



National Science Foundation
4201 Wilson Boulevard
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NSF 09-051

FAQs Regarding Academic Research Infrastructure – Recovery and Reinvestment (ARI-R2) Program Solicitation [NSF 09-562](#)
FAQs – Part 1

IMPORTANT NOTE

These questions and answers are intended for guidance only. The document that defines proposal requirements is the solicitation.

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1. **What is the purpose of the ARI-R² program?**

The purpose of this program is to provide one-time assistance in modernizing the Nation's existing shared research facilities where sponsored and/or unsponsored research activities and research training take place. It is limited to research facilities located at institutions of higher education (including both two-year and four-year institutions) and other non-profit research institutions or consortia. Ideally, facilities for research should be shared by a number of research groups, and not just used by a single researcher and his or her research group. Facilities for research training should support a continuing program that engages a persistent flow of students.

The ARI-R² program focuses on the repair, renovation or, in exceptional cases, replacement of existing physical, mobile or virtual research space, the mechanical and cyberinfrastructure systems of buildings or mobile facilities that are specific to the research purpose of the facility, and fixed equipment that is built into and generic to the research facility. It is not intended to support: new construction; free-standing equipment; basic building requirements such as elevators, loading/delivery areas or restrooms; offices, classrooms, seminar or conference rooms or other space not primarily devoted to scientific or engineering research and/or research training.

Two important goals of the program are to improve the quality and utility of existing research facilities and, more generally, to improve access to, and increase use of, next-generation research facilities for researchers, educators and students. Consistent with these goals, the scope of proposed renovations may include the modernization of the cyberinfrastructure within a facility and of the cyberinfrastructure that connects the facility to external researchers and to external sources of observations and other data used in the research at the facility. Such cyberinfrastructure does not include computers for numerical analysis and similar functions as part of research activities, nor disk nor tape storage systems intended for research activities. These are considered to be research instrumentation. Other funding opportunities exist for researchers wishing to acquire research instrumentation. One that researchers may wish to consider is NSF's Major Research Instrumentation – Recovery and Reinvestment (MRI-R2) program.

It is anticipated that the ARI-R² program will result in a broad portfolio of awards including awards for meritorious proposals from institutions that have historically received limited Federal research funds.

2. **What is the purpose of the Letter of Intent?**

Submission of a Letter of Intent is **mandatory** for all organizations wishing to submit a full proposal. The primary purposes of the Letter of Intent are to assist NSF program staff in gauging the range of proposals that will be submitted and in planning the logistics of the review process. The content of a Letter of Intent is not used to determine whether a project should be funded and is not subjected to merit review. A Letter of Intent should include a synopsis of the project that describes the work in sufficient detail to permit an appropriate

selection of reviewers. It should also include enough information about who will be involved in the project, and who will benefit from the project, so that, in selecting reviewers, potential conflicts of interest can be identified and avoided.

3. Is it necessary to address the Broader Impacts Criterion in an ARI-R² proposal?

Yes. Each proposal submitted to NSF must address the broader impacts criterion included in NSF's standard merit review criteria. Reviewers are asked to evaluate the strengths and weaknesses of a proposal with respect to each review criterion. The solicitation has more information about the Broader Impacts criterion, including the following:

"What are the broader impacts of the proposed activity?

How well does the activity advance discovery and understanding while promoting teaching, training, and learning? How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)? To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships? Will the results be disseminated broadly to enhance scientific and technological understanding? What may be the benefits of the proposed activity to society?"

4. What is the recommended way to address the broader impacts criterion in an ARI-R² proposal?

As with any other NSF proposal, you should address the broader impacts criterion in a way that works best for your research and education activities and the mission of your organization. You can review several examples of broader impacts on the web:

<http://www.nsf.gov/pubs/gpg/broaderimpacts.pdf>

5. The solicitation says that the review of some ARI-R² proposals may involve reverse site visits or site visits. What does this mean?

ARI-R² proposals cover a range of different types of facility modernization. They are evaluated using review procedures that are appropriate for the particular type of research facility and level of project complexity. Typically, each proposal will be reviewed by a panel of experts. In the case of larger and/or more complex projects, after receiving the input from the first review panel, NSF may organize a second stage of review that includes a "reverse site visit" in which the PI and an appropriate colleague (for example, a university facilities manager or other university administrator) are invited to NSF to answer questions from the review team. If necessary to determine the merit and assess the risks associated with a proposal for a large, complex project, NSF may include a "site visit" in the review process. In a site visit, a review team visits the site of the proposed research facility and asks questions of the PI and representatives of the proposing organization(s).

