# LaSPACE

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

Notice of Funding Opportunity (NOFO) & Proposal Guidelines

Offered by the Louisiana Space Grant Consortium

Under the authority of the
NASA Space Grant College and Fellowship Program

**Louisiana Space Grant Consortium (LaSPACE)**
**364 Nicholson Hall, Department of Physics and Astronomy**
**Louisiana State University, Baton Rouge, LA 70803**
**225.578.8697 | http://laspace.lsu.edu/ | laspace@lsu.edu**

*Revised, January 2024*
*All previous versions of this program's guidelines are null and void.*

# LaACES Program Summary Page

## About the LaACES Program

The Louisiana Aerospace Catalyst Experiences for Students (LaACES) Program runs for a full academic year. During the first semester a series of lectures and hands-on activities help build student skills in basic electronics, sensor interfacing, real-time programming, mechanical development, and project management. The second semester is then devoted to applying these skills to the design, development, fabrication, and flight of a small (~500 gram) balloon payload. Payloads from all student teams are then flown at the end of the academic year under the management of LaSPACE. Independent balloon flights by institutions are not supported under LaACES. Proposed efforts that do not conform to this general model will review poorly. New teams are expected to follow the base protocol payload design laid out in the course materials; advanced payload experiments are the exclusive purview of returning students/advisors.

## Program Summary

- Proposals must be signed off on by the Project PI and the Authorized Organizational Representative for Sponsored Programs at your institution.
- Award funds can be requested up to $12,000; no strict cost-match amount is required, but some institutional investment will impact our evaluation.
- Multiple proposals per institution may be submitted, but only one proposal per campus will be funded.
- LaACES materials (lectures, electronics kits, etc.) are provided to LaSPACE affiliates implementing this program at no additional cost and independent of any funding proposed here.
- Only flights conducted under the supervision and direction of LaSPACE Management will be considered for funding. Required deliverables include skeetersat and capstone reports, all Design Documents (PDR, CDR, & FRR), security clearance documents, as well as certain testing and payload requirements determined by LaACES management.
- Please complete the Student Participant List if your student teams have already been identified. Identified students must submit an online LaSPACE Student Participation Form upon recruitment to the project.
- The final invoice and a final project report must be submitted to the LaSPACE office within 30 days of the project end date. Photographs and copies of all papers, presentations, and posters generated should be shared with LaSPACE as they occur and collected/referenced in the Final Report. Final Report guidelines can be downloaded from the LaSPACE website's document center. A link to our new online reporting tool is also available.

## Proposal Submissions

- **Submit all properly executed proposals via email as fully searchable pdf documents to laspace@lsu.edu by 11:59 pm on Monday, April 22, 2024.**
- Important Dates:
  - Proposal Release Date: Thursday, January 25, 2024
  - **Proposal Due Date: Monday, April 22, 2024**
  - Anticipated Award Announcements: May/June 2024
  - Award Period of Performance: 08/15/2024 - 05/31/2025

# LaSPACE General Guidelines

## Introduction to the Space Grant Program

The Louisiana Space Grant Consortium (LaSPACE) is a Designated Consortium in the NASA National Space Grant and Fellowship Program network, which was designed to network colleges, universities, and state education boards with partners in business, industry, and the non-profit sector in order to promote, develop, and strengthen aerospace science, research, technology, education, and awareness. Our mission is "To enhance Space and Aerospace related research, education, and public awareness throughout the State of Louisiana and thereby promote math/science education, training of professionals, and economic development." LaSPACE promotes scientific research, workforce development, and public outreach to develop and strengthen long-term research capabilities within Louisiana that will make significant contributions to the research and technology Mission Directorates of NASA while supporting the goals of the state.

## Basis of Authority

The Louisiana Space Grant Consortium (LaSPACE) currently comprises Louisiana public and private colleges and universities in addition to business/industry partners and other organizations. The consortium is funded jointly by the National Aeronautics and Space Administration (NASA) and by the Louisiana Board of Regents Support Fund (BORSF). The consortium is administered by the LaSPACE Council, under the aegis of NASA and the Board of Regents. The basis of authority for this and other programs of LaSPACE rests in part on the above funding. It is important, therefore, to note that the implementation of LaSPACE-supported projects must conform to applicable Federal and State regulations, in general, and to the NASA stipulations, in particular.

# NASA Agency Information

## NASA 2022 Strategic Plan

NASA's 2022 strategic plan aligns the Agency's future activities along three strategic themes of Discover, Explore, and Develop, as well as a fourth theme focused on the activities that will enable the Agency's mission.

- DISCOVER references NASA's enduring purpose of scientific discovery.
- EXPLORE references NASA's push to expand the boundaries of human presence in space.
- DEVELOP references NASA's broad mandate to promote the technologies of tomorrow.
- ENABLE references the capabilities, workforce, and facilities that allow NASA to achieve its Mission.

The complete plan can be downloaded here.

## NASA Vision

To discover and expand knowledge for the benefit of humanity.

## NASA Mission

Lead an innovative and sustainable program of exploration with commercial and international partners to enable human expansion across the solar system and bring new knowledge and opportunities back to Earth. Support the growth of the Nation's economy in space and aeronautics, increase understanding of the universe and our place in it, work with industry to improve America's aerospace technologies, and advance American leadership.

# NASA Office of STEM Engagement *(formerly Office of Education)*

NASA's journeys have propelled technological breakthroughs, pushed the frontiers of scientific research, and expanded our understanding of the universe. These accomplishments, and those to come, share a common genesis: education in science, technology, engineering, and math. NASA's Office of STEM Engagement (OSTEM) delivers tools for young Americans and educators to learn and succeed. OSTEM seeks to:

- Create unique opportunities for students and the public to contribute to NASA's work in exploration and discovery.
- Build a diverse future STEM workforce by engaging students in authentic learning experiences with NASA people, content, and facilities.
- Strengthen public understanding by enabling powerful connections to NASA's mission and work.

To achieve these goals, NASA's Office of STEM Engagement strives to increase K-12 involvement in NASA projects, enhance higher education, support underrepresented communities, strengthen online education, and boost NASA's contribution to informal education. The intended outcome is a generation prepared to code, calculate, design, and discover its way to a new era of American innovation.

