A new hybrid X-ray detector goes toe-to-toe with state-of-the-art rivals

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A new hybrid X-ray detector developed by the University of Surrey outperforms commercial devices—and could lead to more accurate cancer therapy.

In a study published by the *Advanced Functional Materials* journal, researchers from Surrey's Advanced Technology Institute (ATI) demonstrate a new hybrid X-ray detector architecture with slightly higher sensitivity for X-rays than typically used for radiotherapy.

The authors also show that their new architecture brings several new benefits, including industry-standard ultra-low dark currents that are the lowest reported for such detectors. The device also has fast response characteristics that compete with commercial X-ray semiconductor detectors based on silicon and selenium.

Prabodhi Nanayakkara, the lead scientist of the study and Ph.D. student at the University of Surrey, said, "Our hybrid detector has shown promising results—chief of which is its ability to be more accurate than current X-ray detectors. We hope that our technology will lead to improved patient survival rates and ultimately to a healthier society."

Professor Ravi Silva, Director of ATI at the University of Surrey, said, "Technologies with unique capability such as this only appear once in a lifetime—with its plethora of applications that range from low dose mammography to high-speed border security to non-destructive testing over large areas using portable wireless technology.

"We are proud of this cutting-edge breakthrough and look forward to further developing the technology via our university spin-out vehicle, SilverRay Ltd."

More information: M. Prabodhi A. Nanayakkara et al, Ultra?Low Dark Current Organic–Inorganic Hybrid X?Ray Detectors, *Advanced Functional Materials* (2020). DOI: 10.1002/adfm.202008482

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