

The main topic of this Symposium talk is new development of selenium based x-ray imaging detectors. Some of these new developments include: 1. Very high-resolution direct-conversion detectors for breast imaging; 2. Large area detector with low-noise CMOS readout; 3. Large-area indirect conversion flat-panel imager with avalanche gain obtained with an optically sensitive selenium layer; 4. Possible approaches for 2D photon-counting detector with selenium. The physics of direct and indirect conversion x-ray imaging detectors will be described, and the limitations of existing detector technologies outlined. The basic principle of operation of the emerging detector technologies will be explained, and the rationales for their improved performance and potential clinical applications will be summarized.

Learning objectives:

1. Understand the basic physics of x-ray imaging detectors using either direct or indirect conversion
2. Understand the factors affecting imaging performance, and the limitations of different detector approaches
3. Learn the advantages of some emerging x-ray imaging detector technologies that can address existing problems