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NSF 21-027

Frequently Asked Questions (FAQs) for NSF 21-513: Principles and Practice of Scalable Systems (PPoSS)

PLANNING GRANTS

1. What is the purpose of a Planning Grant?

2. What can I do in a Planning Grant — are workshops and other networking activities appropriate?

3. When writing a Planning proposal, part of the project could be networking/team-building. Does the proposal still need to address progress in four focus areas?

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5. Can a management plan be included as a supplementary document in a Planning proposal?

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FROM PLANNING TO LARGE

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9. Does the entire LARGE proposal team need to be part of the Planning grant?

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11. If a group submits a Planning proposal for the FY 2021 deadline, can they also submit a LARGE proposal for the FY 2022 deadline?

12. What about the timing of Planning vs. LARGE proposals in FY 2021 and FY 2022? The time between the awarding of the Planning Grants and the LARGE Projects deadline is

too short to set up a team and apply for a LARGE project.

13. Can a Planning proposal involve preliminary research (and related budget) to support a subsequent LARGE project?

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20. Can an application count as an area?

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23. Is it acceptable to cover 1 or 2 research areas? How about 5?

24. What is the ideal size of a team for a LARGE project?

25. Is there an expectation that the focus will be equally distributed on each of the chosen areas?

26. Are the focus areas restricted to the ones in the solicitation (Computer Architecture, HPC, Programming Languages and Compilers, Security and Privacy, Systems, Theory and Algorithms)?

27. Is a LARGE project understood to be a research project or a center-based project? The latter might imply a significant amount of activities/outreach.

ELIGIBILITY, ORGANIZATION, AND PERSONNEL

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

29. What if I have a joint appointment as a faculty member at an institute of higher education, as well as at a federal lab — am I eligible?

30. The solicitation states "An investigator cannot be PI, co-PI, or Other Senior Personnel of more than two Planning awards and one LARGE award through the life of this program from FY2020 to FY 2024." If the grant is collaborative, are the investigators at the non-lead organization(s) subject to this restriction?

31. Is there a cap on the number of PIs in the Planning/LARGE proposal?

32. Does a proposal necessarily have to involve multiple organizations?

33. Do we have to have at least as many people as the number of expertise areas? Can one person represent more than one of the areas?

34. Can all the personnel working on the four areas be in the same department?

35. My organization might not have the resources to evaluate scalability. Can I collaborate with industry for data and infrastructure?

36. How can a proposal integrate industry collaboration into the project?

37. Do we need to have an advisory board for a LARGE project?

PLANNING GRANTS

1. **What is the purpose of a Planning Grant?**

   The purpose is to develop and demonstrate readiness for a LARGE project. In a Planning proposal you should demonstrate to the reviewers that you will be able to ramp up to a LARGE project. You don't need to meet all the requirements for a LARGE project in order to submit a Planning proposal, but you need to convince the reviewers that you will have all the requirements at the end of the Planning Grant.

2. **What can I do in a Planning Grant — are workshops and other networking activities appropriate?**

   Yes, the solicitation is deliberately open-ended on planning activities. There are quite a few activities that you can choose to propose, including networking and team-building as well as preliminary research and proofs of concept.

3. **When writing a Planning proposal, part of the project could be networking/team-building. Does the proposal still need to address progress in four focus areas?**

   Yes — you should have a vision for ultimately achieving program goals (including contributions in four distinct areas). However, the requirement for expertise in four areas applies only to LARGE proposals. One aspect of a Planning grant may be to obtain expertise and build the team for your LARGE project.

4. **Should a section on Broader Impacts be included in a Planning proposal?**

   Yes. Every NSF proposal must include a section on Broader Impacts.

5. **Can a management plan be included as a supplementary document in a Planning proposal?**

   No, management plans are only required for LARGE proposals. If you want to include details about the management of research activities then we recommend that it be included within the Project Description section of a Planning proposal.

6. **If we're writing a Planning proposal across multiple organizations, are multiple proposals expected?**

   Collaborative proposals submitted as separate submissions from multiple organizations will be accepted, but are not required. Standard PAPPG rules apply.

FROM PLANNING TO LARGE

7. **Do I need to have a Planning Grant in order to apply for a LARGE Project?**

   It is not mandatory to have received, or applied for, a Planning Grant in order to apply for a LARGE Project.

