



Department of
Mechanical Engineering
The University of Hong Kong



SEMINAR

Colored radiative cooling enhanced by light-extracting structures

Date: 19 April, 2023 (Wednesday)

Time: 11:00 a.m.

Venue: Room 7-34, Haking Wong Building, HKU

Speaker: Mr. She Chenglong (PhD candidate)
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Abstract:

Passive radiative cooling materials can cool objects without any electrical power input under the incidence of solar irradiation by minimizing absorption of incoming solar irradiation and maximizing emission through the atmospheric window (8-13 μ m). It has attracted attention in the field of energy-saving applications. However, owing to the high reflectivity in the solar radiation band, the sub-ambient radiative coolers are typically white or silver, leading to limitations in aesthetics and applications. In this seminar, to realize colored radiative cooling, several phosphor dyes with high internal quantum efficiency are induced inside the radiative cooling materials, contributing to the regulation of the absorption spectrum at visible wavelengths and allowing the fabrication of various colored radiative coolers. Despite the high internal quantum efficiency, the external quantum efficiency is still low because a large amount of photons are still trapped inside the material due to the total internal reflection (TIR), and these trapped photons will be ultimately converted into heat, influencing the performance of radiative cooling. Therefore, efficient light extraction methods are important to address this issue. Some microstructures will be discussed for light extraction, which are examined by the Monte Carlo simulation, a ray-tracing method.

ALL INTERESTED ARE WELCOME

For further information, please contact Prof. X.B. Yin at 3910 2659.