THE UNIVERSITY OF HONG KONG

DEPARTMENT OF MECHANICAL ENGINEERING

SEMINAR

Online

Title: **Prediction of fine-resolution urban heat stress maps over Hong Kong by integrating WUDAPT data into a mesoscale WRF model**

Speaker: **Mr. Ruiqing Du (PhD candidate)**
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Date: **26 April, 2021 (Monday)**

Time: **3:00 p.m.**

Zoom Link: **1) Link to join the meeting:**

https://hku.zoom.us/j/99815918647?pwd=em1mbm5SL3lia01lY2kyWnMwQk1EZz09

2) Meeting ID: 998 1591 8647

3) Password: 767108

Abstract:
Our world is experiencing urbanization at an unprecedented speed. Rapid urbanization has resulted in serious environmental and social problems. One of these challenges for subtropical and tropical cities is the severe heat stress resulting from both high temperature and high humidity. In the past few decades, numerous studies have focused on high-temperature phenomena such as the urban heat island (UHI) effect. In addition to the UHI effect, the higher-humidity phenomena known as the urban moisture island (UMI) effect was also observed in serious cities.

The combination of UHI and UMI may cause tremendous impacts on public health, energy consumption, and air quality. To improve our understanding of UMI as well as the synergistic effects of UHI and UMI, the Weather Research and Forecasting (WRF) simulation was conducted over Hong Kong during a heat wave event (23-28 June 2016).

In this seminar, spatial and temporal variations in urban temperature, moisture, and heat stress index over Hong Kong will be introduced. The numerical results show that the UHI effect may appear all day in compact areas. Meanwhile, the UMI may peak at night in the compact high-rise and mid-rise areas as well as open mid-rise areas. Further study indicates that the physiological subjective temperature (PST) and ventilation rate show a negative correlation. Moreover, it is found that the different surface heat and moisture budgets between weather stations and their surrounding neighborhood regions may result in the underestimate of PST. Therefore, a neighborhood-scale PST map will be provided for the heat-related weather warning systems.

ALL INTERESTED ARE WELCOME
For further information, please contact Dr. J. Song at 3917 2622.

Research area: Natural & Built Environment