Active Project (2015 - 2017)

# Dualband MW/LW Strained Layer Superlattice Focal Plane Arrays for Satellite-Based Wildfire Detection, Phase II Project

SBIR/STTR Programs | Space Technology Mission Directorate (STMD)

## ABSTRACT

Infrared focal plane arrays (FPAs) based on Type-II strained layer superlattice (SLS) photodiodes have recently experienced significant advances. In Phase I we developed and delivered to NASA a 320x256 DUALBAND FPA integrated in a dewar cooler assembly (IDCA) that produces simultaneous and spatially-registered imagery in two spectral bands, namely, a fire channel in the 3-5 micron window and a thermal channel covering 8-12 microns. Such FPAs are known to be uniquely effective for detecting wildfires either locally from aircraft or globally from satellites in low earth orbit. The performance of SLS detectors now rivals that of mercury cadmium telluride but at a fraction of the cost. Their high quantum efficiency combined with the advantages of two-color imagery and data interpretation will permit the detection of wildfires with much reduced false alarm rates. The same devices will also enhance NASA's capabilities in a host of other satellite and airborne Earth-observing missions devoted to long-term global observations of the land surface, biosphere, atmosphere and oceans. They will also be instrumental in supporting future Space Science missions aimed at studying distant galaxies and discovering potentially habitable planets orbiting other stars. In Phase II we will expand dualband FPA format to 1280x1024 (12 micron pitch) and develop and deliver both a compact IDCA and camera so that NASA can field-test this promising new sensor technology for its wildfire-detection and other remote-sensing missions.

## ANTICIPATED BENEFITS

### To NASA funded missions:

Potential NASA Commercial Applications: 1) Satellite-based wildfire detection 2) NASA's other earth-observing missions in the infrared 3) Space- and ground-based astronomy and astrophysics 4) Chemical/spectral mapping of forests, vegetation and crops 5) Temperature mapping of oceans and


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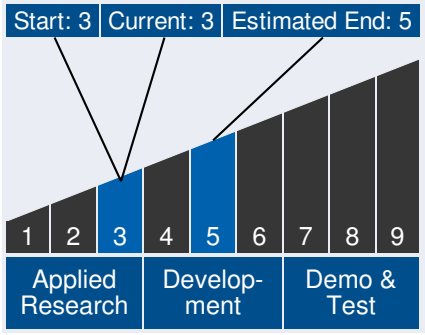
### Technology Maturity




### Management Team

**Program Executives:**

- Joseph Grant
- Laguduva Kubendran

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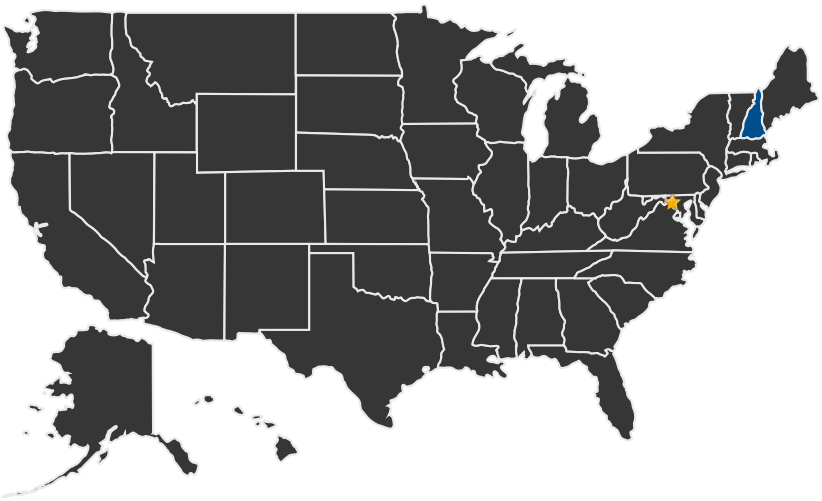
landmasses 6) Atmospheric mapping 7) Pollution monitoring

**To the commercial space industry:**

Potential Non-NASA Commercial Applications: 1) Gas imaging(e.g. for the petrochemical industry) 2) Security and surveillance 3) Thermography 4) Medical imaging 5) Missile defense 6) Space-based situational awareness

## U.S. WORK LOCATIONS AND KEY PARTNERS



U.S. States With Work

**Lead Center:**
Goddard Space Flight Center

**Other Organizations Performing Work:**

- QmagiQ (Nashua, NH)

## PROJECT LIBRARY

### Presentations

- Briefing Chart
  - (http://techport.nasa.gov:80/file/18148)

### Management Team *(cont.)*

**Program Manager:**
- Carlos Torrez

**Principal Investigator:**
- Mani Sundaram

### Technology Areas

**Secondary Technology Area:**
Science Instruments, Observatories, and Sensor Systems (TA 8)
└ Remote Sensing Instruments and Sensors (TA 8.1)
└ Detectors and Focal Planes (TA 8.1.1)

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## DETAILS FOR TECHNOLOGY 1

### Technology Title

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