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Sommario/riassunto	This thesis showcases innovative new approaches aimed at advancing the next generation of long wave infrared (LWIR) light detectors and cameras. Detecting LWIR light at room temperature has posed a

persistent challenge due to the low energy of photons. The pursuit of an affordable, high-performance LWIR camera capable of room temperature detection has spanned several decades. The two approaches detailed within are designed to offer high detectivity, swift response times, and room temperature operation. The first involves harnessing the Dirac plasmon and the Seebeck effect in graphene to create a photo-thermoelectric detector. The second entails the use of an oscillating circuit integrated with phase change materials and the modulation of frequency induced by infrared illumination to achieve LWIR detection. Finally, the graphene-based detectors are integrated with readout circuits to enable the development of a dense pixel focal plane which has strong potential for commercialization. The journey from novel material to device to functional camera presented here is essential reading for researchers in the field of photon detection.