8. **Is it OK to have some overlap between a Planning proposal and a subsequent LARGE proposal, given that their award times will overlap?**

   The purposes of the two types of proposals are different. Planning proposals are for developing a plan and demonstrating readiness. A LARGE proposal is for executing the plan developed in the Planning proposal/grant. Even though they share a vision/theme, their activities should be different.

9. **Does the entire LARGE proposal team need to be part of the Planning grant?**

   No — part of the planning activity is to build the team; you can add new personnel for the LARGE proposal.

10. **Can I start with fewer than four personnel/areas of expertise in a Planning**

proposal and present a plan to build a team covering four areas toward a LARGE proposal?

Yes. A Planning proposal team can include fewer than four areas of expertise (and personnel) and should include plans to build a team with at least four members. However, Planning proposals covering only a single area may be less competitive than those with a team that covers more areas and thus has fewer gaps to fill.

11. **If a group submits a Planning proposal for the FY 2021 deadline, can they also submit a LARGE proposal for the FY 2022 deadline?**

    Yes. If the requirements for submitting a LARGE proposal are ready, the group does not need to wait for the formal completion of a Planning grant.

12. **What about the timing of Planning vs. LARGE proposals in FY 2021 and FY 2022? The time between the awarding of the Planning Grants and the LARGE Projects deadline is too short to set up a team and apply for a LARGE project.**

    We expect Planning grants to be awarded in early fall — if your LARGE depends significantly on your Planning grant, you might want to wait until FY 2023 to submit a LARGE proposal.

13. **Can a Planning proposal involve preliminary research (and related budget) to support a subsequent LARGE project?**

    Yes, the nature of the "preparation" and the activities for a LARGE project is up to the PIs, and as such may include preliminary research.

CONTENT: RESEARCH AREAS AND APPLICATIONS

14. **What levels of technology are you targeting?**

    Hardware architecture and higher layers are in scope. Circuit-level implementation and layers below are not in scope for PPoSS.

15. **Is there an expectation that a project will involve a system that handles big data (e.g., a datacenter), or would other large-scale distributed systems (e.g., mobile Internet of Things (IoT)) be acceptable?**

    Big data is not a requirement for these projects. Do note that if the project is on a distributed system, the scale should be large. As the solicitation makes clear, such projects must: (1) describe the targeted distributed applications and systems, and the heterogeneous platforms on which they run; (2) define relevant notions of scale, and describe how scalability will be theoretically and experimentally evaluated with respect

to the full hardware/software stack while accounting for cross-cutting concerns such as rigorously-proven correctness and accuracy, security, and privacy; and (3) provide preliminary evidence of end-to-end scalability of one or more of the targeted applications in (1), based on proposed theories and abstractions.

16. **If the content is on existing hardware (GPU/CPU) but the proposed research is at the interface where software meets hardware — would that be in scope? Is new hardware required?**

   Yes, that would be in scope. New hardware design is not required.

17. **How much focus is on applications vs. systems? What specific kinds of applications should be targeted?**

   You can choose any large-scale application(s). NSF doesn't have specific preferences — the key is involving expertise from four or more layers of the hardware/software stack, including applications.

18. **What role do applications play? Would development of applications that demonstrate scalability be in scope?**

   Development of applications would be in scope for this project, but your techniques should be broadly applicable — you should demonstrate impact for other applications as well. The novelty should relate to the data-analysis and scalability aspects rather than the domain area.

19. **Is it required to have applications, or can we describe computing activities in support of applications?**

   Every project must describe the targeted distributed applications and systems, and the heterogeneous platforms on which they run.

20. **Can an application count as an area?**

   As the solicitation says, every project must (1) describe the targeted distributed applications and systems, and the heterogeneous platforms on which they run. Once the applications are selected, a project must describe at least four research areas. (Note that the six research areas listed in Section II.A of the solicitation are illustrative, but not exhaustive.) Furthermore the project must (2) define relevant notions of scale, and describe how scalability will be theoretically and experimentally evaluated with respect to the full hardware/software stack while accounting for cross-cutting concerns such as rigorously-proven correctness and accuracy, security, and privacy; and (3) provide preliminary evidence of end-to-end scalability of one or more of the targeted applications in (1), based on proposed theories and abstractions.

