

ICB PhD public presentations**EXPLORING MOLECULAR DESIGN STRATEGIES FOR HIGHLY EMISSIVE AU(III) COMPLEXES IN HIGH-EFFICIENCY ORGANIC LIGHT EMITTING DIODES****Hsin-Hung Kuo**

ICB/The Shih Lab

Supervisor: Prof. Dr. Chih-Jen Shih

Co-examiners: Prof. Máté Bezdek (ETH Zurich) and Prof. Bob Schroeder (University College London)

**19/03/2024, 10:45 am****ETH Hönggerberg, HCI H 8.1 and on Zoom****(<https://ethz.zoom.us/j/67097568305>)**

Project Summary: Organic light-emitting diodes (OLEDs) have transformed humankind's experience with high-end electronics, offering several advantages over conventional LEDs and LCD, such as power-efficiency, vivid color, high contrast, and flexibility. However, the mainstream utilized OLED emitters are Ir(III) and Pt(II) phosphors, the scarcity of which severely concerns long-term sustainability. To this end, Au(III) complex, as a noble metal, have emerged as a promising emitter to address such shortcoming. In my PhD research, I explore molecular design strategies for highly emissive Au(III) emitters, integrating chemistry, photophysics, advanced spectroscopy, computational calculation and OLED engineering. In my talk, I will reveal that (1) how to design and synthesize Au(III) emitters with enhanced Φ_{PL} , radiative rate and molecular alignment, (2) their thermally enhanced luminescence mechanism and (3) their structure-property relationship and impact on OLED performance. Excitingly, as-fabricated OLEDs made with our 3 series of Au(III) emitters achieved record-high η_{ext} of up to 27%. We reckon that our findings will accelerate the development of high-efficiency sustainable OLEDs.

CV. Hsin-Hung obtained his BS and MS at NCU and NTHU, respectively, in Taiwan. In Oct 2019, he joined Shih's lab at ETHZ and will soon become a SNSF postdoc fellow in Oxford.