学 术 报 告

题　目：Plasmon-Enhanced Solar Energy Conversion in Semiconductor-Metal Heterojunctions

报告人：Prof. Nianqiang Wu
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内容简介：

Solar energy can be converted either to electric energy via photovoltaics or to chemical energy via photocatalysts. Emerging of surface plasmon resonance (SPR) provides a new opportunity to improve the performance of photocatalysts and photoelectrochemical cells. This talk will present our effort on fundamental understanding of the underlying mechanism of plasmon-enhanced solar energy harvesting. In particular, the speech will discuss our newly discovered plasmon-induced resonant energy transfer (PIRET) mechanism in the metal-semiconductor heterojunctions. The PIRET mechanism along with the hot electron transfer process suggests that plasmonic nanostructures can act as photo-sensitizers. The discovery of plasmonic photo-sensitizers has opened a new avenue to develop efficient photocatalysts and solar cells. The theoretical maximum efficiency of solar energy conversion in plasmonic metal-semiconductor heterojunctions is predicted. This talk will demonstrate our effort on development of effective plasmonic metal-semiconductor heterojunctions to enable strong coupling between the plasmonic metal and the semiconductor. Our results show that the performance of solar water splitting by a hematite nanorod array can be greatly improved by plasmon-induced photonic and energy transfer enhancement.

报告人简介：

Dr. Nianqiang (Nick) Wu is currently Professor of Materials Science in Department of Mechanical & Aerospace Engineering at West Virginia University (WVU), USA. He received his Ph.D. degree from Zhejiang University in 1997. He was a Postdoctoral Research Fellow at University of Pittsburgh from 1999 to 2001. Afterwards he directed Keck Surface Science Center at Northwestern University in USA in 2001-2005. He then joined WVU in 2005. He currently serves on the advisory board of "Interface", the home journal of the Electrochemical Society (ECS). He also serves as Vice Chair of Sensor Division in ECS. He has received the Benedum Distinguished Scholar Award, and the Alice Hamilton Award for Excellence in Occupational Safety & Health: Biological Category. He has won the WVU Statler College Outstanding Researcher Award twice.

Dr. Wu's current research interest lies in chemical sensors and biosensors for health care and environment monitoring, photocatalysts and photoelectrochemical cells for solar energy harvesting. He has published 1 book entitled "Biosensors Based on Nanomaterials and Nanodevices", 3 book chapters, 145 peer-reviewed papers in journals such as *Nature Photon.*, *Nature Comm.*, *JACS*, *Anal. Chem.* and etc.. 20 of his papers are ranked among the top 1% most cited in their subject fields (Thomson Reuters 2015). His papers were cited about 2200 times in a single year 2015 with a total citation count of >10000 times.