



## 2022 NASA EPSCoR RID Proposal Abstracts

---

---

### Contents

22-2022 RID-0001.....	3
SC NASA EPSCoR Research Infrastructure Development (RID) 2022 - 2027.....	3
22-2022 RID-0002.....	3
South Dakota NASA EPSCoR Research Infrastructure Development Program.....	3
22-2022 RID-0003.....	4
NASA Oklahoma EPSCoR Research Infrastructure Development.....	4
22-2022 RID-0004.....	5
Iowa NASA EPSCoR Competitive Research Network (CoRN).....	5
22-2022 RID-0005.....	6
Research Infrastructure Development (RID) in West Virginia.....	6
22-2022 RID-0006.....	7
The Kansas NASA EPSCoR Research Infrastructure Development (RID) Program.....	7
22-2022 RID-0007.....	7
ALASKA'S NASA EPSCoR Program 2022-2027.....	7
22-2022 RID-0008.....	8
New Mexico NASA EPSCoR Research Infrastructure Development (RID).....	8
22-2022 RID-0009.....	9
Building Maine's New Space Economy.....	9
22-2022 RID-0010.....	10
North Dakota NASA EPSCoR: Promoting Research Infrastructure Development and Engagement in North Dakota.....	10
22-2022 RID-0011.....	11
PR NASA EPSCoR Research Infrastructure Development.....	11
22-2022 RID-0012.....	12
The Hawaii NASA EPSCoR Research Infrastructure Development Program.....	12
22-2022 RID-0013.....	12



## 2022 NASA EPSCOR RID Proposal Abstracts

---

---

<i>Nevada NASA EPSCoR Research Infrastructure Development .....</i>	<i>12</i>
<i>22-2022 RID-0014.....</i>	<i>13</i>
<i>NASA Kentucky EPSCoR Research Infrastructure Development (RID) Program 2022-2026.....</i>	<i>13</i>
<i>22-2022 RID-0015.....</i>	<i>15</i>
<i>The Vermont NASA EPSCoR Research Infrastructure Development Program.....</i>	<i>15</i>
<i>22-2022 RID-0016.....</i>	<i>16</i>
<i>NASA EPSCoR Research Infrastructure Development in Louisiana.....</i>	<i>16</i>
<i>22-2022 RID-0017.....</i>	<i>17</i>
<i>A Plan for NASA EPSCoR Research Infrastructure Development (RID) in Delaware.....</i>	<i>17</i>
<i>22-2022 RID-0018.....</i>	<i>18</i>
<i>Established Program to Stimulate Competitive Research (EPSCoR) - Research Infrastructure Development (RID) .....</i>	<i>18</i>
<i>22-2022 RID-0019.....</i>	<i>18</i>
<i>Mississippi NASA EPSCoR Research Infrastructure Development Program (RID) .....</i>	<i>18</i>
<i>22-2022 RID-0020.....</i>	<i>19</i>
<i>Arkansas NASA EPSCoR Research Infrastructure Development (RID) 2022 .....</i>	<i>19</i>
<i>22-2022 RID-0021.....</i>	<i>20</i>
<i>NEW HAMPSHIRE NASA EPSCoR RESEARCH INFRASTRUCTURE DEVELOPMENT PROGRAM (2022- 2027).....</i>	<i>20</i>
<i>22-2022 RID-0022.....</i>	<i>21</i>
<i>Montana NASA EPSCoR Research Infrastructure Development (RID) Program 2022-2026 .....</i>	<i>21</i>
<i>22-2022 RID-0023.....</i>	<i>22</i>
<i>NASA Nebraska EPSCoR Research Infrastructure Development (RID) FY22-26 .....</i>	<i>22</i>
<i>22-2022 RID-0024.....</i>	<i>23</i>
<i>Alabama NASA EPSCoR FY2022 Research Infrastructure Development .....</i>	<i>23</i>
<i>22-2022 RID-0025.....</i>	<i>24</i>
<i>Idaho NASA EPSCoR Research Infrastructure Development 2022.....</i>	<i>24</i>



## 2022 NASA EPSCOR RID Proposal Abstracts

---

22-2022 RID-0026.....	25
<i>Wyoming NASA EPSCoR Research Infrastructure Development (RID) Proposal: 2022-2027.....</i>	<i>25</i>
22-2022 RID-0027.....	26
<i>NASA EPSCoR in the Virgin Islands of the United States .....</i>	<i>26</i>
22-2022 RID-0028.....	28
<i>NASA Guam EPSCoR Research Infrastructure Development (RID) Program .....</i>	<i>28</i>

### 22-2022 RID-0001

#### SC NASA EPSCoR Research Infrastructure Development (RID) 2022 - 2027

##### **College of Charleston**

##### **Dr. Cassandra Runyon**

The South Carolina Space Grant Consortium (SCSGC) requests \$1,000,000 for its 2022-2027 NASA EPSCoR Research Infrastructure Development (RID) program to further research and improve the quality of South Carolinas future workforce. This RID program will provide support for research and subsequent proposal preparation for scientists, engineers and students working to fulfill NASAs mission requirements in support of NASAs Vision to reach for new heights and reveal the unknown. In South Carolina, the NASA EPSCoR programs goal is to foster academic research that enables faculty to meet NASA mission objectives and to develop a self-sustaining, nationally competitive research program that can successfully compete for non-EPSCoR funds. A partnership between the SC NASA EPSCoR / SC Space Grant Consortium (SCSGC) Office and the SC EPSCoR/IDeA program helps SC researchers to establish contacts with and access resources from NASA. The SC NASA EPSCoR opportunity provides seed grant support for competitively selected projects of benefit to both NASA and the South Carolina jurisdiction. Each proposal receives a high quality external peer review as a part of the competitive process. Those proposals selected for funding include strong research components, and successfully demonstrate: 1) strong NASA ties; 2) the significance of their research to SCs vision for competitiveness in science, technology, engineering and mathematics (STEM); and 3) make evident their potential for growth and sustainability.

### 22-2022 RID-0002

#### South Dakota NASA EPSCoR Research Infrastructure Development Program

##### **South Dakota School of Mines and Technology**

##### **Dr. Edward Duke**

The goal of the South Dakota Research Infrastructure Development (RID) program is to promote competitive research and technology development in the state with an emphasis on areas of strategic importance to NASA. Attaining that goal requires close coordination among the states research institutions, government, industry,



## 2022 NASA EPSCoR RID Proposal Abstracts

---

---

NASA Headquarters, and NASA research and development centers. In recent years NASA EPSCoR activities in South Dakota have become increasingly integrated with efforts of other EPSCoR and EPSCoR-like programs resulting in better overall alignment with the broader mission of nurturing and diversifying the nations scientific and engineering research enterprise.

The implementation strategy to achieve the four major objectives of the NASA EPSCoR Program focus on the major STEM Ph.D.-granting institutions in the state, but also seeks to develop collaborations between those institutions and the seven additional higher education affiliates of the SDSGC, which include two tribal universities, as well as with non-affiliated institutions. Because RID resources are limited, the allocation of these investments in the state is guided by the following criteria: (1) alignment with NASA R&D priorities, (2) development of NASA research contacts, (3) support for state R&D priorities, (4) formation of multi-institution collaborations, (5) meaningful involvement of Minority-Serving Institutions (Tribal College) in research, and (6) potential for economic development and industry partnerships.

SD NASA EPSCoR offers travel grants and seed grants (Research Initiation Grants) to promote development of new contacts and cooperative research ties with NASA Centers and/or Mission Directorates. Because South Dakota has limited university-based and industry-based aerospace R&D, a major focus of SD NASA EPSCoR is redirection of non-aerospace research assets to efforts that address research and technology development needs of NASA. In the solicitations for Research Initiation Grants and NASA EPSCoR major research awards, explicit emphasis is given to development of new or continuing partnerships among colleges and universities in the jurisdiction that will enhance the jurisdictions abilities to respond to the research and technology development needs of NASA.

