

Proposal: 2154250

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Agency

Agency Name: National Science Foundation

Application

 Agency Tracking Number: **2154250**

Project Title: Independence Posets and Dynamical Algebraic Combinatorics

Requested Amount: \$396,594

Received Date: 09/28/2021

PI/PD: Nathan Williams

Authorized Representative: Krenare A Skivjani

Submitting Institution: University of Texas at Dallas

SAM Legal Business Name: UNIVERSITY OF TEXAS AT DALLAS

Program

Program Title: Combinatorics

Program Code: 7970

Funding Opportunity Number: PD 18-7970

Division/Area of Science: Division Of Mathematical Sciences

Program Contact Name: Stefaan De Winter

Program Contact Phone: (703) 292-2599

 Program Contact Email: sgdwint@nsf.gov

Application Status History

Status	Status Date
Declined	03/28/2022

Cognizant Program Officer Comments

Dear Professor Williams,

The evaluation of this proposal in the Combinatorics program has been finalized and I regretfully have recommended the proposal for declination.

Please note that a recommendation for declination of a proposal reflects only that a given proposal, which may be strong in many respects, was considered less compelling than other projects under review. I hope that the reviews and summary prepared by the panel will be useful to you; particularly, you may find some of the comments helpful in preparing future proposals.

Please feel free to contact me should you have any questions.
 Stefaan De Winter

These comments are the review analysis I prepared in support of my recommendation for this proposal, with information deleted that is purely administrative or that might identify reviewers or investigators who are not involved in this proposal.

Review Analysis

Principal Investigator: Williams, Nathan F.
 Proposal Number: 2154250
 Institution: University of Texas at Dallas
 Title: Independence Posets and Dynamical Algebraic Combinatorics

This proposal was considered by one of three virtual panels organized by the Combinatorics program in FY22. The panel considered proposals in the area of algebraic and geometric combinatorics, and related areas. The panel consisted of 12 members whose research specialties covered the aforementioned areas. The panel was conducted and observed by NSF program officers from the Probability, Combinatorics and Foundations programs, as well as from the Algebra and Number Theory program.

Each proposal was assigned to three or more panelists for review before the panel met, and in some cases additional panelists contributed reviews while the panel was under way. The reviews formed the starting point for a panel discussion in which other panelists in addition to the three reviewers participated. Comparisons between proposals took place in these discussions and are reflected in the panel summary. Both intellectual merit and broader impacts were taken into account by the panel in their placement of a proposal. A few proposals received reviews but were Not Discussed by the Panel as they would be considered in in another panel for further review.

The panel sorted the proposals under consideration into a ranked set of equivalence classes that informs the NSF of the panel's assessment of priority for funding within this competition. In some cases additional reviews from other specialists and/or panels were obtained.

DMS program officers asked the panel to sort proposals into three groups (Highly Recommended, Recommended, Not Recommended for Funding) and to rank the Recommended group in detail. Historical funding rates and our estimates of the funds available led us set the sizes of the appropriate groups to be 10%, 30% and 60% of the proposals submitted. Most of the proposals placed by the panel in the Not Recommended category will be recommended for declination. Many of the Recommended category proposals will also be recommended for declination.

This is a proposal in dynamical algebraic combinatorics. The focus of the proposal is to connect independence posets, independence polytopes, and semidistim lattices (developed by the PI) to a range of problems in combinatorics and related fields and push the boundaries of dynamical algebraic combinatorics. The broader impacts involve mentoring, conference organization and textbook development among others.

Three panel reviewers gave this project ratings of G, V, and E and the panel placed the proposal in the Recommended category.

INTELLECTUAL MERIT: All on the panel agreed that the PI is one of the pioneers in the relatively new area of dynamical algebraic combinatorics, and has a strong track-record. Particularly, techniques developed by the PI have proven useful to tackle old conjectures. There was also a consensus that the proposed problems are all interesting and, if solved, would significantly move the field forward. Points of criticism were that the proposal was somewhat vague on strategy and that it was not always clear what success would mean. Overall the intellectual merit was viewed as very good.

BROADER IMPACTS: The broader impacts were viewed as very strong. The PI's work in this realm was considered to be a good mix of standard and less standard activities. Particularly the PI's conference organization and his proposed textbook received accolades.

RECOMMENDATION: Taking into account the positive comments on the intellectual merit and broader impacts, as well as the criticisms on the intellectual merit, the panel concurred that in this year's extremely competitive environment this proposal fell in the top 40%-50% of those reviewed and hence placed the proposal at the bottom of the "Recommended" category. I concur with the placement of this proposal.

While having clear strengths, this proposal was not ranked high enough by the panel to be recommended for funding in the first phase. Due to budgetary and performance pressure the program officers of the Probability, Combinatorics, and Foundations mega-program met virtually to discuss the proposals of the three programs that could not be reached in the first round of funding or were deemed worthy of further consideration. The goal of the meeting was to identify those proposals that would be declined at this stage and those that would be kept for further consideration during a later equalization meeting. Program officers agreed to recommend declination of several projects across the three programs, including this one, since other proposals presented more compelling cases for possible funding.

