NASA Kentucky EPSCoR
Research Infrastructure Development (RID)
2022 Request for Proposals

Announcement: RFP-22-005

Release Date: July 19, 2022

Proposals Due: Wednesday, September 21, 2022, 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/epscor and nasa.engr.uky.edu/requests-for-proposals

NASA KY EPSCoR RID 2022 Request for Proposals

NASA Kentucky EPSCoR RID Program Overview

The NASA Kentucky EPSCoR (Established Program to Stimulate Competitive Research) Programs promote aerospace-related research capability in the state in areas of importance to NASA and Kentucky. Under these EPSCoR programs, Kentucky's Research Infrastructure Development (RID) program awards competitive seed research grants to faculty at Kentucky higher education institutions for scientific and technology development in collaborative partnership with NASA researchers. The Kentucky RID program supports NASA EPSCoR objectives to grow research capacity in the state and increase NASA-related economic impact. Kentucky's NASA EPSCoR investment is strongly focused on developing early-career researchers at state institutions to become nationally and internationally recognized for contributions in their fields. Equally important to building research capacity are the resulting contributions to economic development, evidenced by securing follow-on research funding from non-EPSCoR sources and supporting Kentucky aerospace industry development and associated job creation.

Request for Proposals

NASA KENTUCKY invites proposal submissions for the following:
Research Infrastructure Development Grants (RIDG) and **Workshop/Conference/Seminar (WCS)** awards

Period of Performance: Awards up to one year in the period January 1, 2023 to December 31, 2023.

Program Descriptions: See following pages for description of RIDG and WCS programs.

Cost-Share: No cost-share required

Numbers of Awards: Numbers of awards in each category are determined by size of individual awards and available program funding levels. 5-7 RIDG awards and 2 WCS awards are expected.

Eligibility: Proposals will be accepted from institutions of higher education and affiliated organizations in Kentucky. Eligibility is not limited to NASA Kentucky Space Grant Consortium Affiliate Institutions. US Citizenship not required.

Submission limit: PIs are limited to one (1) proposal submission per program category. There is no limit on collaboration as a Co-I.

Additional information and FAQ: nasa.engr.uky.edu/epscor

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 the proposal as follows, in which PI is last name of proposer and PGM is the program category abbreviation (RIDG or WCS).

- ☐ *SIGNED COVER PAGE:* Scan the signed original and save as PDF. Digital signatures are acceptable. (filename format: PI_PGM_Cover_2022.pdf)
- ☐ *BUDGET FORM AND NARRATIVE:* Complete NASA KY budget form and Include justification detailing requested support. (filename format: PI_PGM_Budget_2022.pdf)
- ☐ *PROJECT DESCRIPTION:* (filename format: PI_PGM_Project_2022.pdf)
  - 12-point font, 1-inch margins, single spaced
  - 5-page limit - See specific program guidelines for required content
  - Additional pages - See specific program guidelines for lists of documents

Submit proposals online at nasa.engr.uky.edu by 5:00 pm ET, Wednesday, September 21, 2022.

General Guidelines

Proposals that omit required materials or exceed the 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 taken into consideration 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 under this RFP.
- *Travel* funds are restricted to domestic travel only.

F&A Rates: NASA EPSCoR is a research development program and proposing universities and colleges should use their full research rate for F&A. Some proposals will be funded by a state funding source, which does not allow for indirect costs.

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 updates post-award. Reporting must be current in order for NASA KY to meet NASA and state annual report cycles.

