



## **Kentucky Space Grant Consortium 2020 Request for Proposals**

### **Announcement: RFP-20-001**

Release Date: April 10, 2020

**Proposals Due: Monday, May 18, 2020, 4:00 pm ET**

Proposal files submitted online at [nasa.engr.uky.edu](https://nasa.engr.uky.edu)

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Proposal forms, FAQ, and additional information available:

[nasa.engr.uky.edu/space-grant](https://nasa.engr.uky.edu/space-grant) and

[nasa.engr.uky.edu/requests-for-proposals](https://nasa.engr.uky.edu/requests-for-proposals)

## Kentucky Space Grant Consortium 2020 Request for Proposals

### **NASA Kentucky Space Grant Consortium Overview**

The NASA Kentucky Space Grant Consortium is a NASA Higher Education program with 28 Kentucky affiliates who support student fellowships and internships, research initiation, and workforce development in STEM areas of interest to NASA and Kentucky. Space Grant promotes networking and cooperation among education, industry, and local, state and Federal government. Recruitment and training of US citizens, especially women, underrepresented minorities and persons with disabilities, for careers in aerospace science and technology is a national priority. The NASA Kentucky Space Grant Consortium supports Kentucky faculty, students, and outreach through award programs in this RFP that address the national interests of NASA and the state needs of Kentucky.

### **Request for Proposals**

*NASA Kentucky invites proposal submissions from Kentucky Space Grant Consortium affiliates for the following:*

**Graduate Fellowship (GF), Research Experience for Undergraduates (REU), Team Projects (TP), Research Initiation Award (RIA), Mini-Grant (MG), and Enhanced Mini-Grant (EMG) awards.**

**Deadline:** Proposal files submitted online at [nasa.engr.uky.edu](https://nasa.engr.uky.edu) by **4:00 pm ET, Monday, May 18, 2020.**

**Period of Performance:** Awards up to one year in the period August 1, 2020 to July 31, 2021.

**Program Descriptions:** Listed on pgs 9-14 of this RFP.

**Number of Awards:** Number of awards in each program category are determined by sizes of the individual awards and available program funding levels. PIs are limited to two (2) proposal submissions per program category.

### **Submission Instructions**

Proposal forms are available at [nasa.engr.uky.edu/requests-for-proposals/forms](https://nasa.engr.uky.edu/requests-for-proposals/forms). All proposals must be submitted via the NASA KY website as PDF files. Please title proposal documents according to the specified file naming convention, in which **PI** is the last name of proposer and **PGM** is the program category abbreviation (see Table 1).

- SIGNED COVER PAGE:** Scan the signed original and save as PDF. Digital signatures acceptable. (File name format: **PI\_PGM\_Cover\_2020.pdf**)
- BUDGET FORM AND JUSTIFICATION:** Include justification detailing requested support and cost-share (File name format: **PI\_PGM\_Budget\_2020.pdf**)
- PROJECT DESCRIPTION:** (File name format: **PI\_PGM\_Project\_2020.pdf**)
  - 12 point font, 1 inch margins, single spaced
  - 5 page limit - See specific program category guidelines for required content
  - Additional pages - See specific program category guidelines for lists of documents
- STUDENT INFORMATION FORM (SIF):** Include with GF and REU projects (File name format: **SLN\_PGM\_SIF\_2020**, where **SLN** is the student's last name.)

**Submit proposals online at [nasa.engr.uky.edu](https://nasa.engr.uky.edu) by 4:00 pm ET, Monday, May 18, 2020.**

**Additional information and FAQ:** [nasa.engr.uky.edu/space-grant](https://nasa.engr.uky.edu/space-grant)

**General Guidelines:** Proposals that omit required materials or that exceed page limits may be rejected without review. Proposals from PIs who are delinquent in meeting reporting requirements on current or prior NASA Kentucky awards may be rejected without review. Failure to complete proposed work on prior NASA KY projects will be taken into consideration in selecting proposals. By submitting to this RFP, the proposer acknowledges that NASA KY reserves the right to request backup financial information at any time during the course of an awarded project. Proposers should contact NASA KY with questions about allowable costs. Submitted proposals must be consistent with the PI institution's policies and practices, e.g. definition of equipment, stipend, etc.

- *Equipment* may not be purchased in any NASA KY award under this RFP.
- *Travel* funds are restricted to domestic travel only.
- *Cost-share* must be from non-Federal sources.
- *Cost-share* from non-US citizen faculty is allowable.

**Eligibility for Space Grant Awards:** Proposals will be accepted from NASA Kentucky Space Grant Consortium Affiliate Institutions. Affiliate Institutions are listed on pg. 6 and may also be found at [nasa.engr.uky.edu/space-grant](http://nasa.engr.uky.edu/space-grant). NASA requires US citizenship for students receiving support under GF and REU awards. Reporting on current and prior awards must be up to date to be eligible for funding under this announcement. PIs are limited to two (2) proposal submissions per program category.

**Affiliate Participation:** Academic affiliates in the NASA Kentucky Space Grant Consortium are eligible for all programs. Non-profit and Industry affiliates can participate in partnership with Academic affiliates or can propose directly involving students of various educational levels via Mini-Grant, Enhanced Mini-Grant, Team Project, and Research Experience for Undergraduate programs.

**Cost-Share:** The NASA Office of STEM Engagement requires cost-share of all state Space Grant consortia, therefore most NASA Kentucky Space Grant Consortium programs require cost-share. Cost-share must be from non-Federal sources. Cost-share from non-US citizen faculty effort is allowable.

