

“Do you understand, cultivate and guard the most impactful and unique aspects of your work as a scholar? Not what an **institution** or **mentor** prioritizes and **tells** you is important through metrics, **rewards**, reprimand and mentoring as **imprinting**, but the unique thing you offer?”

-Dr. Beronda Montgomery

Getting Started on the Path to National Science Foundation Funding

Morgan State University
D-RED Seminars
February 16, 2022

Claudia Rankins, PhD and Falcon Rankins, PhD
PRISSEM Academic Services, LLC

Who We Are

- PRISSEM Academic Services, LLC, a Black-owned company, was founded by Dr. Falcon Rankins in 2005 with the goal of helping HBCU STEM faculty thrive.
- Dr. F. Rankins brings a host of experience working closely with STEM faculty at HBCUs to develop research plans, obtain funding, and successfully carry out funded projects.
- Dr. Claudia Rankins brings 12 years of experience as program officer for the NSF HBCU-UP, CAREER, and HBCU Excellence in Research programs, having managed a portfolio of \$400m in awards, mostly to HBCUs. She also has over 20 years of experience in STEM faculty and administrative positions at an HBCU.

Agenda for Today's Talk

- Introduction to NSF and funding opportunities
- Brief Q&A
- Case studies on interdisciplinary research
- Faculty's role and engagement with NSF
- Additional Q&A
- Discussion on next steps

National Science Foundation

“To promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense; and for other purposes.” –National Science Foundation Act of 1950, Public Law 507-81st Congress

- NSF supports research across all non-medical fields of science and engineering and S&E education
- In FY 2021, NSF...
 - had a budget of \$8.5 billion for STEM research and education & human resource activities
 - Is the funding source for ~27% of federal supported basic research conducted by colleges universities
 - Makes about 11,000 new awards annually, primarily through grants. This is about 25% of the number of proposals received.

What NSF is interested in

- Projects with intellectual merit and broader impacts
- Research across all non-medical fields of science and engineering, including
 - Social and behavioral sciences
 - STEM education
- The 10 Big Ideas and other cross-cutting programs
- Occasionally, topics of interest to the current administration. NSF is part of the executive branch.
- Technology transfer

