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National Science Foundation Awards $600,000 Scholarship Grant to USCB Computational Science Program

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BLUFFTON, SC – The National Science Foundation (NSF) has awarded over $600,000 to the University of South Carolina Beaufort to provide scholarships to academically talented but financially deserving students in the university's Computational Science undergraduate program.

The prestigious grant from the NSF's Scholarships in Science, Technology, Engineering and Mathematics program (S-STEM) will generate educational opportunities for qualified students in need of financial assistance, particularly women and minorities. By reducing or eliminating the burden of tuition, recipients of the S-STEM scholarship will be better positioned to spend more time outside of class concentrating on their studies, engaging in research projects, and seeking out internships that are relevant to their long-term interests. Overall academic performance and program retention rates are expected to improve as a result of the scholarship program. Graduates will have significantly less student debt to pay off, and they will be poised to compete for highly rewarding jobs that demand advanced computing skills.

Despite its modest size of 1,822 students, the University of South Carolina Beaufort (USCB) is one of only a handful of colleges and universities in the nation—and the only institution in South Carolina—to offer an undergraduate

program of study in Computational Science (CSci). This emerging field shares much in common with traditional Computer Science, but focuses more on the application of computing skills to the solution of large-scale problems in such diverse fields as engineering, the natural and life sciences, social science, and business.

"In our Computational Science program, we instruct students in programming languages and the essential foundations of computer science theory, including the design of software and databases, just like in traditional Computer Science programs," says Dr. Yiming Ji, associate professor and coordinator of the CSci program at USCB. "However, while Computer Science represents the study of computing itself, the intention of Computational Science is to apply computing skills to other fields in which problems have become too large for people to solve without the help of high-performance computing technologies."

Indeed, one of the key objectives of the CSci program is to ensure that students learn about computing in real, practical contexts, which helps to promote better understanding, greater knowledge retention, and improved problem solving skills. According to Ji, the Computational Science program is designed to foster close collaboration with every other department and major at USCB, depending on the student's interests. "If students want to focus on a concentration in biology, engineering, business, or some other program offered at USCB, then we require and direct them to take foundation courses in Computational Science along with courses from the associated cognate area," Ji says. "By the time our students graduate, they will have a thorough knowledge of computer science and how it applies to the field they intend to enter, making them much more competitive and adaptable to different types of jobs than graduates of either discipline alone."

USCB's first graduating class of CSci students will receive their diplomas in May 2014, with at least two rising senior students completing their degree requirements by December 2013—a full semester ahead of schedule. This significant milestone for USCB marks five years of developing the CSci program. After receiving $573,245 in NSF grant funds in 2009 to help spearhead the program's creation, Ji and his colleagues prepared the initial four-year curriculum, successfully recruited new professors, and obtained the necessary approvals and accreditations to launch the program for the 2010-2011 academic year. An improved website, an energetic faculty, and news of the program's early successes contributed to the program's growth and sustained high retention. Since the program's inception, enrollment has grown on average by more than 17 students annually, leading up to a total of 70 students enrolled for the forthcoming 2013-2014 academic year.

While all current and prospective Computational Science students are encouraged to apply for one of the new scholarships funded by the $601,650 NSF S-STEM award, the focus will be on incoming freshmen and sophomores. Students with a high school grade point average (GPA) of at least 3.0 along with

a demonstration of financial need will be eligible to apply. Each scholarship recipient will be assigned an academic advisor and will receive invaluable academic support services including tutoring, peer mentoring, seminars, summer research, internship and career support, and other counseling and guidance services. Those who make sufficient academic progress will eventually transition to South Carolina's state-funded, merit-based Legislative Incentive for Future Excellence (LIFE) scholarship, which offers up to $7,500 per year when including enhancement funds for students in certain STEM disciplines.

Dr. Ji, a specialist in wireless communications and computer networks who in 2010 was named a "Rising Star" by the USC Office of Research and Graduate Education, will be joined by six USCB faculty and staff to serve as directors of the scholarship program: Dr. Amy Sears, Director of Grants, Ms. Patricia Greene, Director of Financial Aid, Ms. Joffery Gaymon, Vice Chancellor for Enrollment Management, as well as fellow STEM faculty Dr. Brian Canada and Dr. Xuwei Liang, both assistant professors of Computational Science, and Dr. Kasia Pawelek, assistant professor of Mathematics.

The team of seven worked closely together to prepare the winning NSF S-STEM grant application, which is just the latest in a string of recent successes that have propelled USCB into the spotlight, including the establishment of paid technical internships, the creation of STEM-related outreach activities for secondary school students and for the community at large, as well as the supervision of award-winning undergraduate researchers.

Ji was lavish in his praise for his colleagues. "These six have all worked incredibly hard to help USCB earn this grant," he says. "Their dedication, innovation, and vigorous efforts extend well beyond the typical university responsibilities of teaching, research, and service. They all deserve to be recognized and rewarded for the significant value they add to the CSci program, to USCB, and to the surrounding region—both intellectually and financially."

USCB draws its student body primarily from the Lowcountry region of South Carolina, and a sizeable fraction of USCB's students come from families with low household incomes. In the 2011-12 academic year, over 40 percent of USCB students received federal Pell grants, which provide need-based financial aid to undergraduate and some post-baccalaureate degree students. For Computational Science, the numbers are even higher. About two-thirds of students in the program have demonstrated financial need, and of those, fully 70 percent were from traditionally under-represented groups: African-Americans, Hispanics, and Native Hawaiian Pacific Islanders.

Students who qualify for an S-STEM scholarship will receive up to $5,000 for a two-semester academic year. Because USCB has the lowest tuition in South Carolina for in-state residents (which includes those from selected nearby areas in coastal Georgia), the NSF scholarship funds will cover the full cost of tuition.

"Many of our students who weren't full-time before can become full-time," says Dr. Brian Canada, who will oversee the advancement of research and internship programs for the S-STEM scholarship recipients. "In other words, we don't want students to be distracted by financial pressures that force them to work long hours outside of class just to cover their education costs. If our scholars do need extra money, we'll help see to it that they find good-paying summer employment that's relevant to their field of interest."

Dr. Kasia Pawelek, whose directorial role will be to recruit females and students from underserved populations, agrees. "Students can now spend more time studying and perhaps striving for a better, more flexible balance between school and family life," she says. "For this reason alone, the S-STEM scholarship will bring more students to USCB and to the Computational Science program in particular."

According to program director Ji, the S-STEM scholarship program even has implications for long-term economic growth in the South Carolina Lowcountry region. "USCB may be modest in size, but this grant from the National Science Foundation enables us to compete on equal terms with historically larger, more famous schools that also offer Computer Science and Computational Science programs," says Dr. Ji. "Now that we are positioned to attracted talented students away from those other schools to come to USCB, it's just a matter of time before more and more high-tech companies take notice and set up shop in the region."

Detailed information about eligibility requirements and application instructions may be found on the USCB Computational Science program website, located online at http://www.uscb.edu/csci.