NATIONAL SCIENCE FOUNDATION
4201 WILSON BOULEVARD
ARLINGTON, VIRGINIA 22230

NSF 17-096

Frequently Asked Questions (FAQs) for NSF 17-560, NSF-Simons Research Centers for Mathematics of Complex Biological Systems (MathBioSys)

---

1. **Are letters of intent or preliminary proposals required for the MathBioSys program solicitation?**

   Preliminary proposals are not required. Letters of intent are required and must be submitted by the due date, August 10, 2017. Letters of intent must contain:

   - the names of senior personnel,
   - a list of participating organizations,
   - a synopsis that describes the proposed research of the center in sufficient detail to permit a selection of reviewers with relevant expertise, and
   - a training summary describing plans for significant efforts to train postdocs, graduate, and/or undergraduate students.

Letters of intent are not externally evaluated or used in funding decisions. Full proposals should be submitted by 5 p.m. (submitter's local time) September 29, 2017.

2. **Are there any PI and co-PI submission limits in effect for the MathBioSys solicitation?**

   Yes. An individual may appear as PI, co-PI, or other senior personnel on no more than two proposals submitted in response to this solicitation. Other senior personnel include lead PIs on sub-awards and named postdoctoral research associates. There is no limitation on unpaid consultants.

3. **Are there any limits to the number of PIs or co-PIs and/or sub-awardees who could be on a MathBioSys proposal?**

   Yes. The Cover Sheet limits proposals to 4 co-PIs. However, there is no limit to the number of participating other senior personnel on any one proposal. The roles and responsibilities of other senior personnel, including lead investigators on sub-awards, must be described in the required Supplementary Document, **Other Senior Personnel and Center Leadership** (see FAQ #9). Note that there is a limit of two proposals on which any PI, co-PI or other senior personnel may appear (see FAQ #2).

4. **What areas of science does MathBioSys support?**

   The goal of MathBioSys is to enable innovative collaborative research at the intersection of mathematics and molecular, cellular, and organismal biology, to establish new connections between these two disciplines, and to promote interdisciplinary education and workforce training. Even though a number of areas at the interface of biological and mathematical sciences have been relatively better developed, insufficient attention has been directed to mathematical approaches aimed at understanding the complex causal relationships leading to emergent properties of molecular, cellular, and organismal systems, or to the emergent properties resulting from the complex integration across these levels of organization at different time scales. We strongly encourage PIs who are considering developing proposals to MathBioSys to read carefully the Introduction to the program solicitation and to direct questions about the suitability of their ideas to the MathBioSys Working Group of Program Directors at mathbiosys@nsf.gov.

5. **Are projects that are exclusively focused on developing new mathematical theory and/or approaches, or exclusively focused on biological experimentation with molecular, cellular, and/or organismal systems appropriate for MathBioSys proposals?**

   No. An explicit goal of MathBioSys is to support collaborative research among mathematical scientists, molecular and cellular biologists, and organismal biologists to enable the development of mathematical approaches to understand how and why emergent properties are produced from an enormous number of interacting biological components across spatio-temporal scales. These collaborations will not only advance our understanding about emergent properties, but also lead to new foundational mathematical, statistical, and computational concepts and the development of new theories and tools in mathematical sciences. Proposals should include plans to conduct specific collaborative research activities between mathematical scientists and biologists rather than plans to focus exclusively on mathematical approaches or biological experimentation. In order to advance our understanding in these areas, the cross-disciplinary collaborations must occur during the funding period.

6. **Can I submit a MathBioSys proposal to NSF for a project that was submitted to or is under review at another agency?**

   MathBioSys proposals cannot be duplicates of proposals submitted to any other Federal agency for simultaneous consideration. The only exceptions to this rule are: (1) when the program officers at the relevant Federal agencies have previously agreed to joint review and possible joint funding of the proposal; or (2) proposals for PIs who are beginning investigators (individuals who have not been a PI or co-PI on a Federally funded award with the exception of doctoral dissertation, postdoctoral fellowship or research planning grants). For proposers who qualify under this latter exception, the box for "Beginning Investigator" must be checked on the Cover Sheet. See the NSF Proposal & Award Policies & Procedures Guide (PAPPG) Chapter II.D.2.

7. **In what ways do the Project Summary and Project Description in a MathBioSys proposal differ from these two sections of a proposal based on guidance stated in the PAPPG?**

   The Project Summary and Project Description in a MathBioSys proposal must describe the goals and activities of the proposed center for the entire five-year award period, including research, teaching, and other broader-impact activities. Proposers may consider a ramp-up of the center's activities in the earlier stages of the award, but a full complement of activities must be implemented no later than the beginning of Year 3. In the third year of the award, NSF and the Simons Foundation will conduct a mid-term site visit. In developing the Project Description, proposers should consider the ways in which they will demonstrate progress in achieving goals of the center during the first two years. In the same context, proposers need to consider the metrics they will use to measure performance of the center as they develop their Project Description. The Management Plan (**a required Supplemental Document**) must include a description of the metrics that will be used to evaluate the performance of the center. Therefore the Project Description and the Management Plan must be consistent and coherent.