This NASA EPSCoR RID program proposal outlines South Dakotas plan to continue to support improvement of the research environment in South Dakota and to further promote technology developments that align with NASAs strategic goals. SD NASA EPSCoR is well positioned to identify and cultivate new research collaborations within the state and with NASA that will increase the states capacity in STEM research and education and effectively address the critical research and development and economic development priorities of the state and NASA.

### 22-2022 RID-0003

#### NASA Oklahoma EPSCoR Research Infrastructure Development

##### **Oklahoma State University**

##### **Dr. Andrew Arena**

The key central objectives of this proposal are to:

- Initiate contacts and forge direct partnerships with scientists and researchers at the Mission Directorates, and/or one of more of the NASA Centers;
- Promote collaborative research programs with the NASA Centers, Mission Directorates and Industry;
- Initiate research activities in areas of strategic importance to the Agency; and Support undergraduate and graduate research experiences.



## 2022 NASA EPSCOR RID Proposal Abstracts

---

---

These objectives will be accomplished through the providing competitive opportunities for researchers in the state to receive travel grants and research initiation grants which will allow them to partner with NASA researchers. The partnerships are designed to build strength and increase competitiveness in research and technological development for universities in Oklahoma. Travel grants allow researchers to spend up to three days at a NASA center. Research Initiation grants provide a six-month period for researchers to develop experience and research capability while working with a NASA researcher. This will help awardees be more competitive for follow-on research with NASA Centers and NASA EPSCoR Implementation awards. Graduate and undergraduates will also be competitively selected for internship opportunities at NASA Centers and Oklahoma companies involved in NASA work.

Proposals selected for funding of travel grant and research initiation projects must align with the 2018 NASA Strategic Plan. This guarantees the proposal is significant to NASA interests and programs. Proposals which also align with Oklahomas 2021-2026 Science and Innovation Strategic plan receive higher evaluation weights.

### 22-2022 RID-0004

#### Iowa NASA EPSCoR Competitive Research Network (CoRN)

##### **Iowa State University - Iowa Space Grant Consortium**

##### **Dr. Tomas Gonzalez-Torres**

The Iowa NASA EPSCoR Competitive Research Network (CoRN) program focuses on continued building of core strengths needed to grow competitive research and technology development capabilities in Iowa that address scientific and technical problems of importance, as defined by NASA. CoRN seeks to coordinate with existing NASA-related research programs and industry contacts within the Iowa jurisdiction to stimulate research that aligns with one or more of the NASA Mission Directorates and supports growth efforts of the Iowa Economic Development Authority. The CoRN Research Infrastructure Development (RID) proposal focuses on: a) collaborative ventures between the states researchers and NASA researchers at the NASA field centers or headquarters (virtual or on-site), b) initiation of competitive research and technology development methods and activities, collaborations, publications, patents/licenses c) cultivation of a cadre of researchers that have a working knowledge of NASA programs and research goals that are capable of responding, d) development of a cadre of researchers with long-term, self-sustaining, nationally-competitive capabilities in aerospace and aerospace-related research, e) support of the Iowa Economic Development Authoritys efforts to strengthen the Iowa economy.

The overall goals of this program are to build and grow functional relationships between Iowa researchers and the NASA Centers to foster development of joint research projects, and ultimately move to the next level of competitiveness in NASA-related research areas as well as STEM research in general. These goals are foundational to serve Iowas economic development through STEM research that can transfer to business and industry, and to a lesser degree, STEM workforce development, through student engagement in research efforts from EPSCoR (direct or indirect in service of transfer to business and industry thereby creating STEM jobs and careers) and subsequent work from sustaining programs. In pursuit of these goals, we plan to participate in Iowa research development symposia that bring together intra-state scholars and NASA researchers to better exchange ideas, explore emerging research areas, and to work more effectively with



## 2022 NASA EPSCoR RID Proposal Abstracts

---

---

NASA Centers and offer competitive grants for a) research building seed grant funding for joint research projects within state of Iowa, and b) partnership development travel grants to build upon research connections made with NASA researchers, industry, and other research organizations within the Iowa jurisdiction that develop from the symposia.

The success of the CoRN RID would establish stronger research connections between Iowa researchers and NASA research by increasing awareness of NASA opportunities and NASA researcher efforts. These relationships are to then lead to an increased number of researchers working on NASA technical issues. Other anticipated outcomes are increased intra-state collaboration in the academic and industry communities in NASA-relevant areas. Outcomes would serve the EPSCoR mission of increasing research funding flow to Iowa.

### 22-2022 RID-0005

#### Research Infrastructure Development (RID) in West Virginia

##### **NASA WV Space Grant Consortium**

##### **Dr. Majid Jaridi**

The NASA West Virginia Established Program to Stimulate Competitive Research (EPSCoR) requests \$1,000,000 for the fiscal years 2022-2026 for implementation of the West Virginia Research Infrastructure Development (WV RID) Project. NASA EPSCoR is an integral part of the mosaic of research infrastructure building programs conducted by the WV EPSCoR Committee as an umbrella organization for all EPSCoR programs in the state. The WV State Science and Research Council is the body that oversees all the state's EPSCoR programs and other science initiatives of the state. As Project Director of WV EPSCoR, Dr. Juliana Serafin chairs the statewide EPSCoR Committee.

At the meeting of April 17, 2021, in Charleston, WV, the NASA WV EPSCoR Committee discussed the status and future directions of this program in detail. The Committee came to a consensus that the present combination of programs offered by NASA WV EPSCoR is in line with the overall vision and strategic plan of the state of West Virginia to support and develop high technology workforce and spur economic activities in the state. However, based on the data presented by the NASA WV EPSCoR Director relating to the effectiveness of various programs and the success of researchers supported by this program in the past five years, it was decided that a sub-committee be formed to re-evaluate the matrix of programs to be offered in the next five-year cycle. This sub-committee included Dr. Melanie Page, Associate Vice President at West Virginia University, Mr. Wes Deadrick, IV & V Office Lead at the NASA IV & V Facility, the NASA WV EPSCoR Director, and the EPSCoR Programs Manager. This sub-committee has produced the present document, and the WV EPSCoR Director, who is also the Chancellor of Higher Education in the state, has had a chance to examine and sign off on this proposal.

NASA WV EPSCoR programs are designed in conjunction with the menu of programs offered by the West Virginia Space Grant Consortium. These programs consist of Research Seed Grants, Travel Grants to NASA and scientific conferences, and several other capability enhancement initiatives. Our mosaic of programs covers all aspects of the Science, Technology, Engineering, and Mathematics (STEM) education pipeline and research in



## 2022 NASA EPSCoR RID Proposal Abstracts

---

---

West Virginia. Our partners in academia, the high-tech industry, and the government are hard at work to ensure that we have a highly cost-efficient and seamless transition between our programs and those of our partners. In summary, we have included new offerings to foster and enhance connections and collaborations between our faculty and NASA Centers and Mission Directorate, as well as help our relatively new faculty conduct research of interest to NASA and train graduate students in STEM disciplines.

22-2022 RID-0006

The Kansas NASA EPSCoR Research Infrastructure Development (RID) Program

**Wichita State University**

**Dr. Leonard Miller**

The Kansas NASA EPSCoR RID Program *(Note: This is what was in the system. JP)*

22-2022 RID-0007

ALASKA'S NASA EPSCoR Program 2022-2027

**University of Alaska Fairbanks**

**Dr. Denise Thorsen**

The Alaska State Committee on Research (SCoR) updated the Alaska Science and Technology Plan, To Build a Fire in 2016. In this report, they present a road map for Alaska science and technology development which they organize into seven specific areas to which Alaskas unique characteristics lend themselves. In this NASA EPSCoR RID proposal we identify three priority research areas, Earth System Science, Technologies for Space and Extreme Environments, and Aeronautics Research, which define the intersection between NASAs strategic goals as outlined in the 2018 NASA Strategic Plan and the research priorities in Alaskas Science and Technology Plan. These three areas seek to address current research needs in the state but also to proactively support research areas that could lead to the growth of new industries.

Specifically, this NASA EPSCoR RID proposal seeks to build Alaskas research infrastructure and technology capabilities in areas of interest to Alaska by providing seed funding and training that will lead toward long-term, self-sustaining, nationally-competitive capabilities in support of NASA related research and technology priorities.

