

Proposal: 2145027

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Agency

Agency Name: National Science Foundation

Application

 Agency Tracking Number: **2145027**

Project Title: CAREER: Dynamical Algebraic Combinatorics

Requested Amount: \$505,508

Received Date: 07/26/2021

PI/PD: Nathan Williams

Authorized Representative: Kristanya M Stangel

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: NSF 20-525

Division/Area of Science: Division Of Mathematical Sciences

Program Contact Name: Stefaan De Winter

Program Contact Phone: (703) 292-2599

 Program Contact Email: sgdewint@nsf.gov

Application Status History

Status	Status Date
Declined	01/24/2022

Cognizant Program Officer Comments

Dear professor Williams,

The review of your proposal in the Combinatorics program has been finalized, and I regretfully have recommended declination of your proposal.

The comments below 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.

Principal Investigator: Williams, Nathan F.
 Proposal Number: DMS - 2145027
 Institution: University of Texas at Dallas
 Title: CAREER: Dynamical Algebraic Combinatorics

Review Analysis:

REVIEW PROCEDURE:

This proposal was submitted to the Combinatorics program of the Division of Mathematical Sciences in response to the Faculty Early Career Development (CAREER) Program solicitation NSF 20-525. The proposal was reviewed by the FY2022 Algebra, Number Theory and Combinatorics CAREER Panel (P220143) which met October 20-22, 2021 virtually on the Zoom platform to review CAREER proposals submitted to the Algebra and Number Theory program and to the Combinatorics program, as well as few proposals submitted to other programs that have a significant component in these areas. The panel consisted of 14 researchers and educators with expertise covering a multitude of areas pertinent to the respective areas. The panel evaluated a set of 32 proposals. Three panelists were assigned as reviewers to each proposal. Reviewing was done on the basis of the two standard NSF review criteria (Intellectual Merit and Broader Impacts). Consistent with the expectations described in the CAREER program solicitation, the reviewers were also asked to evaluate the proposals' educational component and the extent to which the proposed educational and research activities are integrated or synergistic. A fourth panelist was appointed by the managing Program Officers as the scribe to write a summary of the panel's discussion of the proposal. All proposals were discussed in turn by the reviewers, followed by a discussion involving the panel. Following the discussion, the panel was asked to place each project into one of three categories (1) Highly Recommended for Funding, (2) Recommended for Funding if Possible, and (3) Not Recommended for Funding. The panel was also asked to rank-order the projects in the second category. The panel was instructed to place approximately 10% of proposals in category (1), 30% in category (2), and 60% in category (3).

A CAREER award is viewed by DMS as the highest distinction that NSF can provide to early-career researchers in the mathematical sciences. As a result, the CAREER Program is quite competitive.

This is a project in algebraic combinatorics, more specifically three topics in dynamical algebraic combinatorics are proposed: developing the theory of "independent polytopes", studying the connections to braid group actions on quantum groups, and resolving related problems on cluster algebras. The broader impacts and educational activities include undergraduate research, conferences and workshop organization, online textbooks and software, and running a math circle.

Three panel reviewers in the Algebra, Number Theory and Combinatorics Panel (ANTC panel) gave this project ratings of G, G/F and V/G. Taking into account the discussion on intellectual merit, broader impacts and educational component the ANTC panel placed this proposal in the Not Recommended for Funding category.

INTELLECTUAL MERIT: Panelists agreed that the PI is well-qualified to work in the proposed area, having introduced Dynamical Algebraic Combinatorics jointly with Striker in 2012. While panelists were convinced that some progress would be made there was a consensus that, despite generally being well-written, the proposal was too vague in several instances and lacking details on the actual strategies to tackle the problems. Several panelists also felt the proposed work was less central than that in the leading proposals.

BROADER IMPACTS AND EDUCATIONAL COMPONENT: Panelists evaluated the broader impacts as good, but less strong and compelling than those seen in several other proposals in this competition. The panel noted that the proposal does not have an explicit educational component (a required section for a successful CAREER). While it was agreed upon that some of the endeavors described under broader impacts could count towards an educational component, this part of the proposal was viewed as not sufficiently developed.

Following the panel meetings, the program directors in the Probability, Combinatorics and Foundations Programs met to discuss the panel reviews, deliberations, rankings, and recommendations for all the CAREER proposals managed by the program. These deliberations were based on the documented evidence regarding both the main merit review criteria and the additional review criteria listed in the CAREER solicitation. Given the criticisms on the intellectual merit and the educational component the program officers agreed that this proposal, while generally a good proposal, does not reach the high standards to which all successful CAREER proposals are held. They agreed with the placement of this proposal in the Not Recommended for Funding category and decided to recommend this proposal for declination. I concur with this assessment

Recommendation: Declination

 Stefaan De Winter
 Program Director
 Combinatorics Program

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	01/24/2022

Proposal Review [Summary of All Reviews](#)

Review	Release Date
Proposal Review #3	01/24/2022
Proposal Review #2	01/24/2022
Proposal Review #1	01/24/2022

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 the 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/Discontinue. 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/Discontinue 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://delweb.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. Information is available on Research.gov.