



Faculty Research Grants

**Project Period:
June 1, 2020 – May 30, 2022**

REQUEST FOR PROPOSALS

Proposal Submissions Due: Monday, April 6, 2020 (5:00 p.m., EST)
Anticipated Award Announcement Date: Monday, May 15, 2020

North Carolina Space Grant Faculty Research Grant - Request for Proposals

1. Summary

The North Carolina Space Grant (NC Space Grant) Faculty Research Grant is designed to provide support for faculty. This award is aimed at both emerging and established researchers who wish to pursue new research directions, develop new projects, and/or cultivate new collaborations to align their work with that of National Aeronautics and Space Administration's (NASA) related Mission Directorates.

The goals of the Faculty Research Grant are to incentivize faculty to:

- 1) Develop new research projects or research directions;
- 2) Meaningfully engage undergraduate and/or graduate students in their research endeavors; and
- 3) Cultivate collaboration among new partners (e.g., universities and colleges, NASA centers, federal laboratories or research facilities, the International Space Station (ISS) U.S. National Laboratory, commercial space and other industry partners, formal and informal education partners, state and local government agencies, etc.).

Recognizing that some faculty and students populations and institutions have historically been underserved and underrepresented within research opportunities and in science, technology, engineering, and mathematics (STEM) fields, NC Space Grant encourages submissions that encourage and enhance diversity, equity, and inclusion (DEI).

2. Background

The National Space Grant College and Fellowship Program (Space Grant) was established by Congress under Title II of the NASA Authorization Act of 1988. Today the national Space Grant program includes over 1,000 partners from universities, colleges, industry, museums, science centers, and state and local government agencies. These partners work together to expand opportunities for U.S. Citizens to understand and participate in NASA's aeronautics and space projects by supporting and enhancing science, technology, engineering and mathematics (STEM) education, research and public outreach efforts.

NC Space Grant is a state-federal partnership with NASA. NC Space Grant strives to inspire and engage North Carolinians to explore the universe and our own planet by capitalizing on NASA's unique contributions in exploration and discovery. The program aims to support STEM research, education, and public understanding that support current and future success at NASA and across the State of North Carolina. In order to achieve those aims, we create and support exceptional opportunities for students, faculty, educators, and the public to participate in space-related research, education, and outreach programs.

NC Space Grant has been administered at NC State University since 1991 and has provided leadership in strengthening connections with NASA's research, technology, and science missions. Programs are conducted in areas of fellowships, scholarships, education, research, and public service to promote, develop, and support aeronautics and space-related STEM training and programs.

It is a national and NC Space Grant priority to increase diversity in STEM, from university students, faculty, and staff to industry employees. Traditionally, minority groups and women have been underrepresented in the STEM disciplines as students and faculty, as well as in the workplace after graduation. NC Space Grant champions diversity, equity, and inclusion (DEI) by proactively recruiting and training a diverse student and faculty population,

as well as engaging a diverse range of public audiences across the state. We engage and serve communities that are representative of the populations where our programs operate.

3. Project Overview and Guidelines

3.A. Range and Performance Period

Space Grant may award up to four (4) Faculty Research Grants subject to sufficient funding and quality of the received applications. Funds will be awarded on a yearly basis and are dependent upon the availability of federal funds. Applicants whose final proposal have been accepted may be asked to revise scopes of work, start and end dates, and budgets to align with available funding.

The Faculty Research Grant will be awarded for a two-year period of performance at a level of up to \$40,000 per award (up to \$20,000 per year).

The period of performance is June 1, 2020 – May 31, 2022:

- Year 1: June 1, 2020 – May 31, 2021
- Year 2: June 1, 2021 – May 31, 2022

Non-federal matching funds equal to at least 50 percent of the federal funding request must be provided (i.e., 0.5:1). This cost-match should be demonstrated in the proposed budget. Facilities and Administrative (F&A or overhead) costs are not allowed. Even though indirect costs (IDC) may not be charged, they may be included as unrecovered IDC costs as part of the match requirement.