**Goal:** Increase Alaskas ability to respond to research and technology development needs of NASA and the State and to partner with Alaskas aerospace industry to expand the space-related capabilities within the State.

**Objective 1:** Develop research infrastructure by awarding a minimum of three Research Development Seed Grants per year in areas of strategic importance to NASA and Alaska which lead to a minimum of three follow-on proposals submitted per year.



## 2022 NASA EPSCoR RID Proposal Abstracts

---

---

Objective 2: Facilitate new partnerships with NASA researchers by providing Partnership Development Travel Grants to attend NASA EPSCoR annual Technical Interchange Meetings and/or other NASA related workshops that will lead to a minimum of one new collaborative proposal per year.

22-2022 RID-0008

New Mexico NASA EPSCoR Research Infrastructure Development (RID)

**New Mexico State University**

**Dr. Paulo Oemig**

Research Infrastructure Development Plan. The purposes of the New Mexico NASA EPSCoR Research Infrastructure Development (RID hereafter called NM EPSCoR RID) Program are to build the core competitive research strength in New Mexico, and to grow research and technology development core capabilities. We will enable faculty to compete for funds from NASA and non-NASA sources outside of the EPSCoR program in order to find solutions for scientific and technical problems of importance to NASA Centers and Mission Directorates. New Mexico NASA EPSCoR RID will continue focusing on collaborative activities and relationships to develop long-term, self-sustaining, nationally-competitive capabilities in space and aerospace-related research. These capabilities will, in turn, contribute to New Mexico's economic viability and expand the Nation's base for science and technology innovation agendas. For the purpose of brevity, we will refer to the program in the proposal as NM EPSCoR RID Program. The formal name of the program will be New Mexico NASA EPSCoR Research Infrastructure Development Program.

Goals, Objectives, and Priorities

NM EPSCoR RID Program participants will perform scientific, engineering research and technology development in areas that support the strategic research and technology development priorities of NASA's Field Centers and Mission Directorates. An emphasis will be placed on developing a core expertise capable of successfully competing for funds from NASA and non-NASA sources outside of the EPSCoR program. The goals, objectives, and priorities for the NM EPSCoR RID Program for the next five years are:

1. Contribute to and promote the development of research infrastructure capability in New Mexico, particularly in the colleges and universities, in areas of strategic importance to NASA in order to gain support from sources outside the NASA EPSCoR program that will increase our capacity to develop space and aerospace related science, technology, engineering and mathematics research.
2. Improve capabilities of the NM NASA EPSCoR through partnerships to increase use of the International Space Station, to grow capability for the New Mexico Universities to design, build, test and fly space technologies to support NASA SMD, STMD, ARMD and HEOMD as these directorates are under-represented in the portfolio of research capabilities and priorities in New Mexico universities and areas of growth for our state.
3. Develop and strengthen partnerships among NASA research assets and New Mexico academic institutions, federal laboratories, industry and private foundations. These partnerships will add to the competitive strength of NASA while expanding participation of partners in STEM throughout the State of New Mexico.





## 2022 NASA EPSCOR RID Proposal Abstracts

---

---

Mexico. These partnerships will provide a gateway for Americans to improve the future capabilities of NASA and other government agencies.

4. Work in close coordination with the New Mexico Space Grant Consortium (NMSGC) to improve mission-driven programs enabling STEM engagement in New Mexico.

22-2022 RID-0009

### Building Maine's New Space Economy

#### **Maine Space Grant Consortium**

#### **Dr. Terry Shehata**

Our goal for the next five years is to contribute to the development of a new space economy in Maine as envisioned by the proposed Maine Spaceport Complex. Our strategy is to build upon the core research and workforce development strengths of our Affiliates to improve Maines research and technology development competitiveness along the new Space Value Chain. Our objectives are to:

- a. Improve Maine research competitiveness allowing researchers to succeed in gaining support from sources outside the RID program by aggressively pursuing additional funding opportunities offered by NASA, industry, other federal agencies, and other sources.
- b. Develop partnerships between NASA research assets, Maine academic institutions, and Maine aerospace-related industry.
- c. Support the overall Maine STEM workforce development (faculty and student involvement) that contributes to the overall research infrastructure, science and technology capabilities, higher education, and economic development of Maine.
- d. Encourage participation from under-represented groups.

Our priority for the next five years is to invest in collaborative research and workforce development projects in topic areas that support strategic research and technology development priorities of NASA Field Centers and/or Mission Directorates and that would lay the R&D foundation for the proposed Maine Spaceport Complex.



## 2022 NASA EPSCoR RID Proposal Abstracts

---

22-2022 RID-0010

### North Dakota NASA EPSCoR: Promoting Research Infrastructure Development and Engagement in North Dakota

**North Dakota Space Grant Consortium**

**Dr. Caitlin Milera**

The overall goal of North Dakota NASA EPSCoR (Established Program to Stimulate Competitive Research) is to increase the competitiveness of North Dakota for merit-based grants and contracts in support of science and technology research from federal funding agencies. This mission statement is the guiding principle for all ND NASA EPSCoR program activities. ND NASA EPSCoR has established the following goals, objectives, and priorities, to train the North Dakota workforce in STEM (science, technology, engineering, and mathematics) disciplines of relevance to NASA.

Following the NASA EPSCoR programs national initiatives, ND NASA EPSCoR has defined the following goals: 1) Establish long-term, self-sustaining, nationally-competitive research capabilities in aerospace and STEM disciplines at North Dakota colleges and universities. 2) Promote research in North Dakota of strategic importance to the NASA mission. 3) Promote programming that demonstrates a lasting and positive impact on the overall research infrastructure, STEM capabilities, economic development, and citizens of North Dakota.

The following ND NASA EPSCoR Objectives each encompass the Goals. 1) Build core competitive research strength in NASA-relevant STEM fields through seed grants awarded to faculty at North Dakota colleges and universities. 2) Promote collaboration and research partnerships through travel grants awarded to North Dakota faculty, staff, and students participating in NASA-relevant research. 3) Support synergistic activities that provide opportunities for North Dakota researchers to participate in meetings, workshops, professional development opportunities, and travel to enhance NASA-relevant research initiatives.

The following priorities are overarching, and permeate all ND NASA EPSCoR goals, objectives, and specific project elements. These priorities collectively contribute to the establishment and enhancement of a well-rounded network of researchers from a variety of backgrounds to best help ND NASA EPSCoR to achieve its goals and objectives.

To achieve ND NASA EPSCoR goals of establishing research capabilities of strategic importance to NASA which have a positive and lasting impact on the economic development of North Dakota, it is essential to focus on seed grants, travel grants, and synergistic activities that incorporate: 1) Fusion of ND and NASA research relevance, 2) Diversity, Equity, Accessibility, and Inclusion (DEAI) initiatives, 3) multi-institution partnerships and collaborations, and 4) significant student support.

Through each of the ND NASA EPSCoR project elements, North Dakotas aerospace and STEM research presence will continue to grow more robust. ND NASA EPSCoR is committed to promotion of all four program priorities in each project element. Goal and objective alignment is discussed within each program element. ND NASA EPSCoRs Project Elements include 1) Seed Grants, 2) Travel Grants, and 3) Synergistic Activities.



## 2022 NASA EPSCoR RID Proposal Abstracts

---

---

22-2022 RID-0011

PR NASA EPSCoR Research Infrastructure Development

**University of Puerto Rico**

**Dr. Gerardo Morell**

Established in 1994 by the Central Administration of the University of Puerto Rico (UPR) in conjunction with the National Aeronautics and Space Administration (NASA), the Puerto Rico NASA Established Program to Stimulate Competitive Research (PR NASA EPSCoR) implements strategic tasks and projects directed at enhancing Puerto Ricans research competitiveness and infrastructure, science and technology capabilities, and higher education, while building the core strength required to engage in technology development methods and activities for the solution of scientific and technical problems of importance to NASA in alignment with NASAs Mission.

