Department of
Mechanical Engineering
The University of Hong Kong

DEPARTMENT OF
MECHANICAL ENGINEERING
THE UNIVERSITY OF HONG KONG

SEMINAR

Title: Soft Electronics and Soft Robotics Based on Metal Nanowires

Speaker: **Professor Yong Zhu**
Department of Mechanical and Aerospace Engineering
North Carolina State University, Raleigh
USA

Date: **20 March 2023 (Monday)**

Time: **10:30am**

Venue: **Room 7-35 Haking Wong Building, HKU**

Abstract:
Soft electronics takes a leap beyond Si-based rigid electronics, so does soft robotics beyond robotics consisting of rigid links. Both are made of ultrathin, compliant, and stretchable materials, with broad applications from personal health monitoring to prosthetics to human-machine interfaces. