



Florida Space Research Program



2020 Program Announcement & Request for Proposals Supporting Statewide University Involvement in Aerospace Research, Technology Development and Education to Expand and Diversify Florida's Economy

Sponsored by

Florida Space Grant Consortium www.floridaspacegrant.org

Space Florida www.spaceflorida.gov

Timeline:

March 16, 2020	Request for Proposals Issued
April 24, 2020	Notice of Intent and Abstract sent to fsgc@ucf.edu
May 22, 2020	Proposals Due
July 24, 2020	Grants Announced
On or after August 3, 2020	Awards made (subject to receipt of funding from NASA for 2020 program cycle)

The purpose of this grant program is to support the expansion and diversification of Florida's aerospace industry by addressing workforce development, including student research experience, and increasing statewide academic involvement in space research, technology development, engineering, education and training programs that are consistent with the state's space industry priorities.

Funding is intended to support research that will: a) align with the priorities of NASA's 4 Mission Directorates; b) compete for larger sponsored research awards; c) attract and leverage other federal or industry funding; d) produce technologies that lead to commercial opportunities; e) promote Florida leadership in emerging aerospace technologies; f) address workforce development issues and/or g) in other ways enhance the technological competitiveness of Florida universities and space industry.

Contact for More Information...

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Program Focus:

The program's focus is on space exploration and the technology required to carry out the exploration of Space **that are aligned with the priorities of NASA's 4 Mission Directorates** (Science Mission Directorate, Human Exploration and Operations, Space Technology, and Aeronautics). By Space exploration, we mean, the scientific understanding of our planet, other planets and solar system bodies, the interplanetary environment, the Sun and its effects on the solar system, and the universe beyond. Space technology is the technology developed by space science or the aerospace industry for use in spaceflight, satellites, or space exploration. Space technology includes spacecraft, satellites, space stations, and support infrastructure, equipment, and procedures. **Please see Appendix A for links to NASA Mission Directorates.**

NASA has released formerly-patented agency technologies into the public domain, making its government-developed technologies freely available for unrestricted commercial use. In addition to the release of these technologies, a searchable database now is available that catalogs thousands of expired NASA patents already in the public domain. NASA's patent portfolio is managed by the agency's Technology Transfer Program. To search the online database of NASA-developed technologies in the public domain, visit: <http://technology.nasa.gov/publicdomain>

These technologies were developed to advance NASA missions but may have non-aerospace applications and can be used by commercial space ventures and other companies free of charge, eliminating the time, expense and paperwork often associated with licensing intellectual property. The more than 1000 technologies include advanced manufacturing processes, power generation, general electronics, sensors, propulsion methods, rocket nozzles, thrusters, aircraft wing designs and improved rocket safety and performance concepts.

Fiscal Year 2021 Budget for NASA invests more than \$25 billion in NASA to reinforce our innovative human space exploration program while maintaining strong support for NASA's full suite of science, aeronautics, and technology work. With the resources provided in the Fiscal Year 2021 Budget, NASA will: partner with commercial industry to build a Human Landing System, keeping NASA on track to land the first woman and the next American man on the lunar surface in 2024; launch American astronauts from American soil on American rockets to the International Space Station; and embark on missions that will yield great scientific discoveries further advancing humanity's knowledge of the universe.

FY 2021 Agency Fact Sheet

https://www.nasa.gov/sites/default/files/atoms/files/fy2021_agency_fact_sheet.pdf

FY 2021 Mission Fact Sheets

https://www.nasa.gov/sites/default/files/atoms/files/fy2021_mission_directorate_fact_sheets.pdf

Eligibility:

Grants are intended for faculty researchers from FSGC affiliated universities and colleges. Please see Appendix B for a listing of FSGC affiliates. Proposals from non-affiliated Florida universities, colleges, community colleges, and industry will be viewed more favorably if the project involves collaborations with FSGC affiliates. Other non-academic organizations are also eligible to receive grant awards, especially if their proposed projects include involvement with FSGC affiliates.

Since FSGC is funded by NASA under a Training Grant and as required under the Terms and Conditions for a Training Grant the following conditions apply:-

- a. Research proposals from PIs who are US citizens may include direct support funds eg. Salary, travel etc. However, proposal from PIs who are non-US citizens may be selected for funding

(based on their reviews) provided that NO salary, stipend, travel or any other form of direct support to the non-US citizen PI is funded from this award.

