MUSIC FOR ALIENS
JONATHON KEATS CREATES INSTRUMENTS FOR NONHUMAN SENSES

Sure, humans have tried before to communicate with any extraterrestrials who might be out there. Most notably, the twin Voyager probes each carry a copy of the Golden Record, intended to communicate “a story of our world” with images, nature sounds, music, and spoken greetings. But experimental philosopher Jonathon Keats says that if we really want to persuade aliens to make contact, we should do more than just tell them our story.

“If you’re in a bar and hear someone who just keeps talking about themselves, it gets annoying,” he says. “I’m trying to make something that’s more universal and more inclusive.”

So Keats has founded Intergalactic Omniphonics—which he calls a startup and others might call conceptual art—to bring sentient beings together through music. He has created several new instruments that he hopes will be accessible to aliens, even if their senses are considerably different from ours.

The simplest of the instruments, which Keats created during a residency at the University of North Carolina Asheville’s STEAM Studio in collaboration with the sculptor Amelia Pate, is the dog-whistle organ. Recognizing that the human hearing range is limited—spanning the audio frequencies of about 20 to 20,000 hertz—Keats and Pate built an organ with a foot pump that sends a flow of air through various ultrasonic whistles.

But what if the aliens aren’t sensitive to the changes in air pressure that we call sound? At its core, “music is the modulation of frequency and amplitude over time,” Keats says. “So anything that allows for that can carry a tune.” He turned to the electromagnetic spectrum, but he didn’t want to limit himself to the portion that’s visible to the human eye. He decided to work with gamma rays, which are emitted by radioactive materials. Keats scrounged his samples from eBay.

“I got radium in an old watch dial and uranium in an old marble,” he says. To make the gamma rays ring out gaily, a player rhythmically lifts lead casings that cover the materials.

Another elegant instrument is a “cello” that sends out gravitational waves—something that Keats says has huge potential for interstellar communication because the waves move through the universe at the speed of light. Thus, an instrument that controls the frequency and amplitude of faint gravitational waves might send a musical message: The cellist plays the instrument by swinging ball bearings of different masses.

As for what to play with these instruments (beyond obvious songs like David Bowie’s “Starman”), Keats has created an anthem that he hopes will be “cognitively meaningful” to any being in the universe. “I’m sure I’ve failed,” he says ruefully. “I’m sure there are some beings that are feeling left out. But I tried my best.”

The anthem takes as its theme the second law of thermodynamics, which holds that closed systems inevitably become more disordered over time, increasing their entropy. Against this backdrop, we living beings extract useful energy from our environments, to make ourselves less disordered. But eventually we die and decay, and our energy goes back into the mix.

“The anthem communicates what it is to be alive, since that’s what we have in common with every organism on this planet and any organism elsewhere in the universe,” Keats says. To represent this concept musically, the anthem’s score calls for a soloist, representing beings everywhere, to make music that goes from a state of greater to lesser entropy, as the larger orchestra tends toward greater entropy in the background. Ultimately, the soloist’s voice becomes more entropic to represent death, and the orchestra becomes marginally less entropic as the being’s energy is added back in. Then it repeats. That’s the cycle of life.

Keats would love to send the anthem beaming out into space, perhaps via the powerful Arecibo radio telescope, in Puerto Rico. Until then, he says, “I’m hoping we can get it played at some ballparks.”

—ELIZA STRICKLAND

An extended version of this article appears in our Tech Talk blog.

‡ POST YOUR COMMENTS at https://spectrum.ieee.org/music0918