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## Researchers find way to target sound to individuals - 27th March 2025

#### Level 4

How we listen to music is changing. Today, we have high-tech ear buds that give a top quality sound. In the future, we will be able to listen to music in public without headphones. New technology will aim beams of sound at us, without others hearing. We will have conversations in public without other people listening in. Researchers developed an innovation called "audio enclaves". The sound waves used for this cannot be heard on their way to the receiver.

The lead researcher said: "Someone within an audible enclave can hear something meant only for them, enabling...quiet zones." He spoke about possible uses of the technology. Museums could give headphone-free audio guides to visitors. People could set up an enclave to make sure their conversations are not overheard. We could also receive personalized ads in shopping malls. Audio enclaves could also reduce noise in busy places.

#### Level 5

How we listen to music has changed over the centuries. Today, we have high-tech noise-cancelling ear buds that provide the highest quality experience. In the near future, we will be able to listen to music in public without headphones. New technology will aim beams of sound at us, without other people hearing. This means we will have conversations in public without others listening in. Researchers in the USA developed an innovation called "audio enclaves". The ultrasound waves used for this cannot be heard on their way to the receiver. The waves can also be bent to get around obstacles.

Lead researcher Jiaxin Zhong spoke to "The Conversation" website. He said: "We essentially created a virtual headset. Someone within an audible enclave can hear something meant only for them, enabling...quiet zones." He spoke about potential uses of the technology. Museums could give headphone-free audio guides to visitors. Car passengers could listen to music without distracting the driver. People could set up enclaves to ensure their conversations are not overheard. We could also receive personalized ads in shopping malls. Audio enclaves could also eliminate noise in offices.

### Level 6

The way in which we listen to music and hear sounds has changed over the centuries. Today, we have state-of-the-art, noise-cancelling ear buds that provide the highest quality aural experience. In the near future, we will be able to listen to music in public without headphones. New technology is being tested that can aim beams of sound at individuals, without people next to them hearing. This means we could be having private conversations in public without others listening in. A team of researchers at Penn State University in the USA developed an innovation called "audio enclaves". The ultrasound waves used for these enclaves cannot be heard en route to the recipient. In addition, the waves can be bent to get around obstacles.

The researchers spoke to the website "The Conversation" about their work. Lead researcher Jiaxin Zhong said: "We essentially created a virtual headset. Someone within an audible enclave can hear something meant only for them, enabling sound and quiet zones." He elaborated on the potential uses of the technology. Museums could provide headphone-free audio guides to visitors. Passengers in a car could listen to music without distracting the driver. Those requiring confidentiality could set up enclaves to ensure their conversations are not overheard. Individuals could also receive personalized ads as they walk through a shopping mall. In addition, audio enclaves could be set up to eliminate noise pollution in busy workplaces.

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