



2020 NASA EPSCOR
Research Infrastructure Development (RID) Augmentation
Proposal Abstracts

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2020 NASA EPSCoR Research Infrastructure Development (RID) Augmentation Proposal Abstracts

20-EPSCoR-RID-0001

2019 South Dakota NASA EPSCoR Research Infrastructure Development Program Funding Augmentation

South Dakota School of Mines & Technology

Director/PI: Dr. Edward Duke

This proposal outlines the use of the FY 2019 funding augmentation to the existing South Dakota Research Infrastructure Development program.

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 state's research institutions, government, industry, 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 nation's 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 grants, explicit emphasis is given to development of new or continuing partnerships among colleges and universities in the jurisdiction that will enhance the jurisdiction's abilities to respond to the research and technology development needs of NASA.

This NASA EPSCoR RID program proposal outlines South Dakota's plan to continue to support improvement of the research environment in South Dakota and to further promote technology developments that align with NASA's 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 state's capacity in STEM research and education and effectively address the critical research and development and economic development priorities of the state and NASA.



2020 NASA EPSCOR Research Infrastructure Development (RID) Augmentation Proposal Abstracts

20-EPSCoR-RID-0002

2019 South Dakota NASA EPSCoR Research Infrastructure Development Program Funding Augmentation

New Mexico State University

Director/PI: Dr. Paulo Oemig

New Mexico's NASA EPSCoR RID Program is designed to provide seed funding to faculty who are striving to conduct research that is directly aligned with the goals of NASA's Centers and/or Mission Directorates. The purpose of this program is to help NASA address its complex national challenges, enable new market development, and perform cutting-edge research in order to inspire and educate while also addressing NASA's strategic goals.

Researchers should focus on these project elements:

- Develop collaborative activities and contribute to the strategy for building future research and innovative activities.
- An emphasis on developing a core expertise capable of successfully competing for funds from NASA and non-NASA sources outside of the EPSCoR program.
- Develop competitive research and technology development methods for the solution of scientific and technical problems of importance to NASA.
- Move progressively toward gaining support from sources outside the NASA EPSCoR program by pursuing additional funding opportunities offered by NASA, industry, other federal agencies, and other sources.

This program is primarily focused upon funding investigators who have yet to become established researchers or those who are attempting to branch out in new directions of interest to NASA.



2020 NASA EPSCoR Research Infrastructure Development (RID) Augmentation Proposal Abstracts

20-EPSCoR-RID-0003

Iowa NASA EPSCoR Economic Development (INEED) - Augmentation FY20-FY21

Iowa State University, Ames

Director/PI: Mr. Tomas Gonzalez-Torres

The Iowa NASA EPSCoR Economic Development (INEED) program is focused on building core strengths needed to grow competitive research and technology development capabilities that address scientific and technical problems of importance, as defined by NASA. This is coordinated with the Iowa Space Grant Consortium (ISGC) programs that feed candidates into the research programs within the INE effort. The Research Infrastructure Development (RID) proposal within the INEED focuses on: a) collaborative ventures between the state's researchers and NASA researchers at the NASA field centers or headquarters, b) initiation of competitive research and technology development methods and activities, collaborations, publications, c) cultivate a cadre of researchers that have a working knowledge of NASA programs and research goals that are capable of responding to and d) development of a cadre of researchers working long-term, self-sustaining, nationally-competitive capabilities in aerospace and aerospace-related research, e) support of the Iowa Economic Development Authority's efforts to strengthen the Iowa economy.

The INEED director and associate director will provide leadership for INEED, and already have a demonstrated capacity to organize and support researchers in service of the NASA mission, as they are also the ISGC director and associate directors. ISGC has twenty affiliates including the four academic core institution affiliates. ISGC has four governmental partner organizations that support various activities when the interests of the organizations align (request to add the Iowa Economic Development Authority as an affiliate has been submitted in connection with this proposal). The number of for-profit industrial affiliates varies as the activities of the ISGC align with the interests of a company. At present there are four industrial affiliates. This proposal focuses on leveraging the ISGC Network and administrative team to promote more NASA-focused research in these Iowa institutions.

The overall goals of this INEED program are to build and grow functional relationships between Iowa researchers and the NASA Centers and their research personnel to foster development of joint research projects and ultimately move the state's researchers up to the next level of competitiveness in NASA related research areas. These goals are foundational to serve Iowa's 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 and subsequent work from sustaining programs. In pursuit of these goals, we plan to offer a) partnership development 'seed' funding for joint research projects within state of Iowa, b) partnership development symposia to bring together intra-state scholars and NASA researchers to better exchange ideas, explore emerging research areas, and to work more effectively with NASA Centers, and c) 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 goals of the project are to establish stronger research connections between Iowa researchers and NASA research by increasing awareness of NASA opportunities and NASA researchers' efforts. These relationships are to then lead to an increased number of researchers working on NASA technical issues. Other anticipated outcome will be increased intra-state collaboration in the academic and industry communities in NASA relevant areas.