**F&A Rates:** Space Grant is a workforce development program and it is important to propose projects that are aligned with the intent of the program, i.e., projects that will emphasize science, technology, engineering and math (STEM) and recruit and train US citizens for careers in aerospace-related science and technology. In line with this program, proposing universities and colleges should use an "other" or training grant F&A rate (if one exists) versus a research F&A rate. University of Kentucky on-campus proposers should use the 34% "Other" rate. No F&A is permitted on NIFs award (GF, REU) as directed by the NASA Office of STEM Engagement: "It is a policy of the Space Grant program that the awardee cannot charge management fees nor indirect costs to any NIF award under this Educational Cooperative Agreement."

**Reporting Requirements:** Principal Investigators (PIs) are required to report research productivity and students supported: 1) during the award period, 2) within 30 days of the end of the award (final technical report), and 3) annual update 1 year post-award. Reporting must be current in order for NASA KY to meet NASA and state annual report cycles. Requests for no-cost extensions must be submitted no later than 30 days prior to the end date and include a status report on all tasks listed in the proposal.

**Award Processing:** All subaward invoices must show appropriate documentation of cost share in relation to expenses. Invoices for subawards made under this RFP must be submitted via the University of Kentucky Online Subaward Invoicing system, with a courtesy copy to [nasa.invoices@uky.edu](mailto:nasa.invoices@uky.edu).

**Attribution:** Publications, posters, and presentations resulting from awards made under this RFP should include an attribution statement acknowledging NASA KY support. Example: "***The material is based upon work supported by NASA Kentucky under NASA award No: 80NSSC20M0047.***"

**Table 1. Summary of NASA Kentucky Space Grant Consortium Programs**

Funding Source	Award Program Category <sup>1</sup>	Program Acronym	Program Description	US Citizen Required <sup>2</sup>	Max Award Request	Indirect Costs Allowed	Required Cost-Share (\$CS:\$Award)	Level of NASA Collaboration
Space Grant	Graduate Fellowships	<b>GF</b>	Salary or stipend, tuition, materials and travel for MS and PhD students to conduct NASA-aligned research	Yes	\$45,000	No	1:1 including	NASA letter of support <sup>3</sup>
Space Grant	Research Experience for Undergraduates	<b>REU</b>	Salary or stipend, materials and travel for undergrad students to conduct NASA-aligned research	Yes	\$8,000	No	None required	Use of NASA resources <sup>4</sup>
Space Grant	Team Projects	<b>TP</b>	Materials, registration fees and travel for student teams participating in NASA-related competitions or design projects	No	\$15,000	Yes	0.5:1	Alignment with NASA objectives <sup>5</sup>
Space Grant	Research Initiation Awards	<b>RIA</b>	Faculty directed research to explore NASA collaborations and NASA-aligned research topics	No	\$40,000	Yes	1:1	NASA letter of support <sup>3</sup>
Space Grant	Mini-Grants	<b>MG</b>	Pre-college and science center outreach activities, targeted student recruiting and teacher PD	No	\$5,000	Yes	None required	Alignment with NASA objectives <sup>5</sup>
Space Grant	Enhanced Mini-Grants	<b>EMG</b>	Priority given to projects aligned with NASA Kentucky Strategic Themes or NASA Space Grant objectives	No	\$25,000	Yes	1:1	Alignment with NASA objectives <sup>5</sup>

**Note:** Full program descriptions listed on [pgs 9-14](#) of this RFP.

<sup>1</sup>PIs are limited to **two (2) proposal submissions per program category**.

<sup>2</sup>**US Citizenship** is required for students receiving direct support under NIFS awards (GF, REU). Citizenship is not required for other programs.

<sup>3</sup>Letter of support required **that commits NASA partnership or collaboration to the project**. Letters endorsing the value or merit of the project without committing specific resources to it do not qualify as letters of support. Letters of support may be from NASA or affiliated organizations including NASA Institutes/Laboratories such as JPL, Space Telescope Science Institute, National Space Biomedical Institute, CASIS, and others. (See [NASA KY FAQ](#) for more information.)

<sup>4</sup>NASA resources include **facilities and collaborators or other resources** such as datasets, modeling, source code, curricula, images, etc. developed and made available to the public or researchers by NASA or NASA-supported missions. Links to NASA research results including NASA PubSpace and NASA Data Portal are available at: [nasa.gov/open/researchaccess](https://nasa.gov/open/researchaccess).

<sup>5</sup>See following sections for description of **NASA STEM Engagement and Research objectives**.

### **Review Process**

Proposals will be rated, ranked, and funded up to the budgeted amount available for each program. NASA KY Space Grant Affiliate Representatives and external content specialists will review proposals and rate the technical content as Definitely Fund, Fund if Possible, or Do Not Fund (Review Criteria). Proposals will be reviewed for budget compliance and programmatic alignment by NASA KY staff. As a panel, the reviewers will recommend proposals for funding to the NASA KY Director. Past reporting and accomplishments will be considered in evaluation of proposals. To avoid conflicts of interest, alternate reviewers may be recruited.