All NC Space Grant-supported projects are subject to annual progress reports and submission of a written final project report. Progress reports must include: accomplishments made to-date on the project (including all publications, proposals, presentations, patents, etc.), where the project is in relation to the originally proposed project timeline and period of performance, and a proposed plan for completing the work. This status report must also include student participation information as requested by NC Space Grant.

3.B. Eligibility

- This solicitation is open to faculty members of all 4-year accredited N.C. colleges and universities in the State of North Carolina, public or private.
- Only tenure-track or research faculty at the level of Assistant Professor or higher are eligible to apply.
- Awardees must be qualified to serve as a principal investigator (PI) at their respective institution.
- U.S. citizens are eligible to apply. Permanent residents, foreign nationals, and resident aliens are also eligible to apply for funding but with budget restrictions (see Section 4.H. Budget and Budget Narrative).
- Any student(s) supported with award funds must be a U.S. citizen(s).
- Submission is limited to one proposal per PI. There can only be one PI per project proposal. Although this grant encourages cross-institutional collaboration, only one PI may be funded (e.g., to travel to another lab or facility to participate in research).
- NC Space Grant encourages proposals from females and underrepresented minority groups.

4. Application Process

Full proposals will be submitted using an online proposal-management system portal:

https://spacegrant.net/proposals/submit/?sponsor_id=1

The deadline for full proposals is 5 p.m., Monday, April 6, 2020. The portal will automatically close after this time. Please do not wait to the last minute to start your application process and/or submit your materials. We will not be able to extend the deadline for anyone for any reason.

All elements of the proposal must be combined into a single PDF document. A complete application package includes:

- A signed Title Page
- Project Description (10 page maximum)
- Project Timeline (1 page maximum)
- Current and Pending Support (1 page maximum)
- References Cited (pages as needed)
- Curriculum Vitae for the PI (2-page limit per CV)
- Letter(s) of Support
- Budget and Budget Narrative (4 page limit)
- Recommended Reviewers
- Data Management Plan (2-page limit)

Proposal Format

The following guidelines and restrictions apply to all proposals. Proposals not meeting these requirements will not be considered.

- Proposals must be submitted in PDF format.
- Proposals must adhere to the following format: 1-inch margins all around, Times New Roman 12-point font, page numbers starting with the cover page as Page 1, and strict page limits as listed above.
- Proposals should contain only the requested sections.

Proposal Content

4.A. Title Page (1 page)

The cover page must include the following items: project title; period of performance (June 1, 2020 – May 31, 2022); total budget request; PI's name, institution, address, phone, and email; signatures from the PI and the Authorizing Official of the proposing institution (sponsored research officer); and the funding opportunity name (NC Space Grant Faculty Research Grant).

4.B. Project Description (10 pages maximum)

PIs are expected to use funds to further establish their professional career through new research projects or research direction related to a NASA Mission Directorate.

The goals of the Faculty Research Grant are to incentivize faculty to:

- 1) Develop new research projects or research directions;
- 2) Meaningfully engage undergraduate and/or graduate students in their research endeavors; and
- 3) Cultivate collaboration among new partners (e.g., universities and colleges, NASA centers, federal laboratories or research facilities, the International Space Station (ISS) U.S. National Lab, commercial space and other industry partners, formal and informal education partners, state and local government agencies, etc.).

This section should include the following:

- Detailed description of the proposed research goals and a research plan;

- An explanation of how the project, research, and/or collaboration is new to the PI and why this is important;
- Relevance of proposed research to NASA Mission Directorates (Appendix A) and [NC Space Grant's strategic plan](#) (Appendix B);
- A description of how students will be meaningfully engaged, the number of students supported through research efforts, as well as any pertinent student demographics (if known);
- Description of how Faculty Research Grant funding will impact the PI's new research project or direction; and
- How funds will be leveraged to obtain additional research funding (and from whom).

NASA is committed to student participation in research. It is strongly encouraged that undergraduate and/or graduate students be significantly involved. A significant award is a monetary award, or experience which includes one or more of the following: (a) has a value of greater than or equal to \$3,000; (b) participation of greater than or equal to 160 hours; and/or (c) through a cost-benefit analysis proves to have significant impact on the student's academic achievement and employment. All students supported must be U.S. citizens.

