NATIONAL SCIENCE FOUNDATION
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NSF 20-021

Frequently Asked Questions (FAQs) About the National Artificial Intelligence (AI) Research Institutes Program (NSF 20-503)

A. PROJECT FORMULATION

1. Can I submit an Institute proposal that responds to multiple themes? Is it a good idea?

2. Theme 2 has a strong emphasis on foundational research advances. What should be the role of use-inspired research in such an Institute?

3. Is it required that an Institute be multi-organizational? How important is this? How many organizations should comprise an AI Research Institute?

4. Can a proposed AI research Institute focus on only a subset of the desiderata spelled out in the solicitation?

5. Is it possible to provide any funding to industrial collaborators?

6. Would an AI Research Institute proposal from a single organization (with no or few subawards) be competitive?

7. Must an AI Research Institute necessarily be a physical Institute or can it: be a network; have a hub-and spokes structure; be wholly virtual?

8. Can Federally-Funded Research and Development Centers (FFRDCs) participate in proposals to this solicitation?

9. How does NSF view international collaboration?

10. Can a foreign institution, as a partner or subcontractor, be financed with funds from an AI Research Institute award?

11. Can an existing "institute" or "center" participate in a proposal to this program?

12. Can National AI Research Institutes award funds be used to develop new

infrastructure? If so, are there limitations on the type of infrastructure or the budget for this?

B. PROPOSAL SUBMISSION

13. The solicitation restricts the number of submissions by "senior personnel." Can you clarify what constitutes "senior personnel"?

14. I have a collaborator and wish to obtain a letter of collaboration from them. Is this allowed, and what are the requirements?

15. We have industry partners that may serve as subawardees. May they apply fees to their budgets?

16. What is the limit on budgetary allocation to a subawardee or consultant?

17. Does the NSF two-month salary limit guideline apply to (non-tenure track) research faculty whose salary is funded through directly billing contracts and grants? Does it apply to the Managing Director?

18. To which division should I submit my proposal?

C. PROGRAM INFORMATION

19. Can you provide more information on the review process that will be used to evaluate proposals? How will proposals that touch on multiple themes be reviewed?

20. Can you provide more information on the number of awards anticipated in each theme of the Institutes track? Is it possible that a theme might receive more than one Institute award?

21. How do the participating agencies' interests align with the Institute topics?

22. If I receive a planning grant in this program this year, does this mean that there will be an opportunity to submit a full Institute proposal in a future round of this program?

23. If I participate in a project awarded by a different NSF program, or have a proposal pending to such a program, am I at a disadvantage in applying to the National AI Research Institutes program?

24. Are AI Institutes awards going to be renewable for an additional five years?

25. What are the plans for this program for future Institute themes? What relationship is expected between planning grants awarded this year and future Institute solicitations?

D. ADDITIONAL QUESTIONS

26. The solicitation does not provide any description of requirements for sections of the proposal listed in the NSF PAPPG (e.g., Budget and Budget Justification, Current and

Pending Support, Facilities, Equipment and Other Resources). Are these sections required?

27. How do the five desiderata for Institutes apply to proposals to the Planning track?

28. In a Planning proposal, how much effort should be allocated towards planning activities vs. research activities?

29. Do planning grants have to be multi-organizational projects?

30. For the same team and idea, can we submit to both the Institute track and the Planning track?

31. Is there a limit on the number of PIs, Co-PIs, or Senior Personnel on either proposal type?

32. Can individuals from organizations other than the lead (submitting) organization be listed as co-PI?

33. What is NSF's guidance regarding collaborations with a partner who would not be a subaward, but instead an unfunded collaborator, and in which case such a collaborator might agree to provide their own funding or other sources of support to the institute?

34. Are letters of interest/support from individuals or organizations permitted?

35. What is the appropriate balance between foundational and use-inspired research?

36. Must a proposal to Theme 1: Trustworthy AI address all aspects of trustworthiness described in the program solicitation? May a proposer expand on these aspects of trustworthiness?

37. In Theme 2: Foundations of Machine Learning, several questions are listed as those that an Institute might address. Is a proposal in this theme required to address these or a subset of these?

38. In Theme 2: Foundations of Machine Learning, what is an appropriate balance between foundational and use-inspired research?