The goal of the PR NASA EPSCoR Research Infrastructure Development (RID) program is to build in Puerto Rico the core strength needed to increase competitive research and technology development methods and activities for the solution of scientific and technical problems of importance to NASA in coordination and collaboration with NASA Centers and Mission Directorates and other research centers around the Nation that seek to advance U.S. scientific, security, and economic interests through a robust space exploration program.

PR NASA EPSCoR RID supports the initiation of new research projects in collaboration with NASA Centers and Mission Directorates that expand Puerto Rico's capabilities in NASA mission-related sciences and technology-development projects. To encourage and nurture activities that advance NASAs research priorities, the RID projects are competitively selected based on their connection, interaction, and relevance to NASA Centers and Mission Directorates. The evaluation criteria include: intrinsic scientific and/or technical merit; alignment with NASA technology needs; relevance to, partnerships with, and interactions with NASA; relevance to, partnerships with, and interactions within the jurisdiction; credentials and track record of the investigators.

The emphasis is placed on developing a core expertise capable of successfully competing for funds from NASA and non-NASA sources outside of the EPSCoR program. With the guidance and support of the Technical Advisory Committee, the RID researchers receive technical assistance to transition their projects progressively toward gaining support from sources outside the NASA EPSCoR program by aggressively pursuing additional funding opportunities offered by industry and other sources.



## 2022 NASA EPSCoR RID Proposal Abstracts

---

22-2022 RID-0012

The Hawaii NASA EPSCoR Research Infrastructure Development Program

**University of Hawaii at Manoa**

**Dr. Luke Flynn**

The objectives of Hawaii NASA EPSCoR Research Infrastructure Development (RID) proposal are three-fold: (1) We will assist and lead the development of a new aerospace economy in Hawaii that is centered on small satellites and UAVs. (1a) Dedicated Small Launch We will support new DoD and commercial launch requests from the Pacific Missile Range Facility rail launcher on Kauai. We will manage new launch opportunities from the State of Hawaii. (1b) Hawaii Space Flight Laboratory (HSFL) was established in 2007 to facilitate the design, building, testing, launching, and operating small satellites from the Hawaiian Islands. HSFL continues to develop and support UH Faculty small satellite and UAV instrument, software, and hardware projects. (1c) Managing/Facilitating State Aerospace Infrastructure Development In addition to the development of small satellite and UAV projects, management of other aerospace-related projects include support for very high altitude UAV projects (like the HAPSMobile HAWK 30), facilitating flight support for suborbital launch providers (like the Dawn Aerospace Mark II rocketplane), and upgrading the Kauai CC ground station with software defined radios. (2) We will partner with other islandconsortia to develop unique research capabilities and opportunities by pooling our resources to form larger collaborative research efforts. (3) We will encourage new NASA infrastructure development in Hawaii by providing seed grants and travel grants to investigators willing to work with NASA Centers or Mission Directorates.

22-2022 RID-0013

Nevada NASA EPSCoR Research Infrastructure Development

**Nevada System of Higher Education**

**Dr. Lynn Fenstermaker**

"The most recent Nevada NASA EPSCoR Research Infrastructure Development (RID) activities have led to the teaming of researchers in the areas of battery development, materials research, aerosol research, life in extreme environments, robotics and vision research, earth systems sciences research, planetary surface processes, and UAS hardware, software and applications. As NSHE plans for the future, the NSHE Sponsored Programs and EPSCoR Office (NSHE SPO/EPSCoR) and its advisory board, as well as the Nevada NASA EPSCoR RID Technical Advisory Committee (Nevada RID TAC) continue to help identify additional strengths and new opportunities to build competitive research programs within NASA relevant STEM fields.

This proposal identifies opportunities to enhance Nevadas research infrastructure that will result in the development of collaborations and research programs relevant to NASA, the State of Nevada and NSHEs STEM interests.

The overall goals of the Nevada NASA EPSCoR program have been and continue to include:



## 2022 NASA EPSCoR RID Proposal Abstracts

---

---

- "" Contribute to the overall research infrastructure, science and technology capabilities, and economic development of Nevada;
- "" Improve the capabilities of Nevada faculty/researchers to gain support from sources outside the NASA EPSCoR program that are most relevant to NASA research and missions;
- "" Develop partnerships among researchers at NSHE, NASA Centers, and industry; and
- "" Coordinate with the national NASA EPSCoR Project Manager and the Space Grant program to address NASA research priorities and improve the environment for science, mathematics, engineering, and technology infrastructure and training in Nevada.

Specific objectives that have been targeted to meet Nevada NASA EPSCoR RID program goals include:

- "" Objective 1: Enhance research infrastructure by competitively awarding at least two significant RID seed grants each year. Seed grants must be relevant to both NASA and Nevada strategic science plans, and in particular must address a NASA Center and/or Mission Directorate science priority as provided in a list by the national NASA EPSCoR Project Manager. A requirement of the seed grant solicitation is the submission of at least one competitive proposal.
- "" Objective 2: Promote the planning and implementation of training and proposal development workshops that will foster NASA collaboration and the development of skills and knowledge to improve Nevada research infrastructure. Funding for at least one workshop per year is budgeted. An expected outcome from any workshop is the submission of a competitive research proposal.
- "" Objective 3: Facilitate new research collaborations among NASA Center scientists and NSHE faculty by awarding travel grants. As many travel sub-awards as possible with remaining RID funds will be made available each year. An expected outcome is the submission of a competitive and collaborative research proposal among NSHE faculty and NASA Center scientists.
- "" Objective 4: Provide administrative support and promote NASA EPSCoR programs and goals within the state of Nevada.

22-2022 RID-0014

NASA Kentucky EPSCoR Research Infrastructure Development (RID) Program 2022-2026  
**University of Kentucky**

**Prof. Alexandre Martin**

The mission of Kentucky's Statewide EPSCoR Program is to enhance research and intellectual capacity of Kentucky universities and colleges by building and coordinating strategic investments in state research capability needed for Kentucky to excel in federal R&D funding competitiveness. This mission aligns with Kentucky's economic development strategy, which emphasizes leveraging growth areas like aerospace and an innovation-driven economy supported by strengths of state academic institutions to enable cutting-edge R&D and a highly educated workforce.



## 2022 NASA EPSCoR RID Proposal Abstracts

---

---

Supporting this statewide mission, NASA Kentucky EPSCoR program goals are to enhance R&D capacity through strategic investments in NASA-priority research areas and to increase competitiveness of state researchers for non-EPSCoR NASA funding. A key factor is initiation of working relationships between Kentucky researchers and NASA engineers and scientists that can develop into productive research partnerships. Every aspect of the programs current RID portfolio emphasizes collaborative relationship-building, including pursuing opportunities that support commercial space partnerships and state industry.

Four specific objectives of the NASA Kentucky EPSCoR program are designed to align with goals of the national NASA EPSCoR program, in combination with state objectives: 1) develop faculty expertise and research infrastructure in areas of strategic importance to the NASA mission, 2) improve capabilities to gain support from sources outside the NASA EPSCoR program, 3) develop partnerships among NASA research assets, academic institutions, commercial space programs and industry, and 4) contribute to overall research infrastructure, science and technology capabilities of higher education, and economic development in Kentucky.

Central to the NASA KY EPSCoR RID Program are Research Infrastructure Development Grants (RIDG), competitively awarded to faculty for one-year research partnerships with NASA. RIDG proposals must demonstrate efforts to build collaborative working relationships with NASA personnel. Faculty principle investigators (PIs) must include a letter of collaboration from a NASA partner based on prior interactions, describe a schedule for regular contact with the NASA partner and plans to visit the NASA site, and, if funded, are expected to result in submission of a jointly authored paper to a conference or journal.

To assist researchers establishing initial connections with NASA and to develop interdisciplinary and multi-institutional research teams, faculty are encouraged to submit proposals for Workshop/Conference/Seminar awards (WCS). Workshop funding builds Kentucky and NASA partnerships to develop interdisciplinary teams interested in pursuing the three-year NASA EPSCoR Research Award (RA) or other nationally competitive solicitations. Conference funding provides partial support for a meeting hosted in Kentucky focused on NASA-related research. Seminar funding supports a series of seminars or webinars on an aerospace topic.

