
# Kentucky Space Grant Consortium
# 2021 Request for Proposals

## Announcement: RFP-21-001

Release Date: April 6, 2021

**Proposals Due: Thursday, June 3, 2021, 5:00 pm ET**
Proposal files submitted online at nasa.engr.uky.edu

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Proposal forms, FAQ, and additional information available:
nasa.engr.uky.edu/space-grant and
nasa.engr.uky.edu/requests-for-proposals

# Kentucky Space Grant Consortium 2021 Request for Proposals

## NASA Kentucky Space Grant Consortium Overview

The NASA Kentucky Space Grant Consortium is a NASA Higher Education program with 27 Kentucky affiliates who support student fellowships and internships, research initiation projects, 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 national interests of NASA and the state needs of Kentucky.

## 2021 Request for Proposals

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

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

**Deadline:** Proposal files submitted online at nasa.engr.uky.edu by **5:00 pm ET, Thursday, June 3, 2021**.

**Period of Performance:** Awards up to 1 year in the period August 1, 2021 to July 31, 2022.

**Program Descriptions:** Included in the following pages.

**Number of Awards:** Number of awards per program category are determined by size of individual awards and available program funding levels. Approximately 20 awards expected.

**Submission limit**: 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. 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 *last name of proposer* and **PGM** is *program category abbreviation* (e.g., GF, REU, TP).

☐ *SIGNED COVER PAGE:* Complete NASA KY cover page form in Adobe Acrobat or Reader. Digital signatures are acceptable or print and sign the original document, then scan and save as PDF.
(File name format: **PI_PGM**_Cover_2021.pdf)

☐ *BUDGET and PROJECT DESCRIPTION:* Submit together as a single document.
(File name format: **PI_PGM**_Project_2021.pdf)

- BUDGET FORM AND JUSTIFICATION: Complete NASA KY budget form and include justification detailing all requested support and cost-share. Pages showing additional budget detail may be included.
- PROJECT DESCRIPTION:
  - 5 page limit – See program descriptions for required content
  - 12 point font, 1 inch margins, single spaced
- ADDITIONAL PAGES: See program descriptions for required elements

☐ *STUDENT INFORMATION FORM (SIF):* Include with GF and REU projects
(File name format: **SLN_PGM**_SIF_2021, where **SLN** is the *student's last name*.)

**Submit proposals online at nasa.engr.uky.edu by 5:00 pm ET, Thursday, June 3, 2021.**

**New and featured program elements:**

Waiver of match requirement: Team Projects (TP) led by regional universities or KCTCS no longer require match. New TP proposals will not require match. GF and RIA projects proposing KY-based research partnerships will not require match (limited selection). Voluntary match is accepted on all programs.

Recruitment: TP and EMG proposals must demonstrate plans to recruit diverse participants in areas including gender, race, ethnicity, background, and academic disciplines.

Communication of project activity: All projects must demonstrate *plans for communications* and/or featured media about project activities and results to the public or academic/educational community.

Mini-Grant amount: The maximum funding request for Mini-Grants (MG) has increased to $7,500. These projects do not require match.

Faculty mentorship: GF, REU and TP must demonstrate plans for faculty mentorship.

Citizenship: Cost-shared faculty effort no longer carries a citizenship requirement. Contributed effort from non-citizen faculty employed at Kentucky institutions may be accepted as cost-share.

Kentucky research collaborations: GF and RIA projects may choose to omit support letters from NASA or NASA-associated institutions and instead submit support letters from collaborators of Kentucky-based, aerospace-related research partnerships, for example, in partnership with Kentucky airports, logistics carriers, data science companies, electric vehicle manufacturers, multiple universities, etc. These proposals should still include narrative that discusses alignment with NASA goals and the potential for future NASA collaboration or follow-on funding. A limited number of such projects without NASA support letters may be selected.

Additional information and FAQ**:** nasa.engr.uky.edu/space-grant

**General Guidelines:** Proposals that omit required materials or exceed page limits may be rejected without review. Proposals from PIs 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 considered when 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 on any NASA KY funds under this RFP.
- *Travel* funds are restricted to domestic travel only.
- *Cost-share* must be from non-Federal sources.

**Eligibility for Kentucky Space Grant Awards:** Proposals will be accepted from NASA Kentucky Space Grant Consortium Affiliate Institutions. Affiliate Institutions are listed on pgs. 8-9 and may also be found at 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 each program category.