8. **Are there any solicitation-specific guidelines or requirements for the Broader Impacts description in MathBioSys proposals?**

   No. Chapter II.C.2d of the PAPPG specifies the following:

   > The Project Description must contain, as a separate section within the narrative, a section labeled "Broader Impacts". This section should provide a discussion of the broader impacts of the proposed activities. Broader impacts may be accomplished through the research itself, through the activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to the project. NSF values the advancement of scientific knowledge and activities that contribute to the achievement of societally relevant outcomes. Such outcomes include, but are not limited to: full participation of women, persons with disabilities, and underrepresented minorities in science, technology, engineering, and mathematics (STEM); improved STEM education and educator development at any level; increased public scientific literacy and public engagement with science and technology; improved well-being of individuals in society; development of a diverse, globally competitive STEM workforce; increased partnerships between academia, industry, and others; improved national security; increased economic competitiveness of the US; and enhanced infrastructure for research and education.

NSF acknowledges that there are many ways to devise and conduct the broader-impact activities. Some of the most successful implementations, however, start with the explicit definition of a problem in the research communities, in science education, or at the interface of science and broader society that will be specifically addressed in the course of proposed work. The projects that have well-defined broader-impact goals tend also to include specific metrics for assessing and evaluating the outcomes and longer-term effects of this component of the proposal.

The proposals that have significant weaknesses in Broader Impacts are rarely selected for funding by NSF.

9. **Are there any required Supplementary Documents that must be included in my MathBioSys proposal?**

   Yes. MathBioSys proposals must include the following four Supplementary Documents:

   - **Appendix 1, Simons Foundation Budget**: Awards will be jointly made with the Simons Foundation. Half of the budget must be prepared by following instructions from the Simons Foundation, included with the announcement of this funding opportunity at the Simons Foundation website (https://www.simonsfoundation.org).
   - **Appendix 2, Other Senior Personnel and Center Leadership (maximum 5 pages)**: Describe the roles of Other Senior Personnel, including lead investigators on sub-awards, and key leadership personnel in the activities of the proposed center.
   - **Appendix 3, Management Plan (maximum 5 pages)**: Provide a detailed management plan describing key leadership positions, reporting relationships, means of communication and interaction among the members of the group and with the community, oversight and accountability mechanisms, metrics to evaluate the performance of the Center, external advisory committees (optional), etc.
   - **Appendix 4, Institutional Capabilities (maximum 2 pages)**: Describe how the current capabilities and resources of the lead and participating institutions will facilitate the proposed center activities.

   See the MathBioSys solicitation for more details on the contents of the required supplementary documents.

10. **Are there minimum or maximum budget limits for MathBioSys proposals?**

    There is no minimum; however, requested budgets should not exceed $2,000,000 per year for each of five years in total costs (direct plus indirect costs). Awards will be jointly made with the Simons Foundation. See the MathBioSys solicitation for information concerning preparation of the requested budget.

    Estimated program budget, number of awards, and average award size/duration are subject to the availability of funds.

11. **Are there solicitation-specific review criteria that reviewers will be asked to use in evaluating MathBioSys proposals?**

    Yes. Please see Section VI of the program solicitation (17-560), NSF Proposal Processing and

Review Procedures, **Additional Solicitation Specific Review Criteria**, copied here.

In addition to the National Science Board merit review criteria, reviewers will be asked to use the following program-specific criteria when reviewing MathBioSys proposals.

- The quality of the stated mission and goals of the center, and its likely effectiveness in meeting the mission and goals;
- The potential and commitment of the center leadership and the key personnel to effectively lead and manage the proposed center;
- The proposed structure and management of the center, including the quality and effectiveness of the Management Plan, and its likely effectiveness in fostering new teams that will build cross-disciplinary capacity in areas relevant to MathBioSys;
- The potential for the Institutional Capabilities to contribute to a successful cross-disciplinary center in areas relevant to MathBioSys;
- The quality, likely effectiveness, and accountability of the proposed outreach activities and proposed strategies for dissemination of results;
- The extent to which the proposed center will take advantage of co-located, ongoing biological research that is relevant to the MathBioSys Program to foster the development of productive, cross-disciplinary research collaborations.

12. **How many awards are expected from the MathBioSys program solicitation?**

NSF and the Simons Foundation expect to co-fund three center awards and that each center will have an annual budget of $2,000,000 combined from both sources. NSF estimates that $15,000,000 will be available to support three center awards of five years duration each. The Simons Foundation estimates that $15,000,000 will be available to support these three center awards over the five-year duration of the awards.

Estimated program budget, number of awards, and average award size/duration are subject to the availability of funds.

13. **What if my question is not addressed by these FAQs?**

Please ask us! For timely responses to your questions, send an email message to the Program Directors on the MathBioSys Working Group at mathbiosys@nsf.gov.