No-Cost Extensions: 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: 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: 80NSSC22M0034.*"

Review Process

Proposals will be rated, ranked and funded up to the budgeted amount available for each program. As a panel, 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. The NASA Kentucky EPSCoR Subcommittee, external content specialists and NASA KY program staff will review proposals and rate them based on the following criteria:

- MERIT: Intrinsic merit of the proposed research (40%)
- RELEVANCE: Relevance of proposed research to NASA and Kentucky priorities; alignment with NASA EPSCoR program objectives (20%)
- FOLLOW-ON: Specific plans for pursuing follow-on funding including further development of NASA and industry collaborations (20%)
- MANAGEMENT: Management and evaluation; Successful and timely completion of prior proposed NASA Kentucky projects and reporting (10%)
- BUDGET: Reasonableness of budget narrative (10%)

Table 1. Summary of NASA Kentucky EPSCoR RID Programs

Funding Source	Award Program Category[1]	Program Acronym	Program Description	US Citizenship Required	Max Award	Indirect Costs Allowed	Required Cost-Share	NASA Collaboration
NASA EPSCoR	Research Infrastructure Development Grants	RIDG	Faculty-directed research to enhance existing collaborations with NASA partners	No	$35,000	Yes	None required	NASA letter of support[2]
NASA EPSCoR	Workshop/ Conference/ Seminar Awards	WCS	Researchers meeting to explore aerospace topics and joint funding opportunities	No	$2,000	Yes	None required	Letter of support from partner[3]

Note: Full program descriptions listed on following pages of this RFP.

[1] PIs are limited to **one (1) proposal submission per program category.** There is no limit on collaboration as a Co-I.

[2] Letter of support required **that describes NASA partnership or collaboration with the project**. Letters of support do not include letters of affirmation (i.e., letters that only endorse the value or merit of a proposal). 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 about NASA letters of support.)

[3] Letter of support describing **support to the project proposal from committed partners** (not required to be NASA partners).

Research Alignment and Collaboration

Programmatic alignment is a determining factor in this funding program. Proposals to this program must address objectives described below and in the following sections. Proposals should align with NASA's missions and research as well as national and state NASA EPSCoR objectives. Proposers should seek to establish a research effort that can contribute to sustainable research capabilities in the state. Proposers should refer to proposal resources available on the NASA KY EPSCoR web page, including the NASA Center Core Competencies, the 2020 NASA Technology Taxonomy and the FY2023 NASA EPSCoR Research Areas of Interest.

National NASA EPSCoR Program Objectives

- Contribute to and promote the development of research infrastructure in NASA EPSCoR jurisdictions in areas of strategic importance to the NASA mission;
- Improve the capabilities of the NASA EPSCoR jurisdictions to gain support from sources outside the NASA EPSCoR program;
- Develop partnerships among NASA research assets, academic institutions, and industry;
- Contribute to the overall research infrastructure, science and technology capabilities, higher education, and/or economic development of the jurisdiction; and
- Work in close coordination with the NASA Space Grant program to improve the environment for science, mathematics, engineering, and technology education in the jurisdiction.

Kentucky NASA EPSCoR Program Objectives

The statewide Kentucky EPSCoR Program mission is to enhance research and intellectual capacity of the state's universities and colleges by building and coordinating strategic investments in human capital necessary for Kentucky to excel in Federal R&D funding competitiveness. Derived from this statewide mission, the NASA Kentucky EPSCoR Program has goals to enhance capacity through strategic investments focused on NASA-priority research areas and competitiveness for non-EPSCoR funding.

A key factor in achieving these goals is initiation of relationships between Kentucky's and NASA's researchers that develop into partnerships. Every aspect of the program emphasizes the process of relationship building, including the contribution of early-career faculty in helping to solve NASA technical problems.

NASA KY EPSCoR investment is focused on NASA priorities including Aeronautics, Science, Human Spaceflight and Space Technology missions, ISS National Laboratory, lunar and planetary exploration, to develop researchers in Kentucky who are nationally and internationally recognized for contributions to their fields.

Equally important to building research capacity are the resulting contributions to economic development evidenced by securing follow-on research funding from non-EPSCoR sources and supporting aerospace-related industrial development and associated job creation. Growth in economic development opportunities as a result of the NASA EPSCoR investment is therefore also a jurisdictional emphasis underlying all aspects of the program. The NASA Kentucky EPSCoR Program receives state support through the Kentucky Cabinet for Economic Development and the statewide Kentucky EPSCoR Committee, the University of Kentucky, and participating institutions statewide.

