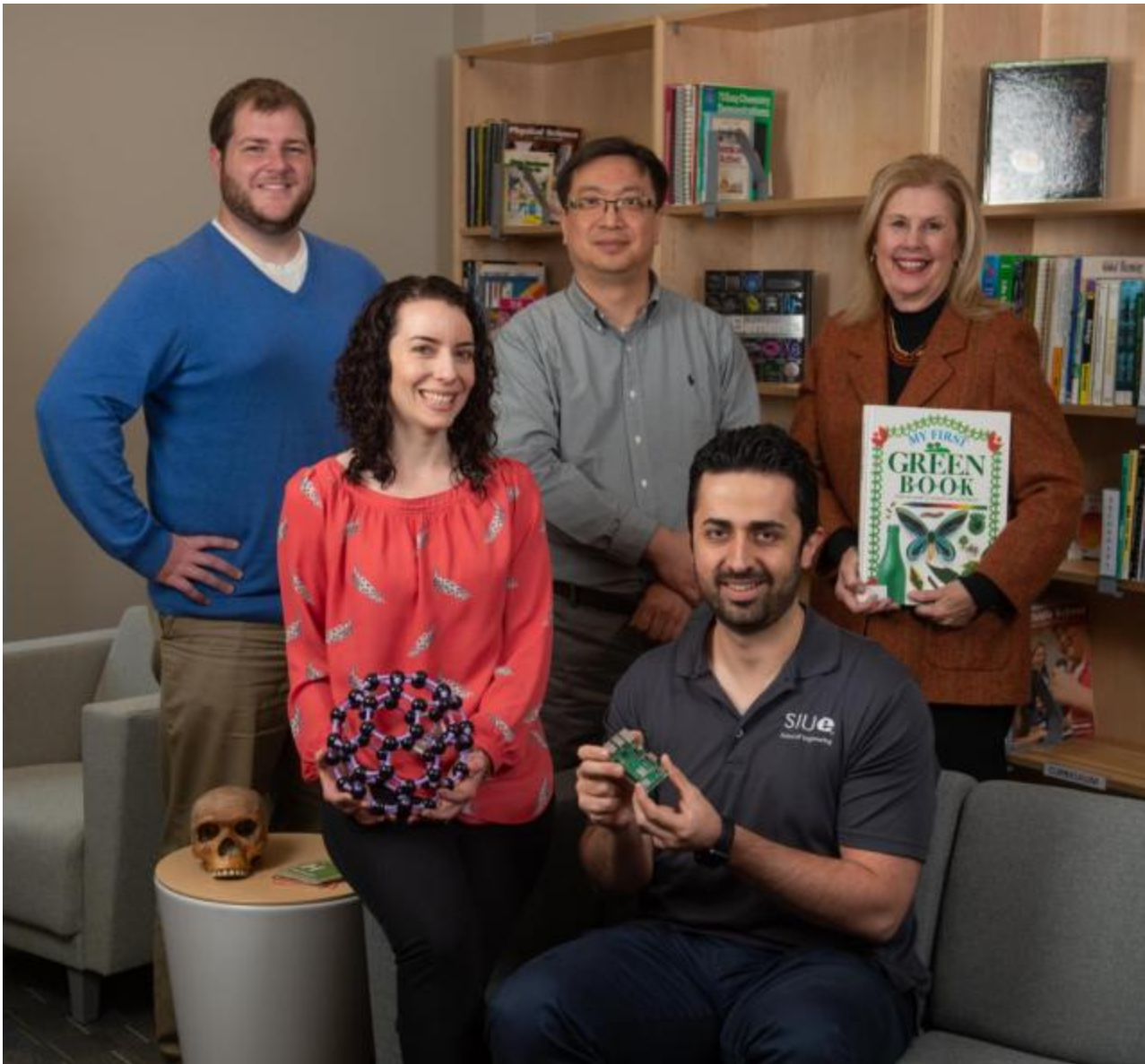




SIUE STEM Center Community Impact Fellowship Program connects faculty research with Metro East educators and students

by Megan Wieser

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EDWARDSVILLE - The Southern Illinois University Edwardsville Center for Science, Technology, Engineering and Mathematics (STEM) Research, Education and Outreach is helping to bridge the gap between the SIUE research community and students across the Metro East through its new Community Impact Fellowship program.

The program supports SIUE faculty as they leverage their existing and active research programs to engage area learners through STEM-based high impact community engagement products and practices.

“The STEM Center has the mission of building a community of researchers and educators who together innovate ways to engage students and the public in STEM,” said Carol Colaninno, PhD, research assistant professor in the SIUE STEM Center. “We see

this program as a way to help faculty work with pre-service and in-service teachers, and students, both K-12 and college, to actively share their scientific research with more audiences.”

