



复旦大学物理系 Colloquium

Time: 14:00, Tuesday, 2024.4.2

Location: C108, Jiangwan Physics Building

Band Structure Engineering and Doping Control in Transparent Conducting Materials

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Abstract: Transparent conducting materials (TCMs) are widely used in optoelectronic devices, including solar cells, touch screens and smart windows. TCMs combine two seemingly contradicting properties, i.e., high electrical conductivity and high visible light optical transmission and the origin of their unusual physical properties remains inadequately understood. In this presentation, I will provide a brief overview of our current understanding on the TCMs and discuss our recent advancements in band structure engineering and doping control within TCMs. Specifically, I will discuss (i) the fundamental band structures and defect properties of conventional TCMs; (ii) strategies aimed at concurrently enhancing optical transparency and conductivity in n-type TCMs; and (iii) explorations and challenges associated with achieving p-type TCMs or even bipolarly dopable TCMs.



Biography: Su-Huai Wei received his B.S. in Physics from Fudan University in China in 1981 and Ph.D. from the College of William and Mary in USA in 1985. He joined the Solar Energy Research Institute (it is now National Renewable Energy Laboratory or NREL) in 1985 as a postdoctoral researcher and later became Staff Scientist, Senior Scientist, Principal Scientist, Manager of the Theoretical Materials Science Group, and was an Institute Research Fellow at NREL before he joins CSRC in 2015. He is a Fellow of both the American Physical Society and The Materials Research Society. He has published more than 560 peer-reviewed papers in scientific journals by the end of July 2023, including more than 70 papers in the prestigious Physical Review Letters with more than 73000 citations (H index > 133 per Google Scholar).