OSK OPTICAL SOCIETY OF KOREA 사단법인 한국광학회 Optical Society of Korea

광과학 분과 Online Lecture Series

Multi-functional passive radiative coolers

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https://korea-ac-kr.zoom.us/j/86912914701?pwd=SnYrUWhtMy9remk0b1Q4MXV3QmszUT09

Over the past few years, the great efforts on passive radiative cooling have been conducted to design and implement the efficient cooling devices as a promising solution of global energy depletion crisis. Based on this continuing efforts on the progress of radiative cooling, various photonic layouts have been proposed such as dielectric/metal multi-layer, paintable polymer composites, and double structure cooling systems. These advanced photonic designs allow highly efficient daytime cooling in direct sunlight. While the majority of focus in the radiative cooling community revolves around various architectures for achieving high cooling performance, affordability, and large-scalability, 'functional' radiative coolers can fill a vital niche with respect to expanding the applicable range of radiative cooling technologies. In this respect, this talk is centered in developing new classes of radiative coolers. This talk includes the detailed working principles, designs, fabrications, and demonstrations for three radiative coolers such as colored daytime radiative cooler[1], bi-directional emitter for enclosed space[2], and non-metallic/flexible cooler for wearable optoelectronics[3].

Reference

[1] Colored, Daytime Radiative Coolers with Thin-Film Resonators for Aesthetic Purposes, *Adv. Opt. Mater.*, **6**, 22 (2018)

[2] A *Janus* emitter for passive heat release from enclosures, *Sci. Adv.*, **6**, 36, eabb1906 (2020)

[3] Outdoor-Useable, Wireless/Battery-Free Patch-Type Tissue Oximeter with Radiative Cooling, *Adv. Sci.*, **8**, 10, 2004885 (2021)

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