, your view of your facility more closely resembles a “utility” where users are provided with support, functionality and services are stable, and access is open, then you may want to pursue a Community Infrastructure (CI) grant. Community Infrastructure grants are meant for very broad research communities, not just geographically co-located groups of institutions.

My institution owns equipment that was created using university funds. Can we apply for CRI funding to enhance that infrastructure?

Yes, infrastructures need not have been funded by NSF to be eligible for CRI funding. The CRI Program will fund enhancements that extend or enhance the research capabilities or useful life of your infrastructure. You can also request funding to support the expansion of your facilities to serve a broader group of researchers inside or external to your institution. So, for example, you might virtualize access to your infrastructure so that it can be used remotely.

We have a collection of equipment that successfully supported our research in the past. Now that it has served its useful life in that context, can we

apply for funding to make it usable for student projects and courses? Can we request funding to transform it into a resource that can be used by a broader educational community? In that case, what will CRI fund?

The CRI program will support educationally-focused infrastructure efforts. Those efforts could be designed to engage students who participate in research projects.

CRI will also support projects that enhance an infrastructure so that it better serves strictly educational purposes. For example, you might transform your existing research platform so that it supports course work, provides a unique research experience for undergraduate educational purposes at your institution or at institutions in your geographical area. CRI is especially interested in supporting projects that make research infrastructure available to pre-K, K-12 institutions, community colleges, minority-serving institutions and predominantly undergraduate institutions.

For allowable funding requests, refer to the appropriate section of the CRI Program announcement that applies to the activity you plan.

Our research infrastructure requirements are quite modest in the context of the CRI funding limits. Will CRI fund research equipment or data purchases in the \$50K region?

As described in the CRI Program announcement: II proposals may request up to \$1.5M total for project durations not to exceed 3 years; CI Planning (CI-P) planning proposals may request up to \$100,000 for a duration of up to one year; CI Acquisition, Development, Deployment and/or Operations (CI-ADDO) proposals may request up to \$4 million for durations of up to 4 years and up to \$250,000 per year for operating the infrastructure.

There is no minimum request in the CRI program. It is expected that only a small number of II awards will be made in the \$750,000-\$1,500,000 range. The majority of II grants will be made in the \$200,000 - \$750,000 range. However, projects that request less than \$200,000 for equipment, data-repository development and/or access, or other research-supporting infrastructures are welcomed from single institutions or consortia of institutions.

Will CRI fund infrastructure to support undergraduate student research?

The CRI program focuses on supporting faculty research. However, faculty are strongly encouraged to provide research experiences for undergraduates, via the proposed infrastructure. But, the CRI program will provide undergraduate student stipend support ONLY when the undergraduate students are participating in the design, acquisition, development or operation (if a CI-ADDO proposal) of the research

infrastructure. Requests for support of undergraduate student stipends that support students' research projects should be submitted to other NSF programs like the Research Experiences for Undergraduates (REU) program.

Can undergraduate institutions submit CRI proposals?

Yes, predominantly undergraduate institutions are strongly encouraged to submit CRI proposals. Universities, two- and four-year colleges (including community colleges) located and accredited in the USA may submit proposals to CRI provided the proposed infrastructure supports a well-defined research activity at those and collaborating institutions.

Will a CRI grant support the costs of convening workshops?

CRI will support workshops under certain circumstances, and when well justified in the proposals. There are several purposes and mechanisms within CRI for funding workshops. The program supports Planning proposals for those who wish to develop Community Infrastructure (CI). For proposals in this category, workshops are strongly encouraged in order to build support for and consensus among potential users of the CI about the support and services that the future CI will provide. . For II projects, particularly those that involve the transformation of an existing infrastructure for broader use by researchers and/or educators, proposers may convene workshops that build community among those users. As another example, CI-ADDO projects may use community workshops as a means by which to enhance or assess user support.

NSF policy no longer invites external letters of support. How should we document user support for our Community Infrastructure proposal?

A CI proposal (whether to create a new infrastructure or enhance or maintain an existing infrastructure) is required to include materials that document the user community's consensus about functional requirements of the infrastructure and the quality of services and support provided to its users. In your proposal's Supplemental Materials, you should describe the research community you will be or are supporting, including a list of institutions and individuals, provide evidence of the community's consensus with respect to the particular characteristics of the proposed infrastructure, and describe how you obtained your documentation of support from the community. If you had a planning grant, a summary of this grant's results should be included as well.