Some examples of factors to consider in highly competitive proposals: technical and scientific merit, research under a NASA Mission Directorate, justification for new research direction, engagement with students in the research, encouraging and enhancing DEI, collaborative partnerships, and a budget that appropriately uses funds to complete the work. This is not an all-inclusive list.

4.C. Project Timeline (1 page maximum)

Include a timeline that illustrates and/or describes deadlines, critical milestones, and other important dates within the period of performance.

4.D. Current and Pending Support (1 page maximum)

Identify current and pending support of the PI including: source of support, project title, amount of award, period covered by award, months or percent of time committed by the PI during the award period, and location of research. Describe past projects supported by NC Space Grant (if applicable).

4.E. References Cited (no max limit)

Use a standard bibliographic format to list the references cited in your proposal.

4.F. Curriculum Vitae (2 pages per CV)

The PI must include a Curriculum Vitae (CV) that includes their professional experience and positions and a bibliography of recent publications, especially those relevant to the proposed investigation. CVs from others who will play critical technical roles in the proposed investigation should also be included, and may not exceed two pages per CV.

4.G Letters of Support (Pages as needed)

Include a letter of support from any critical partner (e.g., universities and colleges, NASA centers, federal laboratories or research facilities, the ISS U.S. National Lab, commercial space and other industry partners, formal and informal education partners, state and local government agencies, etc.). Letters should outline the importance of the proposed research and the nature of the relationship under this grant (an e-mail is acceptable).

4.H. Budget and Budget Narrative (4 page maximum)

Provide detailed budget information using the format outlined in Appendix C, as well as a Budget Narrative, or justification. Complete the budget template for separate budget years (Year 1, Year 2) and cumulative, i.e., one page for Year 1, one page for Year 2, one page for a Cumulative budget, and one page for the budget narrative. An amended budget and budget narrative may be submitted prior to the receipt of funds in Year 2 of the grant with the submission of the annual report. However, cost-share must be met as required.

Specific budget details are noted below:

- Direct salary expenses for PI and students should be separated by titles or disciplines with hours, rates, and total amounts for each position.
- Proposed travel should include the number of trips, destination, duration, etc. at state per diem rates.
- Permanent residents, foreign nationals, and resident aliens may not charge salary or travel expenses to the grant; unrecovered salary and travel can be used to meet the cost-match requirement.
- All students (graduate and/or undergraduate) supported must be permanent U.S. citizens.
- Funds cannot be used to purchase equipment.
- Overhead costs are not allowed. Unrecovered facilities and administrative costs, however, may be used for required cost-matching. The detailed budget must include a description of the required 50% non-federal matching funds.
- Utilization of funds solely for the purpose of supplementing summer salaries is discouraged.

4.I. Recommended Reviewers

Name and contact information for three suggested reviewers of this proposal. Do not list individuals with known conflicts of interests.

4.J. Data Management Plan (2 pages maximum)

Consistent with the NASA Plan for Increasing Access to Results of Federally Funded Research, new terms and conditions about making manuscripts and data publically accessible may be attached to NASA awards. Some proposals may be required to provide a Data Management Plan (DMP) or an explanation of why one is not necessary given the nature of the work proposed. Any research project that does not require a DMP to be submitted shall be explicitly indicated. The type of proposal that requires a DMP is described in the NASA Plan for Increasing Access to Results of Scientific Research (see link below):

[https://www.nasa.gov/sites/default/files/atoms/files/206985_2015_nasa_plan-for-web.pdf](https://www.nasa.gov/sites/default/files/atoms/files/2069852015nasa_plan-for-web.pdf)

5. Proposal Submission

Proposals should be submitted via online application by 5 p.m. on Monday, April 6, 2020.

Proposals must be submitted via the NC Space Grant online proposal system at:

https://spacegrant.net/proposals/submit/?sponsor_id=1

One complete, single electronic file in PDF format is required; authorized college/university signature is required on the cover page.