39. In the section "Additional Solicitation Specific Review Criteria", under the subsection "USDA-NIFA Process", the solicitation states: *"After scientific, technical and programmatic review and consideration of appropriate factors, the NSF Program Officer recommends to the cognizant Division Director whether the proposal should be declined or recommended for award."* The rest of the language under the subsection "USDA-NIFA Process" appears to be very NSF specific, with no mention of USDA. Can you clarify the process?

40. Can the USDA Agricultural Research Service [or other USDA entity?] be a subawardee on an AI Institute grant where the lead institution is a university?

41. In the section, Cost Sharing Requirements, for awards made by USDA-NIFA, for what types and levels of equipment requests does this requirement apply?

42. Theme 5 states that "Moderate equipment purchases to enable the testing of automated routes of synthesis and characterization are anticipated". What might be considered an acceptable budget allocation for such equipment?

43. In Theme 6: AI for Discovery in Physics, the solicitation states that NSF seeks Institutes "that advance AI and accelerate discovery in the physical sciences." How can I confirm whether my proposal is responsive to this theme? For example, would a proposal in astrophysics be responsive? One in condensed matter physics?

44. Theme 6 lists six topics for the AI for Discovery in Physics Institutes. My topic is not listed among the six. Are these six topics meant to be restrictive or indicative of high priority areas for this theme?

A. PROJECT FORMULATION

1. **Can I submit an Institute proposal that responds to multiple themes? Is it a good idea?**

   The solicitation allows for this. It is advisable that relevance to any more than one theme be identified only in cases where significant activity is planned in the five desiderata for Institutes for those additional themes.

   Proposal submission guidelines for Institute proposals specify that Keywords must be used in the Project Summary to identify the theme(s) addressed by the proposal. Where an Institute proposal is identified as relevant to multiple themes, it is recommended that the predominant theme of the proposal, if there is one, be listed first. The text of the Project Summary and Project Description should clearly establish the relative emphasis placed on each theme named in the proposed Institute.

2. **Theme 2 has a strong emphasis on foundational research advances. What should be the role of use-inspired research in such an Institute?**

   All AI Research Institutes must demonstrate how they deliver on all desiderata listed in the program description, including the requirements to both **advance foundational AI research** and **leverage use-inspired research**.

   As for the Foundations of Machine Learning theme, Institutes should incorporate use-inspired research as required for all Institutes, with attention to the additional guidance given in the description of that theme. That is (emphasis added), "Research at an

Institute for Foundations of Machine Learning will... **[deepen] the theoretical foundations** for the science of machine learning. Researchers will **study use cases in so far as they lead to general fundamental results**."

3. **Is it required that an Institute be multi-organizational? How important is this? How many organizations should comprise an AI Research Institute?**

   This program requires that "Institutes will consist of a network of multiple organizations." The program encourages multi-organizational arrangements comprising a "complex, multi-faceted, and innovative enterprise that integrates research, education, broadening participation, and knowledge transfer;" and which engage diverse institutions. Furthermore, the program requires that Institutes create nexus points that "[bring] together the best teams and approaches from institutions of higher education, federal agencies, industry, and nonprofits/foundations." How a particular proposed Institute envisions this will be unique to that Institute. To assess the potential competitiveness of a proposal, note that the solicitation-specific review criteria refer to all five of the desiderata for Institutes provided in the program description.

4. **Can a proposed AI research Institute focus on only a subset of the desiderata spelled out in the solicitation?**

   AI Research Institutes must address all five of the desiderata outlined in the Program Description of the solicitation. Proposed Institutes are expected to configure their functions relative to these desiderata in a way that is unique and appropriate to that Institute's vision. Proposers are reminded that the evaluation of all proposals will take into consideration the full range of solicitation-specific review criteria in the solicitation.

5. **Is it possible to provide any funding to industrial collaborators?**

   Yes, it is allowable to include a for-profit organization as a subawardee to an Institute proposal. Please consult the NSF *Proposal and Award Policies and Procedures Guide (PAPPG)* for guidance on subawards (https://www.nsf.gov/pubs/policydocs/pappg19_1/pappg_2.jsp#IIC2gvie).