6. What types of proposals are likely to be reviewed by reverse site visit or site visit?

NSF anticipates that most proposals requesting less than \$2,000,000 will not be subjected to a reverse site visit or site visit unless the proposed project is unusually complex or high-risk. Proposals requesting more than \$2,000,000, and that receive favorable recommendations in the initial panel review stage, are likely to be subjected to a reverse site visit. NSF anticipates that only a handful of large, complex proposals that have received favorable recommendations in the initial panel review stage and in the reverse site visit stage are likely to be subjected to a site visit.

7. Does ARI-R² have priority funding areas?

The primary constraints are that the proposal has to be for the repair, renovation or, in exceptional circumstances, replacement of existing research facilities; be submitted by an

eligible organization; fall within the budget limits specified in the solicitation; and be for a facility for research and/or research training in an area of science, engineering or education research that is supported by NSF. There is no preference among eligible organizations or eligible areas of research. Research that falls outside the scope of the areas that NSF normally funds includes clinical research and research requiring security classification. Proposing organizations are encouraged to read the solicitation's section on merit review criteria for a description of the factors that the reviewers and NSF staff typically consider when evaluating proposals.

8. Is there any cost-sharing requirement?

There is no cost-sharing requirement, regardless of the type of eligible organization submitting the proposal. However, the project may require costs that are ineligible for reimbursement under the ARI-R² program. In such a situation, the proposing organization must list all of the costs associated with the project on Standard Form 424C (SF424C – see solicitation for details) and differentiate between those costs for which funding through ARI-R² is sought and those that will be funded by the proposing organization(s). The Authorized Organizational Representative's electronic signature of the proposal commits the institution to provide any institutional funding contributions described in the proposal in the event of an award by NSF.

9. If I work in a small museum that does some research, am I eligible to apply?

Yes, if the research is in an NSF-supported field of science, engineering or education research. However, there is a caveat; as a result of language in the American Recovery and Reinvestment Act of 2009, funds may not be used for an aquarium, zoo.

10. Why will the ARI-R² program not provide support for the repair, renovation or replacement of facilities to be used in medical research?

The National Institutes of Health (NIH) is the major U.S. agency that supports medical research, rather than the NSF. Hence, the ARI-R² program will not provide support for **the repair, renovation or replacement of facilities** to be used in medical research and medical education or training, or that supports research with disease-related goals (including work on the etiology, diagnosis or treatment of physical or mental disease, abnormality, or malfunction in human beings or animals). Research facilities related to animal models of such conditions or the development or testing of drugs or other procedures for their treatment also are not eligible for support. However, the **repair, renovation or replacement of a facility for** bioengineering research that advances engineering research and knowledge, applies engineering principles to problems in biology and medicine, aids persons with disabilities, and that may also have clinical uses or diagnosis-related or treatment-related goals is eligible for support. It should be noted that NIH has recently announced funding opportunities for the repair and renovation of medical research facilities.

11. We are a separate campus within a multi-campus state university system and have always submitted proposals without having submissions from other separate and distinct campuses count toward our institutional proposal limit. Does the solicitation allow for one proposal from each campus?

Large, multi-campus systems usually have distinct campuses with their own chancellors, student admissions, and separate research or research training activities. Such a campus, which exists as a separate university, with its own student programs and degrees, qualifies as a separate entity for the purpose of submitting a proposal. If you have a question about this, please contact the cognizant program officer.

12. My university includes a College of Marine Science and a College of Education. Each of these is located some miles from the main university campus on a physically distinct

campus. As a multi-campus institution, may the university submit three proposals for separate renovations at the three campuses?

No. Under the solicitation, campuses in a multi-campus situation may submit independent proposals if they are part of a multi-campus system, such as a state university system or state community college system, and have independent administrative structures typical of universities or community colleges. Campuses headed by Department Heads, Deans, Center Directors or other administrators at similar levels are not eligible to submit an independent proposal to ARI-R².

13. **My university established a Research Foundation specifically to promote, encourage and provide assistance to the research activities of the university. The Foundation is a separate not-for-profit organization, incorporated under State laws and regulations. The Research Foundation also acts as the and is led by a separate governing board and committees. Would a proposal submitted by the Research Foundation count toward our institutional proposal limit or would the Research Foundation be considered a separate entity entitled to submit its own proposal?**

Although the Research Foundation is a separate entity, it supports the activities of the university and cannot be considered an organization with interests distinct from the university. It has no students or faculty of its own, separate from the university. Accordingly, research proposals submitted by the Research Foundation will count toward your institutional proposal limit. If the Research Foundation acts as the fiduciary entity for private contracts and grants for several campuses within the same multi-campus college or university system, and if the campuses are distinct in the sense used in FAQ 11, then the Research Foundation may submit up to one proposal on behalf of each campus.