21. **What counts as an application? Can it be in computer science, or should the scope be broader?**

    An area from within or outside of computer science, where research leads to broadly applicable fundamental advances in the science of scalable parallel and distributed computing is appropriate as an application.

22. **How many applications should we focus on?**

    That is up to the PIs.

23. **Is it acceptable to cover 1 or 2 research areas? How about 5?**

    Less than 4 research areas is not acceptable; you need to cover at least 4. You can cover more than 4 research areas if you so choose; there is no maximum.

24. **What is the ideal size of a team for a LARGE project?**

    This is up to the proposing team; adequate coverage of at least four research areas is required.

25. **Is there an expectation that the focus will be equally distributed on each of the chosen areas?**

    There should be substantial scientific contributions in each area; they don't necessarily have to be equally distributed across the four (or more) areas.

26. **Are the focus areas restricted to the ones in the solicitation (Computer Architecture, HPC, Programming Languages and Compilers, Security and Privacy, Systems, Theory and Algorithms)?**

    No. These areas are listed in the solicitation as "illustrative, but non-exhaustive."

27. **Is a LARGE project understood to be a research project or a center-based project? The latter might imply a significant amount of activities/outreach.**

    LARGE projects are research projects. Just like any NSF-funded research, the proposals are expected to have meaningful Broader Impacts, which will be evaluated alongside the Intellectual Merit by the panels.

ELIGIBILITY, ORGANIZATION, AND PERSONNEL

28. **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. Chapter I.E.7 of the NSF Proposal & Award Policies & Procedures Guide (PAPPG) provides guidance on the circumstances under which this is appropriate.

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 further guidance.

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

29. **What if I have a joint appointment as a faculty member at an institute of higher education, as well as at a federal lab — am I eligible?**

    You are eligible to apply as a faculty member but cannot use PPoSS budget to pay any part of your federal lab salary.

30. **The solicitation states "An investigator cannot be PI, co-PI, or Other Senior Personnel of more than two Planning awards and one LARGE award through the life of this program from FY2020 to FY 2024." If the grant is collaborative, are the investigators at the non-lead organization(s) subject to this restriction?**

    Serving in the role of PI for a non-lead organization in a collaborative award (that is, an award with its own distinct proposal/award identifier) counts towards this restriction.

31. **Is there a cap on the number of PIs in the Planning/LARGE proposal?**

    There is the standard limit by NSF, which is one PI and up to four co-PIs that is a function of how many can be listed on the proposal cover page. There is no limit on the number of Other Senior Personnel per proposal. Please note that participating as Other Senior Personnel counts toward the submission and award limits for individuals, similar to participating as a PI or co-PI.

32. **Does a proposal necessarily have to involve multiple organizations?**

    No. The focus is on the expertise, not the organizations. As long as there is expertise from four or more research areas, there are no restrictions from where the expertise comes.

33. **Do we have to have at least as many people as the number of expertise areas? Can one person represent more than one of the areas?**

A PI, co-PI or Other Senior Personnel can represent multiple areas. We are not counting the number of personnel; we are interested in having the research areas satisfactorily covered.

34. **Can all the personnel working on the four areas be in the same department?**

   Yes. But you need to convince the reviewers that these experts represent at least four distinct areas adequately.

35. **My organization might not have the resources to evaluate scalability. Can I collaborate with industry for data and infrastructure?**

   You can collaborate with industry, but efforts in support of the project by industry would typically not be supported by NSF funding (although see next question for possible exceptions).

36. **How can a proposal integrate industry collaboration into the project?**

   This can be done in multiple ways:

   ○ Industry personnel may participate as (unfunded) collaborators for example, via the GOALI initiative. See PAPPG Chapter II.E.4 for additional information about the preparation and submission of a GOALI proposal.

   For GOALI proposals, academic and industry partners should agree in advance as to how intellectual property (IP) rights will be handled. A signed university-industry agreement on IP (including publication and patent rights) must be submitted prior to issuance of an award. NSF will review this agreement to ensure that the graduation of students will not be unduly affected. NSF is responsible neither for the agreement reached nor the IP information exchanged between the academic institution and the industrial partner.

   ○ In rare cases, industry participants may be included via a subaward within the proposal or may serve as co-PIs or senior personnel on a proposal. (See PAPPG Chapter I.E.3)

37. **Do we need to have an advisory board for a LARGE project?**

   An advisory board is not required.