Proposals will be reviewed and rated based on the following criteria:

- SCIENCE: Scientific merit and implementation; NASA mission and research relevance (30%)
- TECHNICAL: Technical merit and feasibility, including cost risk (30%)
- PROGRAMMATIC: Management and evaluation; successful and timely completion of prior proposed NASA KY projects and reporting; alignment with Kentucky Space Grant Consortium Strategic Themes and NASA Office of STEM Engagement/Space Grant Objectives (30%)
- BUDGET: Reasonableness of budget narrative (10%)

### **Program Alignment and Collaboration**

Proposals should align with goals and objectives of the NASA Kentucky Space Grant Program, NASA Office of STEM Engagement (OSTEM) and the agency's missions and research, as well as the interests of the state of Kentucky. NASA Kentucky Space Grant programs encourage increasing levels of involvement with NASA, from base alignment with NASA objectives for TP, EMG and MG programs, use of NASA resources for the REU program, progressing to a letter of support from a NASA collaborator for GF and RIA. See Table 1, program descriptions, and the following for more information on NASA and programmatic alignment.

Kentucky Space Grant affiliates should develop innovative, integrated and comprehensive projects that clearly and concisely describe the relevance of the proposed work to NASA's currently funded research priorities and programs of the NASA Mission Directorate(s). Proposals should align with one or more of Kentucky's strategic themes and/or research priorities of NASA Mission Directorates and Centers (see below). Proposals shall address how the proposed project and its programmatic elements directly align with goals and objectives of the National Space Grant Program and the NASA Strategy for STEM Engagement as outlined below.

### **Kentucky Science and Innovation Strategy**

Kentucky has undergone an extensive effort to evaluate and produce a science and technology strategic plan, the 2012 Kentucky Science and Innovation Strategy, with a fifth-year anniversary update in 2018, reviewed by the Kentucky Council on Postsecondary Education (CPE). Five high-value areas are identified with strong potential to build innovation capacity in the Commonwealth: 1. Agriculture and Bioscience, 2. Energy and Environmental Technologies, 3. Human Health and Personalized Medicine, 4. Information Technology and New Media, and 5. Material Science and Advanced Manufacturing. The strategy acknowledges the importance of the aerospace sector to Kentucky's economy and that relevant high-value R&D often spans multiple areas, as is the case for aerospace research. The strategy further defines actions to catalyze investment in high-value areas and to build industry/academic partnerships for STEM workforce development, which overlap both NASA Kentucky Space Grant and EPSCoR priorities. NASA Kentucky Space Grant Consortium receives state support through the statewide Kentucky EPSCoR Committee, the University of Kentucky, and affiliate-committed institutional cost-share.

### National NASA Space Grant Program Goal and Objectives

The National Space Grant College & Fellowship Program was initiated by Congress in 1987 in response to the need for a coordinated effort to help maintain America's pre-eminence in aerospace science and technology. The Space Grant national network includes over 1,000 affiliates from universities, colleges, industry, museums, science centers, and state and local agencies, all of which belong to one of 52 consortia in the 50 states, DC and Puerto Rico. The Space Grant Program is dedicated to building, sustaining, and deploying a skilled, high-performing and diverse workforce that meets the current and emerging needs of NASA and the nation. The goal of Space Grant is to contribute to NASA's mission, especially in the area of government and industry partnerships, to improve America's aerospace technologies and advance American leadership by funding education, research and informal education projects through a national network of university-based Space Grant consortia. Specific objectives of Space Grant are to:

- Create cooperative programs among universities, aerospace industry, and Federal, state, and local governments to foster STEM ecosystems;
- Encourage interdisciplinary training, research, and public service programs related to aerospace;
- Establish and maintain a national network of universities with interests and capabilities in aeronautics, space, and related fields;
- Attract, recruit and train U.S. citizens, especially women, underrepresented minorities, and persons with disabilities, for careers in aerospace science and technology;
- Promote a strong STEM education base from elementary through secondary levels while providing support to teachers in these grade levels toward more effectively improving student academic outcomes;
- Create opportunities that enable student contributions to the development of solutions addressing NASA Mission Directorate challenges; and
- Advance aerospace knowledge and expand related activities.

### NASA Kentucky Space Grant Consortium Program Elements

**NASA Internships and Fellowships (NIFs):** Higher education is the top priority of NASA's Space Grant Program. NASA seeks to promote science, technology, engineering and mathematics (STEM) education; encourage interdisciplinary training, research and public service programs related to aerospace; and recruit and train US citizens for careers in aerospace science and technology. Fellowships are designed to support independently conceived or designed research by highly qualified students, in disciplines needed to help advance NASA's missions. Under the NIFs program element, NASA KY offers the **Graduate Fellowship (GF)** and **Research Experience for Undergraduates (REU)** programs in this RFP (pgs. 9-10).

**Research Initiation:** Alignment with NASA interests and meaningful collaborations with NASA scientists are essential to the development of competitive proposals for Federal funding opportunities. Research Initiation Awards (RIA) provide support for early-career faculty proposing research and building NASA connections, where faculty can apply for increasingly-challenging research awards to hone their proposal and research skills, and expand their capacity for student-mentoring. These awards focus on initiating NASA partnerships and maturing collaborative research potential. Under the Research Infrastructure program element, NASA KY offers the **Research Initiation Award (RIA)** program (pg. 12).

**Higher Education:** Higher Education funding is a primary Kentucky Space Grant objective designed to support competitive awards in multiple areas of resource needs for KSGC affiliates, with a goal of attracting talented students to Kentucky institutions of higher education and motivating them to excel and finish their degrees. NASA seeks to promote science, technology, engineering and mathematics (STEM) education; encourage interdisciplinary training, research and public service programs related to aerospace; and recruit and train US students for careers in aerospace science and technology. Under the Higher Education program element, NASA KY offers **Team Project (TP)** and **Enhanced Mini-Grant (EMG)** programs (pgs. 11, 14).