14. **What will happen if my institution submits more than one proposal?**

Since the solicitation limits the number of proposals in which an institution may participate as the lead organization or as a sub-awardee to no more than one, an institution that submits more than one proposal will not have complied with the requirements of the solicitation and all proposals in which that institution is participating may be returned without review.

If an institution's only involvement in a particular proposal is as a sub-awardee and the sub-award is solely for the provision of a widely recognized commercial service, for example, architectural design, construction, or telecommunications services, then, for the purposes of determining compliance with the organizational proposal limit, that particular proposal will not count as a proposal in which the institution is participating. The following examples are intended as illustrations. (1) Ima Small College (ISC) wishes to submit a proposal for a major renovation of a research facility on its campus but it does not have staff with expertise in the supervision of such renovations. Its neighbor, Avery Bigg University (ABU) agrees to provide management services for the renovation at Ima Small College under a sub-contract from the College. ABU will not itself use the research facility in question. ABU plans to submit a proposal of its own for the repair of a research facility on its own campus. ABU may submit its own ARI-R² proposal and be sub-contracted to provide renovation management services under ISC's ARI-R² proposal without violating the one-proposal limit. (2) The Exa-Net Consortium (ENC) is an academic consortium that both conducts research in telecommunications networking and provides network connections to academic institutions. ENC is considering the following: (i) submitting proposal A to upgrade a research facility that its members use for network research, (ii) collaborating with university X, as a sub-awardee in proposal B being submitted by university X, on the repair of a research facility at which researchers supported by research grants to ENC conduct networking research, (iii) agreeing to provide a network connection between university Y and a national network hub under a subcontract in a proposal being submitted by university Y, (iv) agreeing to provide a network connection between university Z and a national network hub under a subcontract in a proposal being submitted by university Z. ENC would not violate the proposal limit if it went

ahead with (i) + (iii) + (iv) or with (ii) + (iii) + (iv). However, it would violate the proposal limit if it went ahead with both (i) and (ii).

Any organization that plans to participate in more than one proposal, with participation in all but one limited to a role as a sub-awardee providing only a widely recognized commercial service, is welcome to contact the program for advice.

15. How do I submit a collaborative proposal?

If two or more institutions wish to submit a collaborative proposal for the repair or renovation of a research facility, they must first choose a single institution as the institution that would administer the award. The proposal should be submitted by that institution and the proposal should include sub-awards for any other institutions that would receive funds if the proposal were to be funded. The collaborating institutions must not submit separately.

16. Can I apply for a grant to build a new wing to an existing lab?

This would normally be viewed as new construction which is excluded by the language in the solicitation. Depending on the nature of the proposed renovation, a plan to expand the space devoted to a research facility within the existing fabric of a building may be eligible.

17. Will ARI-R² support improvements to “virtual research environments?”

Yes. Previous solicitations for the Academic Research Infrastructure program have focused on the physical aspects of research facilities. Recognizing the growth in the use of virtual research environments and research facilities whose spatial reach is extended beyond a single physical location by the use of information technology, the ARI-R² solicitation includes the category of “virtual research space.” Since this is a relatively immature and rapidly evolving area, the ARI-R² program does not provide a precise definition of a virtual research facility and will ask reviewers to use their professional judgment of whether a proposal for the repair or renovation of a virtual research facility is reasonable.

The following provides a hypothetical example. A collaborative research facility includes a unique piece of equipment in one location and provides collaborating researchers in several other locations around the country with the ability to operate the equipment remotely and to receive data from it, including real-time video, for local analysis. A recent upgrade to the equipment in question means that, where it previously generated low-resolution video, it now generates multiple stereo, high-definition video streams. The existing network connections between the sites of the collaborative facility do not have the bandwidth to support the new video streams. An ARI-R² proposal might request funding to acquire higher bandwidth circuits between the sites of the collaborative facility and higher bandwidth networking gear at the sites.

18. Can a proposal include specialized instruments needed for the research that is to be conducted in the facility?

No. The scope of the ARI-R² program does not include instrumentation. Other funding opportunities exist for researchers wishing to acquire research instrumentation. One that researchers may wish to consider is NSF’s Major Research Instrumentation – Recovery and Reinvestment (MRI-R2) program.

