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Seismic Music at UC Berkeley's Campanile, Performed by the Earth

By Laura Sydell
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When the bells of Sather Tower on the UC Berkeley campus ring out on the evening of Tuesday, Feb. 3, the sound will amplify the low rumble of the earth that most of us in the Bay Area prefer to forget.

In a project called "Natural Frequencies," conceived by composer Edmund Campion, artist and roboticist Ken Goldberg and artist Greg Niemeyer—all UC Berkeley faculty—the bells are programmed to play a score composed in real time by the seismic shifts taking place along the Hayward Fault, directly below the Campanile. Accompanying the bells is a light show, also programmed to respond to the fault's movements.

Seismologists predict the Hayward Fault as the source of a major temblor within the next three decades. If an earthquake were to happen during Tuesday's performance, Campion says it would be more than apparent in the sound of the bells and fluctuation of the lights.

Granted, it's unlikely that the performance, which marks the 100th anniversary of Sather Tower, will become a cacophonous soundtrack to crumbling buildings in the Bay Area. Most likely, viewers will simply hear the regular oscillations of the fault that occur every day, oscillations which Campion calls "very musical."

As a composer, Campion has long been drawn to mixing acoustic instruments with emerging computer technology, "bringing together the old and the new," as he says. Among his notable compositions is "Flow, Debris, Fall," in which a ghostly, playerless

digital piano was programmed to randomly generate music while an ensemble of acoustic musicians improvised along with it. The sound was what reviewer Kevin Berger, in the New York Times, called “stunning.”

For “Natural Frequencies,” Campion, with Jeff Lubow at the Center for New Music and Audio Technologies, created a computer program that tells the bells what to play based on the earth’s movements. The program, says Campion, isn’t “reading a score. It’s generating a score.”

Greg Neimeyer, who designed the project’s lighting, has also experimented with the intersection of data and live events; his previous work includes a piece in the 2013 Venice Biennale that translated data from the rising tides threatening the Maldive Islands into a sound and visual composition. Campion also got help from Perin Meyer of Berkeley’s Meyer Sound—the audio firm whose Constellation system, in place locally at Zellerbach Hall and SoundBox, examines audio data and accordingly makes acoustic adjustments. The seismic data at the core of “Natural Frequencies” is supplied by UC Berkeley’s Seismological Laboratory, which has sensors directly below Sather Tower.

In many ways, “Natural Frequencies” taps into a current obsession of the digital age: data visualization. All around the world, as more data is collected by the internet, visualization tools bring it to life. Niemeyer points out that much of the world’s data is used to look back on that which has already happened, but “Natural Frequencies” sees data in “real time,” and that can be exciting or frightening. “It’s a live stream,” he says, “so we don’t know what is going to happen.”

Niemeyer notes that the lighting is designed to move up and down Sather Tower within expected parameters of seismic actvity. If the Earth were to move more than predicted, he says he doesn’t know what might happen. “That’s what makes it real,” he says. “That’s what makes it engaging.” Niemeyer also points to the team’s hope for the project to show how a community can interact with data. If we become more aware of the data about the world around us, he reasons, we can work communally toward new solutions to problems.

The project also re-imagines the purpose of the 100-year-old tower. As the program’s copy notes, bell towers “have been used for centuries as a medium to effectively convey time, calls to prayer and community events, and warnings about invasions, fires, and floods.”

“Natural Frequencies” builds upon that history using modern digital tools to remind us of our connection to a powerful, vibrant, and sometimes frightening earth below.