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**NSF 21-062**

## Frequently Asked Questions (FAQs) for FY21 SCALE MoDL Program (NSF 21-561)

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1. Are there preferred application areas? Should the applications be connected to the theoretical studies in the proposal?
2. What areas of research are appropriate for this program? Can other machine learning theory and methods be in scope?
3. We use deep learning (DL) for X & Y applications. Will a project aiming to improve DL for specific applications be suitable for this program?
4. Can a SCALE MoDL proposal address theoretical foundations of learning in the brain?
5. How narrowly is the electrical engineering expertise interpreted? Can other engineering disciplines be substituted?
6. Can you give some examples of required electrical engineering expertise?
7. I work in field A, and my co-PIs work in fields B and C (or I am in the Dept. of D, and my co-PIs are in the Depts. of E and F; or I have a Ph.D. in G, and my co-PIs' degrees are in H and I). Do we meet the requirement for "appropriate expertise in three disciplines - computer science, electrical engineering, and mathematics/statistics?"
8. What is the role of the Directorate for Social, Behavioral and Economic Sciences (SBE) in this program?
9. What's the expected / preferred team size?
10. Is a single PI proposal allowed?
11. Is there any priority to proposals involving minority serving institutions?
12. Is prior collaboration between PIs required?
13. Where should the expertise of the PIs be explained and how will this be evaluated?
14. What are the requirements for letters of collaboration?
15. Can a team that is collaborating on an existing award participate in this solicitation?

16. Can a foreign institution as a partner or subcontractor, or a PI/co-PI from a foreign institution, be supported with funds from a SCALE MoDL award?
  17. Can we submit a cross-institutional proposal?
  18. Can we resubmit a proposal that is under review by another program to this solicitation?
  19. Can Research Experiences for Undergraduate (REU) students be involved?
  20. Will review panels be separated by disciplines?
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**1. Are there preferred application areas? Should the applications be connected to the theoretical studies in the proposal?**

There are no preferred application areas. Proposals should address foundational questions that are motivated by the difficulties found in particular domains, or types of data sets.

**2. What areas of research are appropriate for this program? Can other machine learning theory and methods be in scope?**

The program welcomes a broad array of research topics involving some of the most challenging theoretical questions in the general area of mathematical and scientific foundations of deep structured learning. Theoretical understandings of the connections between deep learning and other machine learning approaches are also in scope.

**3. We use deep learning (DL) for X & Y applications. Will a project aiming to improve DL for specific applications be suitable for this program?**

The program focuses on theoretical foundations of DL, which could be motivated by challenges from applications. Applications of existing DL theory and algorithms, however, do not fall in scope.

**4. Can a SCALE MoDL proposal address theoretical foundations of learning in the brain?**

SCALE MoDL is not a neuroscience solicitation; the program nonetheless welcomes interdisciplinary theoretical work that is informed by neuroscience in addition to computer science, electrical engineering, and mathematics or statistics. The proposed project must contribute to theoretical understanding of deep learning. It may also contribute to theoretical understanding of the brain.

**5. How narrowly is the electrical engineering expertise interpreted? Can other**

## **engineering disciplines be substituted?**

We recognize that electrical engineering has non-negligible overlap with other areas of engineering; adjacent engineering areas are admissible provided they demonstrate a synergistic interplay with computer science and mathematics/statistics.

### **6. Can you give some examples of required electrical engineering expertise?**

Electrical engineering subtopics such as Information Theory, Signal Processing, Control Theory, and Computational Imaging (to name but a few) have contributed in recent years to the mathematical understanding of deep learning. Proposers should not feel bound, however, to these subtopics, and are encouraged to explore other avenues as well.