**Pre-college and Informal Education:** Pre-college and informal education activities supported by the NASA Space Grant Program help fill the higher education pipeline with well-prepared, inspired and engaged students, motivated to pursue their degrees. NASA seeks to promote science, technology, engineering and mathematics (STEM) education; encourage interdisciplinary training, research and public service programs related to aerospace; and recruit and train US students for careers in aerospace science and technology. Under Higher Education, Pre-College and Informal Education program elements, NASA KY offers **Mini-Grant (MG)** and **Enhanced Mini-Grant (EMG)** programs (pgs. 13-14).

**NASA Kentucky Space Grant Consortium Membership**

The Kentucky Space Grant Consortium consists of 19 academic affiliates and 9 non-academic affiliates across the Commonwealth. Affiliate institutions and contact information for affiliate representatives are listed below:

**Academic Affiliates**

<b>Asbury University</b>	Dr. Duk Lee	duk.lee@asbury.edu	
<b>Ashland CTC</b>	Mark Riggs	mark.riggs@kctcs.edu	606-326-2161
<b>Bellarmino University</b>	Dr. Akhtar Mahmood	amahmood@bellarmino.edu	502-272-7599
<b>Berea College</b>	Dr. Tracy Hodge	tracy_hodge@bera.edu	859-985-3301
<b>Bluegrass CTC</b>	Tammy Liles	tammy.liles@kctcs.edu	859-246-6449
<b>Centre College</b>	Dr. Jim Kelly	james.kelly@centre.edu	859-238-5915
<b>Eastern Kentucky University</b>	Dr. Anthony Blose	anthony.blose@eku.edu	859-622-1521
<b>Hopkinsville CC</b>	Sherry McCormack	smccormack0001@kctcs.edu	270-707-3930
<b>Kentucky State University</b>	Dr. Jens Hannemann	jens.hannemann@kysu.edu	
<b>Morehead State University</b>	Dr. Tom Pannuti	t.pannuti@moreheadstate.edu	606-783-9591
<b>Murray State University</b>	Dr. Aleck Leedy	aleedy@murraystate.edu	270-809-4917
<b>Northern Kentucky University</b>	Dr. Scott Nutter	nutters@nku.edu	859-572-5369
<b>Owensboro CTC</b>	Shawn Payne	shawn.payne@kctcs.edu	270-686-3789
<b>Thomas More College</b>	Dr. Wes Ryle	wesley.ryle@thomasmore.edu	859-344-3367
<b>University of Kentucky</b>	Dr. Janet Lumppp	jklumppp@uky.edu	859-257-4985
<b>University of Louisville</b>	Dr. John Kielkopf	john.kielkopf@louisville.edu	502-852-5990
<b>University of Pikeville</b>	vacant		
<b>West Kentucky CTC</b>	Mellisa Duncan	mellisa.duncan@kctcs.edu	270-534-3097
<b>Western Kentucky University</b>	Dr. Mike Carini	mike.carini@wku.edu	270-745-6198

**Non-Academic Affiliates**

<b>Aviation Museum of Kentucky</b>	Ed Murphy	em1234@twc.com	859-494-3669
<b>Faradine Systems</b>	Jason Rexroat	jason@faradinesystems.com	859-684-4629
<b>Global Parametrics</b>	Dr. Jerry Skees	jskees@globalparametrics.com	
<b>Innoviator, LLC</b>	Alan Beaven	alan@innoviator.com	502-316-4750
<b>Kentucky Science and Technology Corporation</b>	Terry Samuel	tsamuel@kstc.com	859-233-3502
<b>Kentucky Science Center</b>	Veronica Greenwell	Veronica.Greenwell@louisvilleky.gov	502-560-7151
<b>Living Arts and Science Center</b>	Dany Waller	dwaller@lasclex.org	
<b>Space Tango, Inc.</b>	Twyman Clements	tclements@spacetango.com	859-229-2719
<b>Tribo Flow Separations, LLC</b>	Dr. John Stencil	john@triboflow.com	859-523-8782

### **NASA STEM Engagement Strategic Goals and Objectives (from 2018 NASA Strategic Plan)**

NASA's STEM Engagement efforts contribute toward achieving Strategic Objective 3.3 defined in the NASA strategy plan: "Inspire and Engage the Public in Aeronautics, Space, and Science", and specifically to "inspire, engage, educate, and employ the next generation of explorers through NASA-unique Science, Technology, Engineering and Mathematics learning opportunities".

At the core of NASA's efforts in STEM Engagement are the following cross-cutting design and operational principles. These principles guide the STEM engagement community in the planning and execution of work in direct support of achieving the objectives.

- Mission-driven authentic STEM experiences
- Evidence-based practices
- Diversity and inclusion
- Scalability through partnerships and networks

Central to this effort is a new architecture designed to enable relevant student contributions to NASA's mission and work, driven by requirements from NASA's Mission Directorates. NASA's STEM engagement function will play a critical role in achieving the Agency's Strategic Objective 3.3 by implementing activities within three focus areas:

- 1) Create unique opportunities for students to contribute to NASA's work in exploration and discovery;
- 2) Build a diverse future STEM workforce by engaging students in authentic learning experiences with NASA's people, content and facilities; and
- 3) Strengthen understanding by enabling powerful connections to NASA's mission and work.

NASA KY program elements support NASA STEM Engagement goals and help enable objectives described above.

