Karlsruhe Institute of Technology

Seminar

A New Generation of Detectors for Laser Radiometry at NIST

Dr. John H. Lehman

National Institute of Standards and Technology

Boulder, Colorado, USA

Research Fellow of the Alexander von Humboldt-Foundation

Date: Monday, 25.04.2016, Time: 11:00

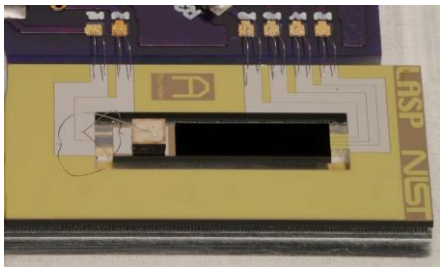
Place: Campus North, ANKA seminar room, building 348, 2nd floor

introduced by the Humboldtian and host Dr. Erik Bründermann (KIT-IPS)

Abstract

Absolute radiometry and the accurate measurement of optical power originated in the late 1800's in Berlin at the original Physikalisch Technische Reichsanstalt (now Bundesanstalt). The principles of such measurements have changed very little for more than one hundred years. The technology for instrumentation has advanced, however, to establish lower uncertainties that are important scientific endeavors such as the study of climate change. I will present an overview of efforts to develop a new generation of standards for laser power and energy measurements at NIST; ranging from single photons to tens of kilowatts (the photonic mole), and from the visible to far infrared wavelengths. In addition to wafer-scale "NIST on a Chip" radiometers employing carbon nanotube arrays, I will present a new paradigm of using radiation pressure (photon momentum) for high-power measurements.

Dr. John Lehman is leader of the Sources and Detectors Group in the Applied Physics Division at NIST in Boulder, Colorado. Presently, Dr. Lehman is undertaking a Special Fellowship of the Alexander von Humboldt Foundation at the Physikalisch Technische Bundesanstalt (PTB) in Berlin. The emphasis of the work is to demonstrate an absolute radiometer based on the multifunctional properties of carbon nanotubes. The radiometer is intended to provide measurements for far infrared (free-field THz) radiation.



Cubesat-based nanotube radiometer for spectral irradiance

(NIST and the Laboratory for Atmospheric and Space Physics)

Some of Dr. Lehman's Awards

Rocky Mountain Eagle Award - Scientific Achievement

Jacob Rabinow Applied Research Award

(The embedded links lead to publications on applications of the "blackest black" made from carbon nanotubes)

See next page on how to get to the ANKA seminar room at KIT Campus North.

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How to get to the ANKA seminar room at KIT Campus North (CN)?

If you do not have regular access to CN you are required to register with your ID/passport at the Entrance/Anmeldung for a Day-Pass.

Visitors arriving with the KIT-Shuttle bus exit at the bus stop adjacent to the entrance. For persons with access to CN use the KIT-Shuttle to the last stop on CN at Bldg. 605, this is nearby the ANKA hall.

The speaker and host will visit the regular CN Casino and cafeteria for lunch and discussions after the seminar. Interested persons of the audience are welcome to join.

ANKA hall
Building 348
Seminarraum
Eingang Nordwest
Upper Level
Stairs/Elevator
then left & straight ahead