6. **Would an AI Research Institute proposal from a single organization (with no or few subawards) be competitive?**

   This program requires that "Institutes will consist of a network of multiple organizations." It is possible (and permissible) for an organization to propose such an arrangement without the need for subawards to partner organizations.

   Note that the program encourages multi-organizational arrangements comprising a "complex, multi-faceted, and innovative enterprise that integrates research, education, broadening participation, and knowledge transfer," and which engage diverse

institutions. Furthermore, the program requires that Institutes create nexus points that " [bring] together the best teams and approaches from institutions of higher education, federal agencies, industry, and nonprofits/foundations." How a proposed Institute envisions this will be unique to that Institute.

To assess the potential competitiveness of a proposal, note that the solicitation-specific review criteria refer to all five of the desiderata for Institutes provided in the Program Description.

7. **Must an AI Research Institute necessarily be a physical Institute or can it: be a network; have a hub-and spokes structure; be wholly virtual?**

The program solicitation does not constrain the nature of a proposed Institute.

8. **Can Federally-Funded Research and Development Centers (FFRDCs) participate in proposals to this solicitation?**

FFRDCs are not eligible as proposing (lead) organizations.

In general, NSF does not normally support research or education activities by scientists, engineers or educators employed by Federal agencies or FFRDCs. However, FFRDCs may, under certain circumstances, be included as subawardees to proposals to this program. The *PAPPG* provides guidance on the circumstances under which this is appropriate (https://www.nsf.gov/pubs/policydocs/pappg19_1/pappg_1.jsp#IE7).

In cases where a lead organization wishes to include an FFRDC under such an exception, the proposing organization must coordinate with the relevant cognizant program officer regarding how the FFRDC meets one or more of the exceptions outlined in the *PAPPG*. The Program Officer will provide guidance.

Proposals incorporating a subaward to an FFRDC must include a statement (uploaded as a supplementary document) substantiating the exception(s) applied.

9. **How does NSF view international collaboration?**

NSF promotes international collaboration when it provides U.S. students and researchers the opportunity to benefit from foreign expertise and/or from resources, equipment, data and geographically-based phenomena that are located abroad. PIs are encouraged to consider how international engagement can enhance effectiveness in any or all of the five desiderata for Institutes, to include the potential to develop a globally-engaged U.S. workforce. NSF encourages a close working arrangement with local scientists and engineers in all international components of research projects. Projects in a foreign country should be designed to be of mutual benefit and must encourage wide distribution of the resulting materials, data, analyses, and publications

within the host country as well as in the U.S.

10. **Can a foreign institution, as a partner or subcontractor, be financed with funds from an AI Research Institute award?**

    NSF does not expect to fund foreign institutions as partners or subcontractors. Extraordinary circumstances may be considered on a case-by-case basis, and when the proposed activities cannot be funded from sources in the foreign country. Such circumstances might include activities that require unique foreign expertise, access to unique foreign facilities, unique foreign data resources not generally available to U.S. investigators (or which would require significant effort or time to duplicate), or other foreign resources that are essential contributing factors to the success of the proposed project.

    Full information regarding NSF support to foreign organizations can be found in the *PAPPG* (https://www.nsf.gov/pubs/policydocs/pappg19_1/pappg_1.jsp#IE6).

11. **Can an existing "institute" or "center" participate in a proposal to this program?**

    There is no restriction regarding how an existing institute or center may participate in a proposal to this program. Any AI Research Institute funded in this program is expected to build significant new capacity in the five desiderata outlined in this program. This includes proposals that build upon or collaborate with existing organizations, including existing Institutes or centers. Proposers are reminded that as a network of multiple organizations that together serve as nexus points for collaborative efforts, proposed Institutes must be meaningfully integrated in such a way that it creates a capability that is more than just the sum of the parts.

12. **Can National AI Research Institutes award funds be used to develop new infrastructure? If so, are there limitations on the type of infrastructure or the budget for this?**

    The program solicitation does not constrain the budget items that can be requested.

    However, Institutes are expected to build on other NSF investments and are expected to coordinate and integrate with ongoing and new initiatives, including center-scale research, infrastructure, and workforce development activities. The Institute teams are expected to coordinate with their constituent organizations and partners to develop a concrete and workable plan for leveraging existing infrastructure resources.

