Louisiana EPSCoR
EXPERIMENTAL PROGRAM TO STIMULATE COMPETITIVE RESEARCH VOL. 10 NO. 4

LA-SIGMA Building Custom Research Experiences for Students

Summer Research Experiences

Six Louisiana universities hosted summer research experiences for 69 participants who worked on advanced materials research and computational tools. The Louisiana Alliance for Simulation-Guided Materials Applications (LA-SiGMA) consortium sponsored the summer programs designed for three types of participants: undergraduates, high school students and teachers.

Funded by the National Science Foundation (NSF) and the Louisiana Board of Regents, LA-SiGMA is pushing the scientific frontiers in computational materials science. Several LA-SiGMA researchers opened up their labs and personally mentored participants.

The Research Experiences for Undergraduates (REU) program hosted 34 undergraduates who spent the summer informally meeting with professors and researchers to build relationships, learning how to conduct research, and working their own independent research projects under the supervision of experienced faculty mentors. Each participant delivered a poster presentation about their research at the end of the program.

Frank Marshall, an undergraduate student at Missouri University of Science and Technology, won first place in the REU poster session with his poster titled, "Temperature Dependence of Porosity for Porous Electrolyte Based NOx Sensors." He performed his research at Louisiana Tech and was mentored by Dr. Erica Murray and Ms. Ling Cui. As the winner, he will attend the 2014 Research Experiences for Undergraduates Symposium in Arlington, VA.

Edward Johnson, a New Orleans high school student, shows University of New Orleans President Peter J. Fos and VP of Student Affairs and Enrollment Management Brett Kemker his final poster presentation during the summer outreach program at the Advanced Materials Research Institute. Photo: University of New Orleans.

REU students are encouraged to continue their research as independent research courses in their home departments with a faculty member. The LA-SiGMA mentors will be available throughout the year to act as advisors to the participants. The students are also encouraged to present the final results of their research in their home institution during the following fall semester.

The Research Experiences for High School Students (REHSS) program sponsored nine students this summer at Louisiana State University and the University of New Orleans. Students lived on campus for six weeks and worked collaboratively on a wide variety of computational science projects, providing them in-depth exposure to a variety of sciences and research.

The Research Experiences for Teachers (RET) Program hosted 26 middle school, high school, and two-year college math and science teachers. Like the REU program, the teachers performed advanced

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"As a physics major, materials science was very much a new field of study to me. To be honest, I wasn't sure what to expect. Once I learned more, I was very grateful for my background in physics. Materials science is essentially a combination of physics and chemistry, and it applies those two fields to materials. I was really happy with my project, and after this research experience, I am leaning towards getting a PhD in materials science. The potential applications of materials science are literally endless. This was a wonderful research experience."

- Brandon Buchanan, undergraduate from Allegheny College, REU participant at the University of New Orleans.

materials and computational tools research and presented their findings in the final poster session. In the process, the teachers discovered ways to bring their knowledge back to the classroom.

Three of the RET participants were selected to be lead presenters at the upcoming Joint Conference for the Louisiana Association of Teachers of Math and the Louisiana Science Teachers Association in Shreveport.

Brad Burkman, from the Louisiana School for Math, Science and the Arts, will lead a session called, "Fraction Addition Under the Common Core." During RET, he used graphics processing unit accelerators and many integrated core (MIC) co-processors to accelerate code for finding "ideal" sets of fraction-addition exercises, providing students the best balanced practice of essential skills in the fewest number of exercises.

Summer RET and REU participants.

Dr. Bruce Niemi, from Tulsa Community College in Oklahoma, will speak about "History for Engineers," the history of technology curriculum, and how to make it relevant to STEM students.

Shawn Liner, from Parkview Baptist School in Baton Rouge, will speak about how to create an eBook, based on his RET experience creating an eBook on superconductivity.

Annual Research Symposium

LA-SiGMA researchers and students recently gathered in Baton Rouge for the annual symposium, a full day of networking and sharing. Presentations were given for each of the science drivers, computational tools and research areas, as well as updates on diversity, sustainability, assessment, and internal and external engagement efforts.

Dr. Sean Kennan, NSF EPSCoR Program Officer, gave a keynote presentation on research funding opportunities available. The External Review Board, Diversity Advisory Council and the Evaluation Team were in attendance and provided valuable feedback and suggestions.

The LA-SiGMA graduate student poster session was held in conjunction with the symposium. Judges interacted with over 50 poster presenters - a record for the team. "The enthusiasm is becoming contagious," said Dr. Vincent B. McKoy, Professor of Theoretical Chemistry at Caltech and member of the LA-SiGMA External Review Board. "The posters were very enjoyable, and it is wonderful to see so many good things going on and the good results coming," he added before announcing the poster session winners.

The first place poster, titled "Metal Organic Frameworks as Vehicles for Drug Delivery," was by Ms. Kiara Taylor-Edinbyrd of Louisiana State University. Her advisor is Dr. Revati Kumar, Assistant Professor in Theoretical Chemistry. The top five poster winners received stipends toward attending the conference of their choice.

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