### **NASA Research and Technology Development Priorities**

The NASA Office of STEM Engagement (OSTEM) identifies research and technology priorities based on alignment with NASA's Mission Directorates. The Aeronautics Research Mission Directorate (ARMD), Human Exploration and Operations Mission Directorate (HEOMD), Science Mission Directorate (SMD), and the Space Technology Mission Directorate (STMD) identify their priorities on the NASA website [www.nasa.gov/about/directorates/index.html](http://www.nasa.gov/about/directorates/index.html). For information on all of NASA's missions, please visit [www.nasa.gov/missions/index.html](http://www.nasa.gov/missions/index.html) and the following URLs:

### **NASA Mission Directorate (MD) Descriptions**

- Aeronautics Research (<http://www.aeronautics.nasa.gov/>)
- Human Exploration Operations (<http://www.nasa.gov/directorates/heo/home/index.html>)
- Science (<http://science.nasa.gov/>)
- Space Technology (<http://www.nasa.gov/directorates/spacetech/home/index.html>)

**Aeronautics Research Mission Directorate (ARMD):** NASA aeronautics has made decades of contributions to aviation. Every U.S. commercial aircraft and U.S. air traffic control tower has NASA-developed technology on board that helps improve efficiency and maintain safety. 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.



**Human Exploration and Operations Mission Directorate (HEOMD):** 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. The directorate is similarly responsible for Agency leadership and management of NASA space operations related to Launch Services, Space Transportation, and Space Communications in support of both human and robotic exploration programs.

**Science Mission Directorate (SMD):** NASA's Science Mission Directorate (SMD) is responsible for directing and overseeing the nation's space research program in Earth and space science. The Directorate engages the external and internal science community to define and prioritize science questions and seeks to expand the frontiers of four broad scientific pursuits: Earth Science, Planetary Science, Heliophysics, and Astrophysics. Through a variety of robotic observatory and explorer craft, and through sponsored research, the Directorate provides virtual human access to the farthest reaches of space and time, as well as practical information about changes on our home planet.

**Space Technology Mission Directorate (STMD):** Technology drives exploration to the Moon, Mars and beyond. NASA's Space Technology Mission Directorate (STMD) develops transformative space technologies to enable future missions. As NASA embarks on its next era of exploration, STMD is focused on advancing technologies and testing new capabilities at the Moon that will be critical for crewed missions to Mars. In many ways, the Moon will serve as a technology testbed and proving ground for Mars. STMD engages and inspires thousands of entrepreneurs, researchers and innovators, creating a community of America's best and brightest working on the nation's toughest challenges. Space technology research and development take place at NASA centers, universities and national labs. STMD leverages partnerships with other government agencies as well as commercial and international partners. Our current technology portfolio spans a range of discipline areas and technology readiness levels. Investments in revolutionary, American-made space technologies provide solutions on Earth and in space. NASA technology turns up in nearly every corner of modern life. We make our space tech available to commercial companies to generate real world benefits – everything from creating jobs to saving lives.

### **NASA Center Internships**

In addition to programs available through this RFP, NASA Kentucky supports Kentucky undergraduate students through internships at NASA Centers. Students are encouraged to visit the NASA Intern website, build a student profile, and apply to internship and fellowship programs available directly from NASA: [intern.nasa.gov](https://intern.nasa.gov)

## NASA KY Space Grant – Graduate Fellowships - \$45,000

**Description:** NASA Kentucky **Graduate Fellowships (GF)** recognize and support students addressing advanced research and engineering challenges related to NASA’s strategic goals. Research advisors at Affiliate Institutions may apply for a one-year fellowship for a specific graduate student. Research projects must emphasize connections to NASA, address specific goals for the fellowship year, and contribute to program metrics including publications, presentations, and student advancement in disciplines of interest to NASA.

**Eligibility:** Proposals will be accepted from Principal Investigators at NASA Kentucky Space Grant Consortium Affiliate Institutions on behalf of Master’s or Doctoral students in NASA-aligned disciplines. Women and minorities are strongly encouraged to apply. US citizenship is required for the student.

**Requirements:** The proposed research topic must utilize NASA resources and identify alignment with NASA priorities addressed by one or more NASA Mission Directorates. Letter of support required detailing NASA (or related) collaboration and interaction to advise on the research direction. Connections with Kentucky companies and/or NASA Kentucky strategic themes will be viewed favorably. The proposal should demonstrate significant input from the faculty research advisor to manage tangible results. Renewal proposals should provide detail of results to date and degree progress. See also Table 1.

**Proposal Content:** See *Submission Instructions* (pg. 1) for budget, format and filename instructions. All proposals should utilize the NASA KY cover sheet and budget form, followed by the project description and additional pages.

### 1) Project Description:

- No more than 5 pages including tables and figures describing: abstract (200-300 words), project summary, alignment with NASA Mission Directorate(s), specific goals for the funded period, milestones, anticipated outcomes, plans to communicate project activities and results, and progress toward degree.
- Additional pages - included after 5-page project description:
  - Bibliography/References as needed
  - Statement by the student relating the project to their career goals (not to exceed 1 page)
  - Unofficial transcript
  - Student’s resume
  - Letter of recommendation from a faculty member other than the research advisor
  - Research Advisor’s 2-page CV
  - List of Current and Pending Awards: Award title, sponsor, dates, amount, commitment
  - Executive summary describing results of all prior NASA KY funding (not to exceed 1 page)
  - Letter of support from a NASA (or related) collaborator (See [NASA KY FAQ](#))

**2) Student Information Form (SIF):** Completed by the student applicant and uploaded with proposal files.

**Budget Guidelines:** Proposers may request up to \$45,000 per student per year. Allowable costs include student salary or stipend consistent with recipient institution policies and practices, fringe benefits, tuition and fees, materials and supplies, and student domestic travel. Required cost-share of at least 1:1 (\$CS:\$Award) must be provided by the proposing institution. Indirect costs are *not* allowed, but unrecovered indirect costs on direct cost-share may be included as cost-share. Non-citizen faculty effort may be used as cost-share. The budget justification should demonstrate effective use of funds that align with the content and text of the proposed project. All proposed costs and cost-share should be fully described in the budget justification.