- b. Non-US citizens may receive support from their universities and these funds may be used as part of the 1:1 matching cost share required for the grant.
- c. Students supported and funded by PIs under this program have to be US citizens only – no exceptions are allowed. Permanent residents are not considered as US citizens for the purposes of this program.
- d. PI's are allowed to submit only one proposal per category.

Exceptions and Previous Funding:

A submitted proposal that falls into any of the following categories must provide the documentation requested to be considered for funding:

- Any Principal Investigator who is required to submit a FSRP final report for a previously funded program but has not done so is ineligible for funding until a complete final report is received by FSGC. Please note that this program was referred to as the “Florida Space Research and Education Grant Program” in previous funding cycles.
- Any Principal Investigator who has received previous funding from FSGC under the FSRP/FSREGP but is not yet required to submit a final report must include a brief progress report in the proposal (item 11) citing the current status of the previously funded project.
- A Principal Investigator who has received a FSREGP/FSRP grant between 2015 through 2019 may apply for the 2020 FSRP, so long as all the above conditions are met.

Categories and Budget:

Grants will be awarded within the priorities of NASA’s four Mission Directorates. The following chart lists the categories, anticipated budgets, and lists the programs under each Mission Directorate. More information on NASA’s Mission Directorates can be found in Appendix A.

The following table describes the 4 Mission Directorates.

Grant Category	Mission Directorate Program	Budget	# of Grant Awards
Science Mission Directorate (SMD)	Earth Science Planetary Sciences Heliophysics Astrophysics	Approx. \$75K	Estimate of 3-4 grants to be awarded. Maximum estimated grant award of up to \$25,000.
Human Exploration and Operations (HEO)	Exploration Systems Development Human Spaceflight Capabilities International Space Station Commercial Spaceflight Development Advanced Exploration Systems Space Life & Physical Sciences Research & Applications	Approx. \$75K	Estimate of 3-4 grants to be awarded. Maximum estimated grant award of up to \$25,000.
Space Technology (ST)	Commercial Space Development Developing Cislunar Space Using the Commercial Orbital Transportation Services (COTS) Model Lunar Surface Innovation NASA Innovative Advanced Concepts (NIAC) Small Spacecraft Technology	Approx. \$75K	Estimate of 3-4 grants to be awarded. Maximum estimated grant award of up to \$25,000.
Aeronautics (ARMD)	Safe, Efficient Growth in Global Operations Innovation in Commercial Supersonic Aircraft Ultra-Efficient Commercial Vehicles Transition to Low-Carbon Propulsion In-Time System-Wide Safety Assurance Assured Autonomy for Aviation Transformation	Approx. \$50K	Estimate of 1-2 grants to be awarded. Maximum estimated grant award of up to \$25,000.

Indirect Costs:

Based on the indirect cost rate requested by FSGC from our prime sponsor, NASA, all proposals under this RFP will carry the flow down indirect cost rate of 10% (to be calculated on total direct cost). Once UCF receives the base FSGC award, Master agreements(s) will be executed between UCF, acting on behalf of FSGC, and each affiliate member institution. The executed Master Agreement will be the base document for all awards received by your institution from FSGC via the respective project specific Task Orders to be executed for each awarded project.

Flow-down clauses in the Master Agreement, amongst others, will include restriction on indirect cost to 10% of total direct cost, no other administrative costs, except for indirect cost, will be supported by UCF funds and foregone overhead may be used by your institution to meet mandatory cost share requirements. Support for these projects are solely from the NASA Florida Space Grant Consortium and Space Florida.

Matching:

The Consortium is required to match its prime award from NASA (from which the awards under this program will be funded). This year, we are asking applicants to match **50%** of their requested funds, with non-federal funds from their institution. Thus, if you are requesting \$25,000 then the matching should be at least \$12,500. Foregone overhead may be used to meet mandatory cost share requirements. Match can be in the form of either cash or in-kind, including waived indirect costs, academic release for faculty members, student stipends, instrument, and computer time. However, equipment purchase and/or cost of pro-rated use cannot be considered as match.