2020 NASA EPSCOR Research Infrastructure Development (RID) Augmentation Proposal Abstracts

20-EPSCoR-RID-0004

Rhode Island NASA EPSCOR Research Infrastructure and Development Grant

Brown University

Director/PI: Dr. Peter Schultz

With this augmentation, we will compete small research seed grants that directly align with our jurisdiction priorities and could enable future funding from NASA through programs such as technology development, planetary instrument development, and industry collaborations, all of which would benefit Rhode Island, thereby increasing competitiveness. In addition, each award may stimulate new NASA connections and collaborations through collaborations with NASA Centers or clear alignment with NASA's Mission Directorates. For this augmentation, we will increase the number of seed grants and increase support for the EPSCoR PI in order to carry out the increased number of activities.



2020 NASA EPSCoR Research Infrastructure Development (RID) Augmentation Proposal Abstracts

20-EPSCoR-RID-0005

NASA Kentucky EPSCoR Research Infrastructure Development (RID) 2019-2021 Augmentation

University Of Kentucky, Lexington

Director/PI: Dr. Suzanne Smith

The Kentucky Statewide EPSCoR Program's mission is to enhance the 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. This mission aligns with Kentucky's economic development strategy, which stresses the transition to advanced manufacturing, leveraging growth areas like aerospace, and the development of an innovation economy driven by the strengths of its educational system: cutting-edge R&D and a highly educated workforce. Supporting this statewide mission, NASA Kentucky EPSCoR's goals are to enhance capacity through strategic investments in NASA-priority research areas and to increase researcher competitiveness for non-EPSCoR NASA funding. A key factor in achieving the latter goal is initiation of relationships between Kentucky's and NASA's researchers that can develop into partnerships. Every aspect of the current RID portfolio emphasizes this process of relationship-building, including pursuing collaborations that enable commercial space partnerships.

To reach these goals, four specific objectives of the NASA Kentucky EPSCoR program align with those of the NASA EPSCoR program: 1) to develop human research infrastructure in areas strategically important to NASA, 2) to gain support from non-EPSCoR sources, 3) to develop NASA Partnerships, 4) to develop science, technology and economic capacity.

The centerpiece of the NASA KY EPSCoR RID Program is the Research Infrastructure Development Grant (RIDG) competitively awarded to faculty for one year. RIDG proposals to NASA KY stress collaborative relationship building with NASA. Faculty principle investigators (PIs) must include a letter of collaboration from a NASA collaborator based on prior interactions, describe a schedule for regular contact with the NASA collaborator and plans for a visit to 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 in establishing initial connections with NASA and developing interdisciplinary 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 EPSCoR Research Area (RA) or other nationally competitive solicitations. Conference funding provides partial support for a local, regional, national or international meeting hosted in Kentucky focused on NASA related research. Seminar funding supports a series of seminars or webinars on an aerospace topic. Faculty Travel (FT) awards are also awarded to assist faculty in developing new relationships with NASA. Individual travel awards are awarded to researchers after review of the application, which must include a NASA invitation to visit and discuss potential collaboration. Analysis of the EPSCoR RAs awarded to KY shows that, to be competitive nationally, it is necessary for a proposed project to have multiple NASA connections. Helping new-to-NASA PIs make an all-important initial contact will 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, NASA KY management also tracks and communicates the impact of NASA Kentucky EPSCoR Programs.



2020 NASA EPSCoR Research Infrastructure Development (RID) Augmentation Proposal Abstracts

20-EPSCoR-RID-0006

A Plan for NASA EPSCoR Research Infrastructure Development (RID) in Delaware Augmentation

University Of Delaware

Director/PI: Dr. William Matthaues

The aim of NASA's EPSCoR RID program is to stimulate and support new collaborations within a state in order to develop research infrastructure in that state. The major goals of the 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 additional augmentation funds will be used to supplement the current NASA EPSCoR RID award projects.



2020 NASA EPSCoR Research Infrastructure Development (RID) Augmentation Proposal Abstracts

20-EPSCoR-RID-0007

2019-2022 Maine NASA EPSCoR RID Augmentation Proposal for Yrs 2 and 3

Maine Space Grant Consortium

Director/PI: Dr. Terry Shehata

The Maine Space Grant Consortium intends to use augmentation funding to increase support for our collaborative seed grant program as proposed in our original, awarded three-year EPSCoR RID Program proposal.



2020 NASA EPSCoR Research Infrastructure Development (RID) Augmentation Proposal Abstracts

20-EPSCoR-RID-0008

New Development for Louisiana Aerospace Research Augmentation

Louisiana Board Of Regents

Director/PI: Dr. Gregory Guzik

Louisiana's commitment to Aerospace Science & Technology development has been well established over the 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 participates in all of the 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 the EPSCoR programs. Program management & technical oversight is conducted primarily out of the Louisiana Space Grant/NASA EPSCoR office housed at LSU. The two offices work intandem to fulfill the mission-driven requirements of NASA while buoying the infrastructure development needs of the state. 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, with the Michoud Facility in New Orleans, and with Stennis Space Center through both EPSCoR and the Louisiana Space Grant (LaSPACE). 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. During our previous 3-year cycle alone – through several small-scale, but targeted programs – we supported 13 different faculty researchers, representing 7 different Louisiana Universities (LaTech, LSU, Southern-BR, Southern-NO, ULL, UNO, and Xavier) to conduct research projects in collaboration with 11 NASA researchers from 5 NASA Centers (Ames, Glenn, Johnson, Marshall, and Stennis). In June 2018 Louisiana NASA EPSCoR RID funding will bring a dozen researchers from 7 campuses to Goddard Space Flight Center in Maryland for a NASA Technical Interchange Meeting. These meetings allow interested Louisiana researchers an opportunity to discuss current projects and support needs with active NASA scientists and engineers, which could lead to future collaborations. Our goal for the next three years is to build upon our previous successful TAP, SAR, & RAP subprograms to expand and improve New Development for Louisiana Aerospace Research.”



