**High efficient halide pervoskite materials for lighting and display application**

*Nankai University, China*

**Xiyan Li**

**Email: xiyan.li@nankai.edu.cn**

Lead-free perovskite materials, such as Cs2NaInCl6:Ag,Bi, have attracted significant attention due to their ultra-broad warmwhite emission originating from self-trapped excitons (STEs). The soft lattice and internal effective exciton-phonon coupling effects of these materials may provide a promising avenue for realizing warm-white afterglow by additionally introducing effective traps. Unfortunately, the precise working mechanism of STEs for white light conversion remains unclear. And the transient production (fs- or ps-scale) and quick recombination (ns- or μs-scale) of STEs under excitation sources present challenges in exploring the behavior of intrinsic transient defect bands. Furthermore, extending STE photoluminescence to afterglow introduces further complexities. We synthesized a series of non-toxic Cs2NaInCl6:Ag,Bi afterglow phosphors under room temperature (RT) based on our previously reported hydrochloric (HCl) acid-assistant powder-to-powder (HAAPP) strategy. For the first time, we observed warm-white afterglow emissions that in line with the PL spectra, which could last over 20000 s at RT after the cessation of excitation sources. The dynamic working mechanism for the STE afterglow based on lead-free perovskites Cs2NaInCl6:Ag,Bi was concluded, in which the long-lived self-trapped states were first detected in the steady-state absorption spectra after excitation.

 **Short Bio:**

**Xiyan Li** received her PhD degree from Changchun Institute of Applied Chemistry, Chinese Academy of Sciences in 2013. She then worked as a post-doctoral fellow at National University of Singapore and University of Toronto from 2013-2019. She is now a professor at the College of Electronic Information and Optical Engineering, Nankai University, China. Her current research focuses on the controlled synthesis, novel properties and optoelectronic applications of semiconductor nanostructures, especially metal halide pervoskite materials based optoelectronic devices.