19. The analysis needs of our researchers have increased dramatically. We would like to upgrade our research facility by adding a small supercomputer. Because of its electrical and cooling needs, it will be attached to special power circuits and water lines. This sounds like fixed equipment. Can we include this in a proposal to the ARI-R² program?

No, regardless of how firmly the computer is attached to the floor, walls, electrical system or plumbing, a computer intended for use in research is regarded as instrumentation and so is not an eligible cost in an ARI-R² proposal. You may wish to examine the solicitation for NSF's Major Research Instrumentation – Recovery and Reinvestment (MRI-R2) program which includes the opportunity to acquire small supercomputing resources.

20. The ARI-R² program is supported with funds appropriated under the American Recovery and Reinvestment Act of 2009. Are there any special Terms and Conditions that apply?

Yes. A number of special award conditions and reporting requirements apply to ARI-R² awards. Please see Section VII of the solicitation for more details.

21. How do the Davis-Bacon Wage Determinations apply to work funded through ARI- R2 proposals?

Grants awarded under this solicitation are subject to Section 1606 of the American Recovery and Reinvestment Act of 2009 (ARRA). This states that, "Notwithstanding any other provision of law and in a manner consistent with other provisions in this Act, all laborers and mechanics employed by contractors and subcontractors on projects funded directly by or assisted in whole or in part by and through the Federal Government pursuant to this Act shall be paid wages at rates not less than those prevailing on projects of a character similar in the locality as determined by the Secretary of Labor in accordance with subchapter IV of chapter 31 of title 40, United States Code." We do not have access to all of the information about your institution, your state regulations and what type of activity you are planning to include in your proposal. However, our expectation is that many proposals to the ARI-R² program will be for projects that involve the work of laborers and/or mechanics and so would be subject to the Davis-Bacon Wage Determinations, if funded. The clauses published at 29 CFR Section 5.5 and the appropriate Davis-Bacon wage determination(s) for the specific project will become part of any grant awarded under this solicitation.

22. What should be addressed in the project management plan?

The reviewers will be asked to evaluate not just the intrinsic merits of the proposed repair or renovation but also the degree to which the proposing organization is prepared to execute the project successfully. This includes: the qualifications and experience of the project manager to plan, lead, coordinate and manage the project and to keep it on schedule; the effectiveness of the proposed mechanisms for interaction among different groups involved in the project; the technical soundness of the proposed plans; the soundness of the risk analysis; the quality of the plans for managing risk; the feasibility of the proposed timeline; the ability of the proposing organization to initiate the project quickly; and whether the budget is consistent with the schedule and scope.

With the exception of the project's budget, which is in a different section of the proposal, the project management plan should provide much of the information that the reviewers will need to assess whether the proposing organization will be able to execute the project successfully. It should identify the project manager and discuss his/her experience and qualifications to plan, lead, coordinate, and manage the proposed project, and to keep it on schedule. (The project manager's curriculum vitae should be included in the Biographical Sketches section of the proposal.) The project management plan should specify the percentage of time that the project manager will dedicate to this project. **It** should include a description of the mechanisms for input to the project by both the end users of the facility and by the institution's physical plant personnel, as appropriate. It should summarize the project's schedule, logistics and phases and demonstrate why, if funded, the project can be initiated quickly and on schedule. It should explain who will do the work in each phase of the project, e.g., in-house personnel or outside contractors. It should describe the process that will be used to manage any competitive bidding that may be required in developing sub-contracts.

The project management plan should assess the risks associated with each phase of the project and describe contingency plans for dealing with unforeseen problems, including a quantitative description of the contingency included in the budget, schedule and scope. The project management plan should describe the methodology used to calculate contingency as well as the procedure by which the proposer would authorize use of contingency to meet project goals. The project management plan **must** provide a description of any regulatory permits required for initiation and completion of the project, a description of what permits have been obtained, and justified estimates of the anticipated time and other resources needed to obtain any that remain to be obtained.

23. Who should submit a project execution plan and what should be addressed?

PIs submitting proposals requesting funding over \$2 million must submit a detailed project execution plan. This should be included as a supplemental document. A list of the items that should be included is given in the solicitation. The project execution plan is a formal document that serves as both a tool for the project manager and a tool to help NSF track progress on an award. It complements and significantly extends the information in the project management plan. If the proposed project is complex, proposals requesting funding below \$2 million may include a project execution plan in the supplementary documents section at the PI's discretion.

