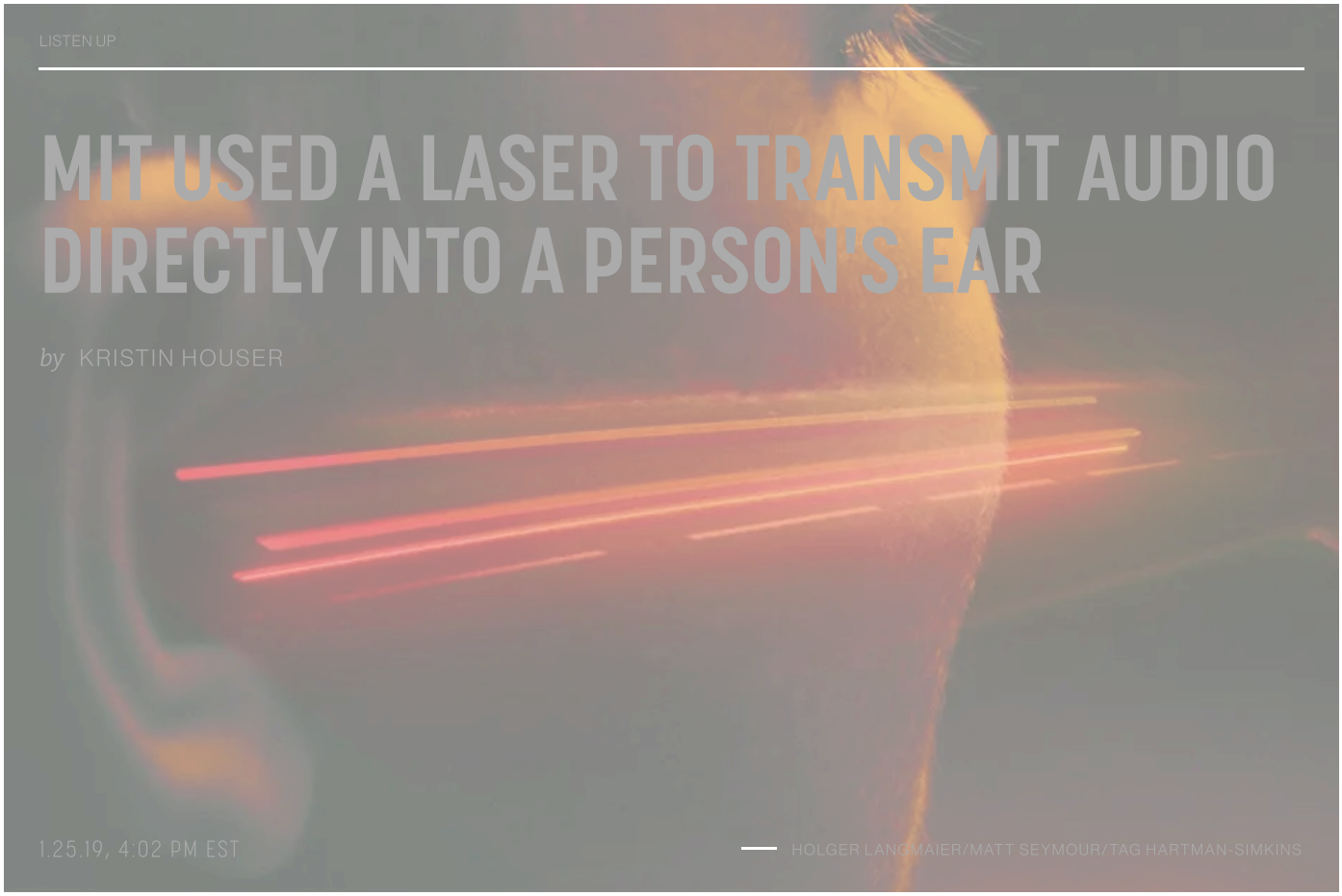
THE BYTE.



ONLY THE TARGETED PERSON COULD HEAR THE MESSAGE.

Frickin' Laser Beams

Scientists have figured out how to use a laser to transmit audio, ranging from music to speech, to a person across a room without any receiver equipment — a potential breakthrough for the future of audio and communication.

"Our system can be used from some distance away to beam information directly to someone's ear," Massachusetts Institute of Technology research Charles M. Wynn said in a press release. "It is the first system that uses lasers that are fully safe for the eyes and skin to localize an audible signal to a particular person in any setting."

Sweeping Success

In a paper published on Friday in the journal *Optics Letters*, the MIT team describes how it developed two different methods to transmit tones, music, and recorded speech via a laser.

Both techniques take advantage of something called the photoacoustic effect, which is the formation of sound waves as the result of a material absorbing

light. In the case of the MIT research, that material was water vapor in the air.

For one of their methods, the researchers "swept" a laser beam at the speed of sound, changing the length of the sweeps to encode different audible pitches.

This technique allowed them to transmit sound to a person more than 8.2 feet away at a volume of 60 decibels — about the loudness of background music or a conversation in a restaurant — without anyone between the source of the sound and the target hearing it.

For the other method, they encoded an audio message by adjusting a laser beam's power. They said this technique produced a quieter but clearer result.

Psst

As cool as it would be to use a laser to sneak a message to a friend across a crowded room, the MIT team has far more important applications in mind for its technology.

They believe further research will allow them to scale up the transmission distance, which could make the technique useful in dangerous situations, such during a mass shooting — authorities could beam instructions directly to individuals without anyone else hearing them.

"We hope that this will eventually become a commercial technology," researcher Ryan M. Sullenberger said. "There are a lot of exciting possibilities, and we want to develop the communication technology in ways that are useful."

READ MORE: New Technology Uses Lasers to Transmit Audible Messages to Specific People [The Optical Society]

More on lasers: Russia's Latest Weapon: A Laser Cannon