2020 NASA EPSCoR Research Infrastructure Development (RID) Augmentation Proposal Abstracts

20-EPSCoR-RID-0009

NASA Established Program to Stimulate Competitive Research

West Virginia University

Director/PI: Dr. Majid Jaridi

The NASA West Virginia Established Program to Stimulate Competitive Research (EPSCoR) respectfully requests augmentation of \$25,000 to its fiscal year 2020-21 Research Infrastructure Development (RID) Program budget and \$50,000 to its FY 2021-22 budget to better serve its constituents and to extend the benefits of NASA's research and infrastructure development to all faculty, researchers and students in West Virginia. The additional funding will enable us to increase our investment in programs to support our Research Seed Grants, other community outreach projects, and more resources for our researchers to travel to NASA Centers and technical and scientific meetings. This augmentation request was developed by a subcommittee of the NASA WV EPSCoR state-wide committee. No additional funding will go towards personnel salaries at the NASA WV EPSCoR/WVSGC office. In the following sections, we have included the budget tables for years 2 and 3, with and without augmentation, and justification details.



2020 NASA EPSCoR Research Infrastructure Development (RID) Augmentation Proposal Abstracts

20-EPSCoR-RID-0010

Montana NASA EPSCoR Research Infrastructure Development (RID) Augmentation 2020-2021

Montana State University, Bozeman

Director/PI: Dr. Angela Des Jardins

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. Due to the success achieved thus far, the goals for the Montana NASA EPSCoR RID program will remain consistent with those of the earlier program.

The general Montana NASA EPSCoR goals are: 1. Bring the capabilities of Montana's nationally competitive researchers to the attention of NASA. 2. Build infrastructure to enhance Montana's capabilities and expertise in areas of importance to NASA, focusing on institutions of higher learning. 3. Use EPSCoR sponsored research to strengthen partnerships with Montana's high-tech companies and drive the growth of Montana's aerospace-related economy. 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. Our RID-Specific goal is: Help boost the research programs of Montana higher education faculty research in areas that match scientific and technical problems of importance to NASA to a new level of national prominence, enabling them to compete successfully for regular NASA research funding.

The Montana RID program includes Research Initiation Grants, Travel Grants, and administrative costs. Research Initiation Grants are competitively awarded to junior Montana faculty to initiate research programs that will develop research and technology that is important to NASA. Funding requests are allowed up to \$50,000 in year two and up to \$60,000 in year three. We support two awards each year. Travel Grants are for Montana researchers to visit NASA Centers and other locations associated with their NASA-related research. We fund up to \$1,000 per visit.

For this augmentation, we primarily add funds to the Research Initiation category. However, due to the reduction of the cost share requirement from 1:1 to 50%, we had to move much of our administration costs from cost share on to the NASA request. This is due to the fact that we will not receive nearly the amount of return in indirect costs with the reduction in cost share. Therefore, we are only able to add about \$4,500 in funds to the Research Initiation Grants for year 2 with the \$25,000 increase in funds (and we reduced the travel fund by \$2,000 and eliminated our supply budget). In year three we are able to add about \$25,000 more than usual to the Research Initiation Grants. With this change, we will allow proposals up to \$60,000. This increase is important because costs for faculty researchers are going up and we haven't increased our allowed amount for ten years.



2020 NASA EPSCoR Research Infrastructure Development (RID) Augmentation Proposal Abstracts

20-EPSCoR-RID-0011

The Hawaii EPSCoR RID 2020 Augmentation

University of Hawaii, Honolulu

Director/PI: Dr. Luke Flynn

The goal of the Hawai'i NASA EPSCoR Program is to develop an academic research enterprise that is directed toward long-term, self-sustaining, nationally-competitive capabilities in aerospace and aerospace-related research. The Hawai'i NASA EPSCoR Program supports a series of collaborative projects that will strengthen ties between the University of Hawai'i system, NASA Centers in closest proximity to Hawai'i, State and Federal agencies, and private industry. Hawai'i underrepresented populations will be preferential recipients of support. The ORS-4 Mission launched unsuccessfully from Kauai on November 3, 2015. While the launcher rail worked perfectly, there was a problem with the Super-Strypi first stage motor and rocket shroud (The shroud was made of wood and delaminated in flight.) Nevertheless, there were numerous successes as a result of the ORS-4 Mission. The ORS-4 mission trained 130 students who helped to deliver the HiakaSat satellite according to US Air Force standards. HSFL, with NASA EPSCoR RID support, is working on a Big Island small launch vehicle (<300 kg to 500 km orbit) site that will handle solid-motor and liquid-engine vehicles. Six US small launch companies have expressed interest to launch from a Big Island site. The EPSCoR jurisdiction director is involved with guiding both efforts.