Research Travel (RT) awards assist faculty in initiating new relationships with NASA. Individual travel awards are awarded to researchers after review of their application, which must include a NASA invitation to visit and discuss potential collaboration. Analysis of the NASA EPSCoR RA awards to Kentucky research teams shows that, to be competitive nationally, it is advantageous for a proposed project to have multiple NASA connections. Helping new-to-NASA PIs make an all-important initial contact will help enable successful submissions for RIDG awards; allowing RIDG PIs to develop relationships and expand their network will prepare them for RA submissions and national non-EPSCoR competitive solicitations in subsequent years.

In addition to managing the proposal submission competitions described above, NASA Kentucky program management also tracks and communicates the impact of NASA Kentucky EPSCoR Programs.



## 2022 NASA EPSCoR RID Proposal Abstracts

---

---

22-2022 RID-0015

The Vermont NASA EPSCoR Research Infrastructure Development Program

**University of Vermont**

**Prof. Bernard Cole**

Vermonts NASA EPSCoR program has had significant success creating an interest in NASA research priorities among Vermonts academic researchers. It has supported activities that have established and strengthened connections between Vermonts academic researchers and collaborators at NASA centers and has made our jurisdictions academic researchers more competitive for non-EPSCoR external funding on the national level. These supported activities have fostered the development of additional aerospace-related research infrastructure in Vermont. The overarching objective of our programs is to encourage research that is (a) novel and strongly aligned with new and continuing NASA priorities and technical needs, (b) builds jurisdictional research capacity, (c) has the potential for attracting new external research funding, and (d) advances collaborative ties between academia, industry, and NASA. The major goals of Vermonts NASA EPSCoR Phase VII RID program are:

Goal 1: Provide opportunities for Vermonts academic researchers to compete for seed funding that will enable early-stage research projects in STEM-related areas that have strong alignment with NASA priorities. Supported projects must have a strong potential to attract additional external research funding. Interaction with NASA research collaborators, including travel to NASA centers, is strongly encouraged.

Goal 2: Provide opportunities for undergraduate and graduate students (enrolled in a degree program at a Vermont university or college) to participate in NASA-related research under the mentorship of a Vermont faculty member.

Goal 3: Expand the base of Vermont NASA EPSCoR industrial affiliates performing research and development activities in aerospace with the purpose of supporting novel research and advancing collaborative ties with Vermonts academic researchers and NASA.

Our plans to achieve these goals are based on three major priorities of the Vermont NASA EPSCoR Office. Our first priority is to offer an array of funding opportunities in support of early-stage research. These opportunities range from small (travel grants) to moderate (pilot research grants) to significant (small-scale research grants). This range of opportunities encourages participation at all levels, including, for example, researchers having little or no prior NASA-related work, who may begin with a travel grant or pilot research grant as an entry to working in an aerospace-related area. Our next priority is to advance collaborative ties between Vermont industry and Vermont academic researchers by expanding our base of industry affiliates, encouraging academic/industry collaborations on pilot and small-scale research projects, and offering grants for NASA-related industrial R&D.

The main project elements proposed for Vermonts RID project include pilot research grants (up to \$5,000), small-scale research grants (up to \$25,000), and research travel grants for eligible academic researchers. Pilot and small-scale research grants are awarded based on a rigorous competitive process with peer review of applications. Additionally, through our Industrial Partners Initiative (IPI) we will seek to expand our portfolio of



## 2022 NASA EPSCoR RID Proposal Abstracts

---

---

industry affiliates in order to facilitate research collaborations between industry and higher education. The IPI includes an annual "Phase 0" grant competition conducted in a cooperative effort with the Vermont State EPSCoR Office. One IPI award of \$10,000 will be made annually based on ability to (a) increase opportunities for Vermont's academic researchers and companies in areas that align with NASA's research and technology needs, (b) promote economic development and the science and technology goals of the state, (c) facilitate technology transfer, and (d) build partnerships between Vermont participants and NASA.

22-2022 RID-0016

NASA EPSCoR Research Infrastructure Development in Louisiana

**Louisiana State University**

**Prof. T. Gregory Guzik**

Louisiana participates in all agency EPSCoR programs through the Office of Sponsored Programs at the Louisiana Board of Regents (BoR), which provides state matching funds and, consequently, acts as the fiscal agent for all EPSCoR awards. The NASA EPSCoR program management & technical oversight is conducted primarily out of the Louisiana Space Grant/NASA EPSCoR office housed at LSU. The two offices work in-tandem to fulfill the mission-driven requirements of NASA while investing in the research infrastructure development needs of the state. Louisiana's commitment to Aerospace Science & Technology development has been well established over decades. We have a diverse cadre of researchers working on active NASA & NASA-related projects across institutions and facilities in the state, and there is an increasing understanding that a highly skilled technical workforce is necessary for our long-term goals. The NASA EPSCoR program is a crucial contributor to the continued growth of Aerospace Science & Technology development.

Louisiana's strategy for EPSCoR success involves engagement, collaboration, and partnership. We engage faculty, post-docs, and students in performing research projects; we develop Collaborations/Mentorships between NASA scientists/engineers and the Louisiana research community, and we establish Partnerships between educational institutions (minority and majority) and with external facilities and other agencies. We are currently working with most of the designated research universities in the State, many of the smaller less research-intensive institutions, and with all NASA Centers and JPL through both EPSCoR and the Louisiana Space Grant (LaSPACE) funded projects. The NASA EPSCoR RID Award provides financial support and a framework to improve the research infrastructure in Louisiana while supporting the mission goals at NASA. The primary objective of the NASA EPSCoR RID program in Louisiana is to expose a wide array of Louisiana researchers to NASA priorities by funding participation in Technical Interchange Meetings at NASA Centers and workshops led by NASA, supporting small-scale research endeavors endorsed by NASA researchers, and increasing the breadth of research support by recruiting participation from less traditionally funded campuses such as HBCUs and community colleges. Finally, the NASA RID allows our management team to support local researchers with networking, proposal development, and help with meeting administrative requirements for NASA funded projects.

As of the writing of this proposal, we are two years into our current three-year FY19 RID award, we have supported 9 different research projects for faculty representing 5 different Louisiana Universities (LaTech, LSU, Tulane, ULL, and UNO) to conduct research projects in collaboration with 9 different NASA researchers from 6





## 2022 NASA EPSCoR RID Proposal Abstracts

---

---

NASA Centers (Ames, Glenn, Johnson, JPL, Langley, and Marshall). Due to COVID-19 restrictions, we have been unable to run our Travel Awards Program and pandemic conditions also impacted our already fledgling Summer Assisted Research program for faculty at teaching-intensive institutions. Our goal for the next five-year award is to sustain our highly successful Travel and Research Award Programs (TAP & RAP), while building a new program to encourage participation from Minority Serving Institutions in Louisiana.

22-2022 RID-0017

### A Plan for NASA EPSCoR Research Infrastructure Development (RID) in Delaware University of Delaware

**Prof. William Matthaeus**

The aim of NASA's EPSCoR RID program is to build the core strength needed to develop competitive research and technology development methods and activities for the solution of scientific and technical problems of importance to NASA as defined by one or more of the four Mission Directorates and/or one or more of the nine NASA Centers plus the Agency's Jet Propulsion Laboratory (JPL).

The major goals of the Delaware program include both academic and industrial components: (i) develop new collaborative activities among researchers in academia and researchers at NASA Centers so that the academic researchers may become better equipped and /or better prepared to submit successful research applications to competitive programs announced by NASA and other agencies; (ii) develop links with industry to identify research areas that align with the state's economic priorities. In the present proposal, we describe how NASA's goals for EPSCoR RID may be implemented in the State of Delaware.