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-related research. The strategy further defines actions to catalyze investment in high-value areas and to build industry/academic partnerships for STEM workforce development, goals which intersect with priorities of both the NASA Kentucky EPSCoR and Kentucky Space Grant Consortium programs.

NASA Research and Technology Development Priorities

The NASA EPSCoR Program and the NASA Office of STEM Engagement (OSTEM) identify research and technology priorities based on alignment with NASA's five Mission Directorates: Aeronautics Research Mission Directorate (ARMD), Exploration Systems Development Mission Directorate (ESDMD), Science Mission Directorate (SMD), Space Operations Mission Directorate (SOMD), and Space Technology Mission Directorate (STMD). For information on NASA's missions, please visit www.nasa.gov/missions/index.html and the following URLs:

- Aeronautics Research (http://www.aeronautics.nasa.gov/)
- Exploration Systems Development (https://www.nasa.gov/directorates/exploration-systems-development)
- Science (http://science.nasa.gov/)
- Space Operations (https://www.nasa.gov/directorates/space-operations-mission-directorate
- Space Technology (http://www.nasa.gov/directorates/spacetech/home/index.html)
- NASA Office of STEM Engagement (OSTEM) (https://www.nasa.gov/stem)
- NASA OSTEM Higher Education (https://www.nasa.gov/stem/highereducation/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.

Exploration Systems Development Mission Directorate (ESDMD): The Exploration Systems Development Mission Directorate defines and manages systems development for programs critical to the NASA's Artemis program and planning for NASA's Moon to Mars exploration approach in an integrated manner. ESDMD manages the human exploration system development for lunar orbital, lunar surface, and Mars exploration. ESDMD leads the human aspects of the Artemis activities as well as the integration of science into the human system elements. ESDMD is responsible for development of the lunar and Mars architectures. Programs in the mission directorate include Orion, Space Launch System, Exploration Ground Systems, Gateway, Human Landing System, and Extravehicular Activity (xEVA) and Human Surface Mobility. ESDMD duties were previously managed under the Human Exploration and Operations Mission Directorate (HEOMD).

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 Operations Mission Directorate (SOMD): NASA's Space Operations Mission Directorate (SOMD) is responsible for enabling sustained human exploration missions and operations in our solar system. SOMD manages NASA's current and future space operations in and beyond low-Earth orbit (LEO), including commercial launch services to the International Space Station. SOMD operates and maintains exploration systems, develops and operates space transportation systems, and performs broad scientific research on orbit. In addition, SOMD is responsible for managing the space transportation services for NASA and NASA-sponsored payloads that require orbital launch, and the agency's space communications and navigation services supporting all NASA's space systems currently in orbit. SOMD duties were previously managed under the Human Exploration and Operations Mission Directorate (HEOMD).

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.

Research Infrastructure Development Grants (RIDG) - $35,000

Description: NASA EPSCoR programs seek to strengthen research capability in the state by promoting development of research infrastructure, improving capabilities to gain support outside of EPSCoR, and developing partnerships with NASA. Proposals submitted for **Research Infrastructure Development Grants (RIDG**) must be aligned with one or more of NASA's Mission Directorates (MD) and advance a collaboration between Kentucky researchers and NASA partners. RIDG funding builds NASA partnerships to develop a successful seed investigation into being competitive for follow-on funding, including next-level preparation for submission to the three-year NASA EPSCoR Research Area (RA) or other nationally competitive solicitations. RIDG support is sufficient for a combination of PI salary, student research assistants, tuition, supplies, publication costs and travel. Faculty and institutions may design a budget within the guidelines to meet the needs of the researcher, institution and planned NASA partnership. Each funded NASA KY EPSCoR proposal is expected to establish research activities that will address strategic research and technology development priorities of a NASA Mission Directorate and contribute to the overall research infrastructure, science and technology capabilities, higher education and economic development of the jurisdiction (KY).