6. Review Criteria

Proposals will be reviewed by peers who are experienced in relevant NASA STEM fields, but not necessarily experts in each proposed field of research. Proposals will be evaluated for technical/scientific merit; alignment to NC Space Grant and NASA goals; encouragement and enhancement of DEI of faculty and students; student engagement; and budget, which will be scored per the parameters below:

- Scientific and technical merit of the research goals and plan (30%)
- Probability of the project to develop new capabilities and/or the potential to increase involvement in funded NASA-related research for the PI (20%).
- Involvement of students (graduate and/or undergraduate) in research. Encouraging and enhancing student DEI is encouraged. (20%)
- Alignment of research to NASA Mission Directorates and NC Space Grant's Strategic Plan (15%)
- Budget alignment to research plan and satisfying cost-match requirement (10%)

- Letters of support (5%)

Recognizing that some faculty and students populations and institutions have historically been underserved and underrepresented within research opportunities and in science, technology, engineering, and mathematics (STEM) fields, NC Space Grant encourages submissions that encourage and enhance diversity, equity, and inclusion (DEI).

Proposals recommended to NC Space Grant for funding will reflect reviewer recommendations, available funding, encouraging and enhancing faculty and student DEI, and current program priorities. Applicants should be aware that not all highly rated projects will be funded. NC Space Grant does not have enough funding to cover all the outstanding applications we receive.

7. Reporting Requirements

Reporting and Data Requests

Awardees will be required to maintain and provide data necessary for NC Space Grant to report to the NASA Office of Education Performance Measurement System (OEPMS) or other federally required data reporting system. This data typically includes, but is not limited to, description of work performed; evaluation of the impact of work performed; number of students, teachers, staff, faculty, and general public involved; gender/ethnic breakdown, birth date and contact information (email) of all significantly supported student participants; list of papers published, presentations given, conferences hosted/attended. This information may be requested at any time throughout the award period.

Any peer-reviewed scientific research publications authored or co-authored by investigators funded, in whole or in part by NASA, are required to ensure that those publications are submitted to PubMed Central system at www.ncbi.nlm.nih.gov.

Reports

A report is due within 30 days of the end of each award year. The report must contain the following:

1. An executive summary of the project that highlights results, conclusions, and impacts. The summary should be written for consumption by general audiences and easy conversion into an NC Space Grant communications product, such as a blog post and/or social media posts. The executive summary should be between 500 and 1,500 words.
2. Statement on how funding assisted the PI.
3. A list of all students involved in the award with required demographic data.
4. List of papers submitted for publication that are relevant to the research performed during the period of this award. Include title, publication, date of publication, author list, and an electronic copy of the paper.
5. List of all presentations delivered during the period of this award. Include presentation title, event, location, and date.
6. List of all proposals submitted during the period of this award that are relevant to the research performed. Include proposal title, announcement of funding opportunity title, name of sponsor, amount of proposal, proposal due date, role of investigator, and funding status.
7. List of all patents that were applied for and/ or approved during the period of this award.
8. List of pending and actual support for PI. Include source, PI, percentage of time, and role of investigator.
9. High-resolution photos of the researcher, research team, research in progress, etc., suitable for sharing in blog posts and on social media

8. Other Requirements

Acknowledgment of Support and Communications

An acknowledgment of NC Space Grant support (logo and/or written) must appear in all publications, posters presentations, etc. of any material based on this funding in the following terms: "Supported by NC Space Grant."

Awardees are required to interact with the NC Space Grant communications specialist (Lee Cannon, lacannon@ncsu.edu) to translate the findings of their research into a communications product(s) (e.g. news article, guest blog post, social media posts, etc.).

Audit and Records

Financial records, supporting documents, statistical records, and other material pertinent to this grant shall be retained by the grantee for a period of at least three years following submission of the final project report and shall be made available to NC Space Grant upon request.

Payments

Contingent upon NC Space Grant's receipt of funds, a sub-agreement will be established between the grantee's institution and NC State University. The grantee institution shall receive payments under this grant through that institution's Office of Sponsored Programs. Invoices must be submitted no later than 30 days after the last day of the month in which the expense was incurred. Late invoices may not be honored.

Notification of Absence

NC Space Grant shall be notified prior to the faculty PI's absence from campus for a period of four months or more.

Transfer of Awards

If the faculty PI leaves the grantee institution or otherwise relinquishes active direction of the project, the institution must notify NC Space Grant as soon as possible. Awards may not be transferred if the PI leaves the grantee institution.