Three SIUE faculty members were selected as FY19 fellows, including:

- **Nima Lotfi, PhD**, assistant professor in the School of Engineering’s Department of Mechanical Engineering. Lotfi will develop content and structure for a teacher workshop to help K-12 educators gain an understanding of mechatronics and robotics engineering (MRE).
- **Caroline Pryor, EdD**, professor in the School of Education, Health and Human Behavior’s Department of Teaching and Learning. Pryor will work with SIUE pre-service teachers and their mentors to develop STEM-social studies integrated lesson plans.
- **Kyong Sup Yoon, PhD**, assistant professor in the College of Arts and Sciences’ Department of Environmental Sciences. Yoon will develop a high school curriculum module on environmental toxicology, neurobiochemistry and evolution of insecticide resistance which will include a short lecture series and laboratory exercise.

“The missing piece of the puzzle in MRE education seems to be a lack of communication and collaboration among MRE educators at universities, K-12 institutions and community colleges,” explained Lotfi, who is the principle investigator of a \$49,957 award from the National Science Foundation aimed at shaping the future of MRE education nationwide. “As we work to develop a knowledge base and best practices for MRE education, we need to conduct outreach to maximize inclusivity and diversity of workshop participants.”

Through this fellowship, Lotfi will initiate efforts to establish a line of communication between SIUE faculty and STEM educators in the Edwardsville area. Then, he anticipates broadening that communication statewide and nationally.

“Educators in K-12 institutions, especially high schools, play a vital role in preparing students for a formal education in MRE,” Lotfi explained. “This work can potentially reshape and reinvigorate STEM education in that environment. Future mechatronics and robotics engineers, with technical breadth and depth, will be uniquely prepared for the future of work at the human technology frontier.”

According to Pryor, her research and collaborative work with the SIUE STEM Center will investigate the efficacy of co-developed STEM-Social Studies integrated curriculum, and identify the processes and resources needed for successful implementation.

“The pre-service teachers in SIUE’s Department of Teaching and Learning participate in observations and teaching at schools across the region,” Pryor noted. “In so doing, they interact with students and faculty at these schools, sharing and trying out cutting-edge research and innovative ideas. Collaboration among SIUE students, school faculty and professors is an ideal way to assess this research. As an educational learning community, we will develop and test lessons that use this innovative approach, and share them with regional teachers.”

Pryor emphasizes this work supports the mission of public education, which is to prepare students to participate in a democratic society.

“The complexity of issues currently facing our citizenry suggests a rethinking of educational curriculum design, as we seek to better prepare students to respond to those issues,” she explained. “It is my goal that a synergy of collaboration will impact entire school communities as our teacher candidates and their mentors learn new ways to draw upon STEM-based resources as an interdisciplinary problem-solving teaching approach.”

The STEM Center’s Community Impact Fellowship is an important opportunity, which Yoon was eager to partake. His work is in conjunction with a high school educator at Edwardsville High School and will identify practical issues in science classrooms.

“I hope this project can promote and encourage high school students to participate in STEM-based problem-solving processes,” Yoon said. “Through the interactions among partners, including myself, SIUE STEM Center staff and high school teachers, we may be able to turn this into an action research project for which all community partners work together to develop proper strategies to tackle the identified issues.”

Yoon anticipates the project expanding into a multi-layered, extramurally supported STEM outreach program.

“We are incredibly lucky to have a highly organized STEM Center facility and dedicated faculty and staff who possess expertise in STEM education and research,” he said. “We are perfectly positioned to provide hands-on STEM learning experiences to local high school students.”

“We see this fellowship program as a win for the SIUE STEM Center, SIUE faculty and the broader community,” concluded Matt Johnson, instructional design and curriculum specialist with the SIUE STEM Center. “We hope that through this process, we can help these faculty bring their research to broader audiences and support them in future funding opportunities.”

STEM Community Impact Fellows will receive a \$1,500 stipend upon project completion. They will share the results of their activities and final products and/or practices at a Community Impact Showcase in fall 2019.

The Southern Illinois University Edwardsville [Center for STEM Research, Education and Outreach](#) comprises an independent group of researchers and educators, innovating ways to engage students and the public in science, technology, engineering and math (STEM). Within the SIUE Graduate School, the Center brings together research faculty, graduate students and practitioners to conduct education research. The Center contributes educational expertise to SIUE undergraduate classes and provides professional development for K-12 teachers. The Center boasts a significant library of equipment and resources, which are available for loan at no cost to campus and regional instructors. For more information, visit <https://www.siue.edu/stem/about.shtml> or contact STEM Center Director Sharon Locke at (618) 650-3065 or stemcenter@siue.edu.