ARTS AND SCIENCES: *Introducing* GoSTEAM

The Goizueta Foundation is helping CEISMC launch a program that integrates the arts into STEM education.

Georgia Tech has long been committed to improving STEM (science, technology, engineering, and mathematics) education in Georgia and making it more accessible to students from diverse backgrounds who are interested in pursuing STEM degrees and careers.

This commitment recently took a significant step forward, thanks to a $5 million grant from The Goizueta Foundation to Tech's Center for Education Integrating Science, Mathematics, and Computing (CEISMC). Over the next five years (one planning year followed by four years of implementation), the funds will be deployed to build a curriculum that integrates the arts into STEM education, from pre-kindergarten through 12th grade.

GoSTEAM will begin in summer 2019 in a select group of metro Atlanta schools where a majority of the students come from low-income families and are underrepresented in STEM fields. It builds upon the findings and lessons learned from The Goizueta Foundation-funded GoSTEM, an ongoing collaboration between Georgia Tech and Gwinnett County public schools to enhance the educational experience of Latino students and strengthen the pipeline into post-secondary STEM education.

The new GoSTEAM program has the potential to demonstrate the value of integrating the arts and culture into engineering and computer science instruction, and to provide multiple roadmaps that other schools can replicate. In the participating schools, the program will give teachers and administrators the time, resources,

and coaching assistance to be able to transform creative ideas into fully implemented programs.

"We want to create a model curriculum that spans pre-K through high school and illustrates meaningful and innovative integration of the arts with science, technology, engineering, and mathematics," said Lizanne DeStefano, executive director of CEISMC, associate dean in the College of Sciences, and professor in the School of Psychology.

DeStefano was recently named by the National Science Foundation (NSF) as one of 18 inaugural members of its STEM Education Advisory Panel. Similar to her mission at CEISMC, and as a contributor to the Georgia Tech Commission on Creating the Next in Education, she is interested in "sharing Georgia Tech's STEM education innovation, and learning from others, across the country."

GoSTEAM will play a crucial role in putting new ideas and collaborations to work in Atlanta's schools — particularly those schools that already emphasize engineering, computer science, entrepreneurship, and innovation. Here, the fine arts, media arts, theater arts, and music will be used to increase student engagement in STEM, problem-solving, and teamwork and collaboration.

And it wouldn't be possible without the power of philanthropy to put bold ideas and fresh thinking to work in creating new generations of learners and discoverers. ///

GoSTEAM aims to demonstrate the value of integrating the arts and culture into engineering and computer science instruction.

TECH PROFESSOR'S ALZHEIMER'S RESEARCH PROMISING

Annabelle Singer's Alzheimer's Research Project tackles the mystery of a baffling and devastating disease head-on. "Ultimately, the goal is to understand how neural activity both produces memories and protects brain health — and then use this knowledge to engineer neural activity to repair brain function," Singer said.

An assistant professor in the Wallace H. Coulter Department of Biomedical Engineering, Singer is also a Packard Fellow, one of only 18 innovative young scientists in the nation to receive this prestigious honor, and currently receives support from the David and Lucile Packard Foundation to further

her research into understanding, treating, and eventually reversing the effects of Alzheimer's. Additional support for Singer's research has been provided by a generous, collective gift from several donors who wish to remain anonymous.

The streams of funding provide Singer the opportunity to continue studying neurons' firing patterns and how they affect neighboring neurons. "We used to think that neurons would fire spikes to neighboring neurons for a few milliseconds... [but] now we're seeing repeating patterns of rumblings and spikes sustained over hundreds of milliseconds," Singer said. The rumblings are fluctuations of electrical potential

within a neuron before it fires a spike, which is a large, electrical signal that communicates with neighbor neurons. "We're starting to see more structure in what was thought to be randomness," Singer explained.

Singer's research is one of the Institute's most high-profile endeavors at the promising intersection of neuroscience and neuro-engineering. "Using non-invasive approaches, we're working to develop new ways to treat diseases that affect memory, like Alzheimer's — for which there are no effective therapies," Singer said. ///
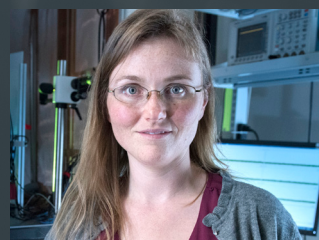
Annabelle Singer's research has great potential for addressing the tragedy of Alzheimer's.