Suspension or Termination

This grant may be suspended or terminated if the grantee fails to comply with all the terms and conditions of the grant.

Nondiscrimination

No person shall be excluded from participation in, be denied benefits of, or be otherwise subjected to discrimination under this grant on grounds of race, color, national origin, religious affiliation, physical disability, gender, or sexual orientation.

Compliance with Regulations

The investigator must abide by all state and federal regulations related to research.

9. POINT OF CONTACT

Sandy Canfield
Assistant Director
srcanfie@ncsu.edu
919-515-5943

APPENDIX A: Strategic Framework for NASA

NASA Mission Directorates

NASA's Mission to *pioneer the future in space exploration, scientific discovery, and aeronautics research*, draws support from four Mission Directorates, each with a specific responsibility.

- The Aeronautics Research Mission Directorate (ARMD) conducts vital research to make air travel more efficient, safe, and green, and to uncover leading-edge solutions for the Next Generation Air Transportation System (NextGen) in the United States. ARMD's fundamental research in traditional aeronautical disciplines and emerging disciplines helps address substantial noise, emissions, efficiency, performance and safety challenges that must be met in order to design vehicles that can operate in the NextGen. (<http://www.aeronautics.nasa.gov>)
- The Science Mission Directorate (SMD) leads the Agency in four areas of research: Earth Science, Heliophysics, Planetary Science, and Astrophysics. SMD works closely with the broader scientific community, considers national initiatives, and uses the results of National Research Council studies to define a set of "Big Questions" in each of these four research areas. These questions, in turn, fuel mission priorities and the SMD research agenda. The SMD also sponsors research that both enables, and is enabled by, NASA's exploration activities. SMD has a portfolio of Education and Public Outreach projects that are connected to its research efforts. (<http://nasascience.nasa.gov>)
- The Human Exploration and Operations (HEO) Mission Directorate provides the Agency with leadership and management of NASA space operations related to human exploration in and beyond low-Earth orbit. HEO also oversees low-level requirements development, policy, and programmatic oversight. Exploration activities beyond low-Earth orbit include the management of Commercial Space Transportation, Exploration Systems Development, Human Space Flight Capabilities, Advanced Exploration Systems, and Space Life Sciences Research & Applications. (<http://www.nasa.gov/directorates/heo/home/index.html>)
- The Office of the Chief Technologist (OCT) serves as the NASA Administrator's principal advisor and advocate on matters concerning agency-wide technology policy and programs. The Office of the Chief Technologist (OCT) is responsible for direct management of NASA's Space Technology programs and for coordination and tracking of all technology investments across the agency. The office also serves as the NASA technology point of entry and contact with other government agencies, academia, and the commercial aerospace community. The office is responsible for developing and executing innovative technology partnerships, technology transfer and commercial activities and the development of collaboration models for NASA. (http://www.nasa.gov/offices/oct/about_us/index.html)

Please visit each NASA organization website to find detailed information about current projects and current areas of interest.

**APPENDIX B:
NC SPACE GRANT STRATEGIC PLAN, 2015-2018**

The complete NC Space Grant 2020-2024 Strategic Plan is available online under [Mission and Strategic Plan](#).

Our Mission

North Carolina Space Grant utilizes NASA-related STEM opportunities to engage and inspire North Carolinians and to build a diverse future STEM workforce. In order to achieve those aims, we create and support unique opportunities for students, faculty, educators and the public to participate in space-related research, education and outreach programs.

Our Vision

NC Space Grant strives to inspire and engage North Carolinians to explore the universe and our own planet by capitalizing on NASA's unique contributions in exploration and discovery. Our program aims to support science, technology, engineering and mathematics (STEM) research, education and public understanding that support current and future success at NASA and across North Carolina.

Strategic Goals

In support of meeting our mission and to continue to expand program engagement, opportunities, and impacts across North Carolina, NC Space Grant will concentrate efforts in the following strategic goals:

1. Support new knowledge generation to meet NASA-relevant interdisciplinary research and educational needs.
2. Prepare the next generation of STEM workers with the technical and professional skills to address current and future workforce needs.
3. Provide access to information and training in NASA-relevant subject matter to formal and informal educators, as well as to the general public, to inspire and educate.
4. Increase North Carolinians' awareness of, and opportunities for engagement with, NASA-related research, education, and outreach products and opportunities.