**Longitudinal Tracking of Students:** Any student receiving a combination of \$3,000 (or more) in NASA funding and/or participating 160 hours or more on NASA-supported projects will be longitudinally tracked by NASA for three years using information provided on the NASA KY Student Information Form (SIF). Longitudinally tracked students will need to keep their information current through follow-up correspondence for the 3-year period.



## NASA Kentucky Space Grant Consortium Research Experience for Undergraduates (REU)

### NASA KY Space Grant – Research Experience for Undergraduates - \$8,000

**Description:** NASA Kentucky **Research Experience for Undergraduates (REU)** recognize and support undergraduate students addressing research and engineering challenges related to NASA's strategic goals. Research advisors at Affiliate Institutions may apply for a one-year fellowship for a specific undergraduate student to conduct 1-on-1 mentored research. Research projects must emphasize connections to NASA, address specific goals for the fellowship year and contribute to program metrics including publications, presentations and student advancement in disciplines of interest to NASA.

**Eligibility:** Proposals will be accepted from Principal Investigators at NASA Kentucky Space Grant Consortium Affiliate Institutions on behalf of undergraduate students in NASA-aligned disciplines. Women and minorities are strongly encouraged to apply. US citizenship is required for the student.

**Requirements:** The proposed research topic must utilize NASA resources and identify alignment with NASA priorities addressed by one or more NASA Mission Directorates. Connections with Kentucky companies and/or NASA Kentucky strategic themes will be viewed favorably. The proposal should demonstrate significant input from the faculty advisor to manage tangible results. Renewal proposals should provide detail of results to date and degree progress. See also Table 1.

**Proposal Content:** See *Submission Instructions* (pg. 1) for budget, format and filename instructions. All proposals should utilize the NASA KY cover sheet and budget form, followed by the project description and additional pages.

#### 1) Project Description:

- No more than 5 pages including tables and figures describing: abstract (200-300 words), project summary, alignment with NASA Mission Directorate(s), specific goals for the funded period, milestones, anticipated outcomes, plans to communicate project activities and results, and progress toward degree.
- Additional pages - included after 5-page project description
  - Bibliography/References as needed
  - Statement by the student relating the project to their career goals (not to exceed 1 page)
  - Unofficial transcript
  - Letter of recommendation from a faculty member other than the research advisor
  - Research Advisor's 2-page CV
  - Executive summary describing results of all prior NASA KY funding (not to exceed 1 page)
  - Description of NASA resources to be used
  - If applicable, letter of support from collaborator (NASA or related)

**2) Student Information Form (SIF):** Completed by the student applicant and uploaded with proposal files.

**Budget Guidelines:** Proposers may request up to \$8,000 per student per year. Allowable costs include student stipend or salary, fringe benefits, tuition and fees, materials and supplies up to \$1,000, and student domestic travel up to \$1,000. Indirect costs are not allowed. Cost-share not required. The budget justification should demonstrate effective use of funds that align with the content and text of the proposed project. All proposed costs should be fully described in the budget justification.

**Longitudinal Tracking of Students:** Any student receiving a combination of \$3,000 (or more) in NASA funding and/or participating 160 hours or more on NASA-supported projects will be longitudinally tracked by NASA for three years using information provided on the NASA KY Student Information Form (SIF). Longitudinally tracked students will need to keep their information current through follow-up correspondence for the 3-year period.

## NASA KY Space Grant – Team Projects - \$15,000

**Description:** NASA Kentucky **Team Project (TP) awards** provide support for higher education student groups participating in competitions and design projects sponsored by NASA or related engineering and science organizations. Projects will be faculty-mentored and focus on authentic, hands-on student experiences in science and engineering disciplines, emphasizing active participation by students in hands-on learning and real-life problem-solving in organized competitions or capstone design. Teams are nominated and mentored by faculty. Proposals should demonstrate plans to recruit a diverse participant team.

Example competitions include but are not limited to: NASA Robotic Mining Competition, NASA University Student Launch, AIAA Design/Build/Fly, AUVSI, and RockOn. An expanded list of examples with links is available at [nasa.engr.uky.edu/space-grant](http://nasa.engr.uky.edu/space-grant) or by contacting NASA KY.

**Eligibility:** Proposals will be accepted from Principal Investigators at NASA Kentucky Space Grant Consortium Affiliate Institutions on behalf of teams of students in NASA-aligned disciplines. Women and minorities are strongly encouraged to apply. US citizenship for faculty or team members is not required.

**Requirements:** The proposed competition must be aligned with NASA priorities addressed by one or more NASA Mission Directorates. Connections with Kentucky companies and/or NASA Kentucky strategic themes will be viewed favorably. The proposal should demonstrate significant input from the faculty advisor to manage tangible results. See also Table 1.