## 2022 NASA EPSCoR RID Proposal Abstracts

---

22-2022 RID-0018

### Established Program to Stimulate Competitive Research (EPSCoR) - Research Infrastructure Development (RID)

**Brown University**

**Prof. Peter Schultz**

This proposal will allow Rhode Island faculty and researchers to develop innovative and cooperative research in space exploration across all NASA Directorates, thereby developing new research directions, enhancing competitiveness, contributing to new collaborations across institutions of higher education, and bringing the business of space into Rhode Island. This proposal will provide partial support for the Principle Investigator (Director) and Program Manager. Their roles will be to inform RI faculty and researchers about opportunities and specifically to solicit and advise potential applicants for NASA/EPSCoR RID Research Seed Grants, = International Space Station, and Rapid Response opportunities. Selections will be based on relevance and priorities for the jurisdiction and NASAs guidelines. The NASA/RI Technical Advisory Committee (TAC) will select applicants for the NASA EPSCoR Competitive Research opportunities through pre-CAN White Papers solicited by this Office. The Program Office will host an annual symposium and/or workshops to describe and discuss these various opportunities and inform potential applicants through various Research Offices, websites, and Space Grant network. The NASA/RI EPSCoR Technical Advisory Committee will meet once a year in order to provide general advice and reviews of proposals to be selected for EPSCoR competitions.

22-2022 RID-0019

### Mississippi NASA EPSCoR Research Infrastructure Development Program (RID)

**The University of Mississippi**

**Dr. Nathan Murray**

The Mississippi NASA EPSCoR Director proposes a continuation of its successful, competitive, seed-grant program to strengthen Mississippis research competitiveness. Individual seed grants will (a) build on the current strengths of individual members of the Consortium, (b) focus these strengths on issues of particular relevance to NASA, and (c) increase the applicability of Mississippis research to areas of interest within NASA. MSSGC uses the RID program to fill a unique role by infusing NASA investment into human research asset development. The goal is to provide initiation funds to set in motion the maturation of innovative research and technology ventures that are relevant to NASA and NASA related Mississippi industry. The competitive seed grant opportunities are focused on developing and/or maturing research activities that EXPLORE promising research avenues, ESTABLISH or strengthen collaboration between researchers in the Jurisdiction, and ENHANCE MS research relevance to NASA through communication/collaboration with NASA scientists.

The MSSGC NASA EPSCoR RID program will utilize the science and technology resources at Jackson State University, Mississippi State University, the University of Mississippi and the University of Southern Mississippi to stimulate sustainable science and technology infrastructure improvements at these institutions to



## 2022 NASA EPSCOR RID Proposal Abstracts

---

---

accelerate the ability of their researchers to compete for federal and private sector research and development funding.

The proposed program will achieve its goals and objectives through two programmatic elements. First, the bulk of the funds will be used to fund seed grants. Second, a small portion of funds will be made available to research faculty to provide travel opportunities to NASA Centers.

22-2022 RID-0020

### Arkansas NASA EPSCoR Research Infrastructure Development (RID) 2022 University Of Arkansas at Little Rock

#### **Dr. Mitchell Hudson**

Arkansas NASA EPSCoR plans to:"" Continue to fund the NASA EPSCoR program office to ensure continued momentum and good progress in NASA relevant aerospace research in Arkansas

"" Continue our Planning and Preparatory (P&P) Grant program to enable Arkansas researchers to obtain NASA EPSCoR Research Award funding with a statewide annual workshop to disseminate information and know-how to potential P&P competitors

"" Continue our Planning and Preparatory (P&P) Travel Grant program to enable Arkansas researchers to obtain funding for teams of researchers to visit NASA Centers, Mission Directorates or the Office of Chief Technologist

"" Conduct a statewide one day long NASA EPSCoR Conference, in conjunction with the annual Arkansas EPSCoR Conference if possible, to bring NASA and other agency sponsored individuals together



## 2022 NASA EPSCoR RID Proposal Abstracts

---

---

22-2022 RID-0021

### NEW HAMPSHIRE NASA EPSCoR RESEARCH INFRASTRUCTURE DEVELOPMENT PROGRAM (2022-2027)

**University of New Hampshire**

**Dr. Antoinette Galvin**

The strategic goal of the NASA EPSCoR RID project in New Hampshire is to support promising academic research enterprises within the State that are directed toward generating or enhancing long-term, self-sustaining, nationally-competitive capabilities in areas of strategic importance to the NASA mission and of mutual benefit to the research infrastructure in New Hampshire. This is a collaborative program between the University of New Hampshire (the directorship institution) and Dartmouth College. UNH and Dartmouth College have Masters and Doctoral degree programs in NASA-related disciplines, encompassing both theoretical and experimental research areas. Both are rated as very high research in the Carnegie Classification System.

The strategic goals of NASA EPSCoR RID in New Hampshire are:

- 1) To enhance New Hampshire's science and technology research infrastructure and expertise in areas aligned with NASA and state priorities, focusing on the states research institutions of higher learning
- 2) To improve the states capabilities of gaining competitive financial support in areas aligned with NASA and state priorities from non-EPSCoR sources, particularly at the states institutions of higher learning, through
  - \* increasing awareness of NASA as a research funding source
  - \* strengthening partnerships among NH institutions of higher learning in areas of mutual interest that are aligned with NASA priorities
  - \* developing collaborations among university research investigators with researchers at NASA Centers and other federal agencies
  - \* strengthening partnerships with the regions industry and research nonprofits

The NH RID will consist of two technical elements:

- 1) The Seed Grants (Research) contribute to the NASA EPSCoR purpose of building core strength needed to increase competitive research and technology development methods and activities for the solution of scientific and technical problems of importance to NASA through the vehicle of small awards for research initiation and/or research analysis grants. These mini-grants are intended to enhance each university's ability to respond to future research and technology proposal solicitations from NASA or other federal agencies by building up needed personnel expertise, institutional expertise, and/or by increasing the Technical Readiness Level (TRL) of different space hardware concepts.
- 2) Seed Grants (Travel) may be used to request travel support to NASA technical interface meetings or other federal agency contact opportunities, with or without an attached Research funding request. The intent is to provide networking opportunities that may result in collaborations in future proposals.



## 2022 NASA EPSCoR RID Proposal Abstracts

---

The seed grant elements contribute to NASA Strategic Goals, with particular application to

"" Expanding the frontiers of knowledge, capability, and opportunity in space, using seed grants that address the development of research tools, mission concepts, and rocket, cubesat, and spacecraft instrumentation;

"" Advancing understanding of Earth and developing technologies to improve the quality of life on our home planet, through seed grants in earth science and natural resources that address infrastructure needed to study climate change, cropland, marshes, and estuaries, and other resources that are essential to society wellbeing; and seed grants in space science and engineering to contribute to magnetometer and particle instrument development for the purpose of space weather monitoring and prediction, in order to safeguard our technical systems on earth and in space;

"" Serving the American public and accomplish the NASA Mission by enabling and advancement of technical and scientific skills for our faculty, research staff and students

### 22-2022 RID-0022

#### Montana NASA EPSCoR Research Infrastructure Development (RID) Program 2022-2026 Montana Space Grant Consortium

##### Dr. Angela Des Jardins

Under the Montana NASA EPSCoR 2022-2026 Research Infrastructure Development (RID) Program, we propose to offer two primary opportunities for Montana faculty to develop research programs: research seed grants and small travel grants. The foci of these programs are: importance to NASA's mission and building strength in aerospace research and economic development in Montana.

Since the beginning of the NASA EPSCoR program in Montana in 1994, great strides have been made in developing and coordinating Montana research activities aimed at solving current technical and scientific problems facing NASA and the aerospace community. These accomplishments and their resulting infrastructure have given many Montana researchers opportunities to work with NASA that were not present prior to the implementation of NASA EPSCoR program. For example, Dr. Brock LaMeres, Montana State University (MSU) Professor of Electrical and Computer Engineering, received a Research Initiation Grant from Montana NASA EPSCoR (MNE) in 2008. Subsequently, Dr. LaMeres won a NASA EPSCoR Research Award, two EPSCoR ISS awards, and is now building a payload that was selected for the 2023 Artemis lunar mission. Due to successes achieved thus far, the MNE RID goals will remain consistent with those of the established program.

RID-Specific Goal (Outcome Objective): Increase the number and quality of NASA research programs led by Montana higher education faculty in areas that match scientific and technical problems of importance to NASA, enabling the investigators to compete successfully for non-EPSCoR NASA research funding.

