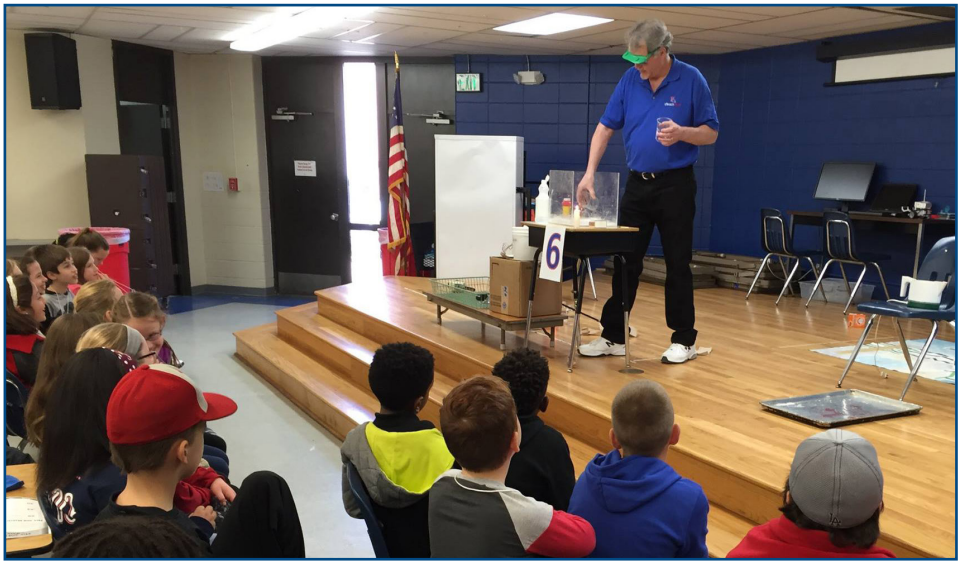
Louisiana EPSCoR
ESTABLISHED PROGRAM TO STIMULATE COMPETITIVE RESEARCH VOL.14 NO.1

Learning Experiences Boosting STEM Education and Interest in STEM Careers

The Louisiana Materials Design Alliance (LAMDA) recently launched a seed funding program for K-12 STEM outreach projects relevant to the Louisiana Student Standards for Science, the LaSTEM statewide goals and objectives, and/or LAMDA's research themes of machine learning, experimental and computational materials science & engineering, and additive manufacturing. LAMDA is an NSF EPSCoR RII Track-1 project striving to propel the State of Louisiana to a leading and sustainable position in advanced manufacturing and materials development. The first projects selected for seed funding reach across the state and are as follows:



Dr. William Deese gives a chemistry demonstration to middle school students.

Exploring Novel Manufacturing Technologies for Lightweight Material Design in Mechanical Engineering

Louisiana State University (LSU) is partnering with the Denham Springs High School STEM and Robotics Center to provide mechanical engineering workshops to high school students. Dr. Geneveive Palardy, Assistant Professor of Mechanical Engineering, and a team of graduate and undergraduate students, will develop and present this new workshop series designed to raise awareness of STEM education and career opportunities in the field of composite materials.

The first workshop will introduce students to photopolymers and polymer composites, as well as novel 3D printing technologies and the basic steps for design. Students will be assigned a mini-Capstone team project to design a lightweight, yet sturdy, vehicle out of the different materials and printing technologies available to them. Additional sessions will be delivered to allow the teams to make progress on their design projects, ask questions, and receive assistance about concept ideas, CAD modeling, 3D printing, and testing. At the conclusion of the series, the teams will have a friendly competition for the best and most lightweight design.

After the workshop, some of the printers will be donated to the partner school to allow them to continue implementing similar activities for future students.

Making a CASE (Collaborating Around STEM Engagement) for Middle Grades

Louisiana Tech University (LATech) will provide multi-disciplinary outreach to middle grade students in Lincoln Parish to stimulate interest and improve basic knowledge in physical science. The CASE program is led by co-PIs Dr. William Deese, Professor of Chemistry, and Ms. Cathi Cox-Boniol, LATech STEM Center Director.

"We are excited to have a LAMDA STEM Outreach award! It provides us with the opportunity to conduct on-campus activities this spring. Our goal is to stimulate interest in science and STEM careers with middle grade students in Lincoln Parish. Understanding how science is done (the scientific method) is extremely important in this age group. We believe we have put together a great program that will achieve these goals," said Deese.

The key experiences will be presented during STEM days on the LATech campus, where the students will tour virtual and physical state-of-the-art facilities. Students will be part of several interactive workshops on the scientific method and matter and its interactions. Students will also meet

LATech STEM professionals from diverse backgrounds and hear their unique journeys and lessons learned in their STEM profession. In addition, teachers will receive mentoring and materials to continue the experiences in the classroom.

Additive Manufacturing Summer Camps

Southeastern Louisiana University (SELU) is leading two-week-long summer camps for underserved, underrepresented minority students from Pine High School and St. Helena College & Career Academy. The PI, Dr. Mehmet Bahadir, Assistant Professor of Industrial Technology, has developed partnerships with Northshore Technical Community College (NTCC), and Northshore Regional STEM Center for these summer camps.

During the first week of the camp, the students and teachers will be trained on 3D printing technologies, 3D computer modeling, and the engineering design process with the Makerbot Print Certification program, earning participants an Operator Certification and an Innovator Certification. In the second week, students will apply their new skills toward a 3D modeling and printing challenge. The challenge experience will culminate with a field trip to NTCC Lacombe STEM campus and SELU's new Computer Science & Technology building.

UNO campers testing their eel robots before the sprint race and obstacle course race.

Robotic Eel Summer Camp

The University of New Orleans (UNO) is expanding their successful Eel camp to the teachers and students at St. Charles Borromeo School in Destrehan.

"This camp exposes middle school kids to various concepts in engineering including: 3D CAD design, 3D printing, hydrodynamics, electrical design and mechanical design using a fun, hands-on approach," said the PI, Dr. Brandon Taravella, Professor in the School of Naval Architecture and Marine Engineering.

During the five day camp, students will be given lessons in using Solidworks 3D modeling and printing software. Campers will get a tour of the UNO campus and engineering facilities. After introductory lessons in hydrodynamics, the students will perform tests in the Towing Tank.

The campers will then be given 3D models of the parts for the eel robot. They will be able to modify the design to improve the hydrodynamic performance and then print the parts for assembly. After programming the eel robots, they test them in the Towing Tank and prepare for the final robot sprint and obstacle course competitions in a swimming pool.

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