Michelle Vigeant, assistant professor in the Department of Mechanical Engineering in the College of Engineering, Technology, and Architecture (CETA), is the first University of Hartford faculty member to receive a National Science Foundation (NSF) Faculty Early Career Development grant. Vigeant will use the five-year, $422,814 grant to pursue her research interests in architectural acoustics.

The coveted award supports junior faculty in engineering and the sciences who exemplify the role of teacher-scholars by integrating excellent education and outstanding research within the context of their organization’s mission. Thousands of researchers from top programs across the country apply for the prestigious grant each year. Vigeant received the award on her first attempt, which is extremely rare.

“I believe my proposal was chosen because it is novel,” Vigeant says. “The results will have a major impact in the science community.”

Vigeant’s project, titled “Importance of Late-Sound-Field Properties and Listener Envelopment to Room Acoustic Quality and Design,” intends to provide an accurate methodology for measuring the acoustics quality of concert halls, in particular listener envelopment, or the sense of being immersed in the sound. These results will allow for more efficient design of music performance venues and reduce the need for costly renovations, Vigeant says.

Her work, which begins this summer 2012, will involve taking measurements in concert halls in the United States and Europe. Vigeant plans to recruit 15 undergraduate students in the University’s acoustics program to work on the project. Female students in particular will be encouraged to participate, as women remain underrepresented in the engineering profession. Over the course of the five-year project, one student will assist with the research during the academic year and two students will assist during the summer months. The students will take measurements in concert halls and administer listening tests to human subjects using the anechoic chamber in the University’s acoustics laboratory.

A summer program for undergraduate students working as research assistants in the science, technology, engineering, and math (STEM) fields will be created to promote a sense of community and to provide seminars about relevant topics, such as pursuing graduate studies.

A second component to Vigeant’s winning proposal is educational outreach. Collaborating with the Connecticut Science Center in downtown Hartford, she will instruct educators in how to teach the concept of sound at the 5th-grade level. In addition, in partnership with the Acoustical Society of America’s education committee, Vigeant will create activity kits to introduce children to the topic of sound through interactive, hands-on activities. The kits will be tested in local schools, including the University of Hartford Magnet School and Annie Fisher School in Hartford, the latter of which includes a STEM focus in its curriculum.

“The goal of the outreach is to expose young students, particularly females, to science and engineering,” Vigeant says. “We’re offering role models. If young people see female scientists and engineers, they may be inspired to follow in those career paths.”

Vigeant earned her PhD in engineering from the University of Nebraska—Lincoln and received a BSc in mechanical engineering from the University of Alberta in Edmonton, Canada. Her teaching methods incorporate service-learning into undergraduate acoustics courses. She has addressed acoustical problems and implemented solutions in a range of venues—church auditoriums, The Hartt School’s practice rooms, and classrooms at The Walker School for special-needs children in Needham, Mass.

“My story is similar to a lot of students in acoustics programs,” Vigeant says. “I played piano and clarinet, and was interested in science and math. I found a perfect match in acoustical engineering, particularly in the field of architectural acoustics.”
In 1976 two faculty members at the University of Hartford with a shared love of music and engineering created a one-of-a-kind undergraduate degree program in acoustical engineering. The late William C. Willett, a professor in The Hartt School, and the late Conrad Hemond Jr., professor emeritus in the former School of Engineering (now part of the College of Engineering, Technology, and Architecture [CETA]), developed the first and only undergraduate program in acoustical engineering and music in the United States. It combines an engineering degree with intensive study at a music conservatory.

Students applying to the acoustical engineering and music program must audition with their instruments at The Hartt School and be accepted for admission there, as well as have the math and science aptitudes required by the mechanical engineering department in CETA. In the past 10 years, the program has grown significantly, with 19 students enrolled in 2002, 29 in 2006, and 36 in 2011. The program is accredited by the Accreditation Board for Engineering and Technology, the established benchmark for undergraduate engineering programs in the United States.

According to Robert Celmer, professor of mechanical engineering and director of acoustical engineering, the success rate for the program’s students graduating and getting jobs in the current sluggish economic climate is still quite high. “Our job placement rate is 93.3 percent over the last six years, and our graduate school acceptance rate is 100 percent,” says Celmer. “A wide range of companies hire our acoustics and music program graduates, including Bose Loudspeakers, Electric Boat, Pratt & Whitney, the U.S. Department of Transportation, and major acoustics consulting firms like Cerami and Associates, and Artec.”

Celmer credits this success rate not only to the quality of the students but also to the needs of the general public. “People are becoming more aware of sound. They want sound to be clear and they also want to appreciate their silence. These are areas where an acoustical engineer can improve their experiences,” he says.

Acoustical engineers work with architects and other building managers to make rooms soundproof in high-noise environments and to make sound quality better for businesses and people. A Class of 2012 graduate who will be working to make the world sound a little better is Cassey Stypowany, who has landed a job after graduation at Cerami and Associates, a New York–based acoustical and audiovisual design consulting firm.

Cerami’s chief executive officer is Victoria Cerami ’81, a former University regent and former member of CETA’s board of visitors. Her company has hired a number of University of Hartford engineering graduates over the years. Stypowany says Celmer urged her to apply to the company for an internship. “Dr. Bob said he had a feeling I would end up there permanently and he was right,” says Stypowany. She interned at Cerami for two summers and was offered a permanent, full-time position starting this July.

Stypowany has had an interest in music and acoustics for some time. She has played the cello for nearly 14 years but suffered from stage fright. In a high-school acoustical engineering class, a teacher suggested that because she had stage fright but still wanted to work in music and sound, perhaps acoustical engineering was a career option for her. After looking into the program at the University of Hartford, Stypowany agreed. “Cassey has been a joy to have in class. She exhibits such strong effort and passion for acoustic music and brings energy to everything,” says Celmer.

Stypowany says she is excited about the overall experience of living in New York City and starting a new career in the field she loves. ■

Robert Celmer ’78 (center), professor of mechanical engineering and director of the acoustical engineering and music program, says the program has a job-placement rate of more than 90 percent. Cassey Stypowany ’12 (left) was offered a job with Cerami and Associates in New York City before she graduated from the program. Craig Healey ’12 (right) landed a job as an acoustical engineer at Electric Boat in Groton, Conn.