LaSPACE

Louisiana Aerospace Catalyst Experiences for Students (LaACES) Program

Offered by the Louisiana Space Grant Consortium

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

Louisiana Space Grant Consortium (LaSPACE)
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Revised, April 2020
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.

Program Summary

- Proposals must be signed off on by the Faculty PI and the Designated Institutional Representative for Sponsored Programs at your institution.
- Award funds can be requested up to $12,000; no strict cost-match is required, but some institutional investment will impact our evaluation.
- Multiple proposals per institution may be submitted, but no more than 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 a PDR, CDR, & FRR, 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 invoices and a final technical 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. A new final report template is available from the LaSPACE office.

Proposal Submissions

- **Submit all properly executed proposals via email as fully searchable pdf documents to laspace@lsu.edu by 11:59 pm on Wednesday, June 20, 2020.**
- Important Dates:
  - Proposal Release Date: Friday, April 24, 2020
  - Proposal Due Date: Wednesday, June 20, 2020
  - Anticipated Award Announcements: late June / early July 2020
  - Award Period of Performance: 08/15/2020 - 08/14/2021

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 2018 Strategic Plan

NASA's 2018 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)** leads human exploration in and beyond low Earth orbit by developing new transportation systems and performing scientific research to enable sustained and affordable human life outside of Earth. HEOMD also manages space communication and navigation services for the Agency and its international partners.

All NASA 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: Karen L. Rugg, Lead, Communications and Education Phone: (202) 358-2197, karen.l.rugg@nasa.gov

Space Technology Mission Directorate (STMD)

POC: Damian Taylor, SBIR and STTR Mission, Directorate Liaison Phone: (202) 358-1432, damian.taylor@nasa.gov

Human Exploration and Operations Mission Directorate (HEOMD)

POC: Bradley Carpenter Phone: (202) 358-0826, BCarpenter@nasa.gov

NASA Center Liaisons

Ames Research Center, *Brenda Collins* Chief, Education and Public Outreach Phone: (650) 604-3540 brenda.j.collins@nasa.gov	Kennedy Space Center, *Jeffrey A. Kohler* Technology Transfer Office Phone: (321) 867-2462 jeffrey.a.kohler@nasa.gov
Armstrong Flight Research Center, *Dave Berger* University Affairs Officer Phone: (661) 276-5712 Dave.e.Berger@nasa.gov	Langley Research Center, *Kim Brush* LaRC OSTEM Integration Manager Phone: (757) 864-6454 kimberly.m.brush@nasa.gov
Goddard Space Flight Center, *James L. Harrington* Computer Research and Development Phone: (301) 286-4063 james.l.harrington@nasa.gov	Glenn Research Center, *Mark David Kankam, Ph.D.* University Affairs Officer Phone: (216) 433-6143 Mark.D.Kankam@nasa.gov
Jet Propulsion Laboratory, Linda *Rodgers or Petra Kneissl* University Programs Administrators Linda Phone: (818) 354-3274 Linda.L.Rodgers@jpl.nasa.gov Petra Phone: (818) 201-8805 Petra.a.kneissl-milanian@jpl.nasa.gov	Marshall Space Flight Center, *Frank Six* University Affairs Officer Office of Academic Affairs (HS30) Phone: (256) 961-0678 Norman.F.Six@nasa.gov
Johnson Space Center, *Kamlesh Lulla* Director, University Research Collaborations and Partnership Office Phone: (281) 483-3065 Kamlesh.P.Lulla@nasa.gov	Stennis Space Center, *Mitch Krell*, Ph.D. Data Analysis Phone: (228) 688-1821 mitch.krell@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 Administration & Institutional Coordinators

General administration and management is the responsibility of the LaSPACE Staff headquartered at Louisiana State University (LSU). Questions about applications to any LaSPACE programs should be directed to the Director or Assistant Director via the general laspace@lsu.edu email address. Unless otherwise directed, all proposals, invoices, reports, and queries should be submitted via email to the program email address (laspace@lsu.edu).

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
Meaghin Woolie, Program Manager, mwooli2@lsu.edu
Doug Granger, Student Flight Program Manager, dgrang2@lsu.edu

Additionally, all member institutions have appointed an institutional coordinator who sits on the LaSPACE Advisory Council and is available to discuss opportunities and processes related to LaSPACE programs. Contact information for all advisors is provided below. For institutions with a vacancy, contact the program manager listed above.

LaSPACE Affiliate Institutional Coordinators

Baton Rouge Community College (BRCC)	Sandra Guzman	guzmans@mybrcc.edu	225-216-8213
BREC / Highland Road Park Observatory (HRPO)	Christopher Kersey	observatory@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
Grambling State University (GSU)	Matthew F. Ware	waremf@gram.edu	318-274-2391
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 Public Broadcasting (LPB)	Christina Melton	cmelton@lpb.org	225-757-4215
Louisiana State University and A&M College (LSU)	Stephen D. Beck	sdbeck@lsu.edu	225-578-5833
Louisiana State University Agricultural Center (LSU-Ag)	Wade Baumgartner	wbaumgartner@agcenter.lsu.edu	225-578-7742
Louisiana State University Health Sciences (LSUHSC)	Lynn Harrison	lclary@lsuhsc.edu	318-675-4213
Louisiana State University of Shreveport (LSU-S)	Urska Cvek	urska.cvek@lsus.edu	318-795-4266
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)	Andreas Pashos	apashos@nunez.edu	504-278-6287
River Parishes Community College (RPCC)	Esperanza Zenon	ezenon@rpcc.edu	225-743-8713
SciPort Louisiana's Science Center	vacant	vacant	vacant
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	504-280-1038
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 *The Spaceporter Newsletter*, 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. **All proposers are encouraged to help recruit diverse participants to their proposed projects.**

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 associated with a LaSPACE affiliated institution. PI must be a research or tenure-track faculty member or designated institutional representative recognized by LaSPACE. All NASA funded participants must be U.S. citizens. 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. First, no student may be funded simultaneously via multiple awards in the scholarship/fellowship programs (Internships, GSRA, LURA, & 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, Tuition, and Foreign Travel are, in general, not allowable costs.

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 12 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 from our proposed start date, unless otherwise indicated.* No cost extensions (NCEs) 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 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).

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. 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 four (4) reviews (Pre-PDR, PDR, CDR, FRR). 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 the NASA Columbia Scientific Balloon Facility (CSBF) in nearby Palestine, Texas. Following flight the students present their results to an audience of CSBF engineers, technicians, and staff, as well as students and faculty mentors from participating peer institutions. 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.

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 Pre-PDR, 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 RFP 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, 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.

Proposal Due Date

LaACES proposals must be completed with all institution approvals and submitted via email as a fully searchable pdf document to laspace@lsu.edu by 11:59 pm on Wednesday, June 20, 2020.

Award Funds

LaACES awards are capped at $12,000 with only one award per campus per academic year. We anticipate selecting 6 to 8 applications 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.

Deliverables

Throughout the course of the LaACES program, there will be several deliverables that are required for participation. Teams that fail to meet these deliverables will not be allowed to fly. Flight groups will be required to submit four (4) documents to LaSPACE management for review. Comments will be returned to the teams and it is expected that these comments will be implemented into future versions of the design documents.

One Day LaACES Training Session: A one day Zoom-based webinar training session will be conducted by LaACES staff in August 2020 (date to be announced) 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 16 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 includes an Arduino Mega controller, the custom "MegaSat" temperature / pressure / humidity / gyroscope / accelerometer / real-time clock shield, and the Adafruit Ultimate GPS Logger shield and all associated training materials. Attendance at this Training Session will be required for the Faculty Advisor and one other leader from each institution planning to participate in LaACES 2020-2021 regardless of LaSPACE funding status. SBC kits will only be distributed to those institutions that attend this session. Further details about this session will be distributed during summer 2020.

Pre-Preliminary Design Review (Pre-PDR) Document: The Pre-PDR document details the initial investigative steps for the design of the project. This document focuses on the payload mission goal, science background, objectives, and requirements and technical background, objectives, and requirements. Successful completion of this document will demonstrate the team's understanding and knowledge of their scientific area of study and significantly improve the chances of a successful payload development effort by the student team later in the academic year. 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 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 goals and objectives of the project, the science 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 plan 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.

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 end of March; however, a final due date will be announced during the LaACES Training Session in August.

Flight Readiness review (FRR) Document: The FRR represents the end of the system testing phase of the project and the group should have a 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 a payload that has survived all system testing (teams will be invited to participate in a thermal vac test at LSU for a full day in April OR they can conduct their own tests, if facilities and equipment are available on their own campuses) and is 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, and identify any outstanding issues that need to be addressed prior to flight. 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 end of April; 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 FRR presentation that all teams must present to CSBF and LaSPACE management 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 to CSBF attendees, other flight groups, and LaSPACE management. This is a 15-20 minute presentation with time for questions. Presentations occur on the last day of the flight campaign.

Final Deliverables

At the end of the project, two final reports are required: the Final Technical Report and the Final Financial Report (Last invoice marked “final”). These reports are due within 30 days of the subcontract expiration date.

The Final Technical Report will be a multi-page write-up that is suitable for transmission to NASA and BOR. This report must follow the template provided by the LaSPACE office and should describe the activities undertaken, the participants, and your assessment, as Principal Investigator(s), of the success of the venture, the impact that it had (or will have), any follow-on proposals in preparation/submitted and any further plans for a continuation

of this or similar projects. Photographs of and testimonials from student participants should be incorporated. An updated Student Participant List must be included. This report shall be submitted to LaSPACE office (laspace@lsu.edu) via email.

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
- 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 for implementing the student ballooning course (part of a course, extracurricular activity), 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.
   3. Plan to recruit and retain student participants in the program (*If students have already been recruited at the time of the proposal, include a completed Student Participant List as an appendix*).
   4. 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 may (should) be used as institutional matching funds.

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

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.

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.

- Cover Sheet
- Proposed Project Summary
- Prior LaSPACE Awards
- Proposal Budget Form
- Student Participant List (online form completion certification)

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 Institutional Rep:_____

10. Signature of Authorized Institutional 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
PROPOSED PROJECT START DATE 08/15/2020 – 08/14/2021
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

Student Participant List must be completed and online demo forms filled out in advance of submitting this application. If students are to be selected after award, you must commit to completing these forms **as soon as students are recruited** to the project.

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

Link to Undergraduate Student Participation Form
Link to Graduate Student Participation Form

☐ Check this box to confirm that all students listed above have completed an online participant form.

☐ Check this box to commit that all recruited students will complete the online form as soon as they are recruited.