



# Department of Mechanical Engineering The University of Hong Kong



## SEMINAR

**Title:** 3D Nanoprinting and Self-Assembly of Architected Materials

**Speaker:** Prof. Wendy Gu  
Associate Professor  
Department of Mechanical Engineering  
Stanford University

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

**Date:** October 8, 2025 (Wed.)

**Time:** 10:00am

### Abstract:

3D nanoprinting is a frontier for many fields, from micro-robotics to energy devices to medicine. Yet, current methods are generally limited to homogeneous polymers, metals or ceramics that lack the complexity of structural engineering materials. In addition, most efforts have focused on the fabrication of static structures, despite significant interest in active, programmable matter such as colloidal crystals that can transform into additional structures. First, I will present a novel two-photon lithography resin that is used to print nanocomposites, nanoporous carbon and nanostructured silk. The key ingredients in the resin are metallic nanoclusters that serve as both photoinitiators and inorganic precursors. Nanocomposite honeycomb, octet and shell-based lattices are fabricated that have a combination of high strength per weight, energy absorption and recoverability beyond other nano and micro-lattices due to a unique strain hardening behavior. In the second part of my talk, I will discuss the two-photon lithography of polyhedral colloidal microparticles that self-assemble into a 2D hcp crystal, and then undergoes a phase transition into a quasi-diamond structure under a gravitational potential. Direct optical imaging of this phase transition reveals the single particle dynamics, including the role of particle rotation and crystalline defects, which is also explored using Monte Carlo simulations. Lastly, I will present the mechanical properties of DNA-silica octahedral nano-lattices made using DNA origami.

### Biography:

Wendy Gu is an Associate Professor of Mechanical Engineering at Stanford University. Wendy received her MS/PhD from Caltech in 2014, and was a postdoc at UC Berkeley from 2015-2017. Wendy is the recipient of the DOE Early Career Award, the ARO Young Investigator Award, the ACS Petroleum Research Fund Doctoral New Investigator Award, and the Hellman **Scholar Award**. Wendy Gu is the current faculty-in-residence in the Stanford-CUHK Bing Overseas Study Program.

**ALL INTERESTED ARE WELCOME**  
**For further information, please contact Prof. Yang Lu**