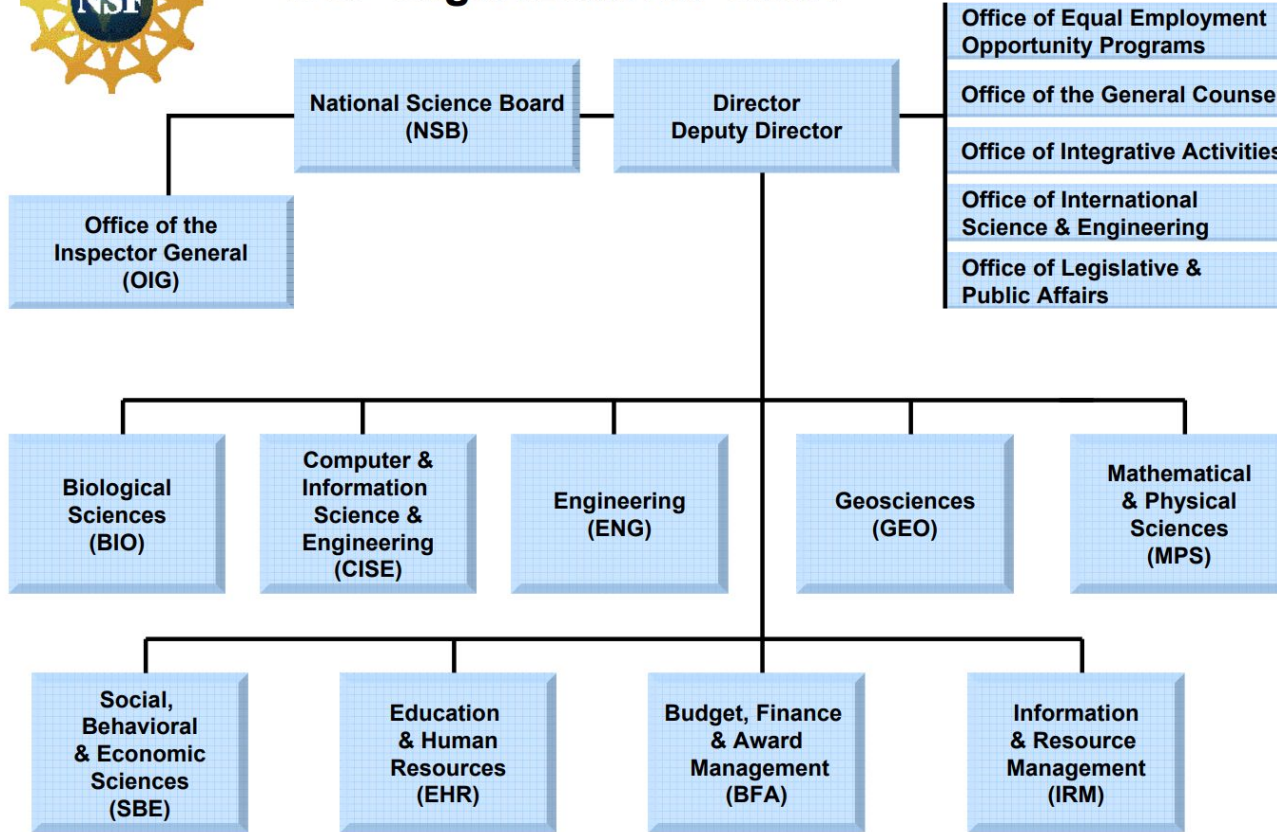
What NSF does NOT fund

- Research with disease related goals, including animal research in that area
- Clinical, counseling, business administration or management, education (except STEM), history (except STEM) areas
- Pharmacologic and other interventions for disease prevention, diagnosis or therapy.

Submitting a proposal that is deemed by the program director to NOT fit into NSF's portfolio is grounds for Return without Review



NSF Organizational Chart



Directorate of Social, Behavioral, and Economic Sciences

- \$280m grant budget for **basic research** on people and society, across:
 - Division of Behavioral and Cognitive Sciences
 - Division of Social and Economic Sciences
 - Division of National Center for Science and Engineering Statistics
 - Multidisciplinary, cross-cutting activities
- Principal source of federal support for fundamental research on...
 - human cognition and behavior
 - social structures and social interaction
 - the intellectual, social, political, cultural, and environmental factors that govern the development and use of science and technology.
- Accounts for 63% of federal funding for basic research in the social sciences (anthropology, archaeology, political science, economics, sociology and the social aspects of psychology)

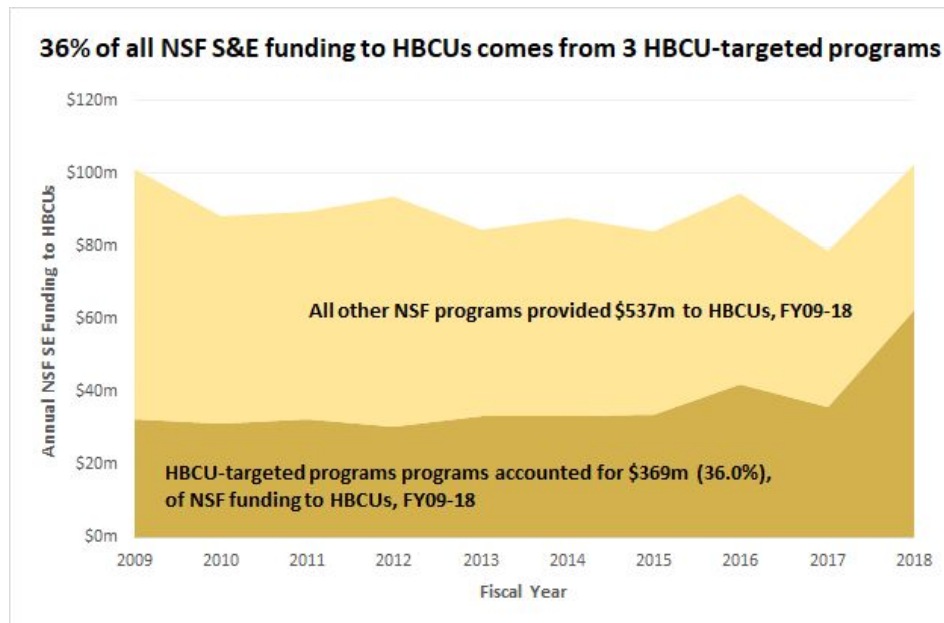
Directorate of Education and Human Resources