HSFL is working on four small satellite missions and mission concepts currently with NASA EPSCoR RID support. (1) Neutron-1: This 3-U CubeSat features a LunaH-Map neutron detector from Arizona State University and is of interest to the NASA Science Mission Directorate as an engineering test of neutron detectors that will go to the Moon. Neutron-1 will be delivered for launch in summer-fall 2020. (2) Hyperspectral Thermal Imager (HyTI): HSFL, JPL, and partners are building a 6-U infrared remote sensing technology demonstration satellite for the NASA Science Mission Directorate Earth Science Technology Office. HyTI is a \$5.6M mission (JPL funds included) that was partially secured with NASA EPSCoR RID funding that was directed to the HSFL engineering team to help to flesh out proposal details. (3) Space-Based Calibration Platform (SBCP): SBCP will be a 100-kg satellite that will support DoD radar testing and is currently in the System Requirements Review stage. NASA EPSCoR RID funds are used to help the Project Manager, Dr. Trevor Sorensen, and the HSFL engineering team to draft proposals for further DoD funding. (4) High-Energy Particle Detection for Astrophysics: Dr. Shaddia Habbal at the Institute for Astronomy wrote a proposal in response to a NASA Science Mission Directorate call for SMEX-level proposals and received encouraging reviews to resubmit. NASA EPSCoR RID funds will be used to support the HSFL engineering team to help with proposal and schematic development of the small satellite to be used in the mission.



2020 NASA EPSCoR Research Infrastructure Development (RID) Augmentation Proposal Abstracts

20-EPSCoR-RID-0012

Mississippi NASA EPSCoR Research Infrastructure Development Program (RID)

University Of Mississippi

Director/PI: Dr. Nathan Murray

Mississippi NASA EPSCoR will utilize the Augmentation to increase the number and size of the seed grant awards for its RID program. In Year 1, two seed grant awards of \$47,500 were made, and each awardee is providing a 1:1 match from her/his own institution. With the Augmentation, the number and size of awards is adjusted for Years 2 and 3:

Year 2: 3 awards of \$36,000 with \$18,000 match required, and

Year 3: 3 awards of \$45,000 with \$22,500 match required.

The second element of the program is the initiation/development of relationships between Mississippi researchers and relevant NASA scientists and engineers in the Mission Directorates and Field Centers. Dollars are set aside to fund these Faculty Travel Opportunities. Under the Augmentation, the total amount budgeted for this purpose is adjusted down from \$14,382 to \$13,698. This small decrease is to facilitate a balanced budget with the increased funding allocation for the seed grants.



2020 NASA EPSCoR Research Infrastructure Development (RID) Augmentation Proposal Abstracts

20-EPSCoR-RID-0013

Alaska's NASA EPSCoR Program 2019-2022

University Of Alaska, Fairbanks

Director/PI: Dr. Denise Thorsen

The Alaska State Committee on Research (SCoR) updated the Alaska Science and Technology Plan, To Build a Fire [see <https://www.alaska.edu/research/research/scor/>] 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 “Alaska’s unique characteristics lend themselves....” Each of the EPSCoR programs (NASA, NSF, DOE, etc.) currently active in the state look to this document to find the commonality between Alaska’s research interests and those of the federal agency. This proposal outlines those commonalities between Alaska’s S&T plan and NASA’s 2018 Strategic Plan.

Specifically, this NASA EPSCoR RID proposal seeks to build Alaska’s 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 Alaska’s ability to respond to research and technology development needs of NASA and the State and to partner with Alaska’s 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.

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.

Objective 3: Promote commercialization and collaboration with industry by supporting faculty and student participation in relevant workshops such as NASA’s Small Business Technology Infusion Road Tour and Lean Launch startup workshops which leads to one significant university/industry collaboration.



2020 NASA EPSCoR Research Infrastructure Development (RID) Augmentation Proposal Abstracts

20-EPSCoR-RID-0014

NASA Nebraska EPSCoR RID Program FY 2019-2021 Augmentation

University Of Nebraska, Omaha

Director/PI: Scott Tarry

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 FY2019 to FY2021 will continue to support and sustain unique research activities that address the priorities of both NASA and Nebraska. NASA Nebraska EPSCoRs philosophy of using strategic investments in seed projects to develop competitive proposals for the national NASA EPSCoR competitions has been incredibly 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.

This Augmentation proposal provides the opportunity to expand the number of research mini-grants and collaborative travel grants to our Nebraska institutions as all of the funds will be added to the subcontract portions of the budget.



2020 NASA EPSCoR Research Infrastructure Development (RID) Augmentation Proposal Abstracts

20-EPSCoR-RID-0015

FY19 North Dakota NASA EPSCoR Augmentation Funding Proposal

University Of North Dakota, Grand Forks

Director/PI: Dr. Caitlin Nolby

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.

ND NASA EPSCoR goals include: 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.

To accomplish each of these goals, ND NASA EPSCoR has established the following methods/techniques (objectives). 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, and travel to enhance NASA-relevant research initiatives.