- 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 MG, EMG, TP and REU programs.
- Kentucky commercial and educational institutions (including K-12) who are not affiliates can participate in projects proposed by affiliate institutions.

**Cost-Share:** The NASA Office of STEM Engagement (OSTEM) requires cost-share of all state Space Grant consortia, therefore some NASA Kentucky Space Grant Consortium programs also require cost-share that contributes to the NASA requirement. Cost-share must be from non-Federal sources and not used as cost-share on other projects. Cost-share from non-US citizen faculty effort is allowable. Voluntary match is accepted on all programs.

**F&A Rates:** Space Grant is primarily a higher education workforce development program and it is important to propose projects that are aligned with the intent of the program, i.e,. projects that recruit and train Kentucky students for careers in aerospace-related science and technology or associated fields (e.g., logistics, manufacturing, education, etc). In line with this program, proposing universities and colleges should use their *"other sponsored projects" or training F&A rate* if one exists instead of their full research F&A rate. University of Kentucky on-campus proposers should use the 34% "Other" rate. A 10% *de minimis* indirect rate may be allowable for those institutions without an established Federal F&A rate. No F&A is permitted on NIFs awards (GF, REU) as directed by the NASA Office of STEM Engagement. Some projects may be funded by Kentucky state matching funds, which do not allow for F&A (to be determined at time of award).

**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.

**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.***"

## 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%)

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

| Funding Source | Award Program Category[1] | Program Acronym | Program Description | US Citizen Required[2] | Max Award Request | Indirect Costs Allowed | Required Cost-Share ($CS:$Award) | Level of NASA Collaboration |
|---|---|---|---|---|---|---|---|---|
| Space Grant | Graduate Fellowships | **GF** | Salary or stipend, tuition, materials and travel for MS and PhD students to conduct NASA-aligned research | Yes | $45,000 | No | 1:1[6] | NASA letter of support[3] |
| Space Grant | Research Experience for Undergraduates | **REU** | Salary or stipend, materials and travel for undergrad students to conduct NASA-aligned research | Yes | $8,000 | No | None required | Use of NASA resources[4] |
| Space Grant | Team Projects | **TP** | Materials, registration fees and travel for student teams participating in NASA-related competitions or design projects | No | $15,000 | Yes | 0.5:1[6] | Alignment with NASA objectives[5] |
| Space Grant | Research Initiation Awards | **RIA** | Faculty directed research to explore NASA collaborations and NASA-aligned research topics | No | $40,000 | Yes | 1:1[6] | NASA letter of support[3] |
| Space Grant | Mini-Grants | **MG** | Pre-college and science center outreach activities, targeted student recruiting and teacher PD | No | $7,500 | Yes | None required | Alignment with NASA objectives[5] |
| Space Grant | Enhanced Mini-Grants | **EMG** | 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[5] |

**Note:** Full program descriptions listed on pgs 12-17 of this RFP.

[1] PIs are limited to **two (2) proposal submissions per program category**.

[2] **US Citizenship** is required for students receiving direct support under NIFS awards (GF, REU). Citizenship is not required for other programs.

[3] 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 do not qualify as letters of support. (See NASA KY FAQ for more information.) 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, etc. A limited number of proposals for KY Research Partnerships may be selected which do not require NASA-affiliated letters of support.

[4] NASA resources include **facilities and collaborators or other resources** such as datasets, modeling, source code, curricula, images, citizen science projects, etc. developed and made available to the public or researchers by NASA or NASA-supported missions. Links to resources available through NASA research results are available at NASA STI: https://sti.nasa.gov/.

[5] See following sections for description of **NASA STEM Engagement and NASA Research objectives**.

[6] **Match requirement waived** for the following: TP proposals led by regional universities or KCTCS; new TP proposals; GF and RIA projects in collaboration with state research partners (limited selection; voluntary match accepted).

## 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.

Proposals shall address how the proposed project and its programmatic elements directly align with goals and objectives of the Kentucky Space Grant Consortium, the National Space Grant Program and the NASA Strategy for STEM Engagement as outlined below. Proposals should align with one or more of Kentucky Space Grant's strategic themes and/or the research priorities of NASA Mission Directorates and Centers (see below).