General Montana NASA EPSCoR Goals:

Goal 1. Bring the capabilities of Montanas nationally competitive researchers to the attention of NASA.



## 2022 NASA EPSCoR RID Proposal Abstracts

---

---

Goal 2. Build infrastructure to enhance Montanas capabilities and expertise in areas of importance to NASA, focusing on institutions of higher learning.

Goal 3. Use EPSCoR sponsored research to strengthen partnerships with Montanas high-tech companies and drive the growth of Montana's aerospace-related economy.

Goal 4. Focus on building nationally prominent, competitive research groups at Montana's major universities while also providing collaborative opportunities to faculty members at smaller institutions.

### 22-2022 RID-0023

#### NASA Nebraska EPSCoR Research Infrastructure Development (RID) FY22-26

##### University of Nebraska at Omaha

##### Dr. Scott Tarry

Introduction-The NASA Nebraska EPSCoR program supports Nebraska faculty researchers who are pursuing aerospace-related research to become nationally competitive and to build research infrastructure in the state. Growing collaborations with NASA scientists and Mission Directorates allows the researchers to solve scientific and technical problems of importance to NASA, while training students for the future workforce. NASA Nebraska EPSCoR has established an outstanding record of success and has demonstrated its commitment to developing research capabilities that are long-term, self-sustaining, and nationally competitive.

The proposed research infrastructure development (RID) program for FY2022 to FY2026 will continue to support and sustain unique research activities that address the priorities of both NASA and Nebraska. In 2020, the Nebraska EPSCoR office released the Science and Technology Plan for Nebraska with input from the state EPSCoR Committee and the Governors office. Research funded by the RID will help to advance the Nebraska priorities identified in this plan. This will be accomplished by continuing our philosophy of using strategic investments in seed projects to develop competitive proposals for the national NASA EPSCoR competitions has been successful in developing Nebraskas aerospace infrastructure. Industry partnerships have been, and will continue to be, vital to the programs success. The proposed RID program will build on these historically productive relationships and will actively involve industry in all facets of the programs implementation - from RID to technology transfer.

##### Goals, Objectives, and Priorities of the NASA Nebraska EPSCoR Program

Nebraskas slogan has long been The Good Life. Building upon this slogan, business, industry, and civic leaders came together from across the state to develop and implement Blueprint Nebraska in April 2018. They recognized that Nebraska has some systemic challenges that may inhibit future generations from enjoying the good life that we know and love today (Blueprint Nebraska, 2019, p. 4). As a result of this effort, a blueprint for the next decade was published in July 2019. The blueprint identifies 15 high-priority initiatives including promoting statewide economic growth and prosperity (Blueprint Nebraska, 2019, p. 4).

The overarching goal of the NASA Nebraska EPSCoR program is to develop the states research infrastructure to facilitate and support long-term, self-sustaining, and nationally competitive research capabilities in aerospace



## 2022 NASA EPSCoR RID Proposal Abstracts

---

and aerospace-related research. To this end, the NASA Nebraska EPSCoR program administers a mini-grant program designed to achieve the following objectives:

1. to elevate the aerospace-related research being conducted in Nebraska to support future infrastructure building and workforce development opportunities, and
2. to help Nebraska researchers develop the capabilities and connections necessary to be successful in securing additional funding through competitive proposals to NASA and/or other federal, state, or private organizations.

Our aerospace research mini-grant program prioritizes capacity-building research projects with strategic importance to NASA's Mission Directorates and to the state of Nebraska.

22-2022 RID-0024

### Alabama NASA EPSCoR FY2022 Research Infrastructure Development

#### University of Alabama in Huntsville

##### Dr. Lawrence Thomas

The central programmatic focus of the Alabama NASA EPSCoR RID program is to build core capabilities at Alabamas universities and other collaborative institutions by further engaging and utilizing Alabamas unique resources and talent for enhancing greater scientific discovery and developing new technologies to address NASAs goals and objectives:

- "" Goal 1: Contribute to and promote the development of research capability in NASA EPSCoR jurisdictions in areas of strategic importance to the NASA mission;
- "" Goal 2: Improve the capabilities of the NASA EPSCoR jurisdictions to gain support from sources outside the NASA EPSCoR program;
- "" Goal 3: Develop partnerships among NASA research assets, academic institutions, and industry; and
- "" Goal 4: Contribute to the overall research infrastructure, science and technology capabilities, higher education, and economic development of the jurisdiction.

With RID funding, we shall continue to build competitive research and technology development capabilities in areas of interest to both NASA and the State of Alabama. The interests of the State of Alabama in this regard are defined by the Alabama State EPSCoR Committee (AESC, <https://alepscor.org/leadership/>) which oversees all EPSCoR programs within the state ([info@alepscor.org](mailto:info@alepscor.org)). The PI of this proposal is Dr. Dale Thomas, the Alabama NASA EPSCoR and the Alabama Space Grant Consortium Director, and Professor at The University of Alabama in Huntsville. Alabama proposes a RID portfolio of projects based on the following 4 elements/objectives:

- "" Objective 1: Researcher Seed Grants Award seed grants each year for Yrs. 1-5 to FY2022-2027 seed research grant/research initiation awardees to researchers in early stages of their careers (5 grants @ \$20K/year) awardees shall be competitively selected;



## 2022 NASA EPSCoR RID Proposal Abstracts

---

"" Objective 2: Contact Development - Develop new contacts and cooperative research ties with NASA Centers (plus JPL) and/or Mission Directorates each year for Yrs. 1-5;

"" Objective 3: Travel Grants Award travel grants for jurisdiction researchers to attend Technical Interchange Meetings (TIMs) and provide small travel funding for EPSCoR Director, Associate Director and Program Manager travel to attend NASA EPSCoR National Directors Meetings/Technical Interchange Meetings each year for Yrs. 1-5; and

"" Objective 4: Partnerships - Develop new or continuing partnerships among colleges and universities in the jurisdiction that will enhance our jurisdiction's ability to respond to NASA's research and technology development needs each year for Yrs. 1-5.

22-2022 RID-0025

Idaho NASA EPSCoR Research Infrastructure Development 2022

**University of Idaho**

**Dr. Matthew Bernards**

Central objectives of the proposal:

Idaho NASA EPSCoR is dedicated to increasing Idaho's competitive research capabilities in areas aligned with NASA's missions and activities. Idaho NASA EPSCoR is guided by the following Vision, Mission, and Strategic Goals that align with NASA's priorities while serving the unique needs of Idaho.

Vision: A nationally-competitive aerospace research capability in Idaho

Mission: To provide opportunities, foster collaboration, stimulate research, and develop innovation in Idaho.

Strategic Goals

"" Goal 1: Promote the development of research expertise and infrastructure that will allow Idaho researchers to compete nationally in areas of strategic interest to NASA and help to retain qualified early career scientists and engineers in Idaho.

"" Goal 2: Develop partnerships with NASA and industry that enable Idaho's researchers and students to contribute to NASA's missions through innovative research opportunities.

"" Goal 3: Support research in areas with the potential to enhance economic development in Idaho.

Methods/techniques proposed to accomplish the proposal objectives:

Through the proposed work, the Idaho NASA EPSCoR will execute a portfolio of competitive and merit-based projects to enhance Idaho's research capabilities in areas of interest to NASA. The majority of funds will support competitive research initiation grants, collaboration grants, and faculty fellowships for NASA research alignment. In addition to the competitive grants, Idaho NASA EPSCoR will identify promising Idaho researchers to attend the Technical Interchange Meetings organized by NASA EPSCoR to help initiate further collaboration





## 2022 NASA EPSCoR RID Proposal Abstracts

---

between NASA researchers and Idaho researchers. All of the proposed activities align with Idaho NASA EPSCoRs Vision, Mission and Strategic Goals.

Perceived significance of proposed work:

Idaho NASA EPSCoRs programs are designed to increase development and use of aerospace and STEM workforce and infrastructure through competitive opportunities and partnerships with Idaho institutions of higher education, state and federal agencies, and other STEM-focused organizations.