ND NASA EPSCoR also focuses on three priorities: 1) diversity, 2) collaboration, and 3) student support. The significance of the seed grants, travel grants, and synergistic activities to NASA can be seen through the five Research Focus Areas (RFAs): RFA A – Astronomy and Planetary Sciences, RFA B – Human Space Exploration, RFA C – Earth Science, RFA D – Materials Science, and RFA E – Small Satellites. These RFAs align with NASA strategic goals 1, 2, and 3. All project elements also align with the NASA Science Technology Mission Directorate (STMD), NASA's Science Mission Directorate (SMD), and NASA's Technology Area (TA) Roadmaps. Through this alignment, ND NASA EPSCoR aims to meet NASA's research and technology development priorities.

This Augmentation Proposal seeks to expand on the ND NASA EPSCoR goals, objectives, and priorities.



2020 NASA EPSCOR Research Infrastructure Development (RID) Augmentation Proposal Abstracts

20-EPSCoR-RID-0016

New Hampshire NASA EPSCoR RID Years 2021-2022

University of New Hampshire, Durham

Director/PI: Dr. Antoinette Galvin

The strategic goal of the NASA Established Program to Stimulate Competitive Research, Research Infrastructure Development (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. We propose an augmentation to the mini-grant (research and travel infrastructure) technical element and a revision to the ionospheric mission technical element.



2020 NASA EPSCoR Research Infrastructure Development (RID) Augmentation Proposal Abstracts

20-EPSCoR-RID-0017

Vermont NASA EPSCoR Program Research Infrastructure Development (RID) Augmentation Request for Years 2 and 3

University Of Vermont, Burlington

Director/PI: Dr. Bernard Cole

Vermont is in many ways the prototype of an EPSCoR state. Predominantly rural, the state's population in 2017 was 623,960 ranking it 49th in the nation. The University of Vermont (UVM) is the state's only comprehensive university offering a full spectrum of graduate programs leading to advanced degrees in STEM disciplines. Baccalaureate degrees and limited Masters level degrees in STEM disciplines are offered at Norwich University, Saint Michael's College, Vermont Technical College and elsewhere in the state college system. With a few exceptions, the largest cohort of active academic researchers in Vermont are faculty at UVM, which is recognized as the state's only research university. Even at UVM, and despite the high quality of the faculty, the pool of academic researchers is comparatively small owing to the institutional size. As a result, it is often a challenge to attain the critical mass of researchers and research infrastructure needed to compete successfully for federal research funding. The fact that Vermont is geographically remote from all NASA centers (the nearest being 600 miles away) adds to the challenge of developing potential collaborations with colleagues at NASA. Despite these challenges, Vermont's NASA EPSCoR program has had significant success creating an interest in NASA research priorities among Vermont's academic researchers. It has supported activities that have established and strengthened connections between Vermont's academic researchers and collaborators at NASA Centers and has made our jurisdiction's 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. During the recent Phases III, IV and V of the NASA EPSCoR RID Program, research funding awarded by Vermont's program has significantly increased the number of research proposals on topics that are NASA research priorities submitted by Vermont academic researchers to NASA and other federal agencies through non-EPSCoR mechanisms. Several of these proposals have led to significant research grants awarded in regular national funding competitions. Research grants from our Core Research Infrastructure Project have also established ties between Vermont's academic researchers and Vermont's small technology-based companies, forged links between Vermont's NASA EPSCoR program and State Agencies, and supported Vermont's economic development goals.

The present proposal for Research Infrastructure Development (RID) funding from 2019 to 2021 will continue to expand the strong foundation established by our prior RID-sponsored efforts. Vermont's proposed 2019-2021 RID project plan has been designed to further increase the national competitiveness of Vermont's academic researchers, to increase Vermont's NASA-related research infrastructure, and to develop new collaborative research ties with NASA centers and Mission Directorates while strengthening existing ones. Locally, the RID VI project will promote academic-industrial partnerships that support State economic development goals and foster collaborations among state colleges and universities that enhance Vermont's ability to respond to the evolving research and technology needs of NASA. The RID funding will be used specifically to support pilot and small-scale competitive research grants, travel grants to enable investigators to visit NASA centers, and the Industrial Partners Initiative, which seeks to strengthen collaborative links between academic researchers and Vermont companies in areas that align with NASA's research and technology needs.



2020 NASA EPSCOR
Research Infrastructure Development (RID) Augmentation
Proposal Abstracts

20-EPSCoR-RID-0018

The Kansas NASA EPSCoR Research Infrastructure Development (RID) Funding Augmentation

Wichita State University

Director/PI: Dr. Leonard Miller

The Kansas NASA EPSCoR Research Infrastructure Development (RID) Funding Augmentation
Wichita State University



2020 NASA EPSCoR Research Infrastructure Development (RID) Augmentation Proposal Abstracts

20-EPSCoR-RID-0019

NASA Oklahoma EPSCoR Research Infrastructure Development

Oklahoma State University

Director/PI: Dr. Andrew Arena

Specific RID activities will target four objectives: 1) Initiate contacts and forge direct partnerships with scientists and researchers at the Mission Directorates, the Office of the Chief Technologies, and/or one or more of the ten NASA Centers; 2) Promote collaborative research programs with the NASA Centers, Mission Directorates, and Industry; 3) Initiate research activities in areas of strategic importance to the Agency; and 4) Support undergraduate and graduate research experiences. The majority of the proposed funding will be used for Travel Grants and Research Initiation Grants awarded to Oklahoma faculty researchers that align with Goals 1-3 of the 2018 NASA Strategic Plan. All of the objectives of this proposal are also in alignment with priorities of the Oklahoma jurisdiction, in particular the "One Oklahoma - A Strategic Plan for Science and Technology" plan published 2016, that ensure that research impacts the State's economy through the technology transfer pipeline, opening doors to universities to license technology and faculty members to own businesses that market technology and invention, and the Council of Science and Technology.