I concur with this decision and regretfully recommend the proposal be declined.

Stefaan De Winter
 Program Director
 Probability, Combinatorics and Foundations

Review Information

Please note: The Sponsored Projects Office (or equivalent) at the submitting organization is NOT given the capability to read the below review information.

Panel Summary

Panel Summary	Release Date
Panel Summary #1	03/24/2022

Proposal Review [Summary of All Reviews](#)

Review	Release Date
Proposal Review #3	03/24/2022
Proposal Review #2	03/24/2022
Proposal Review #1	03/24/2022

Process Statement

All proposals submitted to NSF are reviewed according to the two merit review criteria - intellectual merit and broader impacts - as described in the [NSF Proposal & Award Policies & Procedures Guide](#). If a proposal is submitted to a specific program solicitation, additional review criteria may also have been used in the merit review of the proposal. Any additional review criteria used in the evaluation of a proposal would be described in the program solicitation to which the proposal was submitted. If the proposal was submitted in response to a funding opportunity that involved both NSF and one or more external funding organizations, then NSF staff may consult with those external organizations before finalizing a recommendation.

Your proposal received an external review, either by *ad hoc* reviewers only, by panel only, or by a mix of *ad hoc* and panel reviews. Some proposals may be considered by more than one panel. Reviewers have knowledge of the science and engineering subfields involved in the proposal as well as potential applications when relevant. The reviewers' fields of specialty are usually complementary within a reviewer group. Sometimes, reviewers with a broader scientific, technical, or management expertise are required for proposals involving substantial size or complexity, partnerships, broad multidisciplinary content, or significant national or international implications.

When a panel is used, individual reviewers, who may be panelists or *ad hoc* reviewers, are usually asked to submit written reviews to inform the panel discussions. If, after a panel has discussed a proposal, the Program Officer believes that additional expert advice would be helpful, they may request post-panel *ad hoc* reviews. During a panel meeting, written summaries of the panel's discussions of proposals are prepared. These summaries are brief synopses of the salient points emerging from the panel's discussion of each proposal, as they relate to the NSF and solicitation-specific review criteria. Copies of all the reviews and panel summaries used in the decision-making process for your proposal are available to you and your co-Principal Investigator(s), if any, on the Research.gov ["Proposal Status" screen](#).

When a panel is used, the panel usually has an opportunity to categorize proposals with respect to their degree of competitiveness or priority for funding. Panels may decide that the written reviews capture all the salient points and that no further discussion by the panel is warranted; in those cases a panel summary may not be provided.

Panelists and Program Officers with certain conflicts of interest are disqualified from either serving as a reviewer or otherwise participating in the review process. Panelists or Program Officers with conflicts of interest that do not require disqualification are asked to leave the meeting room while the proposal that contains the conflict is discussed and do not otherwise participate in any funding recommendations for that proposal. Any written review received from a reviewer who is identified as having a conflict of interest is not used in the review process.

In reading the reviews, please keep in mind that the reviews are addressed to NSF staff, and not necessarily to you, the Principal Investigator. Occasionally, reviews may contain irrelevant, non-substantive, erroneous or ad hominem statements. The review panel and the Program Officers disregard such statements in arriving at a recommendation for the proposal.

External reviews are advisory; NSF makes the decision to Award or Decline, or in the case of preliminary proposals, to Invite/Not Invite or Encourage/Discourage. While many projects warrant funding, budget limitations necessitate that many of these be declined. In the difficult decision-making process, Program Officers consider the relative strength of each project as well as other factors, such as award balance among sub-disciplines, geographic distribution, types of organizations, and the potential contribution of each award to broadening the participation of individuals from groups traditionally underrepresented in science, technology, engineering and mathematics.

After scientific, technical and programmatic review and consideration of appropriate factors, the NSF Program Officer recommends to the cognizant Division Director/Office Head/Office Director or their designee whether the proposal should be declined or recommended for an award (or Invite/Not Invite or Encourage/Discourage in the case of a preliminary proposal). Normally, final programmatic approval is at the division/office level; large or complex awards may receive additional levels of review. Because of the large volume of proposals, this review and consideration process may take six months or longer. Large proposals, particularly complex proposals, or proposals in programs involving external partnerships may require additional review and processing time. Information on funding rates for all NSF divisions can be found at <https://dellweb.bfa.nsf.gov>.

NSF allows resubmission of substantially revised proposals as described in the [NSF Proposal & Award Policies & Procedures Guide](#), but encourages investigators to seek the advice of the Program Officer before resubmissions are prepared. Some program solicitations impose restrictions on the timing of resubmissions. Investigators should be aware that the Foundation will treat the revised proposal as a new proposal that will be subject to the standard review procedures.

Information about reconsideration of declined proposals is found in the [NSF Proposal & Award Policies & Procedures Guide](#). If you have questions regarding the review of your proposal, please contact the Program Officer who managed your proposal. Contact information is available on Research.gov.