



Department of
Mechanical Engineering
The University of Hong Kong



SEMINAR

The Stability of Visible Light-induced Actuating Nanomaterials and Fabrication of the Actuating System

- Date:** 27 April, 2023 (Thursday)
Time: 10:30 a.m.
Venue: Room 7-34, Haking Wong Building, HKU
- Speaker:** Miss He Nan (PhD candidate)
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Abstract:

Material-based actuation system has been an emerging field of interest because of its direct and simple mechanism without using complicated hydraulic, electric or magnetic system. Those materials based actuators utilize the external stimuli such as light, temperature or humidity, to drive the system conduct mechanical movement, energy harvesting and so on. In the previous research studies, the transition metal nickel hydroxide/oxyhydroxide are introduced and studied for light actuator based on its simple and effective optical mechanism and possible use in artificial skin due to its soft polymer properties. In the current research, actuators based on nickel hydroxide or oxyhydroxide have been proved can actuate with very small intrinsic strain for about 0.5-1% within seconds, and the multilayer thin film structure shows a curl-up movement brought by the desorption of intercalated water and volume shrinkage with the presence of visible light. However, the real life-applications still has limitations and needs improvements in its actuation performance and the light-driven actuation is also affected by their turbostratic structure crystallization happening over time as well. Therefore, this project aims to introduce a nickel hydroxide with polymer composite actuator that potentially shows a similar actuation magnitude as metal/Ni(OH)₂ bilayer composite but with more flexible manufacturing methods, higher structure stability and improved actuation performance.

ALL INTERESTED ARE WELCOME

For further information, please contact Prof. AHW Ngan at 3917 7900.