# Researchers unveil OLED screen with built-in speakers in every pixel



For years, the television industry has been embroiled in a fierce pursuit of pixel perfection—enhancing brightness, reducing size, and optimising arrangement. However, a transformative new technology from researchers at Pohang University of Science and Technology (POSTECH) is shifting the focus. This innovation introduces the concept of sound-producing pixels, suggesting that advancements in display technology could fundamentally alter how we experience audio-visual content.

The researchers at POSTECH have developed a groundbreaking 13-inch OLED panel where each pixel serves a dual purpose: producing both light and sound. This novel approach, dubbed Pixel-Based Local Sound OLED technology, allows for the creation of spatial sound without relying on traditional speaker drivers. According to a report in Science Daily, the integration of piezoelectric exciters embedded within the OLED display's frame converts electrical signals into sound vibrations. This innovation enables each pixel to act as an independent sound source, effectively eliminating issues like crosstalk—the interference that usually occurs when multiple speakers output sound simultaneously.

Professor Su Seok Choi, who spearheaded the project, noted that the technology holds promise for next-generation devices across various sectors, including smartphones, laptops, and automotive displays. Potential applications extend beyond mere televisions; they include in-car displays that could direct audio to the driver while allowing passengers to listen to music. This adaptability illustrates how the technology could enhance user experiences by tailoring audio outputs according to individual needs, a feature often overlooked in current devices.

While the implications of this technology are exciting, it is essential to approach them with a degree of caution. The current iteration is confined to a 13-inch proof of concept; scaling this innovation to larger formats like televisions poses significant challenges, including maintaining sound quality and effectively managing costs. Moreover, while the promise of spatial audio situated precisely within the display is enticing, actual performance remains to be seen. It is one thing to transmit sound effectively; it is quite another to achieve the high-fidelity audio consumers expect.

Further advancements coming from POSTECH include flexible OLED panels capable of changing their shape while simultaneously functioning as speakers. By utilising a specialised ultra-thin piezoelectric polymer actuator, these panels can take on various configurations—concave, convex, or S-shaped—allowing for even more dynamic audio-visual interactions. Such flexibility suggests an exciting future for device design where displays not only emit sound but can also adapt physically, enhancing both functionality and aesthetic appeal.

However, the journey from laboratory to market is often fraught with hurdles. It will require extensive research and development to transition these innovations from theoretical designs into widely available products. The OLED screen technology represents a leap forward but also highlights the distinct gap between conceptual breakthroughs and the practical realities of product development.

In sum, while this new technology heralds a potential revolution in how we experience audio and visual media, those hoping for an immediate transformation in household devices may need to temper their expectations. The best soundbars and audio systems might not be under threat just yet, as the consumer electronics industry grapples with the complex challenges inherent in realising this ambitious vision.

As Professor Choi aptly noted, “This technology has the potential to become a core feature of next-generation devices,” yet the road to refinement remains long. Advances in OLED technology, particularly in combining sound and display, signal a thrilling, albeit cautious, step forward in the quest for enhanced audio-visual experiences.

## Reference Map:

* Paragraph 1 – [[1]](https://www.techradar.com/televisions/new-oled-screen-with-a-speaker-in-every-pixel-promises-sound-as-precise-as-oleds-contrast), [[2]](https://www.sciencedaily.com/releases/2025/03/250325115834.htm)
* Paragraph 2 – [[1]](https://www.techradar.com/televisions/new-oled-screen-with-a-speaker-in-every-pixel-promises-sound-as-precise-as-oleds-contrast), [[2]](https://www.sciencedaily.com/releases/2025/03/250325115834.htm), [[5]](https://techandsciencepost.com/news/tech/dynamic-smartphone-display-with-integrated-speaker-technology-unveiled/)
* Paragraph 3 – [[3]](https://techxplore.com/news/2025-03-shifting-oled-panel-dynamic-smartphone.html), [[4]](https://www.oled-info.com/researchers-create-flexible-oled-display-can-freely-transform-its-shape-while), [[6]](https://knowridge.com/2025/03/scientists-create-shape-shifting-smartphone-screen-that-also-speaks/)
* Paragraph 4 – [[1]](https://www.techradar.com/televisions/new-oled-screen-with-a-speaker-in-every-pixel-promises-sound-as-precise-as-oleds-contrast), [[6]](https://knowridge.com/2025/03/scientists-create-shape-shifting-smartphone-screen-that-also-speaks/)
* Paragraph 5 – [[2]](https://www.sciencedaily.com/releases/2025/03/250325115834.htm), [[5]](https://techandsciencepost.com/news/tech/dynamic-smartphone-display-with-integrated-speaker-technology-unveiled/)

