

Museum of Science in Boston. Southworth, who graduated from MIT in 2002 in mathematics with a minor in music, incorporates the flashing lights and static from the popular de Graaf generator along with robotic instruments and live performers in her new piece, "Zap Music for Van de Graaf Generator, Robots, Instruments and Voices." "Zap" will premiere on Friday, Feb. 4 at 6:30 p.m. at the Museum of Science's OMOSS Theater of Electricity.

The de Graaf is the largest of its kind in the world and is capable of producing up to 1.5 million volts of electricity.

Like Southworth, the generator, too, in a sense, also an alumnus of MIT. Designed and built at MIT in the 1930s by MIT Professor Robert J. Van de Graaf, the generator was originally used as a research tool in early atom smelting and high-energy X-ray experiments. MIT gave the generator to the Museum of Science (MOS) in 1956, where it is now used in daily demonstrations of lightning and electricity.

"Zap" is an offshoot of a project started by Southworth and Lella Hanson (M.Eng. and S.B. Electrical Engineering 2005), called Ensemble Robot, a small collection of robotic musicians who produce both simple and complex patterns of sound from acoustic sources including strings, pipes, drums and wooden keys. "Zap" will include at least three of these robots but "not all the robots are happy playing in proximity to the high voltage," Hanson said.

Southworth and Alexandra Anderson (S.B. Electrical Science and Engineering & S.M. Electrical Engineering and Com-

munical Interface) writing device, inspired by the Theremin, that she calls a "hermexina."

Human musicians rounding out the cast are Ramon Castillo (conductor/music director), Akili Haynes (percussion/vocals), Blake Newman (bass), Erik Nugent (drum/vocals), Sachu Sato (keyboards), Motoni Lam (keyboards), Christine Southworth (violin), Rebecca Zook (violin) and Jeff Lieberman (guitar/keyboards), an MIT alum (S.B. Mathematics and Physics 2000, S.M. Mechanical Engineering) currently pursuing a Ph.D. in Media Arts and Sciences.

Other contributors to the project include Mike Mayo (sound design), Yicheng Hsu and Giles Hall (programming) and MIT alums Luke Phelan (S.B. Humanities 2002—documentation) and Kevin McCormick (S.B. Electrical Engineering and Computer Science 1999—lighting design). Southworth is currently pursuing a master's degree in Computer Music and Multimedia Composition at Brown University and continues studies in composition with Ketan Sabhi Distinguished Professor of Music Evan Ziporyn, with whom she has also edited and mixed two records. She has received awards and fellowships from the American Composers Forum, The Ernst Bloch Music Festival, Bang on a Can Summer Institute of Music and the MIT Eberstadt Fellowship. A member of MIT's Gamelan Gatah Tika, she also teaches electronic and Balinese music composition to children and adults in Cambridge and Boston.



"Zap" composer Christine Southworth (S.B. 2002) poses with the piece that provides static and flashing lights for her musical composition piece featuring the former atom-smasher in concert with robots, S.B. robots and human voices.



The Van de Graaf generator (above) is the largest of its kind and million volts of electricity. In Southworth's composition, static from the generator, voltage will be controlled by a "hermexina," a device

ArtTalk: Christine Southworth, composer

Lynn Heisenstein of the Office of the Arts asked composer Christine Southworth why she chose to cost the 40-foot de Graaf generator in "Zap."

Q. Why a Van de Graaf generator?

A. The Van de Graaf generator is spectacular. It makes huge sparks of lightning, big booming sounds, or it can make a beautiful glowing corona with a sweet booming buzz. I came up with this idea with Andy Canavara, who works at the museum, and it just made sense. For this piece, I've treated the Van de Graaf generator as a combination percussive instrument and light show.

Q. How did you get the idea for this project?

A. About two years ago I decided that I needed to make robots to play my music, because it was too hard for people to play. This was more of an issue with my notation than anything else, but I thought it would be amusing to be able to play electronic music, as a solo performer, on real instruments. My friend Lella Hanson builds robots, so soon after that we started applying for grants to make this happen, and

Ensemble Robot was born. With generous support from the LEF Foundation, we've spent the past year developing this project.

We went to the museum about a year ago with the idea of putting the robots in the museum as entertainment, perhaps in the cafeteria or lobby. While we were exploring possibilities with that, Andy Canavara mentioned the Van de Graaf generator and this project just exploded into being.

Q. Does "Zap" fall into an identifiable musical category?

A. My music could be called "post-minimalist acoustic/electronic," amplified. I've been influenced by classical music—Vivaldi, Bach—and by modern music—Steve Reich, Terry Riley, Michael Gordon, Louis Andriessen, Arnold Dreyblatt, Meredith Monk, and of course by my teacher, Evan Ziporyn. I've also been influenced by electronics, jazz, hip-hop and rock and roll, specifically Kraftwerk, the Deafones, and Tribe Called Quest. And video game music. And games! I would say my music is pretty: it rocks, grows, and follows no rules really. My teacher at Brown, Slap Shapiro, said "This music doesn't break the rules; it rather reorders the rules of the obsolete." I like that.