    If major infrastructure investment is needed to address the proposed research challenge, the appropriate venue is not this program, but rather other NSF sources of funding specifically for experimental research infrastructure, such as the Major Research Instrumentation program and the Mid-Scale Research Infrastructure

programs.

B. PROPOSAL SUBMISSION

13. **The solicitation restricts the number of submissions by "senior personnel." Can you clarify what constitutes "senior personnel"?**

    See the PAPPG, Exhibit II-7 for definitions of categories of personnel. "Senior personnel" includes the PI and co-PIs, hence the solicitation's clarifying language:

    > "An individual may be designated as senior personnel on no more than TWO project teams submitting to this solicitation. An individual may be designated as senior personnel (which includes but is not limited to PI or co-PI) on at most ONE project team submitting to the Institute track. In the event that an individual exceeds these limits, proposals will be accepted based on earliest date and time of proposal submission, i.e., the first proposal will be accepted, and the remainder will be returned without review."

    Another way to state this is that a person, regardless of their designation on the proposal (i.e., PI, co-PI, or other role as senior personnel), can be on one (and only one) proposal for the Institutes track and up to two for the Planning Grants track (or only one if they are also on one Institutes track proposal).

14. **I have a collaborator and wish to obtain a letter of collaboration from them. Is this allowed, and what are the requirements?**

    In the proposal submission guidelines for Institute proposals, letters of collaboration in such circumstances are encouraged. However, note that their contents are restricted to a specified template in the *PAPPG* (see Chapter II.C.2.j), to only a specified statement about the intent to collaborate as described in the proposal. Note that any statement of further support, either in this letter or in separately-submitted documents, will not be allowed. Also note that while Advisory Boards will be required for an Institute upon time of award, please do not specify potential members (or include associated letters of collaboration) in the proposal.

15. **We have industry partners that may serve as subawardees. May they apply fees to their budgets?**

    Please see the PAPPG's guidance on indirect costs for subawardees (https://www.nsf.gov/pubs/policydocs/pappg19_1/pappg_2.jsp#IIC2gvie).

16. **What is the limit on budgetary allocation to a subawardee or consultant?**

    No limit is imposed by the program or *PAPPG*. This is to be determined by the

proposing organization; and the merit of the arrangement will be evaluated by reviewers and funding agencies.

17. **Does the NSF two-month salary limit guideline apply to (non-tenure track) research faculty whose salary is funded through directly billing contracts and grants? Does it apply to the Managing Director?**

    NSF salary policy applies to senior personnel and limits salary compensation to no more than two months of their regular salary in any one year. If anticipated, any compensation for such personnel in excess of two months must be disclosed in the proposal budget, justified in the budget justification, and must be specifically approved by NSF. This program requires that an Institute be staffed with a Managing Director or Project Manager (potentially distinct from the lead PI) and a suitable Management Team to oversee the operations of the Institute. It is anticipated that such personnel might include those who are not on a regular organizational salary. Regardless of the category of senior personnel and the proposed role, proposers are encouraged to staff the Institute for success and provide adequate justification.

    Details on the practice of limiting senior personnel salaries and wages are contained in the *PAPPG* (https://www.nsf.gov/pubs/policydocs/pappg19_1/pappg_2.jsp#IIC2gia).

18. **To which division should I submit my proposal?**

    All proposals will be submitted to the CISE Division of Information and Intelligent Systems (IIS). At submission time, you will find that this is the only available Unit of Consideration for submissions.

C. PROGRAM INFORMATION

19. **Can you provide more information on the review process that will be used to evaluate proposals? How will proposals that touch on multiple themes be reviewed?**

    All information about the review process is provided in section VI.A. of the solicitation.

20. **Can you provide more information on the number of awards anticipated in each theme of the Institutes track? Is it possible that a theme might receive more than one Institute award?**

    NSF expects to make up to six Institute awards in the themes solicited. Actual number of awards, including by track, is subject to the availability of funds and quality of proposals received.