- Mission:
 - excellence in U.S. STEM education at all levels and in both formal and informal settings
 - diverse and well-prepared workforce of STEM professionals and educators
 - well-informed citizenry that have access to the ideas and tools of S&E
- \$1.1b budget for programs, seeking to:
 - **Attract, prepare, & retain** the next generation of STEM professionals
 - Develop a robust research community to conduct rigorous **research and evaluation** to support excellence in STEM education
 - Increase the **technological, scientific and quantitative literacy** of all Americans so that they can exercise responsible citizenship
 - **Broaden participation** and close achievement gaps in all STEM fields.

NSF funding landscape of HBCUs

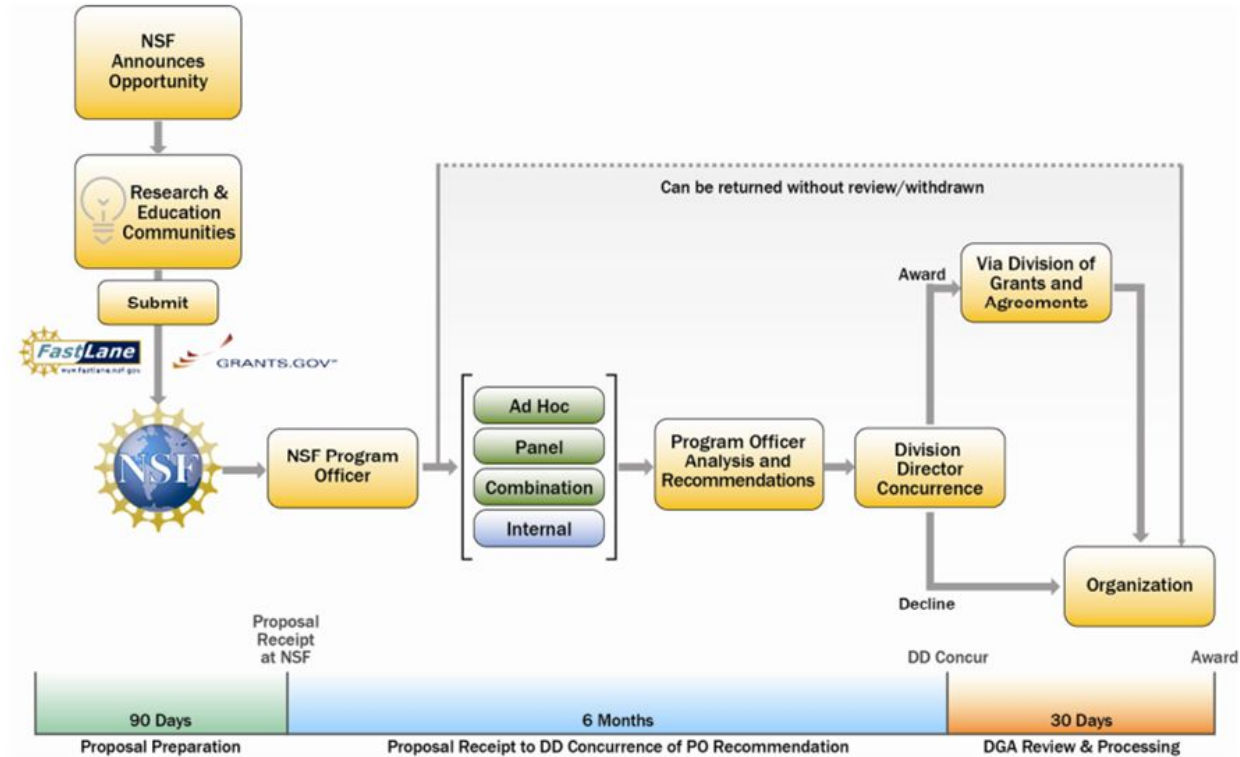
37 currently funded projects at **MSU**, by NSF directorate:

Directorate	# Awards
EHR	12
ENG	7
MPS	6
CISE	5
GEO	5
SBE	1
OIA	1
BIO	0



6 EHR projects funded by HBCU-UP, 1 by CREST

NSF Merit Review Process



NSF merit review criteria

- **Intellectual Merit** – potential to advance knowledge
- **Broader Impacts** – potential to benefit society and contribute to achievement of specific, desired societal outcomes
- Proposers must fully address both criteria
- Other considerations:
 - Creativity and transformative potential valued
 - Plan must be well-organized and well-reasoned
 - Project team must be qualified
 - PI must have adequate resources available

TIP: If following a solicitation, always check for solicitation-specific review criteria.

How programs announce their funding opportunities

Program Solicitation

When preparing a proposal, both the solicitation and the PAPPG NSF 22-1 apply, but the solicitation outweighs the PAPPG if there are deviations from the PAPPG. A solicitation can be for one program or cover all programs in a division, as in physics.

Program Announcement

Not widely used, it is like a shorter version of a program solicitation.

Program Description

Many research programs use program descriptions.

Funding opportunities in general

NSF has about 300 programs to which you can apply, most of them in very specific areas of a STEM discipline.

- Two programs (**HBCU-UP** and **HBCU EiR**) are solely for principal investigators at HBCUs
- NSF has programs that cut across directorates and disciplines
- Some directorates/divisions have dissertation fellowship and postdoctoral programs
- The **Graduate Research Fellowship Program** provides direct support to graduate students at the beginning of their studies
- **REU sites** provide research experiences to undergraduate students in all NSF funded disciplines
- The Education and Human Resource Directorate has programs for **scholarship support** for students
- NSF funds **workshops and conferences**

Reminder: All proposals are evaluated using intellectual merit and broader impact as criteria

HBCU specific funding opportunities

- **Historically Black Colleges and Universities - Undergraduate Program** [NSF 20-559](#) To support STEM research and undergraduate education at HBCUs
- **HBCU Excellence in Research** [NSF 20-542](#) - NSF wide program to increase support for research at HBCUs
- SBE related research, as well as STEM education research can be submitted to both programs

Tip: Morgan St. is currently under-utilizing HBCU-UP opportunities that could benefit SBE and education researchers

STEM student and education specific funding opportunities

- **IUSE Improving Undergraduate STEM Education [NSF 21-579](#)** - provides support for novel, creative, and transformative approaches to generating and using new knowledge about STEM teaching and learning
- **S-STEM NSF Scholarships in STEM [NSF 22-527](#)** - provides scholarship support to enable low-income students with academic ability, talent or potential to pursue successful careers in promising STEM fields
- **REU Research Experiences for Undergraduates [NSF 19-582](#)** - supports active research participation by undergraduate students in any of the areas of research funded by NSF

Specific funding opportunities for researchers across NSF

- **Facilitating research at PUIs** [NSF 14-579](#) - all directorates participate. Research proposals that let faculty at PUIs explain their unique circumstances.
- **Mid Career Advancement** [NSF 21-516](#) - program across 5 directorates for associate professors (or equivalent) to build on current research or acquire new research skills.
- **CAREER** [NSF 20-525](#) - NSF wide program for assistant professors who are untenured (or in an equivalent position). NSF's most prestigious award for early career faculty.

Programs focusing on STEM education research

- **EHR Core Research (ECR)** [NSF 21-588](#) - all EHR divisions participate. The program funds fundamental research (curiosity-driven basic research and use-inspired basic research) that contributes to the knowledge that underlies STEM education in one or more of the three broadly conceived research areas: Research on STEM Learning and Learning Environments, Research on Broadening Participation in STEM fields, and Research on STEM Workforce Development.
- **ECR: Building Capacity in STEM Education Research** [NSF 22-548](#) - all EHR divisions participate. The program supports activities that enable researchers to expand their areas of expertise and acquire the requisite knowledge and skills to conduct rigorous research in STEM education.

