

# *LaSPACE & NASA EPSCoR Program Overview*



**T.G. Guzik, Director**  
**2021 Louisiana Space + Sea Grant Meeting**  
**March 12, 2021**  
**Louisiana State University – Baton Rouge**



# Space Grant / NASA EPSCoR Management



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# The National Space Grant College and Fellowship Program



Congress established the Space Grant program under Title II of the NASA Authorization Act of 1988 (P.L. 100-147)

- Increase the utilization of space resources by promoting a strong educational base, responsive research, training activities, and public service at the universities of the Nation in coordination with the overall NASA program
- Encourage and support the existence of interdisciplinary and multidisciplinary programs of space research within the university community as well as cooperative programs with industry
- Encourage and support the existence of jurisdiction consortia and nation-wide networks made of university and industry members to advance the exploration and development of space resources

The Space Grant network covers the United States (and then some)

- Every state, plus D.C., Puerto Rico, Guam, and Virgin Islands, has a lead Space Grant institution and office that provides / manages Space Grant opportunities across a network of affiliates in the jurisdiction.
- Close to 1000 affiliates across the nation at this point.



# The Louisiana Space Grant Consortium (LaSPACE)



The Louisiana Space Grant Consortium was established in 1991

- Open consortium with 35 affiliates including universities, community colleges, state education boards, museums, industry, and nonprofit organizations
- Each institution designates an institutional coordinator who is responsible for disseminating LaSPACE information across their institution and to represent their institution during LaSPACE Council meetings.
- Significant in-cash cost share from the state and the lead institution (LSU) helps support program administration and augments research opportunities
- All LaSPACE opportunities for affiliates are competitively awarded and some opportunities require an institution cost share.

LaSPACE opportunities and activities organized in four categories

- Internships and Fellowships engage university students in research
- Experiential Workforce Development provides hands-on practical training
- Research awards help jump start early career faculty or new projects.
- K-12 & Outreach engage teachers and the general public in NASA mission



# NASA Internship, Fellowship, and Scholarship Awards



## HBCU Institutional Scholars (HIS) program:

- Support mentoring and engagement of students at LaSPACE HBCU affiliates.
- Awards from \$20,000 to \$40,000 with no match requirement

## Graduate Student Research Assistance (GSRA) program:

- Augment graduate student stipend to help with dissertation research
- Awards are \$8,000 each and requires a cost share

## LaSPACE Undergraduate Research Assistantship (LURA) program:

- Directed to engage undergraduate students in NASA relevant research projects
- Awards are \$4,700 each and no cost share is required

## Summer Internship:

- Support undergraduate student engagement with a NASA relevant research project at either a NASA Center, an Aerospace company, or a university with a NASA supported research program
- Awards are for the summer only at \$7,300 each



# Experiential Workforce Development



## Louisiana Aerospace Catalyst Experiences for Students (LaACES):

- Entry level student ballooning program to teach basic skills, project management and team work while developing a payload flown to 100,000 feet
- Awards up to \$12,000 with no required cost share for a single institution team

## Senior Design awards:

- Support most supplies / materials / travel for senior design projects
- Awards of \$4,000 each with no required cost share

## RockOn!:

- Support usually 5 teams of 3 to participate in the entry level sounding rocket opportunity workshop hosted by Colorado Space Grant and NASA WFF

## Support for Advanced Flight Opportunities for Students (SAFOS):

- Support for development of an advanced rocket, balloon, or satellite payload
- Award up to \$25,000 as funds are available

## High Altitude Student Platform (HASP):

- Student ballooning program for advanced students across the nation

# Revamp of the LaACES program

Did a major revision of the 15+ year old LaACES student ballooning program in 2019-2020

All updated lectures & activities are now online along with video recordings of the sessions

Replaced the core payload hardware with a system based on the Arduino Mega



Recent LaACES balloon launch  
Version 3/11/21d

**LaACES Student Ballooning Course**

Welcome to the Louisiana Space Grant Consortium's Louisiana Aerospace Catalyst Experiences for Students (LaACES) Program.

**Part I – Basic Skills Building and Introduction to Basic Components**

Part I of the LaACES SBC will introduce the participant to all the technical skills required to complete the LaACES MegaSAT program. In addition to the technical skills building, this section will also introduce the participant to analytical analysis, documentation and public presentations.

- + Unit 01 - Introduction to LaACES SBC >
- + Unit 02 - Introduction to Electronics >
- + Unit 03 - Schematics, Prototyping, and Soldering Introduction >

This session will introduce the student to the world of electrical schematics, prototyping an electrical layout, and soldering electrical components. This session has 2 activities associated with it.