21. **How do the participating agencies' interests align with the Institute topics?**

Theme 3, "AI-Driven Innovation in Agriculture and the Food System," is solicited on behalf of the US Department of Agriculture-National Institute of Food and Agriculture (USDA-NIFA). Institutes in this theme will be selected jointly by NSF and USDA-NIFA and funded entirely by USDA-NIFA. Award notifications and administration for that theme will be carried out by USDA-NIFA. Accordingly, proposals submitted to that theme must designate USDA-NIFA as the intended funding agency. For all other themes, all partner agencies will make joint funding decisions in both the Institutes and Planning Grants tracks. Award notifications and administration for those will be carried out by NSF. It is sufficient to designate NSF as the intended funding agency for all submissions other than the Institute proposals to Theme 3.

22. **If I receive a planning grant in this program this year, does this mean that there will be an opportunity to submit a full Institute proposal in a future round of this program?**

    The award of a planning grant acknowledges the potential and importance of long-range, larger-scale research in the area proposed. However, this is not a guarantee of what will be solicited in future program solicitations. This program solicitation is the first step in what is expected to be a longer-range, multi-agency investment in AI research and education. Future solicitations may continue the use of identified themes corresponding to high-priority areas, invite unrestricted proposals for Institutes, or both. NSF and partners strive to be responsive to the research priorities emerging from the community and will also evaluate future investment priorities based on the quality of proposals, progress in funded projects, and emerging national research priorities.

23. **If I participate in a project awarded by a different NSF program, or have a proposal pending to such a program, am I at a disadvantage in applying to the National AI Research Institutes program?**

    Proposals to other NSF programs do not preclude senior personnel from submitting proposals to this program. Nor does involvement in other NSF-funded centers or projects preclude submission to the program. Note, however, that this program aims to support activities of a different scale and scope from those of other programs. Successful National AI Research Institute proposals will make clear the distinction between the proposed activity and other projects in the Current & Pending Support section for the senior project personnel.

24. **Are AI Institutes awards going to be renewable for an additional five years?**

    While the solicitation does not explicitly provide for the renewal of Institute awards beyond the first five years, it is possible that NSF will offer such opportunity competitively in the future. The current solicitation is the first step in what is expected to be a longer-range, multi-agency investment in AI research and education. Future

Institute funding opportunities will be evaluated according to the evolving needs of the research community and national priorities in artificial intelligence.

25. **What are the plans for this program for future Institute themes? What relationship is expected between planning grants awarded this year and future Institute solicitations?**

    This program solicitation is the first step in what is expected to be a longer-range, multi-agency investment in AI research and education.

    Future solicitations may continue the use of identified themes corresponding to high-priority areas, invite proposals for institutes not limited to such research themes, or both. The identification of an Institute theme for this year does not necessarily preclude the possibility that Institute proposals in that same theme or related ones would be welcome in future solicitations.

    NSF and partners strive to be responsive to the research priorities emerging from the community, and will also evaluate future investment priorities on the basis of the quality of proposals, progress in funded projects, and emerging national research priorities.

    If used, future themes may be solicited in areas corresponding to planning activities funded in this year but will not necessarily be limited to these areas.

D. ADDITIONAL QUESTIONS

26. **The solicitation does not provide any description of requirements for sections of the proposal listed in the NSF PAPPG (e.g., Budget and Budget Justification, Current and Pending Support, Facilities, Equipment and Other Resources). Are these sections required?**

    The solicitation addresses only deviations from the PAPPG, including program-specific considerations for certain sections. Where not otherwise addressed, submissions must conform fully to the Proposal Preparation Instructions outlined in the NSF PAPPG, including all required *Sections of the Proposal* (https://www.nsf.gov/pubs/policydocs/pappg19_1/pappg_2.jsp).

    NOTE: Some confusion on this point arose from a misplaced sentence at the end of section V.A. Proposal Preparation Instructions, which read, "Proposals containing items other than those described above will be returned without review." This sentence has been eliminated from the solicitation.

27. **How do the five desiderata for Institutes apply to proposals to the Planning track?**

    The five desiderata for AI Research Institutes pertain to all proposals submitted to this

program. Planning proposals will be evaluated based on the extent to which the proposed planning activities are likely to lead to the development of a viable Institute excelling in the five desiderata for Institutes. See *Additional Solicitation Specific Review Criteria* in the program solicitation for the complete text of this review criterion.