Timeline:

2020 Cycle	March 16, 2020 April 24, 2020 May 22, 2020 July 24, 2020 On or after August 3, 2020	Request for Proposals Issued Notice of Intent and Abstract sent to fsgc@mail.ucf.edu Proposals Due Awards Announced Awards made (subject to receipt of funding from NASA for 2020 program cycle)
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Equipment:

Purchase of Equipment is not allowed under this training grant. "Equipment" will be defined as any single non-expendable item having an acquisition cost of \$5000 or more. However, if an awardee institution uses a lower cost threshold in their definition of equipment, then that lower cost threshold will be used to determine whether any item is "equipment" or not.

Delivery and Proposal Content

The signed proposal (main proposal and signed cover page) must be uploaded to the Florida Space Grant Consortium website. The proposal should be a pdf file. In order to upload the proposal, you must also sign up for an FSGC online account at www.floridaspacegrant.org . You simply have to provide an e-mail address and create a username and password. The email address must be a university email address.

Failure to submit the proposal exactly in the manner stated here will result in the proposal being considered as incomplete and will not be considered for review and participation in the funding process.

Proposers are requested to provide a notice-of-intent to FSGC, including a generalized proposal summary of no more than 500 words, to fsgc@ucf.edu by April 24, 2020. Proposals should contain adequate technical detail to enable a peer review process.

Proposers should follow the format outlined below:

- 1) Completed Signature Page (see attached)
- 2) Project Summary with Title (limit 200 words)
- 3) Significance of Project
- 4) Work Plan
- 5) The prior state of knowledge in the field and how this would carry those issues further
- 6) Extent to which the proposed work supports NASA's 4 Mission Directorates and/or the State's goals of building the space industry in Florida.
- 7) Potential Sources for Continued Support
- 8) Key Personnel and Levels of Commitment, **including details of student involvement in the project**
- 9) References
- 10) Budget (showing funding allocation to each participating organization)
- 11) Previous Funding status (if required)
- 12) Support letters (if any)
- 13) PI and Co-PI's Standard Curriculum Vita (including list of relevant publications)

Proposals will be limited to ten (10) pages in length (exclusive of items 1, 9, 10, 11, 12, and 13 above), preferably less. The proposal must be single- or double-spaced, using standard size (8 1/2" x 11") paper, in no smaller than 12-point font with a minimum of 1" margins on all sides for each page. Use an easily readable font face (e.g. Geneva, Helvetica, Times Roman). All pages must be numbered. No supplementary materials will be accepted, and over-length proposals may not be submitted for merit review.

Performance Period: The performance period cannot be for more than 1 year. The starting date can be as early as August 3, 2020.

Evaluations of Proposals:

The proposals will be evaluated by panels of industrial and academic reviewers chosen by the grant program sponsors. Each proposal will be judged and scored on its own merits using the criteria listed below:

- 1) Scientific/technical merit of the proposed project
- 2) The prior state of knowledge in the field and how this would carry those issues further
- 3) Extent to which the proposed work supports the State's goals of building the space industry in Florida, including industry participation, and supporting NASA's 4 Mission Directorates (see Appendix A)
- 4) Potential for continued project development, including commercial or government support
- 5) Qualifications of the project team as evidenced by related refereed publications and award success
- 6) Soundness of proposed work plan, budget, and schedule
- 7) Student involvement in the project – proposals having higher numbers of student participation with special emphasis on student diversity is strongly encouraged and will be weighted favorably.

Other issues will be considered in the award of grants when evaluations based on the seven above-listed criteria indicate substantially equal merit. These other issues will include: amount and quality of matching contributions (please include documentation showing matching contributions); geographic diversity; and level of collaboration between industry and academia.

Intellectual Property:

Due to the use of NASA funding for this grant program, grant recipients shall follow all applicable NASA rules and regulations for the ownership and use of intellectual property developed under any grant project. As sponsors of the grant program, FSGC and UCF have no ownership or control of such intellectual property, unless a sponsor is also a direct participant, or intended beneficiary, of any grant project. In such cases, intellectual property rights shall be covered under a separate agreement with the grant recipient.

Publications:

Principal Investigator may publish the results of the work in its own form. FSGC will require a copy of any publication within 60 days of the publication date.