The National Space Grant College and Fellowship Program, from which LaSPACE is derived, is a component of the NASA Office of STEM Engagement's larger portfolio, managed at NASA Headquarters in Washington D.C., in alignment with the NASA Mission Directorates, and engagement with all NASA centers and facilities.

NASA Office of STEM Engagement, and by extension LaSPACE, supports the four strategic goals detailed in the 2018 plan. Research and design work supported by Space Grant or NASA EPSCoR must align with one or more of these strategic goals and corresponding objectives.

# NASA Mission Directorates (MD)

*Research and technology priorities are aligned with one or more of NASA's Mission Directorates:*

The **Science Mission Directorate (SMD)** expands the frontiers of Earth science, heliophysics, planetary science, and astrophysics. Using robotic observatories, explorer craft, ground-based instruments, and a peer-reviewed portfolio of sponsored research, SMD seeks knowledge about our solar system, the farthest reaches of space and time, and our changing Earth.

The **Aeronautics Research Mission Directorate (ARMD)** transforms aviation with research to dramatically reduce the environmental impact of flight and improves aircraft and operations efficiency while maintaining safety in increasingly crowded skies. ARMD also generates innovative aviation concepts, tools, and technologies for development and maturation by the aviation community.

The **Space Technology Mission Directorate (STMD)** pursues transformational technologies that have high potential for offsetting future mission risk, reducing cost, and advancing existing capabilities. STMD uses merit-based competition to conduct research and technology development, demonstration, and infusion of these technologies into NASA's missions and American industry. This mission directorate is being refocused as a new Exploration Research & Technology (ER&T) organization to support exploration as a primary customer.

The **Human Exploration and Operations Mission Directorate (HEOMD)** has been divided back into two MDs. The **Exploration Systems Development Mission Directorate (ESDMD)** will define and manage systems development for programs critical to Artemis and plan the Moon to Mars exploration approach in an integrated manner. The **Space Operations Mission Directorate (SOMD)** will focus on launch and space operations,

including the International Space Station, the commercialization of low-Earth orbit, and eventually, sustaining operations on and around the Moon.

All NASA Space Grant subprograms must relate to and support one or more of these directorates. Likewise, all programs supported by LaSPACE must support the NASA organization, align with the NASA Strategic Plan, and support the goals of the Office of STEM Engagement.

# NASA MD Contacts for University Researchers

**Science Mission Directorate (SMD)**
POC: Kristen Erickson, Director, Science Engagement Partnerships Phone: (202) 358-1017, kristen.erickson@nasa.gov
**The Aeronautics Research Mission Directorate (ARMD)**
POC: Dave Berger, OSTEM Embed for Aeronautics, Phone: (661) 276-5712, dave.e.berger@nasa.gov
**Space Technology Mission Directorate (STMD)**
POC: Damian Taylor, SBIR and STTR Mission, Directorate Liaison Phone: (202) 358-1432, damian.taylor@nasa.gov
**Exploration Systems Development Mission Directorate (ESDMD)**
POC: Greg Chavers, DAA for HEO System Engineering & Integration, Phone: (256) 544-0494, greg.chavers@nasa.gov
**Space Operations Mission Directorate (SOMD)**
POC: Marc Timm Phone: (202) 358-0373, marc.g.timm@nasa.gov

# NASA Center Liaisons

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|---|---|
| Armstrong Flight Research Center<br>Veronica Wilson<br>veronica.l.wilson@nasa.gov | Johnson Space Center<br>Jakarda Varnado<br>jakarda.w.varnado@nasa.gov |
| Ames Research Center<br>Veronica Wilson<br>veronica.l.wilson@nasa.gov | Kennedy Space Center<br>Patricia Gillis<br>patricia.j.gillis@nasa.gov |
| Goddard Space Flight Center<br>James Harrington<br>james.l.harrington@nasa.gov | Langley Research Center<br>Bonnie Murray<br>bonnie.murray@nasa.gov |
| Glenn Research Center<br>Gerald Voltz<br>gerald.w.voltz@nasa.gov | Marshall Space Flight Center<br>Vemitra Alexander<br>vemitra.m.white@nasa.gov |
| Jet Propulsion Lab<br>Petra Kneissl<br>petra.a.kneissl-milanian@jpl.nasa.gov | Stennis Space Center<br>Louis Thompson<br>louis.m.thompson@nasa.gov |

# LaSPACE Program

The Louisiana Space Grant Consortium, part of the National Space Grant College and Fellowship Program and in partnership with the Louisiana Board of Regents, supports programs at affiliated academic institutions and other Louisiana organizations that address the NASA mission, federal CoSTEM goals, and state education and economic priorities. LaSPACE programs for Research, Higher Education, Workforce Development, K-12 Teacher Development, and Public Outreach, strengthen the Science, Technology, Engineering, and Math (STEM) education needed for a diverse technical workforce, and develops the research and economic infrastructure to boost Louisiana's contribution to the aerospace frontier.

## Goals and Objectives

LaSPACE Goals and Objectives are directly aligned with NASA Office of STEM Engagement and National Program Emphases on Diversity, Workforce Development, Community Colleges, Pre-College teacher engagement, Competitiveness, NASA Research Relevance, Industry Relations, and State Government Involvement. The updated LaSPACE 2019 Strategic Plan describes a comprehensive program of Research, Education, and Service via 5 strategic goals, each in line with one or more NASA OSTEM objectives , to (1) Foster aerospace research and education (OSTEM 1.1, 1.2, 2.1, 2.2, 2.4, 3.2), (2) Foster and support hands-on experiential programs for higher education students (2.1, 2.2, 2.3, 2.4), (3) Contribute to pre-college STEM education excellence (1.2, 3.1), (4) Engage and educate the general public (3.1), and (5) Maintain an effective consortium of institutions involved in LaSPACE.

Major objectives for the achievement of these goals includes (1) Support for student and faculty research at consortium institutions, (2) Strengthening interactions between Louisiana aerospace industries, faculty, and students, (3) Increased participation in Space Grant programming with the state's HBCUs and Community & Technical Colleges, (4) Provide support to undergraduate and graduate students for research, design, and internship opportunities, (5) Engage students in experiential learning environments, (6) Support middle and high school educator training, and (7) Foster informal education and public outreach. Proposals to LaSPACE programs should explicitly support one or more of these seven objectives.