28. **In a Planning proposal, how much effort should be allocated towards planning activities vs. research activities?**

    This is a matter for the proposal to address. You are reminded that proposals to this track will be evaluated for their responsiveness to the Planning track goal to "to develop communities and capacity for full Institute operations through diverse and sustained activities." Basic research activities are not required of Planning proposals. If proposed, research should clearly contribute to this purpose. Planning proposals will be evaluated based on the extent to which the proposed planning activities are likely to **lead to the development of a viable Institute** excelling in the five desiderata for Institutes. See *Additional Solicitation Specific Review Criteria* in the program solicitation for the complete text of this review criterion.

29. **Do planning grants have to be multi-organizational projects?**

    All proposals (either track) are to be submitted by a single organization. Any (funded) multi-organizational arrangements you include must be structured as subawards in the proposal budget. The extent to which you include such collaborations is up to you.

30. **For the same team and idea, can we submit to both the Institute track and the Planning track?**

    You cannot propose the same work in two different proposals.

31. **Is there a limit on the number of PIs, Co-PIs, or Senior Personnel on either proposal type?**

    The proposing organization can list one PI and up to four co-PIs, who will appear on the cover sheet of the proposal. There is no limit on the number of additional senior personnel who can be listed on the proposal. However, it is advisable that proposing organizations list personnel in any of these roles **only where those personnel are described as playing a substantive role in the proposed project**. Such a substantive role is usually accompanied by a request in the budget for salary support of the individual corresponding to that individual's commitment to the project. Submitting organizations are advised against listing unfunded senior personnel who are not actively contributing to the project.

    The designation of roles on your subawards is a decision to be taken between the submitting organization and those other organizations. However, we recommend you

follow the same principles above when choosing to list people in the submission.

32. **Can individuals from organizations other than the lead (submitting) organization be listed as co-PI?**

    The PAPPG provides guidance. See the section, *Submission of a collaborative proposal from one organization*:

    > "The single proposal method allows investigators from two or more organizations who have developed an integrated research project to submit a single, focused proposal. A single investigator bears primary responsibility for the administration of the grant and discussions with NSF, and, at the discretion of the organizations involved, investigators from any of the participating organizations may be designated as co-PIs. Note, however, that if awarded, a single award would be made to the submitting organization, with any collaborators listed as subawards. (See Chapter II.C.2.g(vi)(e) for additional instructions on preparation of this type of proposal.)"

33. **What is NSF's guidance regarding collaborations with a partner who would not be a subaward, but instead an unfunded collaborator, and in which case such a collaborator might agree to provide their own funding or other sources of support to the institute?**

    The NSF guidelines for unfunded collaborations apply. Please follow the policy/guidance in the PAPPG: https://www.nsf.gov/pubs/policydocs/pappg19_1/pappg_2.jsp#IIC2div.

    Take care also to not structure this as voluntary committed cost sharing, which is prohibited: https://www.nsf.gov/pubs/policydocs/pappg19_1/pappg_2.jsp#IIC2gxii.

34. **Are letters of interest/support from individuals or organizations permitted?**

    This program does NOT allow the submission of letters of support. Letters of collaboration are permitted. Please consult the PAPPG for this distinction and for guidance on submission of letters of collaboration: https://www.nsf.gov/pubs/policydocs/pappg19_1/pappg_2.jsp#IIC2j.

35. **What is the appropriate balance between foundational and use-inspired research?**

    The goal in this program is that each Institute incorporate substantial efforts in both foundational AI research and use-inspired research such that they form a virtuous cycle in which foundational results provide a starting point for use-inspired research and results from use-inspired research are generalized and made foundational. Each proposal will establish this synergy in a manner appropriate to the vision for that

proposed activity. This applies where specific Institute track themes are concerned. Themes 3 through 6 are coming from a strong use-inspired starting point. In those, it is critical that proposed Institutes convey how foundational AI will be advanced in service of the use-inspired vision. Themes 1 and 2 are oriented on foundational research challenges. In these, it is critical that use-inspired research demonstrably advances the discovery and development of general results.

36. **Must a proposal to Theme 1: Trustworthy AI address all aspects of trustworthiness described in the program solicitation? May a proposer expand on these aspects of trustworthiness?**

    This theme is intentionally broad, encompassing a range of issues sometimes taken separately and sometimes in combination with one another to express the critical need that AI systems be trusted to be reliable, explainable, privacy-preserving, and fair. The solicitation presents these as "aspects of trustworthy AI". It is not necessary that an Institute give each of these equal consideration, or even restrict its vision to these aspects or definitions of those aspects.