We plan to submit an Institutional Infrastructure proposal for a facility that will serve our own university. Can CRI funds be used to support Broadening Participation activities outside our university?

All NSF proposals must involve Broader Impacts. Those impacts may influence change in any of a variety of arenas.

One critical Broader Impact for the nation results from projects that pay attention to Broadening Participation. Broadening Participation (BP) activities address the roles that infrastructure can play in expanding the participation of under-represented groups in computing. CISE investments in research and education rely on a diverse, competitive, engaged, pool of participants. CRI BP activities focus on improving the resources available to under-represented groups to enhance opportunities and benefit the future success of research in CISE. BP, in the context of CISE-infrastructure, supports activities focused on: inclusivity -- supporting access to research infrastructure for members of under-represented groups and institutions that serve under-represented cohorts; diversity -- supporting the participation of under-represented groups in research and education in computing; and excellence -- supporting the engagement of under-represented investigators in cutting-edge research projects to enhance the human capital in CISE-related exploration.

CISE strongly encourages all individual and team-proposers to seek the full participation of women, minorities, and persons with disabilities in research and education activities. Consequently, women, minorities, persons with disabilities, and minority or minority-serving institutions, are strongly encouraged to submit proposals. In addition, the CRI program seeks research and education related proposals that take extraordinary steps to initiate, expand and retain the pool of minority computer scientists engaged in research, to expand the population of role models at minority or minority serving institutions, or that propose innovative activities designed to attract members of under-represented groups that engage in infrastructure-related computing research. So for example, if you propose to work with a local community college whose faculty and students will have access to your II for research and education purposes, CRI funds could be used to engage your collaborators in the design, development, acquisition and/or deployment of the infrastructure.

Does hiring an undergraduate or graduate student during the summer satisfy the “Integration of Research and Education” merit review criteria?

No. The role of undergraduate students directly supported by a CRI award is limited to their involvement in the development of the infrastructure, not for their participation in research. The integration of research and education may be accomplished through other means such as the development of curricula related to the research efforts supported by the CRI award.

How should we document the “national need” requirement for a Community Infrastructure project?

Because CI projects are more comprehensive and targeted for use by a broad community, CI proposals must document that a community exists, that the community agrees that there is need for the proposed infrastructure, as well as specifying the scope, quality, and conditions of its use, and the existence of such a community engaged in the research supported by the CI is important to the nation.

Evidence should be provided from a variety of sources that justifies the investment of CRI funding in a CI project on the basis of a national need. The need may be based on global competitiveness, national safety and security, or other rationales.

Will CRI fund an operation and maintenance project where operation and maintenance functions and costs are outsourced with a sub-contract?

If it is proposed that any aspects of the operation and maintenance of a CI infrastructure is to be contracted out of the host institution, that out-sourcing must be carefully documented and justified in the proposal and its budget. The out-sourcing of intellectual aspects (e.g. user support, configuration management, etc.) of a CI project is discouraged.

Will either II or CI grants fund “expert consultants?” What about professional programmers who are not students?

Support for “Expert Consultants” may be requested since some projects may require expertise of personnel other than the PI and Co-PIs. When such personnel are included in the proposal their role is limited to activities directly related to the development of the infrastructure. Of course, such requests must be well justified in the proposal. In particular, the CRU program will support professional programmers for software development activities when the requests are well justified.

Projects may also include funding for undergraduate and graduate students, and Post-Docs, providing those participants’ responsibilities that are funded through the CRI project do not involve research. Also, it is important that their role in supporting the CRI infrastructure does not interfere with their engagement in research outside the context of the CRI project. The inclusion of staff engaged in activities other than infrastructure development and/or operation and maintenance is not supported.

The project supported by the infrastructure we are proposing will involve some field work (where sensors are installed in remote locations). Will CRI funding support the cost of the field work?

Any justified activities for the development and/or maintenance of an infrastructure are supported, including the costs associated with necessary field-work.

We have the opportunity of collaborating with researchers from industry. Will CRI support the travel costs for both sets of participants? What about international collaborations?

Salary or travel for industrial collaborators is not supported by CRI. Support for international travel by the project's PI and/or Co-PIs can be provided through CRI.