**Lecture 03.01:** Schematics Prototyping and Soldering [PDF Version](#) | [Powerpoint Version](#) | [Recorded Session \(YouTube\)](#)

**Lecture 03.02:** Assembly Techniques [PDF Version](#) | [Powerpoint Version](#) | [Recorded Session \(YouTube\)](#)

**Activity 03.01:** Soldering Tutorial [\(PDF\)](#) | [Recorded Session \(YouTube\)](#)

**Resource 03.01:** Reading Circuit Diagrams Part 1 [\(PDF\)](#)

**Resource 03.02:** Reading Circuit Diagrams Part 2 [\(PDF\)](#)

**Resource 03.03:** Reading Schematic Diagrams [\(PDF\)](#)

- + Unit 04 - SkeeterSAT Assembly and Operation >
- + Unit 05 - SkeeterSAT Calibration and Reporting >

All LaACES materials including video presentation are now online at <https://laspace.lsu.edu/laaces/student-balloon-course/>  
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The Arduino Mega, custom MegaSat board, and Adafruit GPS logger is used as the LaACES payload core

# HASP Restarted in 2021 with 11 Teams

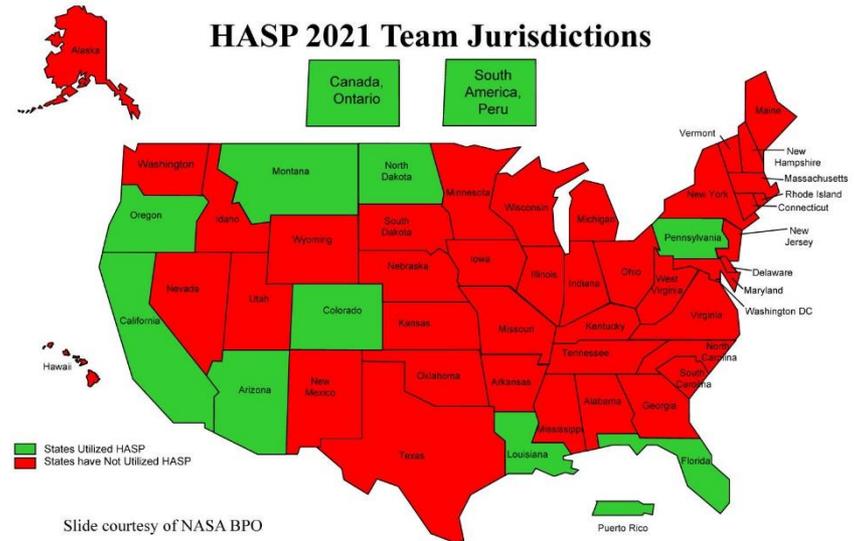
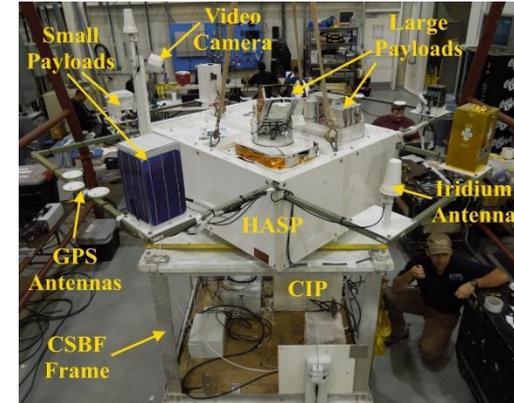
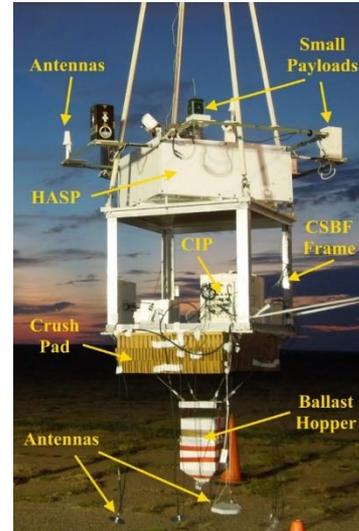
Supported by NASA SMD APD, BPO, CSBF, and Louisiana Space Grant

11 student teams selected for 2021 including 8 U.S. (1 Florida / North Dakota collaboration), 1 Puerto Rico, 1 Ontario Canada, 1 Peru South America

Several teams studying ionizing radiation including the impact of charged and neutral particle radiation on tissue equivalent gas. Flight test of experimental hardware for larger future experiments, including cubesats and the 2024 Solar Eclipse Balloon Project. Partnering with Colorado Space Grant and WFF to fly “extra” RockOn! 2021 sounding rocket student payloads as a piggyback.