37. **In Theme 2: Foundations of Machine Learning, several questions are listed as those that an Institute might address. Is a proposal in this theme required to address these or a subset of these?**

    The solicitation does not limit the range of potential investigations here, as long as the Institute in this theme has as its primary focus the goal to deepen the theoretical foundations for the science of machine learning. It is important to emphasize that applications of machine learning should not be the central aim of the Institute responding to this theme.

38. **In Theme 2: Foundations of Machine Learning, what is an appropriate balance between foundational and use-inspired research?**

    As is appropriate throughout the program, use-inspired research is expected to contribute to and enable foundational advances. In this theme, the study of use cases should demonstrably advance the discovery and development of general results that deepen the theoretical foundations of machine learning.

39. **In the section "Additional Solicitation Specific Review Criteria", under the subsection "USDA-NIFA Process", the solicitation states:** *"After scientific, technical and programmatic review and consideration of appropriate factors, the NSF Program Officer recommends to the cognizant Division Director whether the proposal should be declined or recommended for award."* **The rest of the language under the subsection "USDA-NIFA Process" appears to be very NSF specific, with no mention of USDA. Can you clarify the process?**

To clarify, the NSF-specific process that follows does not apply to awards made by USDA-NIFA. Proposals selected for award by USDA-NIFA will be resubmitted to that agency for award processing.

40. **Can the USDA Agricultural Research Service [or other USDA entity?] be a subawardee on an AI Institute grant where the lead institution is a university?**

    If the proposal designates USDA-NIFA as the requested funding agency, ARS is eligible to be a sub-awardee. Please refer to section IV. Eligibility on page 9 of the solicitation for more information.

41. **In the section, Cost Sharing Requirements, for awards made by USDA-NIFA, for what types and levels of equipment requests does this requirement apply?**

    This cost-sharing requirement for equipment applies to all budgeted equipment expenditures in any proposal to USDA-NIFA, subject to the conditions for waiver specified. Proposers may justify a request for such a waiver initially in the Budget Justification section of the proposal.

42. **Theme 5 states that "Moderate equipment purchases to enable the testing of automated routes of synthesis and characterization are anticipated". What might be considered an acceptable budget allocation for such equipment?**

    The solicitation is intentionally vague in encouraging moderate equipment purchases since equipment needs will vary between Institutes. Equipment purchases that support Institute performance of appropriate and robust activities in each of the proposed functions (desiderata) will be considered and should be discussed in the Project Description. If you have specific equipment purchases in mind and would like to discuss the scope of these proposed purchases before proposal submission, please reach out to the points of contact in CHE and CBET.

43. **In Theme 6: AI for Discovery in Physics, the solicitation states that NSF seeks Institutes "that advance AI and accelerate discovery in the physical sciences." How can I confirm whether my proposal is responsive to this theme? For example, would a proposal in astrophysics be responsive? One in condensed matter physics?**

    An Institute proposal under Theme 6, as stated in the solicitation, should demonstrate how the Institute will advance both AI and domains supported by the Division of Physics at NSF. PIs considering submission to this theme are encouraged to consult the description of physics domains supported by the Division of Physics at https://www.nsf.gov/mps/phy/about.jsp. Applied to the first example, a proposal advancing discovery in astrophysics, a domain supported by the Division of Astronomy,

would not be responsive. However, if the proposal was in particle astrophysics, it would be responsive because it is in the scope of research supported by the Division of Physics. In the second example, condensed matter physics would not be responsive, as it is in the domain of the Division of Materials Research. Specific questions of this sort should be emailed to the lead program contact for this theme. The NSF Division of Materials Research supports condensed matter physics.

44. **Theme 6 lists six topics for the AI for Discovery in Physics Institutes. My topic is not listed among the six. Are these six topics meant to be restrictive or indicative of high priority areas for this theme?**

No. This list of examples is neither prescriptive nor limiting. We encourage submissions in all topics and domains supported by the NSF Division of Physics. Specific questions about the responsiveness of a topic should be emailed to the lead program contact for this theme.