

Seeing Inside Batteries: Separating Structure and Material Changes Using Ultrasound

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Batteries power many parts of our lives—from phones to electric vehicles—but what’s happening inside them is still a mystery in many ways. My research explores a new way to “listen” to batteries using harmless sound waves. Just like a doctor uses ultrasound to see inside the body, we use ultrasound to detect changes inside batteries—such as how their materials shift and how full they are—without opening them up. By studying how sound behaves inside different types of battery structures and materials, we’ve developed a general tool that helps researchers and manufacturers monitor battery health in real time. This method could make battery testing faster, safer, and more accurate, helping future technologies—from electric cars to smart grids—run more reliably and sustainably.