The primary activities and majority of the funding support Travel Grants, which provide opportunities for researchers to forge a direct partnership with a NASA Center, Mission Directorate, or Office of Technology Development for possible collaborations. Once Travel Grant awardees have successfully established links, they may apply for a Research Initiation Grants (RIGs), to further develop research collaborations.



2020 NASA EPSCOR Research Infrastructure Development (RID) Augmentation Proposal Abstracts

20-EPSCoR-RID-0020

SC NASA EPSCoR RID AUGMENTATION - 2020 - 2022

College of Charleston

Director/PI: Dr. Cassandra Runyon

We propose to expand on an existing research consortium, CORE SC, to work with our island colleagues in Puerto Rico, US Virgin Islands, Alaska, Hawai'i and Guam to better understand the natural hazards facing our jurisdictions. Collectively, we will address key research questions in response to, and in support of, NASA's effort to understand the response of the Earth System to disasters and disaster resilience.

South Carolina NASA EPSCoR is a member of CORE SC – Center of Resiliency Excellence in South Carolina. Together, Charleston County, the College of Charleston and the SC Aquarium form the nexus for research, innovation, and collaboration that leads to actionable outcomes to improve community and societal resiliency in response to natural and anthropogenic events. Acting also as a virtual hub, CORE SC supports, connects, and coordinates regional and national partners engaged in all aspects of the entire life cycle of resilient program development. These aspects include ideation, research, data acquisition, policy creation, prototype implementation, field-testing, deployment, maintenance, and commercialization. We will use existing NASA data such as AVIRIS, UAVSAR, G-LiHT and more to support data collected in the field.

Two planning workshops are proposed in Year 2 to identify and evaluate issues and best practices on the east and west coasts of the US to be addressed in a larger workshop in Year 3. Topics to be discussed include five central resiliency sectors for each of the partner jurisdictions:

1. Water – maintaining healthy drinking water, mitigation of coastal erosion, sea-level rise, filtering and controlling storm run-off, responding to climate change
2. Energy – Testing, developing, deploying renewable energy sources such as solar, wind, water, battery, bio-sources
3. Connectivity – Ensuring societal access to internet and other means of communication
4. Agriculture – Providing sustainable Food Sources (Aqua/Land)
5. Natural Hazards – Mitigating and communicating / responding to effects of earthquakes, tsunamis, flooding, hurricanes, tornados.



2020 NASA EPSCoR Research Infrastructure Development (RID) Augmentation Proposal Abstracts

20-EPSCoR-RID-0021

Puerto Rico NASA EPSCoR Research Infrastructure Development Augmentation

University Of Puerto Rico, San Juan

Director/PI: Dr. Gerardo Morell

Established in 1994 by the Resource Center for Science and Engineering (RCSE) 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 Rico's 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 NASA's 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 NASA's research priorities, the RID projects are competitively selected based on their connection, interaction, and relevance to NASA centers. The evaluation criteria include: intrinsic scientific and/or technical merit; alignment with NASA technology needs; relevance to, partnerships with, and interactions with 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.



2020 NASA EPSCOR Research Infrastructure Development (RID) Augmentation Proposal Abstracts

20-EPSCoR-RID-0022

Arkansas - 2019 EPSCoR Research Infrastructure Development (RID) Funding Augmentation

University of Arkansas, Little Rock

Director/PI: Dr. Mitchell Hudson

Proposal Summary 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
- 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 annual workshop to disseminate information and know-how to potential Research Award competitors
- Conduct a statewide one day long NASA EPSCoR Conference, in conjunction with the annual Arkansas PSCoR Conference if possible, to bring NASA and other agency sponsored individuals together



2020 NASA EPSCoR Research Infrastructure Development (RID) Augmentation Proposal Abstracts

20-EPSCoR-RID-0023

Idaho NASA EPSCoR Proposal in Response to 2019 Established Program to Stimulate Competitive Research (EPSCoR) Research Infrastructure Development (RID) Funding Augmentation

University Of Idaho, Moscow

Director/PI: 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 that will 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 and collaboration activities. 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 between NASA researchers and Idaho researchers. All of the proposed activities align with Idaho NASA EPSCoR's Vision, Mission, Strategic Goals, Objectives and Priorities.

Perceived significance of proposed work:

Idaho NASA EPSCoR's 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.



