

## Room Temperature Nanowire Tunneling Infrared Photodetector

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.

### The technology

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

Prototype of the device has been developed and tested. Preliminary testing has shown increased detectivity and a high signal-to-noise ratio.

### Benefits

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

### Applications

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

#### Patent status:

Patent issued

#### License status:

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

#### Category:

Engineering and physical science

#### VCU Tech #:

11-096

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#### External resources:

[US 8,946,678 B2](#)  
[Bandyopadhyay, S., et al. \(2012\)](#)

#### Contact us about this technology

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