**APPENDIX C: Faculty Research Grant – Proposed Budget
(June 1, 2020 – May 31, 2022)**

Institution: _____

PI: _____

AWARD AMOUNT YEAR 1: \$ _____ ; **COST-SHARE COMMITMENT YEAR 1:** \$ _____
(Year 1 total up to \$20,000. Cost-share requirement is at least 50 percent of the federal funding request.)

YEAR 1: June 1, 2020 – May 31, 2021

Budget Category	Requested Funding Year 1	Cost-Share Year 1	TOTAL
Salaries	\$ _____	\$ _____	\$ _____
Travel	\$ _____	\$ _____	\$ _____
Supplies	\$ _____	\$ _____	\$ _____
Services	\$ _____	\$ _____	\$ _____
Equipment**	\$ ___XXX___	\$ _____	\$ _____
Student Salaries/Stipend	\$ _____	\$ _____	\$ _____
Other (Explain)	\$ _____	\$ _____	\$ _____
Indirect Costs*	\$ _____ XXX	\$ _____	\$ _____
TOTALS:	\$ _____	\$ _____	\$ _____

*Indirect costs are not allowed. Unrecovered facilities and administrative costs may be used for required cost-matching.

** NASA funds cannot be used to purchase equipment.

Budget Narrative: (please attach on a separate sheet)

**APPENDIX C: Faculty Research Grant – Proposed Budget
(June 1, 2020 – May 31, 2022)**

Institution: _____

PI: _____

AWARD AMOUNT YEAR 2: \$ _____; **COST-SHARE COMMITMENT YEAR 2:** \$ _____
(Year 2 total up to \$20,000. Cost-share requirement is at least 50 percent of the federal funding request.)

YEAR 2: June 1, 2021 – May 31, 2022

Budget Category	Requested Funding Year 2	Cost-Share Year 2	TOTAL
Salaries	\$ _____	\$ _____	\$ _____
Travel	\$ _____	\$ _____	\$ _____
Supplies	\$ _____	\$ _____	\$ _____
Services	\$ _____	\$ _____	\$ _____
Equipment**	\$ ___XXX___	\$ _____	\$ _____
Student Salaries/Stipend	\$ _____	\$ _____	\$ _____
Other (Explain)	\$ _____	\$ _____	\$ _____
Indirect Costs*	\$ _____ XXX	\$ _____	\$ _____
TOTALS:	\$ _____	\$ _____	\$ _____

*Indirect costs are not allowed. Unrecovered facilities and administrative costs may be used for required cost-matching.

** NASA funds cannot be used to purchase equipment.

Budget Narrative: (please attach on a separate sheet)

**APPENDIX C: Faculty Research Grant – Proposed Budget
(June 1, 2020 – May 31, 2022)**

Institution: _____

PI: _____

CUMULATIVE AWARD AMOUNT: \$ _____

(Cumulative total up to \$40,000.)

CUMULATIVE COST-SHARE COMMITMENT: \$ _____

(Cost-share requirement is at least 50 percent of the federal funding request.)

CUMULATIVE BUDGET: June 1, 2020 – May 31, 2022

Budget Category	Total Requested Funding	Total Cost-Share	TOTAL
Salaries	\$ _____	\$ _____	\$ _____
Travel	\$ _____	\$ _____	\$ _____
Supplies	\$ _____	\$ _____	\$ _____
Services	\$ _____	\$ _____	\$ _____
Equipment**	\$ ___XXX___	\$ _____	\$ _____
Student Salaries/Stipend	\$ _____	\$ _____	\$ _____
Other (Explain)	\$ _____	\$ _____	\$ _____
Indirect Costs*	\$ _____ ___XXX___	\$ _____	\$ _____
TOTALS:	\$ _____	\$ _____	\$ _____

**Indirect costs are not allowed. Unrecovered facilities and administrative costs may be used for required cost-matching.*

*** NASA funds cannot be used to purchase equipment.*

Budget Narrative: (please attach on a separate sheet)