Eligibility: Proposals will be accepted from institutions of higher education in Kentucky. Eligibility is not limited to NASA KY Space Grant Consortium Affiliate Institutions. US citizenship is not required.

Requirements: The proposed activity must identify alignment with NASA priorities addressed by one or more of the Mission Directorates. A letter of support is required describing NASA (or related) involvement with the project. Funded research activities should result in submission of a joint publication. Strengthened partnerships will result from the collaboration and provide an established foundation for submission to EPSCoR Research Area or non-EPSCoR funding opportunities. Funded projects will be expected to develop plans for follow-on funding and should result in submission of one or more proposals. 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 including specific goals for the funded period, milestones and anticipated outcomes, NASA alignment, plans to communicate project activities and results and plans for follow-on funding. Proposals must describe a schedule for regular contact with a NASA collaborator or a collaborator from a NASA-affiliated organization and plan for a technical interchange visit to the NASA site or an academic conference.
- Additional pages - included after 5-page project description
  - Bibliography/References as needed
  - Principal Investigator's 2 page CV; 1 page CV for Co-Is
  - List of Current and Pending Awards: Award title, sponsor, dates, amount, commitment
  - Executive summary describing results and impact of prior NASA KY funding (not to exceed 1 page)
  - Letter of support (or email) from a NASA collaborator (or related organization) indicating mutual interest in the proposed research project, relevance to NASA priorities and willingness to participate in the proposed research.

Budget Guidelines: Proposers may request up to $35,000 for one year. Allowable costs include faculty salary, student stipend or salary, fringe benefits, tuition, materials and supplies, publication costs and domestic travel. Indirect costs are allowed. No cost-share is 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: All students receiving compensation must be reported to NASA KY.

Workshop/Conference/Seminar Grants (WCS) - $2,000

Description: NASA EPSCoR programs seek to strengthen research capability in the state by promoting development of research infrastructure, improving capabilities to gain support outside of EPSCoR and developing partnerships with NASA. Proposals submitted for **Workshop/Conference/Seminar (WCS)** awards must be aligned with one or more of NASA's Mission Directorates (MD) and increase collaboration among Kentucky researchers and NASA partners. Workshop funding can build Kentucky and NASA partnerships to develop interdisciplinary teams interested in pursuing the three-year EPSCoR Research Area (RA) or other nationally competitive solicitations; conference funding can provide partial support for a local, regional, national or international meeting hosted in Kentucky focused on NASA-related research; and seminar funding can support a series of seminars or webinars on an aerospace-related topic.

Eligibility: Proposals will be accepted from institutions of higher education and affiliated organizations in Kentucky. Eligibility is not limited to NASA Kentucky Space Grant Consortium Affiliate Institutions. US citizenship is not required.

Requirements: WCS activities must be aligned with NASA priorities addressed by one or more of the Mission Directorates. WCS projects must be promoted regionally or statewide, impacting at least six participants from at least two different organizations. A summary document of the meeting/sessions that summarizes the discussion should be prepared and submitted post-meeting. NASA EPSCoR and the NASA Kentucky EPSCoR Program must be acknowledged as sponsors of the event. Connections with Kentucky companies 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 MD, specific goals for the funded period and anticipated outcomes. Proposals must describe a schedule and identify potential participants.

- Additional pages - included after the 5-page project description
  - Bibliography/References as needed
  - Principal Investigator's 2-page CV
  - Letter of support from institution partner, scientific site and/or NASA collaborator

Budget Guidelines: Anticipated award levels are $500 up to a maximum award amount of $2,000. Allowable costs include transportation and lodging for participants and guest speakers, speakers' fees (not honoraria), and meeting room rental. Food costs are not allowed. No cost-share is required, however partnerships are strongly encouraged and will be viewed favorably. Indirect costs are allowed.