2020 NASA EPSCoR Research Infrastructure Development (RID) Augmentation Proposal Abstracts

20-EPSCoR-RID-0024

Wyoming NASA EPSCoR RID Augmentation Proposal: FY 2019 - 2021

University of Wyoming

Director/PI: 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 (UW) 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. In recent UW Academic Plans, areas for development in critical areas of science and technology have been identified, one being materials science research. Additionally, there is a continued focus on materials science and engineering research through the UW Tier-1 Engineering and Science Initiatives, both of which are involved in developing and identifying high-priority areas for research and economic focus for WY and the University. The WY Governor's UW Top-Tier Science Programs & Facilities Task Force also identified material science as an area for future development, so there is considerable interest in this area within our jurisdiction. With support from previous WY NASA EPSCoR RID awards, the Materials Science and Engineering program (MSE) at UW 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 mechanical engineering. Materials science is a multidisciplinary field involving collaborations across many academic programs and the MSE program provides a rich, collaborative research environment for researchers to interact. Current strengths at UW include new materials synthesis, advanced laser materials processing and analytics, as well as computational methods for materials design. MSE members collaborate with established centers of excellence on campus, including the School of Energy Resources, the Carbon Engineering Initiative, the Center for Photoconversion and Catalysis, the newly formed Artificial Intelligence and Machine Learning Center, and the NIH INBRE program, which sponsors biomaterials-related research projects. The development of the MSE program has allowed for greater networking, collaboration, equipment sharing, and faculty and student opportunities in the area of materials science research at UW.

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. The goal of this RID project, therefore, is to further develop NASA-related materials science research at the University of Wyoming and to continue to expand the MSE program. The long-term vision and implementation strategy for the MSE program is to develop a Center for Materials Science and Engineering at UW aligned with NASA research objectives that actively engages with NASA Centers conducting materials science research. This long-term vision will be achieved in multiple steps, which include: 1) establishing a multidisciplinary PhD program in Materials Science and Engineering, 2) participating in national NASA EPSCoR meetings to develop NASA contacts, 3) supporting faculty, especially early career faculty, in successfully obtaining extramural funding for materials science research, 4) building grant funding, research, and collaborative successes to allow for the application of larger center-related grant proposals, and 5) integrating NASA Technology Readiness Level (TRL) training into courses and in developing collaborative research projects aimed at not only basic research, but also producing products. The RID Augmentation will enable us to further these goals by providing additional faculty seed grants, as well as additional funding for travel to allow our faculty and students to engage in networking opportunities and develop research collaborations, and to bring external speakers to UW.



2020 NASA EPSCoR Research Infrastructure Development (RID) Augmentation Proposal Abstracts

20-EPSCoR-RID-0025

Nevada NASA EPSCoR Research Infrastructure Development; Augmentation

Nevada System of Higher Education

Director/PI: Dr. Lynn Fenstermaker

This proposal identifies additional opportunities to enhance Nevada's research infrastructure that will result in sustainable research programs relevant to both NASA and the State's interests. As stated in the base award proposal, Nevada NASA EPSCoR Research Infrastructure Development (RID) goals are provided below.

Goals, Objectives and Priorities

The overall goals of the Nevada NASA EPSCoR program are:

- Contribute to the overall research infrastructure, science and technology capabilities, higher education, and/or 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 the Nevada System of Higher Education (NSHE), NASA Centers, and industry; and
- Work in coordination with the NASA Space Grant program to improve the environment for science, mathematics, engineering, and technology education in Nevada.

Specific objectives that were targeted in the base award remain the same as listed below.

- Objective 1: Enhance research infrastructure by competitively awarding at least three significant RID seed grants each year. Grants will be relevant to both NASA and Nevada strategic science plans, as well as the NASA Center and Mission Directorate science priorities provided 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 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 the workshops is the submission of a competitive research proposal.
- Objective 3: Facilitate new research collaborations among NASA Centers 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.

This augmentation proposal funding will allow us to fund an additional RID Seed award in Years 2 and 3 of the proposal (3 awards per year). Please see budget narrative for details.



2020 NASA EPSCoR Research Infrastructure Development (RID) Augmentation Proposal Abstracts

20-EPSCoR-RID-0026

NASA EPSCoR in the Virgin Islands

University of The Virgin Islands

Director/PI: Dr. David Morris

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 6 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. Seven 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 7 years, UVI has raised its level of CAN responses to 5 per year (academic 2017-18), its level of NASA-sponsored research and education support to more than \$1,000,000 per year (academic 2017-18), and now employs 7 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(see Figure 1, below) 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 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.

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. Through NASA-EPSCoR RID funding in 2016-2018 we have:

- Established the first-ever NASA-seed-grant program at UVI
- Funded several UVI students to do research at UVI both through direct funding and through seed grants
- Supported travel for several UVI students to national meetings
- Supported 2 USVI high school students to do research at UVI during the summer.
- Supported the hiring of a dedicated NASA grants administrator at UVI to assist in all grant-related activities and reporting in the USVI



2020 NASA EPSCoR Research Infrastructure Development (RID) Augmentation Proposal Abstracts

20-EPSCoR-RID-0027

Alabama NASA EPSCoR FY2019 Research Infrastructure Development (RID) Augmentation

University Of Alabama, Huntsville

Director/PI: Dr. Lawrence Thomas

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

- Contribute to and promote the development of research capability 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; and
- Contribute to the overall research infrastructure, science and technology capabilities, higher education, and economic development of the jurisdiction.

