

# THE NIST RADIOMETER

Ref. 13-008

## THE TECHNOLOGY

**U.S. Patent Number 9,291,499**

This advanced radiometer is composed of a substrate, a radiation absorber placed on the substrate to absorb radiation, a thermal component placed on the substrate to change electrical resistance in response to a change in temperature of the radiometer, and a thermal link to connect the radiometer to a thermal reference. The NIST radiometer is designed to absorb approximately 100% incident optical power using vertically aligned carbon nanotubes – the most ideal absorber – to accurately measure optical power.

## ADVANCED ABSORBENT EFFICIENT

The NIST radiometer, the most advanced technology to date in measuring optical power, can give accurate measurements with the following benefits:

Non-bulky and does not require many individual components to craft

Is optimal for detecting transient optical signatures

Is not limited in reading conical surfaces

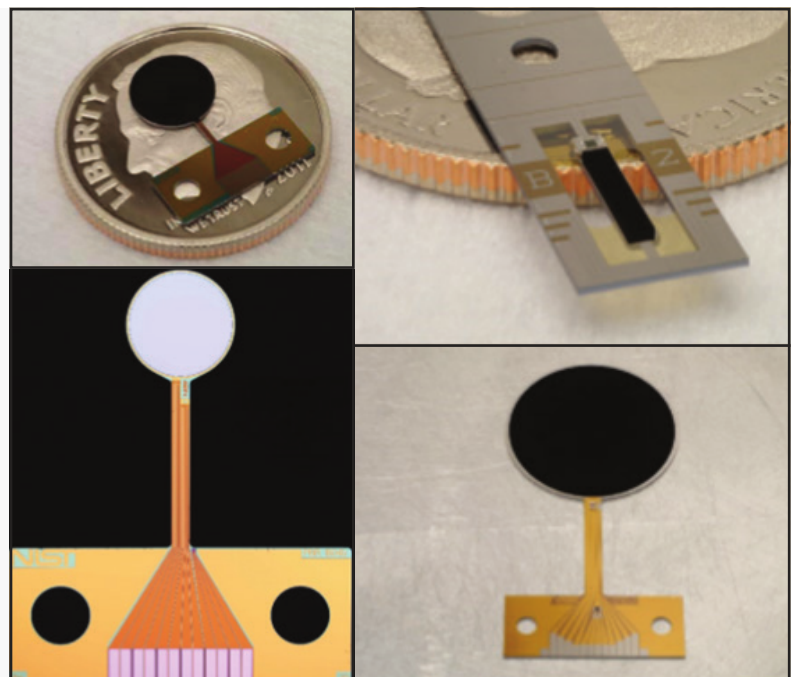
## BENEFITS

Wide variety of usages including optical power meters

Useful in an imaging array, a broadband (multispectral) sensor, or a multi-element trap radiometer

Is a thermal detector for optical radiation, including infrared radiation

Can be electrically connected or optically connected to various devices



*Clockwise from upper left: bolometer for optical fiber power measurement operates at 4K, bolometer for space-based measurement of solar spectral irradiance, operates at room temperature; bolometer for continuous wave, visible/near infrared laser power measurement, operates at room temperature; bolometer for fast far infrared power calibration, operates at 4K*

## CONTACT

**Technology Partnerships Office (TPO)**  
National Institute of Standards and Technology  
Gaithersburg, MD 20899  
[licensing@nist.gov](mailto:licensing@nist.gov)