

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

**Title:** Phototactic behaviors and the navigation mechanisms of biological microswimmers

**Speaker:** Mr. Wang Zhao (PhD candidate)  
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**Date:** 6 May, 2022 (Friday)

**Time:** 10:30 a.m. (Hong Kong Time)

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

<https://hku.zoom.us/j/91752456227?pwd=eFNXa0lIZmV1cXlYS1g4WkN0ajlLUT09>

2) Meeting ID: 917 5245 6227

3) Password: 137715

**Abstract:**

Biological microswimmers have developed versatile strategies to sense and move in response to environmental stimuli. Phototactic microswimmers such as *Chlamydomonas reinhardtii* optimize their light conditions to perform photosynthesis and to avoid photodamage due to direct exposure to strong light. *Chlamydomonas* cells swim in helical trajectories to navigate the surrounding light field. They exhibit positive or negative phototaxis in response to the light stimuli. The cells swim towards weak light in positive phototaxis, whereas the cells swim away from strong light in negative phototaxis. In this seminar, we first introduce the cellular architecture and phototactic behaviors of *Chlamydomonas* cells under different light stimuli. We then discuss a mathematical model that captures the biophysical mechanisms underlying the phototactic behaviors of *Chlamydomonas*. We will demonstrate how the cells achieve complex navigation tasks in response to the received light signals. These results provide design principles for navigation mechanisms in natural and artificial microswimmers.

**ALL INTERESTED ARE WELCOME**

For further information, please contact Dr. A.C.H. Tsang at 3917 1505.

**Research area: Biomedical Engineering**