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 Consortium Profile

**Kentucky Space Grant Consortium (KSGC),** a diverse group of 27 affiliate members, including 18 Kentucky universities, colleges and community colleges, 5 industry partners and 4 science centers, uses a portfolio-of-programs approach and best practices to set students and faculty on *Pathways of Opportunities* towards aerospace-related career goals, contributing to a skilled, high-performing and diverse workforce to meet emerging needs of both NASA and Kentucky. KSGC programs engage competitively-selected participants in STEM education and training primarily at the post-secondary level, including developmental pipeline pre-college programs. Diversity of students, faculty, academic disciplines and institutional types is essential and integral to this approach. NASA Mission Directorate and OSTEM alignment is required for all programs. Three current strategic themes chosen by KSGC are ***Data + Science***, ***Earth + Space***, and ***Aerospace + Innovation***. These themes enable multiple programs to be unified in a portfolio approach that can be balanced to serve state and national aerospace needs. A fundamental premise of KSGC programs is that STEM education should reach out to inspire and recruit talent from all student populations to engage and enable innovative contributions to NASA and the National Space Grant College and Fellowship Program. Special focus areas to increase program and participant diversity in Kentucky include participation from minority-serving institutions, community and technical colleges, students from rural and urban historically underserved backgrounds, students with disabilities, and minority and female students and faculty.

Proposals to KSGC are competitively selected under specific funding programs. NASA Center Internships (NCI), Kentucky Industry Internships (KII), Graduate Fellowships (GF) and Research Experience for Undergraduates (REU) offer hands-on NASA-aligned training, guided by NASA, industry and faculty mentors, serving to advance the student's knowledge and provide experience of working with technical professionals in support of NASA's missions or with established and start-up aerospace companies in Kentucky. Team Projects (TP) support faculty-mentored experiences focused on authentic, hands-on design in science and engineering to inspire innovation, including participation in team competitions and flight opportunities. Research Initiation Awards (RIA) support early-career faculty building NASA-aligned research programs as one entry point to sustained NASA research collaboration and development of student-mentoring opportunities. Mini-Grants (MG) and Enhanced Mini-Grants (EMG) provide higher education and pre-college opportunities aligned with Kentucky and NASA priorities including STEM camps and competitions, K-12 teacher training, and museum-based astronomy and aerospace programs. Kentucky Space Grant Consortium began serving the Commonwealth in 1991 and since 2010 has been managed by NASA Kentucky at the University of Kentucky.

## Kentucky Space Grant Strategic Themes

***Strategic Theme 1: Data + Science (Multidisciplinary Data Science)***

Data science is central to the future of many research fields and investigators find themselves challenged with managing exponentially growing datasets. This is true for NASA Kentucky Affiliates pursuing research in exo-solar discovery, space-based astronomy, ground-based astronomy, earth science, atmospheric science, and meteorology, among others. Cybersecurity, secure communications and data fidelity are also topics of special concern due to widespread usage of data-collection sensors and peer-to-peer networking architecture. Training in data science methods can benefit students across disciplines. This theme captures the need to address data science in multiple NASA-related disciplines as well as interconnect and support Kentucky's growth in data science degree programs and supercomputer applications, to establish additional NASA collaborations, and engage use of NASA resources including high-end computing and large datasets. Data mining and analyzing NASA databases are recurring themes cross-cutting many NASA opportunities. KSGC projects that engage these pursuits will be better positioned to participate in new discovery and to compete for follow-on funding from NASA and other sponsors.

This theme has relevant topics to engage all KSGC affiliates, including museums and science centers, businesses, community colleges and 4-year institutions. Related areas such as data visualization and virtual reality are outreach tools that can communicate technical concepts and enable younger students and the public to better understand scientific studies and results. Data science finds new relevance when associated with related tangible experience, therefore this theme encourages project concepts to associate data science with experiential approaches in which a hands-on component helps students better understand and engage with data science methods. Examples include data collection in conjunction with ground-based astronomical observations from Kentucky's several observatories or student-led flight projects such as drones or scientific balloons that fly data-collection instruments. **NASA Mission Directorate (MD) Alignment: SMD, HEOMD, STMD, ARMD**