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## Bibliography

1. <https://www.techradar.com/televisions/new-oled-screen-with-a-speaker-in-every-pixel-promises-sound-as-precise-as-oleds-contrast> - Please view link - unable to able to access data
2. <https://www.sciencedaily.com/releases/2025/03/250325115834.htm> - Researchers at Pohang University of Science and Technology (POSTECH) have developed a 13-inch OLED panel where each pixel functions as both a light and sound source. This innovation, termed 'Pixel-Based Local Sound OLED technology', aims to deliver multi-channel sound with exceptional precision without the need for traditional speaker drivers. The technology could revolutionise audio-visual devices by integrating sound directly into the display, eliminating the need for external speakers and maintaining the thin profile of OLED panels.
3. <https://techxplore.com/news/2025-03-shifting-oled-panel-dynamic-smartphone.html> - POSTECH researchers have unveiled a flexible OLED panel capable of transforming its shape while simultaneously functioning as a speaker. This advancement is achieved through the integration of a specialised ultra-thin piezoelectric polymer actuator, allowing the display to change into various complex forms, such as concave, convex, S-shaped, and wave-like configurations, all while emitting sound. This innovation maintains the OLED's thinness, flexibility, and lightweight nature, paving the way for next-generation devices with dynamic, audio-responsive displays.
4. <https://www.oled-info.com/researchers-create-flexible-oled-display-can-freely-transform-its-shape-while> - A team from Pohang University of Science and Technology (POSTECH) has developed a flexible OLED display that can freely transform its shape while simultaneously functioning as a speaker. This is achieved by integrating a specialised ultra-thin piezoelectric polymer actuator into the OLED panel, enabling electrically driven shape transformation into various complex forms without the need for mechanical hinges, gears, or external motors. The same actuator also generates vibrations to produce sound, allowing the display surface itself to emit audio.
5. <https://techandsciencepost.com/news/tech/dynamic-smartphone-display-with-integrated-speaker-technology-unveiled/> - POSTECH researchers have introduced a novel OLED panel that combines shape transformation and sound emission in a single ultra-thin, flexible display. By integrating a specialised ultra-thin piezoelectric polymer actuator, the panel can dynamically change into various complex forms, such as concave, convex, S-shaped, and wave-like configurations, while also functioning as a speaker. This innovation eliminates the need for external components, maintaining the OLED's signature thinness, flexibility, and lightweight profile, and opening new possibilities for intelligent, shape-adaptive, and audio-responsive displays.
6. <https://knowridge.com/2025/03/scientists-create-shape-shifting-smartphone-screen-that-also-speaks/> - Scientists at Pohang University of Science and Technology (POSTECH) have developed a flexible OLED panel that can change its shape and function as a speaker simultaneously. This is achieved by integrating a specialised ultra-thin piezoelectric polymer actuator, allowing the display to transform into various complex forms, such as concave, convex, S-shaped, and wave-like configurations, all while emitting sound. The technology maintains the OLED's thinness, flexibility, and lightweight nature, potentially leading to new devices with dynamic, audio-responsive displays.
7. <https://www.electronicsonline.net.au/content/design/news/scientists-unveil-flexible-oled-panel-with-built-in-speaker-241105144> - Researchers from Pohang University of Science and Technology (POSTECH) have developed a smartphone-type OLED panel that can transform its shape while functioning as a speaker, without sacrificing its ultra-thin and flexible properties. This study, led by Professor Su Seok Choi from the Department of Electrical Engineering, was published in the journal npj Flexible Electronics. The OLED panel developed by POSTECH is based on a specialised ultra-thin piezoelectric polymer actuator, enabling electrically driven shape transformation into various complex forms without the need for mechanical hinges, gears, or external motors.