Supervised Undergraduate Research Experiences (SURE)

A Program for Women and Underrepresented Minorities[*] in STEM Disciplines

Request for Applications

DEADLINE DATES:

RFP ISSUE DATE: (**September 9, 2019**)

Last day for questions and answers about this RFP: (**October 4, 2019**)

Proposals due: (**November 8, 2019, 4:30 PM Central Time**)

LOUISIANA ESTABLISHED PROGRAM TO STIMULATE COMPETITIVE RESEARCH (EPSCoR)

Sponsored By:
The National Science Foundation and the
Louisiana Board of Regents

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[*] Blacks or African-Americans; those of Hispanic or Latino ethnicity; American Indian or Alaskan Natives; Native Hawaiian or other Pacific Islanders; or those with disabilities (e.g., hearing, visual, or mobility impairments)

A.   Program Overview

One of the goals of the Louisiana Established Program to Stimulate Competitive Research (LA-EPSCoR) project, funded by the National Science Foundation (NSF), is to increase the participation of women and other underrepresented minorities in STEM (Science, Technology, Engineering, and Mathematics) fields.

The LA EPSCoR Supervised Undergraduate Research Experiences (SURE) program seeks to further this goal by fostering opportunities for such students who conduct supervised research under the mentorship of a faculty member in areas directly related to materials and advanced manufacturing themes. Priority will be given to research topics relevant to the two CIMM Science and Technology Thrust areas described in Section A.1, as well as emerging areas of data-driven materials science and machine learning with applications to manufacturing. Other topics relevant for advanced manufacturing are also acceptable. Students will have the opportunity to become engaged in a professional researcher's work, to learn how he or she formulates a hypothesis, develops a plan to investigate it, obtains research funding and other resources, gathers and examines evidence, encounters obstacles, and evaluates and shares results with the scientific community. By participating in research, students have the chance to learn more about the advanced manufacturing field of study and can use the experience to help them decide whether or not to pursue further education by attending graduate school.

A.1. Consortium for Innovation in Manufacturing and Materials (CIMM) Overview

The Consortium for Innovation in Manufacturing and Materials (CIMM) is an NSF EPSCoR RII Track-1 project focused on advanced manufacturing research. The current Science and Technology Thrusts (STTs) of CIMM address underlying technologies in two areas: 1) STT1 (Multiscale metal forming and replication) addresses challenges in high-throughput manufacturing of components with functional features ranging from microns to millimeters and beyond with high fidelity and repeatability; 2) STT2 (Laser-based 3D metal printing) focuses on adaptive manufacturing of application-specific structures with a high degree of geometric and microstructural complexity and variability. The unifying scientific challenge for these STTs is the multiscale nature of the underlying phenomena, which span multiple length scales (nanometers to millimeters and beyond) and time scales (nanoseconds to hours). A major challenge in multiscale forming is that well-established macroscale manufacturing methods cannot be simply scaled down to the relevant dimensions. To address this, STT1 tightly couples experimentation with modelling and simulation on multiscale plasticity and physics and mechanics of interfacial regions, with focus on mechanical size effects and engineered interfaces. A major challenge in laser-based 3D metal printing is that an understanding of the complex interplay between multi-physics and multiscale phenomena—which are required for tailoring composition and microstructure of printed parts—is presently incomplete. To address this, STT2 couples experimentation with hierarchical modeling and simulation tools, with a focus on laser printing processes and custom powder synthesis. Experimentally validated models and simulation tools, developed through this effort, will lead to advancement of scientific understanding and acceleration of further technology development. CIMM's research program also includes the development of data handling and workflow management capabilities to support material and process development within the Integrated Computational Materials Engineering (ICME) framework. CIMM has established an ecosystem of User Facilities at LSU and Louisiana Tech to support advanced manufacturing research and development and is expanding this network of user facilities where CIMM-affiliated users are given access at the same rates charged to the on-campus users. Collectively, these are called CIMM Core User Facilities (CIMM-CUF). Additional

information about CIMM can be found at http://www.lsu.edu/eng/cimm/index.php.

B.   General Information

B.1   Program Goals

- Increase the participation of women and underrepresented minorities in STEM (Science, Technology, Engineering, and Mathematics) fields
- Motivate students toward advanced education and careers in STEM fields
- Give students a clearer idea of their options for a future in research
- Encourage students to attend graduate school
- Provide opportunities for students to learn modern research and laboratory techniques
- Provide mentors assistance to enhance their research programs
- Improve student written and oral communication skills

B.2   Eligibility

Students: The SURE program is available to full-time[†] undergraduate students who are matriculated at a Louisiana public institution of higher education, or in a higher education institution that is a member of the Louisiana Association of Independent Colleges and Universities (LAICU). Eligibility is further limited to female students or students (male or female) who are considered underrepresented minorities by NSF: i.e., Black or African-American; Hispanic or Latino; American Indian or Alaskan Native; Native Hawaiian or other Pacific Islander; or those students with disabilities (e.g., hearing, visual, or mobility impairments). Students who are not yet enrolled full time may apply as long as they will be enrolled full-time at the time the SURE research experience begins. Students who will have completed their bachelor's degree before the research experience begins are not eligible.

Faculty Mentors must hold a faculty position at a Louisiana public institution of higher education, or in a higher education institution that is a member of the Louisiana Association of Independent Colleges and Universities (LAICU), in a STEM discipline supported by NSF. Faculty mentors need not be currently funded by CIMM.

Students and Faculty Mentors can be from the same institution or different institutions.

Eligible Disciplines are those STEM fields that are directly related to materials and advanced manufacturing themes. Priority will be given to research topics relevant to the two CIMM Science and Technology Thrust areas described in Section A.1 as well as emerging areas of data-driven materials science and machine learning with applications to manufacturing, but other topics relevant for advanced manufacturing are also acceptable.

B.3   Award Amounts

Students accepted for the SURE program will receive a stipend/scholarship of $4,500. This amount is based on a level of effort consistent with no less than 320 total hours of work. Faculty mentors will receive a supplemental grant of $500 per student for the purchase of research supplies associated with mentoring students, travel by students/mentors to meetings or conferences to present research findings, or other expenses directly related to the SURE project.

[†] Students with disabilities that prevent them from enrolling full-time are exempted from this requirement.

The funds for both the stipend/scholarship and the Faculty Mentor supplemental grant will be made available to the Faculty Mentor's institution as a subcontract. Indirect costs (i.e., overhead) are not allowed under this program. The research experience must be completed within one year of the award date.

Prior to submission of a SURE grant application, campus grants administrators must confirm, to the best of their ability, that student applicants are eligible to receive SURE funding, and determine the impact of SURE funding on other sources of financial support received by the student applicants. Consistent with the purpose of the program, SURE funds must be provided supplementary to other student financial support unless campus restrictions strictly prohibit it. Prior to accepting a SURE award, the campus will be asked to determine the terms upon which the student awardee will be paid and formally notify the Board of Regents. These provisions will be made a part of any subsequent contract from the Board of Regents. If a SURE student applicant holds a scholarship, fellowship, or other financial support from the campus, this should not be cancelled, suspended or replaced, in whole or in part, by SURE funds unless the student is notified in writing, prior to acceptance of the award, of the impact the SURE award will have on this support. If a student awardee is not fully informed of said impact, the Board of Regents will reserve the right to require return from the campus of any or all SURE funds provided for the student awardee.

B.4   Duration of Research Experience

Students are expected to complete the research experience over no more than three consecutive terms/semesters, which may include summer. For example, a research experience may be completed in one summer; over summer and the following (fall) semester/term; or over spring, summer and fall semesters/terms. The period of performance is to be January 1, 2020 – July 31, 2020. It is the intention of the Board of Regents to request a six-month no-cost extension on the parent award from NSF.

B.5   Student Responsibilities

- Dedicate a level of effort consistent with no less than 320 hours of work over the course of the research experience

- Participate in seminars, workshops, discussion groups, and other activities as required by the Faculty Mentor

- Complete a program evaluation form

- Respond to queries from LA-EPSCoR after completion of the research experience for program evaluation purposes and reporting to NSF

B.6   Mentor Responsibilities

- Assist student in defining project goals, timeline, and structure

- Communicate expectations to the student regarding work hours, laboratory protocols, and evaluation of the student's performance

- Meet with student regularly to discuss progress and offer suggestions, feedback, and constructive criticism

- Respond to queries from LA-EPSCoR after completion of the research experience for program evaluation purposes and reporting to NSF

B.7   Selection Criteria

Applications will be reviewed according to the quality of the proposed research described in the SURE Student Application Form, the student's interest in pursuing an advanced degree, the letter of recommendation from the Faculty Mentor, and other information provided in the Application Form.

Criteria	Possible Points
Letter of recommendation from faculty member(s)	50 points
Quality of proposed research	30 points
Interest in pursuing an advanced degree in graduate or medical school	10 points
GPA	10 points

C.   Proposal Submission

The proposal must be submitted to the Board of Regents by the submitting institution's authorized representative no later than the close of business (4:30 p.m.) Friday, November 8, 2019. All online submissions must be uploaded as a single PDF document through the LOGAN system. Proposal submission is a two-step process. Following PI submission, the proposal is routed to your employing institution for review, approval, and final submission to the Board of Regents' EPSCoR office; the Board does not receive and will not accept the proposal directly from the PI. Deadlines listed in the RFP are absolute; all approved proposals must be submitted by the campus and received by the Board on or before the published proposal deadline. The proposal submission system will automatically close at 4:30 p.m. Central on the deadline date.

