

Technology uses 'single' approach to develop electronics, acoustics

25 March 2021, by Chris Adam



Purdue University innovators developed a new approach to creating popular thin films used for devices. This image shows work on a sample of that innovation while it was heating up. Credit: Purdue University/Robynne Paldi

A Purdue University innovator has developed a new approach to creating popular thin films used for devices across a broad range of fields, including optics, acoustics and electronics.

Epitaxial lithium niobate (LNO) thin [films](#) are an attractive material for electronics and other devices. These films offer flexibility and other properties that are important to manufacturers.

The challenge is that these devices demand high-quality [thin films](#) that can be difficult to grow and produce. Haiyan Wang, a Purdue materials engineer, developed a new approach to creating these films. The work is published in *Advanced Photonics Research*.

"We created an approach that makes these films easier to produce," said Wang, the Basil S. Turner Professor of Engineering in Purdue's College of Engineering. "We developed a versatile nanocomposite-seeded approach that allows us to create single-layer films. Typically, engineers have used a double-layer approach, which adds to the

complicated production process."

"Our approach offers an efficient new option for optics, acoustics and electronics," said Robynne Paldi, a Ph.D. candidate at Purdue who helped lead the research. "Our films are grown through a pulsed laser deposition method and growth conditions are optimized to achieve high-quality films that can be easily integrated into devices."

The innovators worked with the Purdue Research Foundation Office of Technology Commercialization to patent their technology.

More information: Robynne L. Paldi et al, Nanocomposite-Seeded Epitaxial Growth of Single-Domain Lithium Niobate Thin Films for Surface Acoustic Wave Devices, *Advanced Photonics Research* (2021). [DOI: 10.1002/adpr.202000149](#)

Provided by Purdue University

APA citation: Technology uses 'single' approach to develop electronics, acoustics (2021, March 25)
retrieved 7 May 2021 from <https://phys.org/news/2021-03-technology-approach-electronics-acoustics.html>

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