There are several options for obtaining additional funding for international collaboration. NSF's Office of International Science and Engineering (OISE) will support planning visits and workshops/seminars, programs for students and post-docs, dissertation enhancement, Summer Institutes/Advanced Studies Institutes, International Postdoctoral Fellowships, and Partnerships for International Research and Education. OISE will also co-fund collaborative international research and education activities within NSF programs, such as CRI, through new proposals and supplements to active NSF grants.

With very few exceptions, NSF will not directly support your international collaborators. Proposers should refer to NSF's Proposal and Award Policies and Procedures Guide guidance on international collaboration: http://www.nsf.gov/pubs/policydocs/pappguide/nsf08_1/index.jsp

For a project that involves building or annotating data that serves as a research infrastructure, what kinds of costs will be funded?

All the costs of developing such an infrastructure, which are clearly justified and documented in the budget, are covered by CRI. This may include, for example, the cost of annotations or other activities associated with structuring, storing, and using such a repository.

Does the CRI program address minority serving institutions or minority researchers the way CISE's Minority Institutional Infrastructure (MII) program did?

The CRI program is committed to maintaining a broad portfolio of projects that support research and education across a diverse population and lessens the digital divide. The program strongly encourages proposals from minority and minority-serving institutions or from teams that include such institutions.

Can we request an enhancement grant for an infrastructure that does not consist of equipment?

Yes, you can request an enhancement grant for such an infrastructure; however, as in the case of equipment you'd need to describe the new research which would be made possible by the proposed enhancement.

Will CI operations and maintenance funding cover our costs for delivering services such as communications, supplies, documentation (e.g. building our website) and other incidental costs?

Expenses that are directly attributable to and justified for the maintenance of the infrastructure will be funded. So, for example, proposals may not include expenses for the institution's "general computer services" unless those costs are in some way connected to the operation of the CI facility. Likewise, only those incidental expenses directly related to the support of users may be requested. For example, the design and maintenance of a website that provides specific information that users require to engage in their research using the infrastructure may be supported, when well justified. However, the maintenance of a web site that simply disseminates general information about the infrastructure would not be supported.

Why doesn't the CRI Program fund our graduate students and post-docs to engage in their research? Will CRI cover the costs of hiring full-time researchers who do not have tenure faculty appointments?

CISE provides many research programs that support graduate students and post-docs to engage in research (a comprehensive list of DISCOVERY programs is provided at the end of the solicitation). The CRI program provides funding for planning, development, and/or procurement, deployment, enhancement, extension, sustainability and use of research infrastructure to **support** research in CISE disciplines. The CRI does NOT fund research activities per se. Consequently, the CRI program supports (including students and individuals who do not have tenure faculty appointments) ONLY to engage in the development or maintenance of infrastructure. The role of students and other personnel should be carefully documented in the proposal and its budget justification. Requests for support of research activities should be made through CISE's core research programs.

Our project involves cross-disciplinary activities with researchers from our institution's Biology department as well as the local medical college. Will CRI cover any of their efforts?

CRI will fund activities that are directly related to the development or maintenance of an infrastructure. The program does not fund the research activities that the infrastructure supports. So, if aspects of your collaborators' involvement contribute directly to the infrastructure, support can be requested in keeping with the guidelines

in the CRI Program announcement.

If we submit an operations and maintenance or enhancement proposals for our existing infrastructure, how should we document the quality of service we provided to users?

It is important for you to prepare comprehensive evidence of your past performance in supporting research with your infrastructure. You should not submit user letters as “testimonials”. Prepare a data-rich summary that captures the quality of the service your infrastructure has provided including, as a minimum: the identity of and contact information for users, the kinds of research that is being carried out using your infrastructure, a list of the specific projects that used the infrastructure, statistics about response time and other quality of service measures, a description of user-support mechanisms, URL(s) for your website and websites developed by users of your infrastructure, lists of publications that cite your resource, and any other data that captures the value of your resource to the broader research community. This material should be tabulated and summarized.

Will CRI fund the activities needed to make our community infrastructure available to new populations of users through virtual-access?

Yes -- CRI is particularly interested in creative new ways to leverage research infrastructure so they can serve a broader community.

Is it allowable to propose to develop an REU-Site around a CRI-funded infrastructure?

Yes – providing that the REU-site participants are directly involved in research activities related to the infrastructure and that they do not interfere with its use by the originally targeted researchers that the infrastructure was meant to serve. The integration of research and education and the mentoring of future researchers is strongly encouraged and supported by CISE.