Principal Investigator's publication shall acknowledge support of FSGC by inclusion of the following sentence in the published document " THIS PROJECT WAS SUPPORTED BY THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION THROUGH THE UNIVERSITY OF CENTRAL FLORIDA'S NASA FLORIDA SPACE GRANT CONSORTIUM AND SPACE FLORIDA".

International Compliance

Projects involving international recipients must comply with all applicable export control laws and federal regulations. Proposals that feature international participation should include a brief section on their plans to comply with federal requirements, or describe why such requirements do not apply to their project.

Reporting:

A final technical report is due 13 months after commencement of project. This final report may contribute to follow on proposals that can be submitted to other agencies for continued support of the project. The grant program sponsors may coordinate with Principal Investigators to submit their final reports or abstracts for presentation and publication at upcoming Space Congress events and other space-related conferences. FSGC may establish a special seminar or conference where all funded research will be reported.

FSGC may contact PIs and students of approved projects from time to time for additional reporting information.

Any financial or programmatic changes, including student involvement, will require prior approval of FSGC before such changes can be implemented. Failure to meet the proposal goals in relation to student recruitment for the project may result in reduced funding.

Since FSGC is a Training Grant, student demographics and other information is required for onward submission to NASA HQ as part of our annual report. We do not send individual information. All the information is aggregated and then compiled into our annual report to NASA. NASA in turn uses this information to present Space Grant program highlights to Congressional delegates in order to secure future years funding for the National Space Grant program through the NASA Education Office.

Leveraged Funding:

Proposers must indicate in their proposals whether their project is receiving funds from other sources, or whether they are involved in similar projects that are funded by state or federal grants. These other funding sources should be listed.

Confidential Information in Proposals:

Patentable ideas, trade secrets, privileged or confidential commercial or financial information, disclosure of which may harm the proposer, should be included in proposals only when such information is necessary to convey an understanding of the proposed project. Such information must be clearly marked in the proposal and be appropriately labeled with a legend such as,

"The following is (proprietary or confidential) information that (name of proposing organization) requests not be released to persons outside UCF, except for purposes of review and evaluation."

Awardee Responsibility:

- Recipient of the FSGC award must ensure that students being supported through this project are US citizens only (permanent residents are not allowed) and that the students submit their completed longitudinal tracking form, awardee questionnaire form and student authorization form to FSGC within 7 days of their hire on the project.
- If a student, supported with these award funds, graduates before the end of the project, the final report must be collected in a timely manner from the student so that it can be incorporated into the researcher's final report when it is due.
- Office of Education Performance Measurement (OEPM) form. The Office of Education Performance Measurement System (OEPM) is the centralized collection point for collection and reporting of Office of Education performance measurement data. The required information includes an abstract of the work and details of the students participating in the project. Instructions will be sent before the end of the award.

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PROPOSAL COVER PAGE

Project Name: _____

Faculty or Industry PI: _____

Department/Institution: _____

Address: _____

Phone: _____ E-mail: _____

Budget Request: Note: A detailed budget justification is required.

Grant \$ _____

Matching Contribution \$ _____

Total Project Cost \$ _____

Please identify which categories are applicable to your project (check one that is most appropriate):

Science Mission Directorate (SMD)

Human Exploration and Operations (HEO)

Space Technology (ST)

Aeronautics (ARMD)

