Metal Halide Perovskite Nanoparticle based Color Conversion Film Technology

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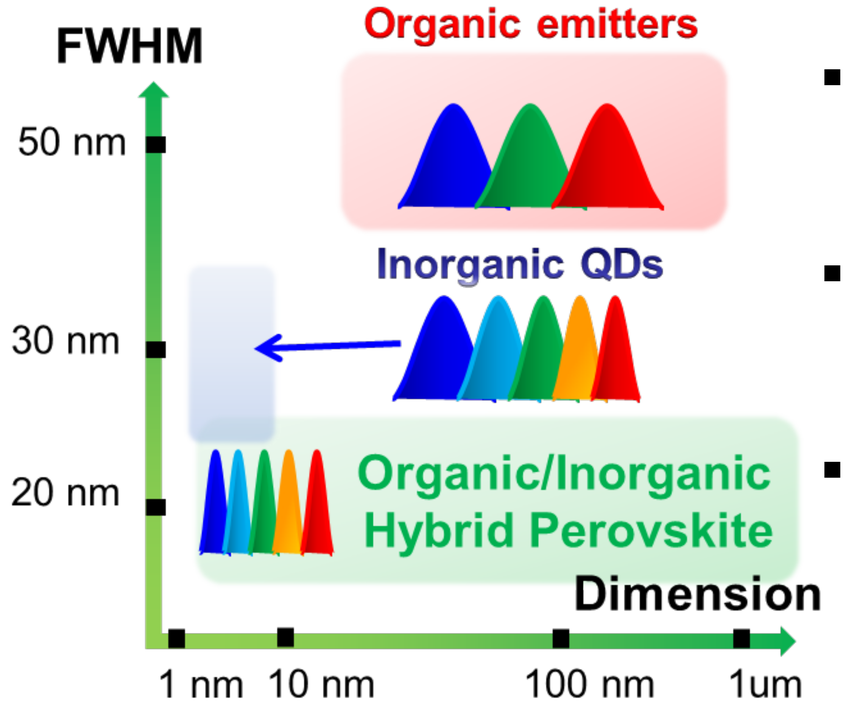
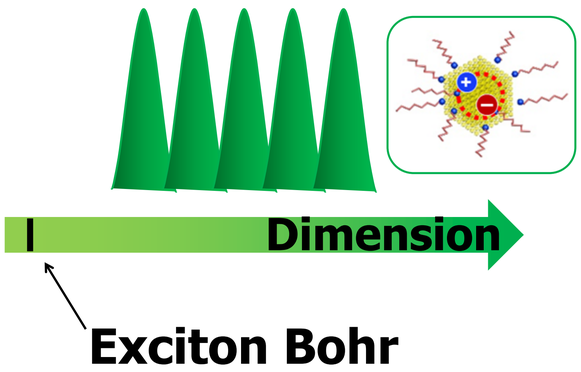
Research Background



- **Organic emitters have low color purity, complex synthesis route and low charge carrier mobility.**
- **Inorganic quantum dot (QD) emitters have size-dependent color-purity and high material costs.**
- **Metal halide perovskite emitters which have size-independently high color-purity and low material cost should be developed.**

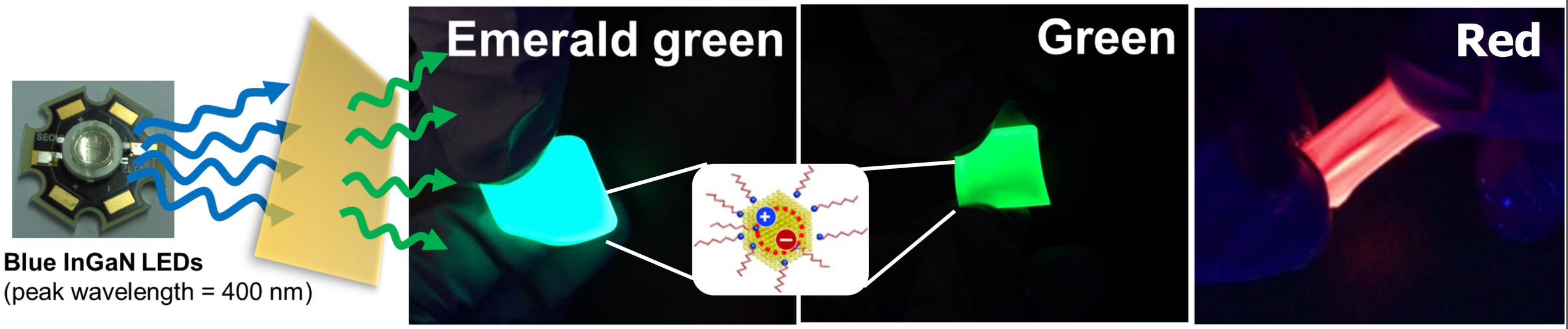
Technology

Perovskite Nanoparticles ($\geq D_B$)



- **Perovskite nanoparticle (NPs) with a dimension > D_B (regime beyond quantum size) have size-insensitively high color-purity (full width at half maximum (FWHM) ~ 20 nm) and wavelength of emitted light, thus, we do not need to consider size distribution.**
- **Perovskite NPs manage the recombination of excitons occurred at surface traps and inside the NPs, thus show high PLQE > 70%.**

Perovskite NP Color-Conversion Film



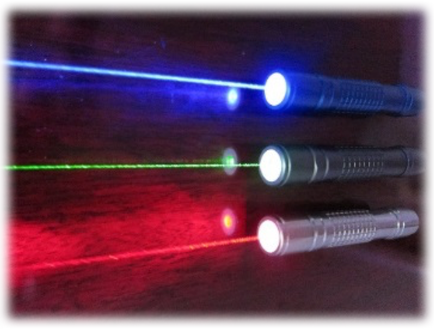
- **Perovskite NP based color conversion film can down-convert the blue light to green, red, white light with high color purity.**

Patents

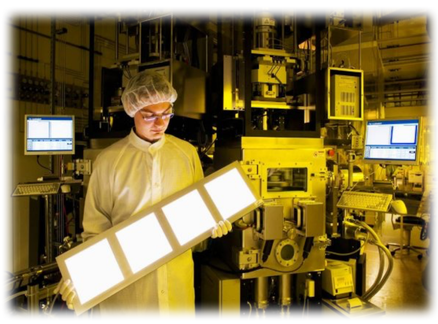
- **Wavelength conversion substance, manufacturing method of the same and light-emitting device comprising the same (10-2014-0153967, PCT/KR2015/011957)**

Applications

Display



Laser



Lighting