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## **3D Position-Sensing Semiconductor Gamma-Ray Detectors: Current Research on CsPbBr<sub>3</sub> and Commercialization on CZT Imaging Spectrometers**

*Wednesday 5 March 2025 10:00 (30 minutes)*

This presentation summarizes the development of 3-dimensional position-sensitive (3-D) semiconductor gamma-ray detectors, including the advantages of 3-D single-polarity charge sensing and real-time gamma-ray imaging that have been pioneered by the University of Michigan. High energy resolution of close to 0.30% FWHM at 662 keV have been experimentally achieved on 6 cm<sup>3</sup> CZT detectors, and larger volume CZT detectors up to 4x4x1.5 cm<sup>3</sup> have been demonstrated. The 3-D detector technology has been advanced for CsPbBr<sub>3</sub> perovskite gamma-ray detectors in recent years, and better than 1.0% FWHM energy resolution has been achieved on multiple detectors with thickness in the range of 5 –13 mm. These results have shown promise of CsPbBr<sub>3</sub> for high-resolution gamma-ray spectrometers and imagers.

The commercialization of room-temperature semiconductor gamma-ray detectors by H3D Inc., a spin-off company from University of Michigan, will be introduced. Applications include nuclear safety in nuclear power plants, safeguard for IAEA nuclear inspectors, national security and emergency response, space applications, nuclear medicine imaging, as well as for basic science discoveries.

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**Session Classification:** Session 1: Source Location and Tracking