Speaker Information

Name	Chieh-Ting Lin	
Current position	Associate Professor National Chung Hsing University	
Education & Training	Imperial College London London, Unite Kingdom, Phd.,Materials, Nov. 2016-Apr. 2020	
Research Area	Perovskite Solar Cells, Thin Film Processes	
Professional Experience	Gwangju institute of science and technology, Research Associate, Nov. 2020-July-2021 Imperial College London London, Unite Kingdom, Research assistant/Research Associate, Feb. 2020-Aug. 2020	
Professional background	Dr. Chieh-Ting Lin completed his PhD at Imperial College London in 2020, under the guidance of Professors Martyn Mclachlan and James Durrant. Following his doctorate, he pursued postdoctoral research at both Imperial College London and the Gwangju Institute of Science and Technology (GIST). In 2021, Dr. Lin joined the faculty at National Chung Hsing University in Taiwan. His research team is dedicated to advancing high-efficiency hybrid tin-lead perovskite solar cells. Additionally, Dr. Lin has a keen interest in exploring the use of thin-film solar cells within the realm of agricultural photovoltaics.	
Selected publications	1. Enhancing the Efficiency and Stability of Tin-Lead Perovskite Solar Cells via Sodium Hydroxide Dedoping of PEDOT:PSS. *Small Methods* 2024, 2400302. 2. Highly reproducible self-assembled monolayer based perovskite solar cells via amphiphilic polyelectrolyte. *Journal of Materials Chemistry A* 2024, 12, 2856-2866 3. Reducing optical reflection loss through textured PEDOT:PSS in hybrid Sn–Pb perovskite solar cells. *Sustainable Energy Fuels*, 2024, 8, 1712-1718	

Speech title	Strategies to Suppress Interfacial and Bulk Recombination in Hybrid Sn–Pb Perovskite Solar Cells
Abstract	Hybrid tin–lead (Sn–Pb) perovskite solar cells are promising candidates for low-cost, high-efficiency photovoltaic applications, particularly as bottom cells in all-perovskite tandem architectures. However, their performance is often limited by interfacial and bulk recombination losses. In this work, we present a comprehensive strategy to suppress both types of recombination through rational hole transport layer (HTL) design, interface engineering, and controlled crystallization. We demonstrate that dedoping PEDOT:PSS with sodium hydroxide effectively reduces its acidity, enhances its conductivity, and improves energy level alignment, thereby minimizing interfacial recombination and enhancing device stability. Additionally, surface texturing of PEDOT:PSS using polymer nanospheres significantly reduces reflection losses and increases light harvesting. By further incorporating donor–acceptor copolymer-based HTLs, such as cPTANMe, we achieve reduced parasitic absorption and improved carrier extraction. Complementary bulk passivation is realized via chaotropic agent-assisted crystallization, enabling enhanced grain size and reduced trap densities. These combined strategies yield Sn–Pb perovskite solar cells with power conversion efficiencies up to 22.6% and improved operational stability, offering a viable route toward scalable and efficient tandem PV technologies.