New temperature sensor sounds good
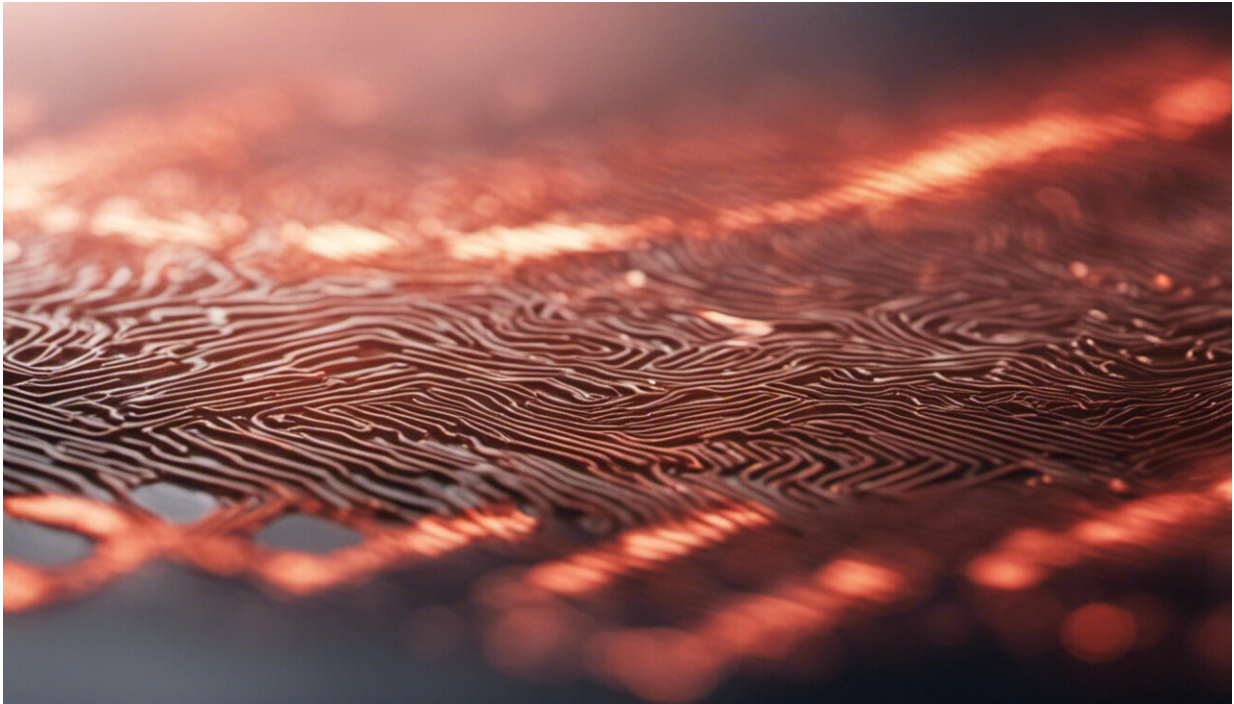
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Temperature scientists at NPL are developing a thermometer that uses sound waves to measure temperature.

The thermometer works on the principle that the speed of sound changes with temperature, travelling faster through warmer air. Such an instrument could potentially replace traditional thermometers in environments where extreme temperatures cause a loss of accuracy.

NPL's Michael de Podesta, who leads Acoustic Thermometry research, said, in an interview with The Engineer magazine: "Potential uses include any hostile environment [for example] inside a furnace above 1,000 °C."

"Any contact thermometer used in this environment degrades as soon as it is used and is usually placed in the environment inside a protective tube. The practical acoustic thermometer consists just of the tube itself."

The acoustic thermometer works by transmitting sound waves along a gas-filled tube from a speaker at one end to a microphone at the other. By measuring the amount of time it takes the sound waves to travel along the tube, the temperature can be calculated.

"The principle is very simple but the application is pretty complicated," said Dr Rob Simpson from the Engineering Measurement team. "The difficult part is working out how to produce the sound and then how to listen to it."

Acoustic thermometry offers a cheap and robust alternative to current instruments, and could potentially reduce the need for equipment to be replaced and calibrated, providing cost and efficiency savings to industry.

Provided by National Physical Laboratory