Does your project have any student participation? Yes ___ No ___

If yes, how many? _____

Start Date: _____ Ending Date: _____

(Signature) Faculty PI / Date

(Signature) Department Head / Date

Name

Name

Title

Title

(Signature) Institute Official / Date

Name

Title

Appendix A. Strategic Framework for NASA

I. 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.

- Aeronautics Research Mission Directorate (ARMD): Research conducted by ARMD directly benefits today's air transportation system, the aviation industry, and the passengers and businesses who rely on aviation every day. ARMD scientists, engineers, programmers, test pilots, facilities managers and strategic planners are focused on aviation's future. They design, develop and test advanced technologies that will make aviation much more environmentally friendly, maintain safety in more crowded skies, and ultimately transform the way we fly. NASA's aeronautics research is primarily conducted at four NASA centers: Ames Research Center and Armstrong Flight Research Center in California, Glenn Research Center in Ohio, and Langley Research Center in Virginia (<https://www.nasa.gov/aeroresearch>)
- The Science Mission Directorate (SMD) leads the Agency in four areas of research: Earth Science, Heliophysics, Planetary Science, and Astrophysics. NASA's Science Mission Directorate (SMD) and the nation's science community use space observatories to conduct scientific studies of the Earth from space to visit and return samples from other bodies in the solar system, and to peer out into our Galaxy and beyond. NASA's science program seeks answers to profound questions that touch us all:
 - How and why are Earth's climate and the environment changing?
 - How and why does the Sun vary and affect Earth and the rest of the solar system?
 - How do planets and life originate?
 - How does the universe work, and what are its origin and destiny?
 - Are we alone?<https://science.nasa.gov/>
- The Human Exploration and Operations (HEO) 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. The International Space Station, currently orbiting the Earth with a crew of six, represents the NASA exploration activities in low-Earth orbit. 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 and Physical Sciences Research & Applications. <https://www.nasa.gov/directorates/heo/index.html>
- Space Technology Mission Directorate (STMD). STMD rapidly develops, demonstrates, and infuses revolutionary, high-payoff technologies through transparent, collaborative partnerships, expanding the boundaries of the aerospace enterprise. STMD employs a merit-based competition model with a portfolio approach, spanning a range of discipline areas and technology readiness levels. By investing in bold, broadly applicable, disruptive technology that industry cannot tackle today, STMD seeks to mature the technology required for NASA's future missions in science and exploration while proving the capabilities and lowering the cost for other government agencies and commercial space activities. (<http://www.nasa.gov/directorates/heo/home/index.html>)

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

II. NASA Research Areas of Interest

NASA research priorities are defined by the Mission Directorates—Aeronautics Research, Science, Human Exploration and Operations, and Space Technology. Each Mission Directorate covers a major area of the Agency’s research and technology development efforts.

Research priorities for each of the Mission Directorates can be found at the following locations:

Aeronautics Research Mission Directorate (ARMD)

Researchers responding to the ARMD should propose research that is aligned with one or more of the ARMD programs. Proposers are directed to the following:

- ARMD Programs: <https://www.nasa.gov/aeroresearch/programs>

Science Mission Directorate (SMD)

Detailed information on SMD research priorities is available at the following URLs:

- NASA Science Strategy: <https://science.nasa.gov/about-us/science-strategy>
- Web pages for scientists and engineers who plan to propose or have submitted a proposal to a research solicitation from the Science Mission Directorate. <https://science.nasa.gov/researchers>
- Funding Opportunities: Grant Solicitations <https://science.nasa.gov/researchers/sara/grant-solicitations>

Human Exploration and Operations (HEO) Mission Directorate

For information on HEO programs, please go to <http://www.nasa.gov/directorates/heo/home/index.html> and click on programs

Space Technology Mission Directorate (STMD)

For the Space Technology programs, please go to <https://www.nasa.gov/directorates/spacetech/home/index.html> and click on STMD Programs.

NASA’s Technology Transfer Program

To search the online database of NASA-developed technologies in the public domain, visit:

<http://technology.nasa.gov/publicdomain>

APPENDIX B

FSGC Affiliates

Universities and Colleges

Bethune-Cookman University (Don Spence)

Embry-Riddle Aeronautical University (Remzi Seker)

Eckerd College (Joel Thompson)

Florida Atlantic University (Frederick Bloetscher)

Eastern Florida State College (Steve Kane)

Florida Gulf Coast University (Michael Fauerbach)

Florida Institute of Technology (Tristan Fiedler)

Florida International University (Berrin Tansel)

Florida Polytechnic University ()

Florida State University (Michelle Personnette)

Florida A&M University (Charles Weatherford)

University of Central Florida (Yunjun Xu)

University of Florida (Jamie Foster)

University of Miami (Qingda Yang)

University of North Florida (Nirmal Patel)

University of South Florida (Stephanie Carey)

University of West Florida (Leonard W. ter Haar)

Other Organizations

Astronauts Memorial Foundation (Thad Altman)

Kennedy Space Center (Theresa Martinez)

Orlando Science Center (Stacy Kelley)

Space Florida (Tony Gannon)