### 22-2022 RID-0026

#### Wyoming NASA EPSCoR Research Infrastructure Development (RID) Proposal: 2022-2027

##### **University of Wyoming**

##### **Dr. Shawna McBride**

Wyoming remains the state with the smallest population (~500,000) and its economy is largely driven by extractive industries, agriculture, and tourism. The University of Wyoming is the only Ph.D. granting research institution in the state and therefore scientific activities that address key areas of state concern are concentrated at UW. Over the next five years, the Wyoming NASA EPSCoR Research Infrastructure Development (RID) project will focus on two areas of research that have been identified as critical areas for increased research and economic development in the state, as well as areas of interest to NASA: 1) materials science and 2) computing and technology research innovations.

With support from previous Wyoming NASA EPSCoR RID awards, the Materials Science and Engineering program (MSE) at the University of Wyoming has become a recognized and cohesive research group on campus. The MSE program brings together students and faculty with research interests and expertise in materials science and engineering from physics, chemistry, chemical engineering, electrical engineering, environmental engineering, geology and geophysics, and mechanical engineering. Materials science is a multidisciplinary field involving collaborations across many traditional academic programs and the MSE program provides a rich, collaborative research environment for graduate students, research scientists, and faculty to interact across departments.

Current strengths at UW include new materials synthesis, including 2D materials and composite materials, advanced laser materials processing and analytics, as well as computational methods for materials design. These strengths fall into four main areas of emphasis within the core members of the program: catalytic materials, biomaterials, nanomaterials, and optoelectronic materials. Many of the core MSE members also collaborate with established centers of excellence on campus, including the School of Energy Resources, which is engaged in a Carbon Engineering Initiative, as well as the newly formed Artificially Intelligent Manufacturing Center at the University. In addition, several MSE members are supported by the NIH INBRE program, which sponsors biomaterials and bioinformatics-related research projects. The development of the MSE program has allowed for greater networking, collaboration, equipment sharing, and student opportunities in the area of materials science at the University of Wyoming.



## 2022 NASA EPSCOR RID Proposal Abstracts

---

---

While the MSE program has become a recognized program on campus, there is still a considerable need for growth to establish the MSE program as a core center of expertise and excellence on campus. One of the goals of this RID project, therefore, is to further develop and continue to support NASA-related materials science research at the University of Wyoming and to assist in expanding the MSE program. Wyoming NASA EPSCoR will continue to support the MSE program by providing funding for a MSE Speaker Series, MSE Research Symposium, and travel grants to encourage collaboration.

To further expand research infrastructure development in Wyoming in a manner that complements the MSE program and supports the needs of the Jurisdiction, the University of Wyoming, and NASA Mission Directorate research priorities, Wyoming NASA EPSCoR will focus research efforts in computing and technology research innovations, including computer science, computational science, artificial intelligence, machine learning, quantum computing, quantum materials, data science, and breakthrough technologies. Support will be provided for faculty seed grants and travel grants for faculty, postdocs, and graduate students to attend scientific conferences, travel to NASA Centers, or for research collaborations.

22-2022 RID-0027

NASA EPSCoR in the Virgin Islands of the United States

**University of the Virgin Islands**

**Dr. Dario Carbone**

The United States Virgin Islands (USVI) has entered a new era in its partnership with NASA to promote STEM research, education, and outreach in the territory. Over the past 9 years, the University of the Virgin Islands (UVI) has led a focused effort to leverage existing facilities and faculty expertise to raise the level of awareness of, participation in, and support for NASA-related science activities in the USVI. Just 10 years ago, UVI had \$0 in NASA federal awards, only 1 full-time physics faculty, and no scientists in the territory were submitting competitive proposals to NASA's Cooperative Agreement Notices (CAN). Over the past 10 years, UVI has raised its level of CAN responses to 5 per year (academic 2017-21), its level of NASA-sponsored research and education support to more than \$1,000,000 per year (academic 2017-21), and now employs 10 full-time physics faculty and researchers.

This dramatic growth in NASA-related research activities at UVI was initiated through a 2013 NASA-EPSCoR Research Award that supported revitalization of research instrumentation at UVI's Etelman Observatory, provided student funding for authentic research experiences at the Observatory and at our NASA partner, Goddard Space Flight Center, and provided funding to hire the first-ever full-time astrophysics resident observer-researcher at UVI (stationed at Etelman Observatory). The success of this project coincided with an unprecedented growth in interest and enrollment in physics and astronomy courses at UVI from 2009-2014 as well as a dramatic increase in scientific production in physics and astronomy. This dramatic increase in physics and astronomy activity at UVI led to our successful submission of a NASA-MIRO proposal, in 2015, to support the first-ever 4-year degree in physics at UVI, designed to capitalize on the success of our ongoing NASA EPSCoR-funded project and to better meet the increased demand for physics offerings at UVI. Through the



## 2022 NASA EPSCOR RID Proposal Abstracts

---

---

new UVI physics program, UVI has hired 3 new full-time physics faculty who now support this increasing demand for physics and astronomy offerings at UVI with research projects and additional courses in physics and astronomy. We have also dramatically increased the number of students doing research at UVI and with our research partners. At the same time, researchers at UVI in fields other than physics and astronomy have also begun to recognize opportunities to do NASA-related research in their own fields and have begun to respond to NASA requests for proposals. In 2015, UVI's Center for Marine and Environmental Research became the first-ever non-physics group at UVI to be awarded a NASA research award, receiving a 3-year NASA EPSCoR research award.

This unprecedented growth in faculty and student research activity in the USVI together with rapidly growing ranks of faculty and researchers with NASA-related research interests and highly-trained students in physics and astronomy, has provided an unparalleled opportunity to embed NASA research activities as a cornerstone of the STEM educational experience in the USVI. This tremendous growth has been made possible through infrastructure support provided by the NASA EPSCoR program. Through the project described within this proposal, we seek to strengthen and expand these ongoing research activities and bring new research communities in the USVI into the NASA research world.



## 2022 NASA EPSCoR RID Proposal Abstracts

---

---

22-2022 RID-0028

NASA Guam EPSCoR Research Infrastructure Development (RID) Program

**University of Guam**

**Dr. Leslie Aquino**

The U.S. territory of Guam is located some 3800 miles west of Hawaii, making it one of the westernmost locations of U.S. soil. It is isolated from the U.S. mainland by its distance yet still closely connected by ever-improving technology and political ties. Guam is also part of the region, Micronesia, which is part of the richly diverse areas of Oceania and nearby Asia, with regional and historical influences evident in Guams culture and common challenges facing Guam and its neighbors. This creates an opportunity for Guam as a jurisdiction to build a sustainable research infrastructure that utilizes and advances NASA research goals while also investigating topics crucial to Guams economic future and of importance to the region. Of particular relevance is research conducted by NASAs Earth Science Mission Directorate, which encompasses research pertaining to physical geography, including but not limited to, climate change, soil science, oceanography, geology, freshwater systems, coral reef ecosystems, terrestrial habitats, karst terrains, atmospheric studies. As Guam seeks new industries beyond tourism that can be sustained within a small economy, there may be opportunities for a new generation of STEM-savvy entrepreneurs, tech developers, and engineers to work with NASA technologies or to support NASA suborbital flight or space missions.

The goal of the NASA Guam EPSCoR Research Infrastructure Development (RID) project is to develop a competitive science, technology, engineering, and mathematics (STEM)-based research program within Guam that aligns with NASA missions and goals. The primary objectives are:

- "" Conduct research relevant to Guam and the region and aligned with NASA missions, increasing competitiveness for non-NASA EPSCoR funding;
- "" Promote education and workforce development, with a focus on GIS and remote sensing applications;
- "" Promote research and capacity building efforts through faculty seed grant awards, travel awards, and other initiatives;
- "" Improve and maintain a strong cyber infrastructure backbone, and serve as a data science hub in Micronesia in order to encourage computer intensive analyses at UOG;
- "" Foster collaboration and partnerships between Guam and NASA scientists, U.S. and international academic institutions, local and federal government agencies, non-governmental organizations and private industry."