Instructions for PIs:

Go to URL: https://web.laregents.org/logan/pi_login.pl

Login using your LOGAN credentials.

If you are new user and do not have a LOGAN login, please click on "New user registration" to register.

If you have logged into LOGAN before and have forgotten your credentials please click "Forgot your password? Reset your account and receive a new system assigned password" to receive a new system-assigned password.

After logging in, click on "Go >>" next to "SURE Proposals".

Follow on-screen instructions to complete your proposal.

Send completed proposal to the appropriate campus office by clicking "Send Proposal to OSP/OSR". A proposal reference number will be assigned after the proposal is successfully sent to the PI's Office of Sponsored Programs/Research.

An email confirmation of submission to the campus will be sent to the PI with the proposal reference number.

The OSP/OSR will review the proposal, and, if approved, submit the proposal to the Board of Regents.

Instructions for the OSP/OSR:

Go to URL: https://web.laregents.org/logan/institutional_login.pl

Login using your Institutional credentials.

Select "SURE Proposals".

Follow on-screen instructions to submit the proposal to the Board of Regents' EPSCoR office.

An email will be sent to both the PI and OSP/OSR to confirm successful submission of the proposal to the EPSCoR office.

If both the PI and the OSP/OSR do not receive confirmation emails within 4 hours, the proposal was not received. Please contact the LA EPSCoR office by phone at by email at support@laregents.org.

Modules for proposal submission in LOGAN will be available as of September 12, 2019.

D.   Reporting and Evaluation

Annually the LA-EPSCoR office must submit a report to NSF summarizing progress toward its project goals. At the conclusion of your SURE contract, the principal investigator shall submit the SURE report modules and must respond to the questions within 30 days.

 It is also requested that the faculty mentor and/or student respond to requests for information (e.g., current educational/career situation) each year for five years after completion of the research experience to assist LA-EPSCoR in assessing the long-term effectiveness of the program.

E.   Questions about this RFA

Specific questions concerning this RFA and the requirements set forth herein should be directed **in writing** to support@laregents.org. Questions will be accepted and answered through **4 October 2019**. A running compilation of all questions asked about this RFA and all answers provided in response to those questions will be periodically posted on the BoR website at https://web.laregents.org.

F.   Attachment

SURE Student Application Form

The SURE Application Form is provided for informational purposes only. Proposers will complete the form <u>online</u> using the Board's LOGAN system, following the instructions outlined in Section C of this RFA.

LA EPSCoR SURE 2020 Application
(Provided for information only - DO NOT complete this form in the format shown below –use the LOGAN SURE module.)

Last Name:
First Name:

Personal Information:
Gender:
Ethnic Background:
Racial Background: (mark one or more boxes)
☐ American Indian or Alaska Native
☐ Asian
☐ Black or African American
☐ Native Hawaiian or Other Pacific Islander
☐ White
Do you have a disability that limits your activities?
If yes, please explain:

Contact Information:
Email Address:
Phone number (with area code):

Mailing Address:
Line 1:
Line 2:
City:
State:
Zip:

Permanent Address (if different from above):
Line 1:
Line 2:
City:
State:
Zip:

Academic Information:
Current Undergraduate Institution:

Current Major/Minor:

Current Standing (Year)

When do you expect to receive your bachelor's degree?

GPA (out of 4.00):

Do you have prior research experience?

Are you currently receiving any stipends or involved in another research experience for undergraduates (REU)? If yes, please mention title, funding source, and duration:

LA EPSCoR SURE 2020 Application
(Provided for information only - DO NOT complete this form in the format shown below –use the LOGAN SURE module.)

Future Educational Plans:
I plan to enter this school:
I am currently considering: (check all that apply)
☐ Graduate School
☐ Medical School
☐ Have not decided yet
☐ I don't plan to pursue further education

Proposed Research Project: Student must first contact a Faculty Mentor and discuss the proposed research project. The proposed project may be your idea, one suggested by your Faculty Mentor, or a combination of both.

Name of Faculty Mentor:

Email Address:

Phone number (with area code):

Faculty Mentor Institution/Department:

Title of Proposed Research Project:

Proposed Duration of Project (weeks):

Abstract of Proposed Research Project: (max 250 words)

For Student to complete: What are your expectations for your SURE experience?: (max 250 words)

Letter of Recommendation from Faculty Mentor
A letter of recommendation from the Faculty Mentor who has agreed to sponsor your research experience is required. This letter should address your potential as a researcher, and the potential benefits of the research experience to your education and career, as well as any other pertinent information. No other letters of recommendation are allowable.