The SBE Directorate

The Social, Behavioral, and Economic Sciences Directorate offers many funding opportunities for research

- Most programs have a program description and target dates
- The directorate offers postdoctoral fellowships
- Some programs offer doctoral dissertation fellowships
- Two programs focus on broadening participation:
 - **Build and Broaden** ([NSF 22-530](#))
 - **Science of Broadening Participation** ([PD](#))
- SBE programs have relatively small budgets
- Let's take a look at the [SBE](#) website

Q&A break

Questions

For the next 10 mins:

Questions and concerns about what we've just discussed?

- Put them in the chat
- Raise your hand. When we call on you, unmute yourself and turn your camera on
- There will be additional opportunities for Q&A after this

Case Studies

Award #1818665 to Winston Salem State University

Targeted Infusion Project: **Enriching Student Learning through Biophysics and Music at Winston Salem State University**

- \$400K, awarded by: Division on Human Resource Development/HBCU-UP
- Interdisciplinary collaboration involves professors from physics, music, education, and biology

This project established an enriching interdisciplinary experience for undergraduate students that intersects physics, music, and biology through course redesign, research, and outreach. This was achieved through the following activities and strategies: a course entitled "Music Physics/Acoustics" is designed to integrate active learning through the use of music to enhance learning in physics and biology; undergraduate students to conduct research with the faculty; and undergraduate students to be involved in disseminating the components of the project through presentations, a one-week summer research program, and interactions with the K-12 community.

Presley, Tennille D. "Sounding the Right Note: Integrating Music and STEM Teaching" *Scientia*, 2020
<https://doi.org/10.33548/SCIENTIA532>

Award #2121207 to James Madison University

RUI: Collaborative Research and Education Architecture for Transformative Engagement

- \$305K awarded by Division of Social and Economic Sciences/Science & Tech Studies
- An example of a research study on the implementation of new pedagogies
- Collaborators are Colorado School of Mines, Michigan State Univ., and Univ. of Maryland - College Park

This project implements and evaluates a model for collaboratively developing Science and Technology Studies (STS) pedagogies with a cohort of STEM and humanities faculty and undergraduate students, designed to build new interdisciplinary STS modules for each participating faculty member's course. This research has the potential of refining a model that can be adopted by a variety of institutions to facilitate the dissemination and uptake of STS pedagogies across the curriculum.

This project addresses three research questions: 1) Can this model effectively support the integration of humanities and STEM perspectives in undergraduate training? 2) Can collaborative STS pedagogy development effectively cultivate new interdisciplinary collaborations between humanities and STEM experts? 3) Does this model contribute to the recognition and value of STS in interdisciplinary undergraduate training within four-year degree programs?

Award #2123683 George Mason University

Collaborative Research: SCH: Optimal Desensitization Protocol in Support of a Kidney Paired Donation (KPD) System

- \$4m awarded by Division of Information & Intelligent Systems/Smart and Connected Health
- Collaborators are George Washington University Transplant Institute and VCU Health Transplant Center

This project focuses on improved patient access to kidney transplantation by studying the inclusion of a personalized antibody removal regimen known as “desensitization” into a kidney paired donation (KPD) system. The research objective is to develop an integrated dynamic stochastic simulation-optimization model comprised of: (i) an optimization strategy to identify the optimal personalized protocol for desensitization; (ii) improved robust/stochastic optimization methods to integrate the desensitization therapy into the KPD matching; and (iii) a decision-support tool to help patients decide whether to accept the desensitization regimen with a less compatible kidney, or wait for a more compatible one.