### **7. I work in field A, and my co-PIs work in fields B and C (or I am in the Dept. of D, and my co-PIs are in the Depts. of E and F; or I have a Ph.D. in G, and my co-PIs' degrees are in H and I). Do we meet the requirement for "appropriate expertise in three disciplines - computer science, electrical engineering, and mathematics/statistics?"**

It is up to the proposers to make the argument that the PIs provide expertise necessary to meet the program's goals. The qualifications of the PIs will be assessed by their research expertise rather than their affiliations. Each proposal is required to have a Project Management Plan, as a separate supplementary document, which must describe the duties and expected contributions of each individual in the collaboration, the expertise in the appropriate disciplines provided by the PIs, and ways for working together to meet the goals of the program. The Project Management Plan will be evaluated by the panelists or reviewers as part of the proposal review process.

### **8. What is the role of the Directorate for Social, Behavioral and Economic Sciences (SBE) in this program?**

The program solicitation does not require the PI team to include researchers in the social, behavioral or economic sciences. Nevertheless, the Program and NSF recognize that many topics that fit the solicitation also may be of interest to SBE researchers. Where appropriate, we welcome the integration of SBE PIs in research teams.

### **9. What's the expected / preferred team size?**

The requirement is that the PI teams must collectively possess appropriate expertise in three disciplines: computer science, electrical engineering, and mathematics/statistics. In most cases, this requirement will be met by assembling teams of two or more individuals, but there is no preferred team size.

**10. Is a single PI proposal allowed?**

Technically this is allowed. We require proposals to have a multi-disciplinary orientation, which might be difficult with a single PI. PI teams must collectively possess appropriate expertise in three disciplines (computer science, electrical engineering, and mathematics/statistics), and each project must clearly demonstrate substantial collaborative contributions from members of their respective communities.

**11. Is there any priority to proposals involving minority serving institutions?**

As stated in the program solicitation, proposals from, or with an integral partnership with, minority serving institutions are particularly welcome.

**12. Is prior collaboration between PIs required?**

Previous collaboration is not a prerequisite. The Project Management Plan, required as a supplementary document, should clearly indicate the roles of the PIs and the expertise that each PI brings.

**13. Where should the expertise of the PIs be explained and how will this be evaluated?**

The expertise in the appropriate disciplines provided by the PIs should be included in the supplementary Project Management Plan, which will be evaluated by the panel. See the SCALE MoDL solicitation for details.

**14. What are the requirements for letters of collaboration?**

Please see [PAPPG Chapter II.C.2.j](#) for guidance.

**15. Can a team that is collaborating on an existing award participate in this solicitation?**

Yes. In practice, the team would have to convince the reviewers that the proposed work is not already in scope of their existing grant(s).

**16. Can a foreign institution as a partner or subcontractor, or a PI/co-PI from a foreign institution, be supported with funds from a SCALE MoDL award?**

NSF does not expect to provide funding support to foreign organizations, however unfunded collaboration with international partners is allowed. See guidance in [PAPPG Chapter I.E.6.](#)

SCALE MoDL is a participating program in the research cooperation between NSF and the US-Israel Binational Science Foundation (BSF). Collaborative proposals involving

Israeli researchers will be accepted to the SCALE MoDL program for review. Please see more detailed guidelines in the NSF-BSF Dear Colleague Letter (DCL) [NSF 20-094](#).

NSF has formed partnerships with several foreign funding agencies and announced these partnerships via DCLs(e.g., [NSF 19-082](#) and [NSF 20-064](#)). PI teams interested in these opportunities are encouraged to send an email inquiry to the MoDL Working Group at [modl@nsf.gov](mailto:modl@nsf.gov).

**17. Can we submit a cross-institutional proposal?**

Yes. A cross-institutional team can submit a collaborative set of proposals from multiple organizations or a single proposal from one organization with subawards. See more details in [PAPPG Chapter II.D.3](#).

**18. Can we resubmit a proposal that is under review by another program to this solicitation?**

Submitting a substantially similar proposal to one already under review may result in the redundant proposal being returned without review.

**19. Can Research Experiences for Undergraduate (REU) students be involved?**

Yes. REU Supplements for the first year of the project may be included as a component of proposals to this program; see more details in the REU solicitation [NSF 19-582](#).

**20. Will review panels be separated by disciplines?**

The review panels will be joint, involving reviewers with relevant and interdisciplinary expertise.