

Applications

- Night vision technology
- Car collision avoidance systems
- Astronomy
- Remote monitoring systems for geological research
- Military missile technology and detection
- Home electronics and games

Advantages

- Robust
- Inexpensive
- Mass producible
- 10x higher detectivity

Inventors

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Market Need

Infrared (IR) photodetectors are used in a wide variety of different technologies and modern day electronics. Currently, most IR photodetectors do not function at room temperature and require an additional cooling system. This results in an expensive and bulky detector due to the addition of a peltier or cryogenic cooling device. Some IR detectors have been developed that can function at room temperature, however these tend to be extremely fragile and exhibit poor detectivity. Additionally, these room temperature IR detectors are fabricated using a costly and elaborate process making them very expensive and not as viable for commercial production.

Technology Summary

Researchers at VCU have developed a room temperature IR photodetector that is robust, inexpensive and mass-producible. Initial testing has shown that this novel photodetector exhibits ten times higher detectivity than existing room temperature detectors. This device also has a high signal-to-noise ratio allowing for easier detection of light. Fabrication involves a simple electrochemical self assembly process that can be easily scaled up to allow production at commercial levels. Due to the absence of a cooling system and its resistance to damage, this novel system can be applied to more versatile applications than traditionally possible

Technology Status

Patent pending: U.S. rights are available.

Prototype of the device has been developed and tested. Preliminary testing has shown increased detectivity and a high signal-to-noise ratio. See publication: Bandyopadhyay, S. *et al.*, *Physica E*, **44**(7–8): 1478-1485 (2012)

This technology is available for licensing to industry for further development and commercialization.