***Strategic Theme 2: Earth + Space (Earth & Space Discovery)***

The 2020-2024 Space Grant cycle represents an exciting moment for Kentucky Space Grant Consortium affiliates to engage in earth and space discovery like never before, with new opportunities enabled by growth of commercial spaceflight, development of NASA's Artemis and Gateway lunar programs, and satellite and flight-based research platforms that will enable Kentucky students and faculty to increasingly participate in space-related scientific missions and discovery at national and local levels. Many of these efforts can be utilized to address challenges facing life on Earth. Geosciences, such as atmospheric science and meteorology, will continue recent advancements thanks to new approaches in remote sensing and data collection. Earth analogue studies can be used to help understand other solar system bodies and exoplanets, as studies of other planets and moons can be used to help understand Earth. Atmospheric flight missions offer Kentucky students the chance to be significantly engaged in scientific investigation with near-space balloon missions, UAV flight campaigns, parabolic aircraft flights, or sounding rocket launches that can serve as important milestones in a student's academic career. Consortium pre-college efforts can be targeted towards the next group of college students to prepare for Space Grant projects focused on the 2024 total solar eclipse. Opportunities exist as well for Kentucky students to participate in missions beyond Earth. Microgravity research is being utilized to develop new insight into the influence of gravity and understand fundamental physical phenomena. Re-entry spacecraft are being developed to study atmospheric fluid dynamics and improve thermal protection systems. Students can be involved with NASA's Artemis mission, via internships and research fellowships, as well as with NASA's Lunar Gateway Program, lunar-related technology development and other lunar missions such as GLEE and lunar-orbiting small satellites.
**NASA MD Alignment: SMD, HEOMD, ARMD**

***Strategic Theme 3: Aerospace + Innovation (KY Engineering, Technology & Workforce Development)***

Kentucky's aerospace industry continues to grow along with the state's role as a leader nationally in aerospace manufacturing product exports. In relation to the importance of Kentucky's aerospace manufacturing, more

employees trained in advanced manufacturing skills are needed by the state's industries. Kentucky Space Grant team projects have been effective for motivating students at all levels to become involved in teamwork activities that pursue innovation and problem-solving, such as the NASA Human Exploration Rover Challenge and Robotic Mining Competition (Lunabotics). This cycle of Space Grant continues these kind of opportunities for students to be engaged in a learning framework that contributes to student retention and degree attainment and that benefits the state's workforce needs. From pre-college STEM motivation to post-secondary research and engineering careers, this theme brings together a common thread of engagement, innovation and enterprise that improves career readiness and workforce development at all levels. Internships contribute to this theme by allowing Kentucky students opportunity to increase their skill and work experience through the summer by working at one of ten NASA Centers nationally or with aerospace-related industries within the state. Technology-focused research fellowships, performed in Kentucky university labs in collaboration with NASA personnel, support NASA's missions and work and contribute to the state's research and entrepreneurial activity in significant areas including hypersonics, electric aircraft, energy storage, materials science, robotics, artificial intelligence, thermal protection, small satellites and more. These academic and internship experiences prepare students to contribute to aerospace workforce and technology sectors in support of the Consortium's industrial affiliates, the state's employers, university research enterprises and new technology commercialization. **NASA MD Alignment: HEOMD, STMD, ARMD**

## 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. The NASA Kentucky Space Grant Consortium receives state support through the Cabinet for Economic Development and the statewide Kentucky EPSCoR Committee, the University of Kentucky, and cost-share commitment from affiliate institutions statewide.

## 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. 12-13).

**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. 15).

**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 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. 14, 17).

**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 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 Pre-College and Informal Education program elements, NASA KY offers **Mini-Grant** (MG) and **Enhanced Mini-Grant** (EMG) programs (pgs. 16-17).

## NASA Kentucky Space Grant Consortium Membership

The Kentucky Space Grant Consortium consists of 18 academic affiliates and 9 non-academic affiliates across the Commonwealth. Affiliate institutions and contact information for affiliate representatives are listed below:

### Academic Affiliates

| | | |
|---|---|---|
| **Asbury University** | Dr. Duk Lee | duk.lee@asbury.edu |
| **Ashland CTC** | Mark Riggs | mark.riggs@kctcs.edu |
| **Bellarmine University** | Dr. Akhtar Mahmood | amahmood@bellarmine.edu |
| **Berea College** | Dr. Tracy Hodge | tracy_hodge@berea.edu |
| **Bluegrass CTC** | Tracy Knowles | tracy.knowles@kctcs.edu |
| **Centre College** | Dr. Jim Kelly | james.kelly@centre.edu |
| **Eastern Kentucky University** | Dr. Anthony Blose | anthony.blose@eku.edu |
| **Hopkinsville CC** | Sherry McCormack | smccormack0001@kctcs.edu |
| **Kentucky State University** | Dr. Jens Hannemann | jens.hannemann@kysu.edu |
| **Morehead State University** | Dr. Tom Pannuti | t.pannuti@moreheadstate.edu |
| **Murray State University** | Dr. Aleck Leedy | aleedy@murraystate.edu |
| **Northern Kentucky University** | Dr. Scott Nutter | nutters@nku.edu |
| **Owensboro CTC** | Shawn Payne | shawn.payne@kctcs.edu |
| **Thomas More College** | Dr. Wes Ryle | wesley.ryle@thomasmore.edu |
| **University of Kentucky** | Dr. Janet Lumpp | jklumpp@uky.edu |
| **University of Louisville** | Dr. John Kielkopf | john.kielkopf@louisville.edu |
| **West Kentucky CTC / CLC** | Mellisa Duncan | mellisa.duncan@kctcs.edu |
| **Western Kentucky University** | Dr. Mike Carini | mike.carini@wku.edu |

