

**DEPARTMENT OF MECHANICAL ENGINEERING****SEMINAR****Online**

Title: Action on hot and humid cities: understand and mitigate the synergistic effect of Urban Heat Island and Urban Moisture Island

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Date: 26 April, 2021 (Monday)

Time: 2:00 p.m.

Zoom Link: 1) Link to join the meeting:

<https://hku.zoom.us/j/91574728448?pwd=aG1IdCttN3dVbUg0emNPY3VXY1hPZz09>

2) Meeting ID: 915 7472 8448

3) Password: 138035

Abstract:

In the context of rapid urbanization, Urban Heat Island (UHI) phenomenon has been extensively studied, while the higher urban air humidity, known as Urban Humidity Island (UMI) phenomenon, still lacks in-depth exploration. The synergistic effect of UHI and UMI exacerbates the heat stress in Hong Kong during hot summers due to its unique high-rise compact urban morphology. To unravel the underlying mechanisms and investigate the optimal mitigation strategies, we developed a new advanced urban canopy model that more realistically

represents the anthropogenic heat emissions from buildings and tree effects. With this advanced model, we quantified the effects of urban geometry, air conditioning systems, and urban vegetation on outdoor air temperature and humidity during a heat wave period. The all-day UMI phenomenon in street canyons with high aspect ratios was found to be associated with higher anthropogenic latent heat emissions, tree evapotranspiration and urban roughness alteration effects, and weakened urban ventilation. Combined with optimal indoor environment control and optimal tree selection, our comprehensive mitigation strategy will effectively alleviate the synergistic effect with a 10%-35% reduction in thermal dangerous hour percentages, which would hopefully shed light on more informed urban planning.

ALL INTERESTED ARE WELCOME

For further information, please contact Dr. J. Song at 3917 2622.

Research area: Natural & Built Environment