24. What should be addressed in the sustainability plan?

The sustainability plan should be a detailed plan for the maintenance, operation, and technical support of the modernized facility for, at least, three years after the conclusion of the improvement of the facility. This plan should identify who will have responsibility for the management of the facility in its operational phase, describe the staff that will operate the facility and provide any necessary technical support, and describe how the facility will be maintained. The plan should include budget projections for management, maintenance, operation and technical support during the operational phase and identify the sources of these funds. The plan should describe who the users of the facility will be and, if there are restrictions on use, how the users will be selected. It should describe the expected mechanisms for oversight of the facility by the institutional administration and include a description of the mechanisms that will be used to ensure user input into the operation and management of the facility. Note that a letter of commitment to operate the facility for, at least, three years after the completion of the improvement project must be included by the submitting organization in the Supplementary Documents section of the proposal.

25. The solicitation asks for schematic drawings. How should these be submitted?

The solicitation asks proposing organizations to include in their proposals, "One set of page-size schematic drawings showing existing conditions and work to be done. Drawings must be an integral part of the proposal package and should be as extensive as possible. These drawings should show appropriate details of existing conditions and proposed work." These are to be submitted as part of the Supplementary Documents section of the full proposal. The documents should be prepared (or scanned) as Portable Document Format (PDF) files and integrated with the other supplementary documents into a single PDF file that can be uploaded into the Supplementary Documents section of the proposal. Please make sure that the paper size setting is 8.5"x11".

26. Can a proposal for the repair or renovation of an existing research facility involve multiple, physically separate locations used for different types of research?

The solicitation is written in terms of a single research facility per proposal. It does not define what exactly a research facility is. The proposals will be reviewed by a group of external reviewers who will first read the solicitation and make their assessments in the context of the wording of the solicitation. If you feel that you can make a strong case in the proposal that the infrastructure in separate locations constitutes a single research facility and you feel that

reviewers and program officers are likely to find this convincing, then you are free to try this. You should be careful to avoid creating the perception that your proposal is an attempt to get around the one-proposal-per-institution limit.

27. **We have a building that is not currently used as a research or research training facility. We would like to renovate this and include some research space in the renovated building. Is this suitable for an ARI-R² proposal?**

No. The solicitation states that proposals must be for the improvement of an existing research facility.

28. **Can a proposal to upgrade an existing research or research training facility include the renovation of a newly acquired building that is not currently used for research or research training? Can a proposal to upgrade an existing or existing research or research training facility include the acquisition of a building from its current owner and its subsequent conversion to a research or research training facility?**

The answer to both of these questions is no.

29. **If a building or part of a building is currently a research or research training facility, can it be renovated to create a research or research training facility with an expanded or otherwise different scope of research or research training?**

Yes. This is consistent with the language of the solicitation.

30. **If part of a building is currently a research or research training facility, can the extent of the space used for research or research training be expanded?**

Yes, provided this does not involve the construction of a new wing, annex, building or similar.

31. **We have a building that was constructed some years ago. Part of the interior is unfinished, shell space. Can we propose a renovation that includes converting this shell space to research or research training space?**

If the building contains some space that is currently used for research or research training and so is an existing research or research training facility, then yes, otherwise, no.

32. **The solicitation states that under exceptional circumstances replacement may be considered. What is an example of such a circumstance?**

The proposal should convincingly demonstrate that it would be unreasonable to repair or renovate the existing facility; for example, by showing that replacement would be more cost effective than repair or renovation, or by showing that environmental or regulatory conditions would mean that even a renovated facility would be unsuitable for research or research training.

33. **Is razing and rebuilding a facility the only acceptable form of replacement?**

No. For example, renovating a different existing building and moving the old facility to space in the newly renovated building would be acceptable provided that: (a) the old space is no longer used as a research or research training facility so that the proposed project is truly a replacement; and (b) repair and renovation are not reasonable alternatives.

34. **Some academic regional optical research networks are incorporated as independent, non-profit organizations; some others have an administrative home within an institution of higher education. In the latter case, if a host institution submits an ARI-R² proposal on behalf of the associated academic regional optical research network, is that institution excluded from submitting an ARI-R² proposal on behalf of itself?**

No. Regardless of the administrative arrangement, academic regional optical research networks are regarded as separate institutions for the purpose of ARI-R² and are each eligible to submit an ARI-R² proposal without prejudice to a host institution.

35. **Our university owns a ship used for coastal research. May we submit a proposal to renovate the research laboratory space on this ship?**

Yes. Proposals to repair or renovate mobile research facilities such as research aircraft and research ships are acceptable.