Award #2050161 to University of Arkansas Little Rock

REU Site: The Scope and Consequences of Hate Crime Victimization in the South

- \$325K awarded by SBE Office of Multidisciplinary Activities
- Example of research housed in the School of Criminal Justice and Criminology

This project focuses on the extent and scope of hate crimes, discrimination, and stigmatization. Over three years, each cohort of students work on a different aspect of this project. In Year 1 (2022), the focus is on experiences, perceptions, and concerns with regards to stigmatization and victimization based. In Year 2 (2023), the SCJC-REU team examines the extent and scope of hate crimes in Arkansas through the distribution and analysis of a statewide survey. In Year 3 (2024), the policies, procedures, and decision-making processes of the law enforcement who handle hate crime incidents in Arkansas are explored, in addition to the perceptions of lawmakers and the obstacles in passing hate crime legislation in Arkansas. Through these projects, students learn how to conduct meaningful research that can contribute positively to the NSF's mission to promote public welfare by heightening public awareness of hate crimes along with obstacles to social integration, reporting, and seeking support after experiencing hate crimes.

Faculty's role in engaging NSF

When to contact the PD

- If you are responding to a solicitation like HBCU-UP or S-STEM and the expectations are clearly described, there may not be a need to contact a PD, as long as you adhere to the solicitation guidelines.
- **Always** contact the PD if you plan to submit an Excellence in Research, RAPID, EAGER, or conference/workshop proposal or a supplement.
- **Always** contact one or more PDs if your idea does not clearly fit into a program.
- If you plan to submit a research proposal, it is a **great idea** to contact a PD.

Tips on contacting program directors

- Generally sending an e-mail is better than calling; it is ok to follow-up after a few days if no response is received
- Do not mass email - multiple program directors may work on a program, talking to many creates redundancy
- Be specific in what you are asking for:
 - advice on where to submit an idea
 - feedback on a one-pager to a program
 - procedural advice (be sure to first look for the answer in the PAPPG or solicitation)

Preparing a One-Pager

- Be concise and informative
- Express the intellectual merit and broader impacts in a sentence or two
- Clearly describe major goals and a brief description of methodology
- For conference/workshop proposals, supplement requests, and unsolicited proposals, include an estimate of the total budget requested

General tips

- Use a targeted approach to which proposals to submit to which program
- Carefully follow all guidelines in the latest documents
- Fully address all merit review criteria
- Take time to complete all required forms
- Please have someone proofread your proposal
- Look for consistency in style and appearance of your document

General tips

- Choose your collaborators wisely
- Cite the latest sources and do a thorough literature search
- Look at other projects that have been funded in the program you are submitting to
- Make sure your budget reflects the work proposed

What to do if you don't get funded

- Don't give up (but take a brief step back)
- Give mindful consideration to reviewer/panel feedback
 - Look for **fundamental concerns**
 - Don't chase every minor reviewer critique
 - Remember: reviewers will change between submissions
- Consider a conversation with the program officer
- Revise and resubmit

Be an influencer in the broader science community

Become involved in the decisions of what science gets funded and who gets to do science

- Send your CV to the program director if you are interested in serving on a panel or being considered for ad hoc reviews.
- If it fits into your career goals, consider serving for 1 to 3 years as a rotating program officer. Openings are announced on the NSF website.
- Serve on NSF committees or advisory boards.

“Let’s imagine a science that is made better in ways we aren’t yet capable of imagining, because we don’t understand what is important and valuable to the people who we have been actively excluding from science.”

- Dr. Falcon Rankins

Next Steps

Common challenges HBCU PIs face

- Identifying programs that could be a good fit
- Finding time to write proposals and/or serve as reviewers
- High teaching loads/finding time to conduct research
- Finding collaborators
- Lacking access to vital instruments or study populations
- Lacking access to interested students who can support research activities
- Lacking access to administrative support
- Systemic racism

Drop in chat: What do your challenges look like?

How do we collectively overcome these issues?

- Identifying programs that could be a good fit
- Finding time to write proposals and/or serve as reviewers
- High teaching loads/finding time to conduct research
- Finding collaborators
- Lacking access to vital instruments or study populations
- Lacking access to interested students who can support research activities
- Lacking access to administrative support
- Systemic racism

Let's discuss:

What do your personal solutions look like?

What specific forms of support would help your efforts?

What's your next step?

Question:

What's one thing you can do tomorrow to help you get an NSF grant?

- Drop your answer in the chat
- Can be a big or small thing, but try to make it as specific as possible

Thank you!

Questions, thoughts, feedback?
info@prissem.com