With RID augmentation 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 (SEC), which oversees all EPSCoR programs within the state. The PI of this proposal is Dr. L. Dale Thomas, the Alabama NASA EPSCoR Director, the Alabama Space Grant Consortium Director, and a professor at The University of Alabama in Huntsville. Alabama proposes a RID augmentation program based on the following elements:

- Seed grants – Seed grant augmentation for Yrs. 2 and 3 to current FY19 seed research grant/research initiation grants awardees to researchers in early stages of their careers (5 grants @ \$16K/year) – awardees were competitively selected.
- Dr. Raziq Yaqub, Alabama A&M University, Cyber Security for Decentralized Aero-vehicle Control Systems
- Dr. Nicholas Tsolas, Auburn University, The Next Frontier in Space Exploration - Cubesats: Investigating the combustion characteristics of imidazole-based ionic liquids and HAN bipropellants to enable dual-mode propulsion systems
- Dr. Todd Freeborn, University of Alabama, Evaluating localized electrical impedance myography to quantify segmental fluid shifts induced by simulated micro-gravity conditions
- Dr. Kannatassen Appavoo, University of Alabama at Birmingham, Effect of Space Radiation Environment on Emerging Photonic Technologies
- Dr. Yu Lei, University of Alabama in Huntsville, Development for Advanced Fuel Coatings;
- Continued development of new contacts and cooperative research ties with NASA Centers (plus JPL) and/or Mission Directorates;
- Continued funding for EPSCoR Director travel and travel grants for jurisdiction researchers;
- Continued travel to the annual NASA EPSCoR National Director's Meetings;
- Continued development of new or continuing partnerships among colleges and universities in the jurisdiction that will enhance our jurisdictions' ability to respond to NASA's research and technology development needs. One way we plan to do this is to host a 2-day state-wide Technical Interchange Meeting/Workshop in Yr. 3 (\$12K) which is open to all researchers at all universities and colleges.



2020 NASA EPSCoR Research Infrastructure Development (RID) Augmentation Proposal Abstracts

20-EPSCoR-RID-0028

NASA EPSCoR Research Infrastructure Development (RID) Funding Augmentation 2 – Guam Jurisdiction

University of Guam

Director/PI: Dr. Leslie Aquino

The overall goal of the NASA Guam EPSCoR Research Infrastructure Development (RID2) Project Plan is to develop a competitive research and technology aerospace research program within Guam. The goal will be carried out through four project objectives as stated in the original RID2 proposal:

(1) Increase support for the UOG EPSCoR NASA CAN (GEOCORE) and the sub-award from Hawaii EPSCoR CAN (ACTUAS), (2) Develop a science education, workforce training, and fiber cable hub and research station at the location of the former Apollo 11 Tracking Station in Dandan, Malojloj, Guam, (3) Collaborate with Ames Research Center's Laboratory for Advanced Sensing (LAS) and Dr. Ved Chirayath to use fluid lensing and MIDAR toward high resolution coral reef mapping efforts and rapid coral bleaching assessments in Guam and Micronesia, and (4) Foster innovative research from UOG faculty through seed grants.

The NASA Guam EPSCoR RID2 Augmentation proposal seeks to expand collaboration with NASA centers and other NASA EPSCoR jurisdictions in Years 2 and 3 of the RID. In particular, we would like to enable more researchers and faculty to be able to travel to the annual NASA Technical Interchange Meetings (TIM) and to NASA centers to meet with specific NASA scientists for purposes of technical consultation. Also, we will continue building the "island" or "coastal" consortium with Alaska, Hawaii, Puerto Rico, South Carolina, and U.S. Virgin Islands. This will be through workshops hosted by one or more of the jurisdictions. The ultimate goal of increasing collaboration with NASA scientists, and with researchers across jurisdictions, will be to develop and submit at least one new R3 and/or one new CAN proposal each year, especially considering that GEOCORE and ACTUAS will end in the early part of Year 2 of the RID. This proposal also requests funding for technical workshops in Years 2 and 3 and a research symposium near the end of Year 3. The technical workshops will cover a variety of GIS and remote sensing topics, to be offered to researchers and practitioners on Guam. This expands research capacity of the jurisdiction and increases workforce development in these areas. With the increase in collaboration and competition for more NASA EPSCoR awards; the increase in faculty involvement through seed research grants and technical workshops; and the conclusion of major projects (e.g., GEOCORE, ACTUAS, and Fluid Lensing); there will be sufficient results and preliminary findings to present at a research symposium at the end of Year 3. This research symposium and a technical workshop could be timed to coincide with the annual Conference on Island Sustainability, held in early April every year, to allow for attendance at both events and minimize travel costs for attendees from off-island. Finally, we would also like to revisit Objective 2 of the original RID proposal. The costs involved in renovating the Apollo 11 tracking station are too prohibitive to make it feasible under the current RID award funding level. However, the objective of creating a physical hub for science education, workforce training, and research related to NASA technologies is still a desirable and viable goal. Suggestions for alternate venues include shared educational space between the University of Guam, the Guam Community College, and George Washington High School, all in close proximity to one another, or partnering with the Guam Museum for space. Another possibility is to conduct the creation of this hub in phases. The first phase would reconfigure House 5 at UOG to be focused on NASA EPSCoR research and small group training, and the second phase would expand or possibly relocate to a larger science and education center that would be open to K-12 educators and the general public. This will likely entail increases in supplies, equipment, and contractual costs beyond the amounts in the original RID2 proposal, which are modestly accounted for in the budget summary.