

UNIVERSITY OF MACAU
FACULTY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF ELECTRICAL AND COMPUTER
ENGINEERING

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**“A Green Campus and Renewable Energy
Research”**

by

Prof. Paul K. L. YU

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Distinguished Professor

Department of Electrical and Computer Engineering

University of California, San Diego

Date : 30/10/2013 (WEDNESDAY)

Time : 11:00

Venue : HG01

Abstract

In the first part of the presentation we give an overview of the various campus wide “Green” projects at the University of California, San Diego. These projects aim at higher energy saving and efficiency. These involve PV panel installation, green building design, solar forecasting, and biofuel investigation using algae. Next, in the second part, we discuss the concept and demonstration of novel photovoltaic and photo-electrochemical cells research based on various semiconductor nanostructures, specifically compound semiconductor quantum wells and nanowires, and the use of plasmonic and related scattering effects from metal or dielectric nanoparticles to increase efficiency of optical absorption. In particular, vertical nanowire arrays were engineered to optimize optical confinement within the nanowires, and core-shell heterostructures were employed to achieve broad-spectrum absorption while maintaining high open-circuit voltages. Branched nanowire photo-electrochemical cells were also made and characterized for their spectral incident photon-to-current conversion efficiency. These works were sponsored by U.S. Department of Energy and National Science Foundation.

Biography

Prof. Paul K.L. Yu joined the UC San Diego in 1983 and is the inaugural William S.C. Chang Endowed Chair and Distinguished Professor in the Electrical and Computer Engineering Department, and the Associate Vice Chancellor for Research Initiatives at UC San Diego. Prof. Yu conducts research on semiconductor materials and devices for various photonics and microwave photonics applications. His current research projects include high-speed and high-power optical detectors and modulator devices for analog fiber-links, and high-power semiconductor optical switches for microwave generation. He serves as the President of IEEE Electron Devices Society in 2012-2013. He is Fellow of IEEE, AAAS, OSA and SPIE. He has published more than 150 papers in the area of photonics. He received a Ph.D. in Applied Physics from Caltech in 1983.

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