Integration: 7/23 – 7/30 at CSBF

Flight Ops: 8/29 – 9/14 at Ft. Sumner



Slide courtesy of NASA BPO

## Research Enhancement Awards (REA):

- Supported usually by Board of Regents funds to develop new NASA relevant research projects or directions, and to foster collaborations
- Awards usually at level of \$35,000 for one year

## Teacher professional development

- Support multiple K-12 teachers to attend the annual TXSG LiftOff workshop or similar programs

Most outreach is done by LaSPACE staff and volunteers via the Mobile Astronomy Resource System (M.A.R.S.)



Version 3/11/21d



2021 Louisiana Space + Sea Grant





# EPSCoR was established in 1988



Congress formally established the “*Experimental Program to Stimulate Competitive Research (EPSCoR)*” in 1988 in order to help address a major discrepancy in the distribution of competitive research awards.

Even now the ~28 EPSCoR states receive just 13.6 percent of all NSF research funds. A larger portion—15%--went to just eight of the nation’s research universities.

The 1988 statute stipulated that the program was to increase research and infrastructure capacity, thereby improving the ability of institutions in EPSCoR states to compete for non-set-aside federal R&D funding.

Participating states were required to demonstrate a commitment to the program by establishing science and technology governing committees to ensure NSF funding was sensitive to the state’s overall strategy for research. Congress also required significant cost sharing between states and the federal government.





# NASA EPSCoR was established in 1992



- Established in 1992 (P.L. 102-588) to enable jurisdictions to develop an academic research enterprise directed toward capability in aerospace and aerospace-related research and to contribute, in turn, to the jurisdiction's economic viability.
- Management function at NASA assigned to Office of Education (now Office of STEM Engagement).
- Established linkage between National Space Grant College & Fellowship Program and the NASA EPSCoR program.
  - Some similar research and workforce development goals
  - Require jurisdiction Space Grant Director to also be PI on all NASA EPSCoR projects.
- The National NASA EPSCoR Caucus was organized by the jurisdiction Directors in 2012 to create an effective network of persons and institutions to support the NASA EPSCoR program.



# NASA EPSCoR Program Opportunities



**Research Infrastructure Development (RID):** This “base” funding is awarded to all jurisdictions. Used for jurisdiction management, travel support for jurisdiction researchers to NASA centers, seed money research projects. (\$175k NASA, \$125k BoR per year)

**Research:** Three-year research project support, focused on a major NASA interest area, and addressing jurisdiction needs. (\$750k NASA, \$750k BoR, 3 years)

**ISS Flight Opportunity:** Awarded only to Science-Is who have developed an instrument under NASA EPSCoR research that could be tested on the ISS. Funds only for travel and review support. No instrument development. (\$100k NASA, 3 years)

**Suborbital Flight Opportunity:** Open to all researchers in a jurisdiction to develop and fly a NASA relevant payload on a suborbital balloon, sounding rocket, aircraft or reusable rocket vehicle. (\$250k NASA, 3 years)

**Rapid Response Research (R3):** In second year of implementation. More focused on specific tasks identified at the NASA centers or mission directorates rather than innovative research in a general area of interest. Offers an opportunity for developing a close working relationship with NASA researchers. (\$100k NASA, 1 year)

**NSF / NASA EPSCoR FAST:** Joint NSF / NASA EPSCoR pilot to engage MSI and NASA researchers, establish strategic collaborations, and build experiences and know-how across respective communities.



# Louisiana NASA EPSCoR Research



Two current NASA EPSCoR Research projects are focused on coastal science studies using NASA remote sensing resources

“Understanding and Quantifying Carbon Export to Global Oceans through Deltaic Systems (CEDS)”, Zuo “George” Xue (LSU)

- Collaboration between LSU-BR and Southern University-BR
- Program period 1/1/2018 – 12/31/2021 (in 4<sup>th</sup> year, 1<sup>st</sup> NCE)

“Satellite-Assisted Forecasting Environment for Improving Oyster Safety (SAFE Oyster)”, Zhiqiang Deng (LSU)

- Collaboration between LSU-BR, Southern University-BR, LaTech, and LSU-Health Science Center
- Program period 9/1/2020 – 8/31/2023 (in 1<sup>st</sup> year)

These are good examples of the NASA and NOAA common research priorities – **Stay tuned for details**