Transmission electron microscopy (TEM) relies on advanced detector technologies to acquire high-quality structural and analytical information. While direct electron detectors and hybrid pixel detectors have attracted significant attention for applications such as cryo-EM, MicroED, and 4D-STEM, indirect detection cameras continue to play an important role because of their versatility, robustness, and broad applicability.

This talk provides an overview of detector technologies used in modern TEM, with particular emphasis on indirect detection systems. The principles and characteristics of lens-coupled and fiber-coupled architectures will be introduced, together with key detector components such as scintillators and fiber-optic plates (FOPs). The development of a fiber-coupled CMOS camera optimized for TEM applications will then be presented, highlighting technical approaches for achieving high sensitivity, low noise, high frame rates, and distortion-free imaging. Representative examples including low-dose imaging and dynamic observation will also be discussed, along with future perspectives for detector development in electron microscopy.