### Non-Academic Affiliates

| | | |
|---|---|---|
| **Aviation Museum of Kentucky** | Ed Murphy | em1234@twc.com |
| **Challenger Learning Center of KY** | Tom Cravens | tom.cravens@kctcs.edu |
| **Faradine Systems** | Jason Rexroat | jason@faradinesystems.com |
| **Global Parametrics** | Dr. Jerry Skees | jskees@globalparametrics.com |

| | | |
|---|---|---|
| **Innoviator, LLC** | Alan Beaven | alan@innoviator.com |
| **Kentucky Science and Technology Corporation** | Terry Samuel | tsamuel@kstc.com |
| **Kentucky Science Center / CLC** | Veronica Greenwell | Veronica.Greenwell@louisvilleky.gov |
| **Living Arts and Science Center** | Jessica Byassee | jbyassee@lasclex.org |
| **Space Tango, Inc.** | Twyman Clements | tclements@spacetango.com |

## 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 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. For information on NASA's missions and educational objectives, please visit www.nasa.gov/missions/index.html and the following URLs:

- 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)

- NASA Office of STEM Engagement (https://www.nasa.gov/stem)
- NASA OSTEM Higher Education (https://www.nasa.gov/stem/highereducation/index.html)
- NASA SMD Science Education (https://science.nasa.gov/learners/science-activation-teams)
- NASA Space Grant (https://www.nasa.gov/stem/spacegrant/home/index.html)
- NASA EPSCoR (https://www.nasa.gov/stem/epscor/home/index.html)

## NASA Mission Directorate (MD) Descriptions

**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

## 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. Projects that propose Kentucky research partnerships may choose instead to submit a support letter from KY-based collaborators (limited selection). 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 (pg. 4).

**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 student's 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)
  - Student's resume and unofficial transcript
  - 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 prior NASA KY funding (not to exceed 1 page)
  - Letter of support from a NASA (or related) or KY collaborator (See also Table 1 and 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. Projects that propose Kentucky research collaborations may choose to waive cost-share (limited selection). 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. 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 KY Space Grant – Research Experience for Undergraduates - $8,000

**Description:** NASA Kentucky **Research Experience for Undergraduates (REU)** recognize and support undergraduate students addressing scientific 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 student degree progress. See also Table 1 (pg. 4).

**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 student 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)
  - Student's resume and 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 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. 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.

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 or by contacting NASA KY.

**Eligibility:** Proposals will be accepted from Principal Investigators at NASA Kentucky Space Grant Consortium Affiliate Institutions on behalf of student teams or clubs in NASA-aligned disciplines. Women and minorities are strongly encouraged to apply. US citizenship 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. Proposals must demonstrate plans to recruit diverse participants in areas including gender, race, ethnicity, background, and academic disciplines if applicable. See also Table 1 (pg. 4).

**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 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. 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. Cost-share is waived for new team projects and projects proposed by teams from regional universities or KCTCS.

**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 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. Projects that propose Kentucky research partnerships may choose instead to submit a support letter from KY-based collaborators (limited selection). 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 (pg. 4).

**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 prior NASA KY funding (not to exceed 1 page)
  - Letter of support from a NASA (or related) or KY 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 also Table 1 and 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. Projects that propose Kentucky research collaborations may choose to waive cost-share (limited selection). 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. 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.

## NASA KY Space Grant – Mini-Grants - $7,500

**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 institutional 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 (pg. 4).

**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 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 $7,500 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 should be fully described in the budget justification. Event meals and promotional items are *not allowable* as expenses.

**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 – 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 educational 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. Proposals must demonstrate plans to recruit diverse participants in areas including gender, race, ethnicity, background, and academic disciplines if applicable. See also Table 1 (pg. 4).

**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 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. 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.