**Proposal Content:** See *Submission Instructions* (pg. 1) for budget, format and filename instructions. All proposals should utilize the NASA KY cover sheet and budget form, followed by the project description and additional pages.

### 1) Project Description:

- No more than 5 pages including tables and figures describing: abstract (200-300 words), project summary, alignment with NASA Mission Directorate(s), specific goals for the funded period, milestones, anticipated outcomes, plans to communicate project opportunities, activities and results, prior experience with team competitions, and schedule of competition deadlines.
- Additional pages - included after 5-page project description
  - Bibliography/References as needed
  - Faculty Advisor's 2-page CV
  - Executive summary describing results of all prior NASA KY funding (not to exceed 1 page)
  - If applicable, letter of support from collaborator

**Budget Guidelines:** Proposers may request up to \$15,000 per team per year. Allowable costs include student stipend or salary, fringe benefits, registration fees, materials and supplies, shipping costs to/from competition site, and faculty advisor and student team member domestic travel. Required cost-share of at least 0.5:1 (\$CS:\$Award) must be provided by the proposing institution. Indirect costs are allowed and unrecovered indirect costs may be included as cost-share. The budget justification should demonstrate effective use of funds that align with the content and text of the proposed project. All proposed costs and cost-share should be fully described in the budget justification.

**Longitudinal Tracking of Students:** All students receiving support must be reported to NASA KY. Any student receiving a combination of \$3,000 or more in NASA funding and/or participating 160 hours or more on NASA-supported projects will be longitudinally tracked by NASA for three years using information provided on the NASA KY Student Information Form (SIF). Longitudinally tracked students will need to keep their information current through follow-up correspondence for the 3-year period.



## NASA KY Space Grant – Faculty Research Initiation Awards - \$40,000

**Description:** NASA Kentucky **Research Initiation Awards (RIA)** are a flexible funding program for faculty to become familiar with NASA research programs and Mission Directorates, establish and cultivate relationships with NASA scientists, and visit NASA facilities. RIA funding is the first step in the faculty pathway to build capacity to conduct NASA-aligned research. Next steps include NASA KY EPSCoR Research Infrastructure Development Grants (RIDG), student support for research through Graduate and Undergraduate Fellowships, and NASA research solicitations (ROSES etc). RIA proposals may include any combination of allowable costs below. Preference given to early-career faculty or faculty demonstrating change in research direction. Projects should contribute to program metrics, including publications, presentations, curriculum enhancement, and pursue follow-on funding.

**Eligibility:** Proposals will be accepted from Principal Investigators at NASA Kentucky Space Grant Consortium Affiliate Institutions to develop NASA-aligned research activities. Women and minorities are strongly encouraged to apply. US citizenship for students and faculty is not required.

**Requirements:** Proposed research topics must utilize NASA resources and identify alignment with NASA priorities addressed by one or more NASA Mission Directorates. Letter of support required detailing NASA (or related) collaboration and interaction to advise on the research direction. Connections with Kentucky companies and/or NASA Kentucky strategic themes will be viewed favorably. Principal Investigators are expected to submit at least one proposal for follow-on funding based on RIA activities. Renewal proposals should provide detail of results to date. See also Table 1.

**Proposal Content:** See *Submission Instructions* (pg. 1) for budget, format and filename instructions. All proposals should utilize the NASA KY cover sheet and budget form, followed by the project description and additional pages.

### 1) Project Description:

- No more than 5 pages including tables and figures describing: abstract (200-300 words), project summary, alignment with NASA Mission Directorate(s), specific goals for the funded period, milestones, anticipated outcomes, plans to communicate project activities and results, and plans for follow on funding.
- Additional pages - included after the 5-page project description
  - Bibliography/References as needed
  - Principal Investigator's 2-pg CV
  - List of Current and Pending Awards: Award title, sponsor, dates, amount, commitment
  - Executive summary describing results of all prior NASA KY funding (not to exceed 1 page)
  - Letter of support from a NASA (or related) collaborator expressing mutual interest in the research topic and agreement to collaborate and interact with the project, including meeting with the Principal Investigator in person at a research facility or a specific conference. (See [NASA KY FAQ](#))

**Budget Guidelines:** Proposers may request up to \$40,000 per year. Allowable direct costs include faculty salary, student stipend or salary, fringe benefits, tuition, materials and supplies, and domestic travel. Indirect costs are allowed and unrecovered indirect costs may be included as cost-share. Required cost-share of at least 1:1 (\$CS:\$Award) must be provided by the proposing institution. Space Grant is a workforce development program. In line with this, proposing institutions should use an "other" or training grant F&A rate (if one exists) versus the research F&A rate and indicate in the budget justification. The budget justification should demonstrate effective use of funds that align with the content and text of the proposed project. All proposed costs and cost-share should be fully described in the budget justification.

**Longitudinal Tracking of Students:** All students receiving compensation must be reported to NASA KY. Any student receiving a combination of \$3,000 or more in NASA funding and/or participating 160 hours or more on NASA-supported projects will be longitudinally tracked by NASA for three years using information provided on the NASA KY Student Information Form (SIF).

## NASA KY Space Grant – Mini-Grants - \$5,000

**Description:** NASA Kentucky **Mini-Grants (MG)** provide support for pre-college and educational outreach programs for science-related groups, at scientific sites (museums, observatories, planetariums, etc.), hosting pre-college students on campus, and group travel to NASA-related events. Project examples include educational outreach programs at planetariums and observatories; pre-college student field trips or workshops designed to recruit STEM students to the affiliate institution in disciplines of interest to NASA; professional development workshops for K-12 STEM teachers; and small group travel to Affiliate Institutions or to a NASA-related event such as Space Camp, AirVenture, rocketry competition or a scientific site.