# LaSPACE Program Team & Affiliate Representatives

General administration and management is the responsibility of the LaSPACE Team headquartered at LSU. Questions about applications to any LaSPACE programs should be directed to the program management team via the general laspace@lsu.edu email address. Unless otherwise directed, all proposals, invoices, reports, and queries should also be submitted via email to the program email address (laspace@lsu.edu). Please refer to the LaSPACE FAQs before contacting LaSPACE management and/or affiliate reps.

LaSPACE Program Office, laspace@lsu.edu, 225-578-8697
LSU Department of Physics & Astronomy |364 Nicholson Hall, Baton Rouge, LA 70803
T. Gregory Guzik, Director, tgguzik@lsu.edu | Colleen H. Fava, Assistant Director, colleenf@lsu.edu |
Doug Granger, Student Flight Program Manager, dgrang2@lsu.edu |
Aaron Ryan, Student Flight Program Instructor & Outreach Coordinator, aryan21@lsu.edu

Additionally, all member institutions have appointed an affiliate representative who sits on the LaSPACE Advisory Council and is available to discuss opportunities and processes related to LaSPACE programs. Contact information for all affiliates is provided below. For institutions with a vacancy, contact the LaSPACE program office at LSU.

# LaSPACE Affiliate Representatives

| | | | |
|---|---|---|---|
| Baton Rouge Community College (BRCC) | vacant | vacant | vacant |
| BREC / Highland Road Park Observatory (HRPO) | Christopher Kersey | o@brec.org | 225-768-9948 |
| Cain Center for STEM Literacy (Cain Center) | Frank Neubrander | fneubr1@lsu.edu | 225-578-4082 |
| Delgado Community College (DCC) | Raymond Duplessis | rduple@dcc.edu | 504-671-6419 |
| Dillard University (Dillard) | Abdalla Darwish | adarwish@dillard.edu | 504-816-4840 |
| East Baton Rouge Parish Library (EBRPL) | Mary Stein | mstein@ebrpl.com | 225-231-3710 |
| Grambling State University (GSU) | vacant | vacant | vacant |
| LaSTEM at LA BOR (LaSTEM) | Clint Coleman | Clint.coleman@laregents.edu | 504-352-4891 |
| Louisiana Arts and Science Museum (LASM) | vacant | vacant | vacant |
| La Board of Elementary & Secondary Education (BESE) | Ann Wilson | ann.wilson@la.gov | 225-342-0140 |
| Louisiana Board of Regents (BOR) | Jessica Patton | jessica.domingue@la.gov | 225-342-4253 |
| Louisiana Business and Technology Center (LBTC) | Roy Keller | rkeller@lsu.edu | 225-578-3985 |
| Louisiana Civil Air Patrol (La CAP) | Jud Ergle | fergle@cap.gov | 504-756-9255 |
| Louisiana Community and Technical College System (LCTCS) | Susana Schowen | SusanaSchowen@lctcs.edu | 225-588-9944 |
| Louisiana Economic Development (LED) FastStart | Paul Helton | paul.helton@la.gov | 225-313-5543 |
| Louisiana Public Broadcasting (LPB) | vacant | vacant | vacant |
| Louisiana State University and A&M College (LSU) | Stephen D. Beck | sdbeck@lsu.edu | 225-578-5833 |
| Louisiana State University at Alexandria | vacant | vacant | vacant |
| Louisiana State University Agricultural Center (LSU-Ag) | Wade Baumgartner | wbaumgartner@agcenter.lsu.edu | 225-578-7742 |
| Louisiana State University Health Sciences (LSUHSC) | Diana Cruz-Topete | diana.cruz@lsuhs.edu | 318-675-4213 |
| Louisiana State University of Shreveport (LSUS) | Urska Cvek | urska.cvek@lsus.edu | 318-675-5128 |
| Louisiana Tech University (LaTech) | Mary Caldorera-Moore | mcmoore@latech.edu | 318-257-2207 |
| Loyola University (Loyola) | Martin McHugh | mmchugh@loyno.edu | 504-865-2451 |
| McNeese State University (McNeese) | Ning Zhang | nzhang@mcneese.edu | 337-475-5873 |
| National Center for Biomedical Research & Training (LSU-NCBRT) | Jason Krause | jkrause@ncbrt.lsu.edu | 225-578-0285 |
| Nicholls State University (Nicholls) | Matt Marlow | matthew.marlow@nicholls.edu | 985-448-4576 |
| Northshore Technical Community College (NTTC) | Chuck Crabtree | charlescrabtree@northshorecollege.edu | 985-545-1231 |
| Northwestern State University of Louisiana (NSULA) | Anna Dugas | dugasa@nsula.edu | 318-357-5519 |
| Nunez Community College (NCC) | vacant | vacant | vacant |

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|---|---|---|---|
| River Parishes Community College (RPCC) | Esperanza Zenon | ezenon@rpcc.edu | 225-743-8713 |
| SciPort Louisiana's Science Center | Heather Kleiner | hkleiner@sciport.org | 318-424-3466 |
| Southeastern Louisiana University (SELU) | Gerard Blanchard | gerard.blanchard@selu.edu | 985-549-2159 |
| Southern University and A & M College (SUBR) | Michael Stubblefield | michael_stubblefield@subr.edu | 225-771-5231 |
| Southern University of New Orleans (SUNO) | Illya Tietzel | itietzel@suno.edu | 504-286-5111 |
| Tulane University (Tulane) | Mark J. Fink | fink@tulane.edu | 504-862-3568 |
| University of Louisiana at Lafayette (ULL) | Afef Fekih | afef.fekih@louisiana.edu | 337-482-5333 |
| University of Louisiana at Monroe (ULM) | Ken Leppert | leppert@ulm.edu | 318-342-1918 |
| University of New Orleans (UNO) | Matthew Tarr | mtarr@uno.edu | 504-280-6836 |
| Xavier University of Louisiana (Xavier) | Ashwith K. Chilvery | achilver@xula.edu | 504-520-5149 |

# LaSPACE Requirements and Restrictions

In this section, requirements and restrictions applied to all LaSPACE programs are summarized. Additional requirements and restrictions pertaining to individual programs offered by LaSPACE are detailed later in these guidelines.

## Public Nature of Applications to LaSPACE

Once an application is received in the LaSPACE office, it becomes public record. Although the staff will not disseminate applications to individuals other than to reviewers, applicants should be aware that, if a request for information is made by the public (e.g., the news media), a copy of the application, by law, must be provided.

## Disclosure of Information

All LaSPACE programs must conform to applicable Federal, State and NASA regulations and stipulations. This includes annual reporting of award participant information to both the Louisiana Board of Regents and NASA. Part of this information will include both directory information such as name, address, telephone number, date of birth, and demographic information such as gender, ethnicity, and race for all award participants including faculty, staff, and students. Further, LaSPACE outreach includes public dissemination of its supported programs through newsletters, the LaSPACE website (https://laspace.lsu.edu/), as well as papers and/or presentations at Space Grant or related Education & Public Outreach conferences. The contents of award reports, including participant names, titles, institution, project summaries, results or conclusions and images, might be included in such public outreach articles. It is not intended that these public articles will disclose directory or demographic information except as aggregated statistical data.

## Diversity

It is a national priority to increase diversity in Science, Technology, Engineering, and Mathematics (STEM), from university students, faculty, and staff to industry employees. Traditionally, minority groups and women have been under-represented in the STEM disciplines as students and faculty as well as in the workplace after graduation. LaSPACE is committed to addressing this priority and utilizing its programs, to the degree possible, to increase the diversity among its awardees. LaSPACE also aims to support a diverse set of institutions and disciplines. **All proposers are expected to help recruit diverse participants to their proposed projects.** To ensure that PIs are making a reasonable effort to recruit diverse participants, a diversity recruitment plan must be included in all proposals submitted to LaSPACE.

To ensure that PIs are making a reasonable effort to recruit diverse participants, a diversity recruitment plan must be included in all proposals submitted to LaSPACE. PIs should expand recruitment to include efforts with local chapters of underrepresented groups such as the National Society of Black Physicists, National Society of Black Engineers, National Organization for the Professional Advancement of Black Chemists and Chemical Engineers, Society of Women Engineers, etc. Even for programs where students have already been selected at the time of proposal (e.g. GSRA, LURA, HIS, etc), the general diversity recruitment plan for the PI's lab must be detailed, as well as the specific efforts used to recruit the proposed student participant(s).

## Animal Use

Any project proposing the use of an animal model for validation must include a local IACUC approval letter, fully signed, which specifies a validity period longer than the proposed project period. Failure to obtain the Institutional Animal Care and Use Committee's approval in advance, is grounds for returning the proposal unreviewed. Attach the IACUC material as an additional appendix.

## Human Subjects

Projects that involve human subjects are not acceptable for this program.

## Eligibility

PI must be authorized by an affiliated institution to serve as Principal Investigator on behalf of said institution. Students directly funded under programs designated as NASA NIFs programs must be U.S. citizens. Current NASA NIFs programs offered by LaSPACE: GPS, GIRAF, GSRA, HIS, Internships, LURA, LaSSO. Additional, or altered, restrictions may apply to specific programs.

## Concurrent, Overlapping, and Consecutive Awards

PIs may hold more than one LaSPACE Award concurrently with some restrictions. No student may be funded simultaneously via multiple awards in the scholarship/fellowship programs (GSRA, Fellows, LURA, LaSSO, & HIS programs). Consecutive, non-overlapping awards in these program areas may be issued to exceptional students in the midst of extended research. Proposals for additional year(s) of funding may be submitted if 1) the previous period of performance has recently passed or is 60 days or less from completion, 2) must explicitly reference the completion of proposed tasks from the current/previous award within the new proposal, **3) must include a Final Report, or preliminary Final Report if still in progress, in an appendix**, and 4) must clearly state the objectives and goals for the new proposal differentiating said goals from the prior work.

## Budgeting

Capital Equipment purchases and Foreign Travel are, in general, not allowable costs**.** The submitting PI is responsible for the writing of the budget. **Any requests to rebudget funds must be submitted in writing to laspace@lsu.edu for consideration.** A completed LaSPACE Budget Revision Request Form (available for download from the LaSPACE Document Center) must be included and minimum requirements for direct student funding commitments must be met.

## Disbursement of Funds

LaSPACE Award fund distribution will be managed by the applicant's college or university, either via a cost-reimbursable subcontract if the applicant is at an affiliate other than LSU, or by transfer of funds from LaSPACE to the applicant's department for projects at LSU. The institution/department will assume responsibility for administering, distributing, and documenting costs charged to this program.

## Period of Performance

Unless otherwise stated, LaSPACE programs have a default period of performance of no greater than 9.5 months. Shorter periods of performance may be proposed, or even required by the LaSPACE office, to meet any requirements or restrictions related to the parent grant. *A proposed period of performance is provided for each program cycle on the summary page; proposers may request a different period within 60 days after our proposed start date, unless otherwise indicated and with advance permission from the LaSPACE Management team.* For the GSRA program, a period of performance of 1 semester is not appropriate.

## No-Cost Extensions

LaSPACE will no longer consider full-year No-Cost Extensions (NCEs). We may consider NCE requests for up to 6 months. We are getting more pressure from NASA to complete as much spending as possible within each program year. It is harder to justify NCEs for our subawarded projects. We need you to propose an NCE for ***only***

***exactly how much additional time you need***. If we deem that there are avoidable reasons for you needing an NCE, it may be rejected. Do your best to spend according to your proposed timeline. Reach out earlier rather than later if you hit early snags.

**NCE's for ongoing projects may be submitted to the LaSPACE program office no later than 60 days before the initial project end-date**. All NCE requests must be submitted to laspace@lsu.edu and must include a status report which addresses all accomplishments made to-date on the project (including all publications, proposals, presentations, patents, etc), where the project is in relation to the originally proposed end date, reasons why the project has been delayed, and a proposed plan for completing the project. This status report must also identify all participants on the project (students, post-docs, faculty, and staff). ***We anticipate that No Cost Extensions will not be available for awards issued for the 2024-2025 program year.***

## Invoicing & Reporting Requirements

Invoices must be submitted monthly by the 15th of the month, beginning no later than the second full calendar month of the award period using the billing form available in our document center. Example: For awards with a period of performance of 08/15/2024—05/31/2025 the first invoice must be submitted in October by 10/15/2024 with additional invoices submitted before the 15th of each subsequent month. The final invoice must be submitted within 30 days of the of the last day of the period of performance. For the example period of performance, the final invoice would be due by 06/30/2025.

A final report must be submitted by the PI/Project Lead no later than 30 days after the project end date. Photographs and copies of all papers, presentations, and posters generated should be shared with LaSPACE as they occur and collected/referenced in the final report. Final Report guidelines can be downloaded from the LaSPACE website's document center. Please review the reporting guidelines at the start of your project to identify in advance the kinds of information you must share at the end of your award. For example, you must track participation hours & total funding per student and collect reflective statements from your students. Develop a plan to collect this info early!

Failure to submit timely invoices and reports may result in new restrictions and requirements, including a potential suspension of eligibility to apply for LaSPACE funding.

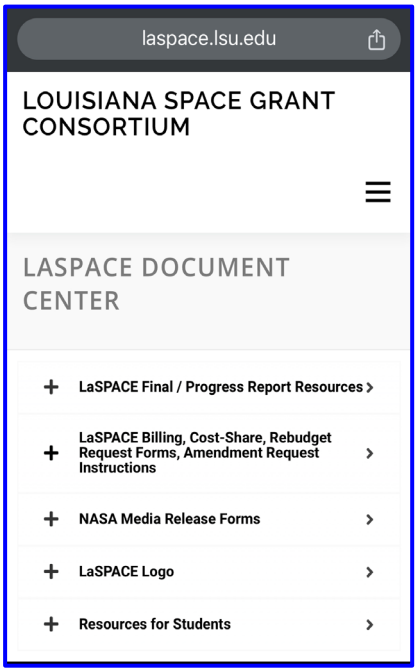


*Figure 1: Screen Shot of the LaSPACE website's Document Center showing available content linked there; including Reporting Resources, Billing/Budgeting forms, Media Releases, the LaSPACE Logo, and Resources for Students.*

## LaSPACE Annual Meeting Participation

Funded participants are expected to make every effort to attend the LaSPACE Annual Meeting held during the fall semester on a Friday and Saturday at a different affiliate institution each year. For the 2024 meeting we will meet at Southeastern Louisiana University in Hammond, LA on October 4 & 5. Information will be sent out to our affiliate representatives and funded awardees and posted to our website here. Recently/currently funded students are expected to present a poster at the student poster session on Saturday.

# Louisiana Aerospace Catalyst Experiences for Students (LaACES) Program

## Application Guidelines

## About the LaACES Program

The Louisiana Aerospace Catalyst Experiences for Students (LaACES) Program runs for a full academic year. A Student Balloon Course (SBC) curriculum has been developed by the LaSPACE team to guide the participants throughout the course of the program. Funded teams must use the SBC materials while participating in this program. During the first semester a series of lectures and hands-on activities help build student skills in basic electronics, sensor interfacing, real-time programming, mechanical development, and project management. Students will also complete two technical reports (SkeeterSat and Capstone). The second semester is then devoted to applying these skills to the design, development, fabrication, and flight of a small (~500 gram) balloon payload. The payload development process is monitored by requiring the students to document and orally defend their progress during three (3) reviews (PDR, CDR, FRR) and a final science results/failure analysis after flights. Payloads from all student teams are then flown at the end of the academic year under the management of LaSPACE. The payloads are flown to 100,000 feet using a helium-filled latex sounding balloon launched from Western Louisiana or Eastern Texas. Prior to receiving final flight certification teams will orally defend their payload as Flight Ready to LaACES management as well as students and faculty mentors from participating peer institutions. After the flight teams will be required to orally present their results or failure analysis to the same audience. Independent balloon flights by institutions are not supported under LaACES and only flights under the supervision and direction of LaSPACE Management will be considered for funding. Proposed efforts that do not conform to this general program model will review poorly. New teams are expected to follow the base protocol payload design laid out in the course materials; advanced payload experiments are the exclusive purview of returning students/advisors.

## Background and Objectives

The State of Louisiana's prime goal is to develop a well-trained, technical workforce capable of moving the state forward in R & D, attracting high tech industries, and promoting economic development. This is precisely what NASA desires and what LaSPACE is working to achieve. The core focus of the LaSPACE program continues to be student involvement in genuine scientific research and engineering projects. The long-term goals of LaACES are to 1) attract new students to aerospace related science and engineering programs, 2) provide students with a background to develop and manage modern aerospace projects, 3) give students practical experience with sensors, electronics, and “spacecraft” systems, 4) assist in retaining these students by exciting their imagination and fostering their innate curiosity, and 5) disseminate this program to institutions across Louisiana.

LaSPACE institutions that wish to initiate, or continue, a LaACES program on their campus should use this document as a guide for preparing a proposal to LaSPACE. *Note that: LaACES materials (lectures, electronics kits, etc) are provided to LaSPACE affiliates implementing this program at no additional cost and independent of any*

*funding proposed here. However, even unfunded participating teams are required to participate in the PDR, CDR, & FRR reviews, as well as adhere to testing and structural requirements to be able to fly their payloads.*

# PI Eligibility

Proposals to the LaACES Notice of Funding Opportunity (NOFO) may be submitted only by an authorized individual at a LaSPACE affiliate academic institution. This person becomes the project's Principal Investigator (PI) and is responsible for administering the ballooning course lectures, monitoring the student teams as they develop their payloads, ensuring all project deliverables are completed correctly (Lab Reports, PDR, CDR, FRR, Science Report) and managing the team's participation in the May launch. Institutions may submit more than one proposal per campus, but no more than one proposal per institution will be funded.

# Award Funds

LaACES awards are capped at $12,000 with only one award per campus per academic year. We anticipate selecting 4 to 6 proposals for award. The proposal may include wage support for personnel (including students), funds for travel to launch, and costs for materials, supplies, and support for constructing/testing student payloads and analyzing flight data. A strict cost-share is not required, but some institutional investment will be reviewed favorably. Only one LaACES project per campus will be awarded, though a single award may support more than one student team. HBCU campus interested in applying for a HIS to supplement student participant support costs should indicate the concurrent proposal to the HIS program in the narrative. For more guidance contact the LaSPACE office at laspace@lsu.edu.

# Deliverables

Throughout the course of the LaACES program, there will be several deliverables that are required for participation. In the fall semester, students will share their SkeeterSat and Capstone reports for feedback. In the spring, flight groups will be required to submit three (3) professional documents related to their payloads to LaACES management for review (PDR, CDR, FRR). During the flight week teams will give two ~15-minute oral presentations, an oral summary of their FRR before the flight and a presentation of their payload's performance after the flight. Comments will be returned to the teams, and it is expected that these comments will be implemented into future versions of the design documents. Local instructors should provide a feedback loop to student participants before submitting to LaACES management.

**LaACES Training Session:** A Zoom-based webinar training session will be conducted by LaACES staff in August 2024 (tentatively scheduled for Thursday, 08/15/2024; date to be confirmed at least 30 days in advance) that will explain and illustrate the LaACES Student Ballooning Course (SBC), which includes lecture presentations, activities, and hardware materials that each institution will use to run a LaACES program. The SBC has been developed, field proven, and updated as necessary over the last 18 years and has been shown to be effective in preparing a student team to successfully progress through the project reviews and develop an operational balloon payload. The latest version of the SBC is designed to allow new team to develop a basic balloon payload consisting of an Arduino Mega2560 microcontroller, the custom "MegaSat" sensor board, and the Adafruit Ultimate GPS Logger shield. Attendance at this Training Session will be required for the Faculty Advisor and one other optional leader (additional faculty/staff or advanced student) from each institution planning to participate in LaACES 2024-2025 regardless of LaSPACE funding status. Further details about this session will be distributed during the summer.

**Monthly Instructors' Meeting:** The PIs and local instructors running LaACES projects on their campuses will be expected to participate in a virtual monthly meeting to report on progress, discuss challenges and opportunities, and build community. A day and time will be selected via survey with all participants.

**Provided Materials.** LaSPACE will provide all the necessary components to complete all SBC course activities in the form of PCBs and part kits for each individual student. A team applying to the LaACES program for the first time will receive an Arduino Mega, AdafruitGPS shield, and SD card for each student. Returning teams are expected to reuse the material provided in previous years. Each team will also receive a MegaSAT kit to be built as the core of the team's payload. Applicants must provide a working lab space with access to a general set of tools and electronic supplies. A recommended minimum list of tools and supplies is show below in table 1:

*Table 1: Minimum recommended set of tools and supplies for LaACES teams.*

| | |
|---|---|
| Needle Nose Pliers | Flush Cutting Wire Cutters |
| Lockring pliers (Lisle 44900 or similar recommended, used to separate Arduino stacks without damaging the pins) | Hand-operated Vacuum pump (for pressure sensor calibration) |
| Small size screwdriver set | Wire Strippers (AWG 22 and 24) |
| Solder Sucker/Desoldering Pump | Solder Wick |
| Hand Magnifier | Digital Multimeter with Voltage, Current, and Amperage capability |
| Temperature Controlled Solder Station | Safety Glasses |
| Solder | 22 AWG stranded core wire |
| 22 AWG stranded wire in multiple colors | Liquid Electrical Tape |

**Weekly Lectures & Activities.** All student teams, managed by their local instructor(s)/PI, are expected to complete all materials provided for the student ballooning course; lectures and activity sessions are typically covered in twice weekly sessions throughout the fall semester and early in the spring semester. All lecture slides and activity sheets are posted to the LaACES website and videos of most lectures completed by LaSPACE LaACES Management are also available. Alternatively, local instructors may choose to present the materials live on their own campuses. Local support is always expected for the activities. Regardless of the overall method chosen, the LaACES SBC curriculum must be implemented.

**SkeeterSat Report.** Early in the semester students will be required to generate a short report based on the SkeeterSat circuit project. LaSPACE management provides the guidelines for this report and each student must write an individual report. The final version of the report after review by local instructors shall be turned in to LaSPACE. This document is usually due mid-October; however, a final due date will be announced during the LaACES Training Session in August.

**First Semester Capstone Report.** At the end of fall semester students will combine the basic programming and electronics skills learned to build and calibrate a simple temperature sensor consisting of breadboarded circuit, Arduino, and GPS/SD card. Students will then write up a report on this process. LaSPACE management provides the guidelines for this report and each student must write an individual report. This document is usually due mid-December; however, a final due date will be announced during the LaACES Training Session in August.

**Preliminary Design Review (PDR) Document:** The PDR includes all the results of the preliminary design phase of the project. The PDR should present a basic understanding of the scientific and technical goals and objectives of the payload, the background and requirements, a Preliminary System design, conceptual hardware and software

designs, preliminary task list and work schedule including information on resources and long-lead items, and a preliminary risk assessment and management plan. LaSPACE management provides a template for this review document and requires the submitted document to adhere to the format presented in the template. This document is usually due in February; however, a final due date will be announced during the LaACES Training Session in August.

**Security Clearance Form.** Project PIs must complete and submit a security clearance document for their flight teams. This document must include all individuals intending to attend the May flight. A form will typically be distributed to PIs in February with a due date in March. Depending on launch location and changing NASA requirements additional documentation may be required from some attendees.

**Critical Design Review (CDR) Document:** The CDR represents the end of the critical design phase of the project. The CDR is a continuation of the documentation provided in the PDR. As such, all comments provided in the PDR reviews must be addressed. In addition, the CDR should present the final designs of the project through analysis, breadboarding, prototyping, and testing. The CDR should also include finalized task lists, schedule, testing and calibration procedures, budgets, pre- and post- flight operations, and updated risk assessment and management plans. LaSPACE management provides a template for this plan and requires the submitted document to adhere to the format presented in the template. This document is usually due at the beginning of April; however, a final due date will be announced during the LaACES Training Session in August.

**Thermal Vac Test / Analysis.** In April teams will have the opportunity to travel to LSU and test their payload in simulated near-space conditions. Teams are expected to bring a flight ready payload to LSU where it will be tested at the temperature and pressure extremes that will be experienced during the flight. Teams will spend the entire day at LSU and present a brief analysis at the end of the day detailing their payload's functionality, documenting their findings, and sharing any corrective actions required in advance of the May flight. Teams are expected to participate in this test and if they are unable to travel to LSU they must participate remotely and present the results of similar testing performed at their home institution. The tentative date for this test is April 18, 2025.

**Flight Readiness Review (FRR) Document and Presentation:** The FRR is the culmination of the project work and documents the team's flight ready payload. The FRR is a continuation of the documentation provided in the PDR and CDR. As such, all comments provided in the CDR reviews must be addressed. The FRR should present the payload as built and include any corrective actions from all system testing, ready to be connected to the flight string. This document must include documentation and results of all testing and calibrations, provide evidence that the payload is safe and will perform properly, describe procedures for checkout, integration with flight vehicle, and mission operations. All sections of the template should now be completed. LaSPACE management provides a template for this plan and requires the submitted document to adhere to the format presented in the template. This document is usually due at the beginning of May; however, a final due date will be announced during the LaACES Training Session in August. In addition, this document should be used to create the ~15-minute FRR presentation that all teams must present on the first day of flight operations during the annual launch trip.

**Science Results or Failure Analysis Presentation:** After the flight, all teams will be required to present their science results or a failure analysis. This is a ~15-minute presentation with time for questions. Presentations occur on the last day of the flight campaign.

# LaACES Proposal Requirements & Format

LaACES proposals should be submitted as fully searchable pdf documents via email to laspace@lsu.edu. Proposals **must** include the following completed sections in the order presented:

- LaSPACE Cover Page
  - Proposals must be signed off on by the Project PI and the Authorized Organizational Representative for Sponsored Programs at your institution.
- Proposed Project Summary Form
- Prior LaSPACE Awards Form

A. Proposal Narrative (not to exceed 6 pages)

1. Description of proposed science/engineering project and payload instrument concept.
2. Plan to recruit and retain student participants in the program. Proposers are expected to make every effort to include students from traditionally underrepresented groups in STEM. Specific plans for diversity recruitment must be detailed in this section: explicitly describe the steps taken to encourage / recruit diverse students to your lab in general and this project in particular; include details regarding obstacles, challenges, successes, & failures in this recruitment process.
3. Key Personnel: Faculty and Staff implementing and managing the project, including the PI.
4. Plan for implementing the student ballooning course (part of a course, extracurricular activity). This should include anticipated student time commitment and anticipated structure of student faculty interaction (e.g. twice weekly classes, weekly lab meetings, etc.). You should also discuss the resources, facilities, and personnel available to support the project, and a table of major milestones (including the required deliverables) for completion of the project (*a schedule of dates will be provided at the August training session).* If this is an ongoing project, include a summary of prior experience and explain how this year's team will build upon the experience of previous years. Include some discussion about what sort of payload you plan on having your teams develop. A technical description of the payload is not required, a short conceptual description acceptable. Payloads should fall within one of three categories: base LaACES MegaSAT payload only (recommended for new PIs), MegaSAT with additional sensors, self-designed payload (Advanced/Returning teams only).
5. Anticipated outcomes for student learning and development and benefits to your department and institution.

B. Budget

1. LaSPACE Budget Form
2. Budget Justification: narrative explanation of all costs. Note: It is hoped that for a student team award of this type, your institution will be willing to forego some or all of the indirect charges. Waived indirect should be used as institutional matching funds.

C. Student Participant List & Form Submission Confirmations page

D. NASA Media Release Form (submitted online by PI and all identified student participants)

E. Principal Investigator Short CV (1-2 pages)

***NOTE to Proposers:***

- Do NOT include anything that is not explicitly listed above. If you believe additional content/sections are needed, contact our office at laspace@lsu.edu to request permission.
- Do NOT include the guidelines in your proposal submission.

# LaACES Evaluation Criteria

*Each proposal will be evaluated using the following evaluation form.*

**LaACES Evaluation Form**

| | |
|---|---|
| **Institution** | |
| **PI Name** | |
| **Proposal Title** | |
| **Funding Recommendation** | |

| **Proposal Formatting and Required Contents** |
|---|
| All sections are present and in the right order |

| **Relevance to & Alignment with NASA** |
|---|
| Clearly aligned to a NASA Mission Directorate and priorities |

| **Overall Quality of Proposal** |
|---|
| Clarity & quality of the proposed work and key personnel |

| **Evidence of Likely Completion of the Project** |
|---|
| Management and task plan is detailed and specific and is in-line with required deliverables; evidence of past success. |

| **Contribution to Diversity (not just student and faculty participation, but institutions & disciplines)** |
|---|
| LaSPACE Program Portfolio aims to support projects around the state and not only on the same few campuses focused on the same handful of disciplines. The recruitment plan to recruit diverse students for this project must be included. |

| **Budget Appropriateness** |
|---|
| Appropriate to the work and to the goals of this program. Sufficient narrative details on costs. |

| **Additional Comments** |
|---|
| Additional Comments |

# Attachments
# Required Proposal Forms

## Required Forms for Proposal

All proposals submitted to LaSPACE must use the forms included following this page. Proposals not using these forms may be rejected without review.

- LaSPACE LaACES Program Proposal Cover Sheet (*Note: Proposals must be signed off on by the Project PI and the Authorized Organizational Representative for Sponsored Programs at your institution.*)
- Proposed Project Summary
- Prior LaSPACE Awards
- LaSPACE Proposed Budget Form
- Student Participant List & Form Submission Confirmations
- NASA Media Release Form (submitted online by PI and all identified student participants)

# LaSPACE LaACES Program Proposal Cover Sheet

1. Title of Proposed Project: _____

_____

2. Principal Investigator: _____
(Name) (Highest Degree Earned) (Citizenship)

_____
(Department)

3. Institution of Higher Education: _____

4. Address: _____
(Street Address/P.O. Box Number)

_____
(City, State) (Zip Code)

5. Telephone: _____ FAX: _____

E-mail: _____

6. Date of Submission: _____

7. Total Funds Requested: $ _____ Institutional Match: $ _____

**********

**Certification of Compliance with Applicable Executive Orders and U.S. Code:** By signing and submitting this proposal, the signatories certify that the statements made in this proposal are true and complete to the best of their knowledge; they agree to comply with LaSPACE award terms and conditions if an award is made as a result of this proposal; and the institution and proposed project are in compliance with all applicable Federal and State laws and regulations including, but not limited to, Executive Order 12549, Debarment and Suspension, 34 CFR Part 85, Section 85.510, Participant's responsibilities; Non-Discrimination; Certification against Lobbying imposed by section 1352, title 31, U.S. Code; Compliance with China Funding Restriction as detailed in Public Laws 112-10 Section 1340(a) and 112-55, Section 539; ACORN Compliance in accordance with 534 of the Consolidated and Further Continuing Appropriations Act of 2012 (Pub. L.112-55); and does not have a federal tax liability or federal felony conviction (sections 544 and 543 of Public Law 112-55).

8. Signature of Principal Investigator: _____

9. Name of Authorized Organizational Rep: _____

10. Signature of Authorized Organizational Rep: _____

11. Date Signed: _____

# Proposed Project Summary

| |
|---|
| NAME OF INSTITUTION (INCLUDE BRANCH/CAMPUS AND SCHOOL OR DIVISION) |
| ADDRESS (INCLUDE DEPARTMENT, BUILDING & ROOM #, CITY, STATE, ZIP) |
| PRINCIPAL INVESTIGATOR NAME, TITLE, & EMAIL |
| PROJECT TITLE |
| NASA MISSION DIRECTORATE ALIGNMENT (Check all that apply to your project. Narrative proof for selected alignment(s) must be included in your proposal narrative.)<br>☐SMD ☐STMD ☐ARMD ☐ESDMD ☐SMOD |
| ☐ Check to confirm all named participants have completed an online LaSPACE NASA Media Release |
| ABSTRACT (DO NOT EXCEED 250 WORDS) |

# Prior LaSPACE Awards

(Limit this list to the last 5 years)

For each prior LaSPACE award, as a PI or a Co-I please provide the following:

1. Project Title:

2. Dates:

3. Was a final technical report submitted? _____YES _____NO*

   If no, explain:

4. Did a proposal to a funding agency result? _____NO _____YES

   If yes, Agency:

   Title:

   Date:

   Status: _____Funded _____Declined _____Pending

(Add additional pages as necessary.)

# LaSPACE Proposed Budget Form

*Include this form in your proposal. Be sure to only ascribe funds to categories explicitly open to the program area to which you are applying. Following this form, include a detailed narrative explanation of all proposed costs.*

Proposal Title: _____

Principal Investigator: _____

Institution: _____

| | | LaSPACE Funds Requested | Institutional Match Funds* |
|---|---|---|---|
| A. Direct Labor | | | |
| | 1. Researchers | $ | $ |
| | 2. Graduate Student(s) | $ | $ |
| | 3. Undergraduate Student(s) | $ | $ |
| | 4. Fringe Benefits | $ | $ |
| | 5. Subtotal A | $ | $ |
| | | | |
| B. Supportive Expenses | | | |
| | 1. Travel | $ | $ |
| | 2. Supplies & Materials | $ | $ |
| | 3. Communications & Equipment | $ | $ |
| | 4. Other Direct Costs (Identify) | $ | $ |
| | 5. Subcontracts | $ | $ |
| | 6. Subtotal B | $ | $ |
| | 7. F&A (Indirect) | $ | $ |
| | | | |
| C. Total Project Cost | | | |
| | | **$** | **$** |

**Must be certified on all financial billings/reports.*

# Student Participant List & Form Submission Confirmations

The Student Participant List must be completed, and online participant forms filled out in advance of submitting a proposal. Copy and complete the participant list and confirmation checkboxes below into your proposal.

| Name | Classification | Major | Project Role |
|---|---|---|---|
| *e.g. Jane Smith* | *Undergraduate, Junior* | *Electrical Engineering* | *Electrical Design Lead; Technical Writing Co-Lead* |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

☐ Check this box to confirm that all students listed above have completed a LaSPACE student participant form. Include this page in your proposal.

☐ Check this box to confirm that all students listed above have completed a NASA STEM Gateway profile. Include this page in your proposal.

# LaSPACE Student Participant Form Instructions

Link to LaSPACE Student Participant Form

Please provide the following guidance to students completing the online participant form.

- The LaSPACE Student Participant Information Form must be completed in advance of submitting this application. If any section is left blank in the online form, you will be disqualified from consideration.
- Upon completion of the form, a message will appear on the screen to confirm the form was successfully submitted. Additionally, a confirmation email will be sent to the school email provided in the form. Once the email is received, it is safe to close your browser. Save the confirmation email and forward to your Principal Investigator / Project Lead. Do NOT include NOR share screenshots or copies of your demographic information. This is to protect your Personally Identifiable Information.
- The **Project PI / Lead** should be the PI who is submitting this proposal. Please provide the students with your office phone number and email address to input.
- The **LaSPACE Program** should be the program for which students are currently applying for/participating in. If working under multiple LaSPACE projects, students will submit a participant form for each separate project. For this proposal students will select GSRA.
- The **Project Start Date** is the first day of the project's Period of Performance (PoP). This is not your personal start date on the project. Confirm PoP start date in the program guidelines or ask your Project PI / Lead. Project Start date should be 8/15/2024 for students under this current proposal submission.
- The **Participating Semester(s)** is where students select their semesters of participation on the project.

# NASA STEM Gateway Profile Instructions

All students funded under any National Space Grant Program must register in the NASA STEM Gateway system here: https://stemgateway.nasa.gov/public/s/login/SelfRegister. Guidance on setting up your profile will be posted to the LaSPACE website.

# LaSPACE NASA Media Release Form Instructions

The LaSPACE NASA Media Release Form provides permission to LaSPACE and NASA to share your photographs in our reports, newsletters, and online channels. It must be completed in advance of submitting this application. If any section is left blank in the online form, you will be disqualified from consideration. After submitting the form, check the relevant confirmation checkbox on the Proposed Project Summary Form.

LaSPACE NASA Media Release Form

- The online form should be completed and submitted by the PI and any other named, known participants (i.e. undergraduate student researcher for a LURA / graduate student for a GSRA, etc) at the time of proposal submission. Facilitators/participants recruited later and/or featured in photos associated with the funded activities should complete their own forms before, or at the time, of Final Report submission.

- For projects that involve recruiting student participants during the active award period (i.e. Senior Design, LaACES, etc), we suggest requiring completion of this form and the student participant form on the first day of official participation by the student.
- Upon completion of the form, a message will appear on the screen to confirm the form was successfully submitted. Additionally, a confirmation email will be sent to the school email provided in the form. Save this email and have students/external participants forward to the Principal Investigator / Project Lead.
- For large-scale public events, we suggest bringing a device for folks to complete on-site releases.
- For registration-based activities, we suggest including a link to our online form in your registration materials.