

## High-resolution CdZnTe detectors for room temperature X-ray and gamma ray detection

*Wednesday, 3 December 2025 11:00 (30 minutes)*

In the last two decades, great efforts have been made in the development of new-generation X-ray and gamma ray detection systems based on room temperature semiconductor detectors (RTSDs), allowing direct radiation detection and superb room temperature performance. Among RTSDs, cadmium zinc telluride (CdZnTe or CZT) represents the leading detector material: the combination of high atomic number ( $Z_{\max} = 52$ ) and wide bandgap (1.6 eV), together with the continuous progress in crystal growth and device technology, gives high detection efficiency within few millimetres and excellent room-temperature energy resolution. In this work, we will present the performance of new CdZnTe-based detection systems, recently developed by our group. Several detector prototypes will be presented, designed for applications in nuclear medicine, food inspections and precision X-ray measurements in accelerator environments.

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**Session Classification:** Exotic atoms: fundamental aspects, applications and advances in radiation detectors