**Eligibility:** Proposals will be accepted from Principal Investigators at NASA Kentucky Space Grant Consortium Affiliate Institutions who may collaborate with science-related groups or sites (museums, observatories, planetariums) or institution recruiters. Women and minorities are strongly encouraged to apply. US citizenship not required.

**Requirements:** The proposed activity must be aligned with NASA priorities addressed by one or more NASA Mission Directorates. Small group travel awards must support at least six students and/or educators on the proposed trip. Connections with Kentucky companies and/or NASA Kentucky strategic themes will be viewed favorably. See also Table 1.

**Proposal Content:** See *Submission Instructions* (pg. 1) for budget, format and filename instructions. All proposals should utilize the NASA KY cover sheet and budget form, followed by the project description and additional pages.

### 1) Project Description:

- No more than 5 pages including tables and figures describing: abstract (200-300 words), project summary, alignment with NASA Mission Directorate(s), specific goals for the funded period, milestones, event dates, anticipated outcomes, and plans to communicate project opportunities, activities and results.
- Additional pages - included after 5-page project description
  - Bibliography/References as needed
  - Principal Investigator's CV (2-pg limit)
  - Executive summary describing results of all prior NASA KY funding (not to exceed 1 page)
  - Letter of support from institution partner, scientific site and/or NASA collaborator

**Budget Guidelines:** Proposers may request up to \$5,000 per year. Allowable direct costs include registration and entry fees, materials and supplies, salary and fringe benefits for college student assistants, transportation (buses), domestic travel expenses for mentors, chaperone and students, and other related costs. Indirect costs are allowed. Cost-share not required, but match and in-kind cost-share of allowable costs are viewed favorably. The budget justification should demonstrate effective use of funds that align with the content and text of the proposed project. All proposed costs and cost-share should be fully described in the budget justification. Event meals and promotional items are not allowable as expenses or cost-share.

**Longitudinal Tracking of Students:** All students receiving support must be reported to NASA KY. Any student receiving a combination of \$3,000 or more in NASA funding and/or participating 160 hours or more on NASA-supported projects will be longitudinally tracked by NASA for three years using information provided on the NASA KY Student Information Form (SIF). Longitudinally tracked students will need to keep their information current through follow-up correspondence for the 3-year period.



## NASA Kentucky Space Grant Consortium Enhanced Mini-Grants (EMG)

### NASA KY Space Grant – Enhanced Mini-Grants - \$25,000

**Description:** NASA Kentucky **Enhanced Mini-Grants (EMG)** provide support for Affiliate Institutions to envision and pursue NASA-related STEM education objectives through post-secondary projects and pre-college activities. Project examples include short and long duration workshops, hands-on student activities, new or revised courses, professional development and pre-service teacher training, student-based programming at museums or science centers, or STEM competition teams. Projects must be aligned with NASA Mission Directorate initiatives, NASA Kentucky strategic themes, and/or NASA Space Grant objectives. Cost-share is required.

**Eligibility:** Proposals will be accepted from Principal Investigators at NASA Kentucky Space Grant Consortium Affiliate Institutions who may collaborate with scientific sites (museums, observatories, planetariums) or affiliate institution recruiters. Women and minorities are strongly encouraged to apply. US citizenship not required.

**Requirements:** The proposed activity must be aligned with NASA priorities addressed by one or more NASA Mission Directorates. Group travel awards must support an appropriate number of students and/or educators on the proposed trip. Connections with Kentucky companies and/or NASA Kentucky strategic themes will be viewed favorably. See also Table 1.

**Proposal Content:** See *Submission Instructions* (pg. 1) for budget, format and filename instructions. All proposals should utilize the NASA KY cover sheet and budget form, followed by the project description and additional pages.

#### 1) Project Description:

- No more than 5 pages including tables and figures describing: abstract (200-300 words), project summary, alignment with NASA Mission Directorate(s), specific goals for the funded period, milestones, event dates, anticipated outcomes, and plans to communicate project opportunities, activities and results.
- Additional pages - included after 5-page project description
  - Bibliography/References as needed
  - Principal Investigator's CV (2-pg limit)
  - Executive summary describing results of all prior NASA KY funding (not to exceed 1 page)
  - Letter of support from institution partner, scientific site and/or NASA collaborator

**Budget Guidelines:** Proposers may request up to \$25,000 per year. Allowable direct costs include registration and entry fees, materials and supplies, salary and fringe benefits for faculty, staff or college student assistants, transportation (buses), domestic travel expenses for mentors, chaperone and students, and other related costs. Indirect costs are allowed. Required cost-share of at least 1:1 (\$CS:\$Award) must be provided by the proposing institution. Unrecovered indirect costs may be used as cost-share. In-kind cost-share of all allowable costs is permitted. The budget justification should demonstrate effective use of funds that align with the content and text of the proposed project. All proposed costs and cost-share should be fully described in the budget justification. Event meals and promotional items are not allowable as expenses or cost-share.

**Longitudinal Tracking of Students:** All students receiving support must be reported to NASA KY. Any student receiving a combination of \$3,000 or more in NASA funding and/or participating 160 hours or more on NASA-supported projects will be longitudinally tracked by NASA for three years using information provided on the NASA KY Student Information Form (SIF). Longitudinally tracked students will need to keep their information current through follow-up correspondence for the 3-year period.