

## This is your brain on music

*Hamilton Spectator*

Behind the walls of McMaster's psychology building, a groundbreaking new project that will attract both world-class musicians and leading-edge researchers is taking shape.

McMaster's Live Lab — part concert hall, part scientific research facility — will be used to study how music influences our brains, explains Laurel Trainor, the director of McMaster's Institute for Music and the Mind. Think of it as a small-scale Hamilton Place outfitted with equipment that can monitor the brain activity, heart and breathing rates, and even the amount of sweat produced by both performers and audience members.

The \$8 million project, which is in the final stages of construction, is the first of its kind in the world.

"There isn't another space that's been specifically built for this purpose," Trainor says.

In many ways, the Live Lab will be a traditional concert hall. Designed by Drew Hauser at McCallum Sather architects, the venue will have 96 seats, full theatre lighting, and a well-appointed lobby space for intermissions.

However, the space is also a high-tech laboratory. Each seat will be wired to allow researchers to collect information from EEG and infrared motion sensors. That information will be sent directly to the lab's computer system, where it can be analyzed and broken down into patterns.

"There's thousands of feet of cable in this place," said Dan Bosnyak, a research scientist and technical director of the Live Lab.

By analyzing the data collected during performances, Trainor and her team of musicians, psychologists, engineers and mathematicians hope to shed light on how our brains process music. Do we react differently to music when we hear it in a group, compared to when we listen alone? How do musicians interact while they're performing? How does learning to play in a musical ensemble affect a child's cognitive development?

The Live Lab will also be outfitted with a high-tech speaker system that will be able to reproduce any acoustical space, from a large, reverberant theatre like Carnegie Hall to a tinny subway station. This feature will not only affect the audience's interpretation of the music, but it can also be used to research everything from improving hearing aids to determining the most effective sounds for medical and warning systems.

In order to eliminate outside noise, the floors and walls are floating, making them entirely isolated from outside sound and vibrations. Massive air vents have been installed to allow for a low airflow that emits almost zero decibels.

"You have to start with the most dead space," said Trainor. "That's what we have that really no one else has — total acoustic control."

McMaster has partnered with the Hamilton Philharmonic Orchestra and conductor Jamie Somerville, but Trainor says the space will also host a range of world-class musicians.

Trainor says the project will be operational by the fall and will celebrate its grand opening in the spring. Anyone interested in volunteering to be an audience member can contact [livelab@mcmaster.ca](mailto:livelab@mcmaster.ca).

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Laurel Trainor and Dan Bosnyak inside the Live Lab's studio/theatre/lab.



The foyer for McMaster's Live Lab.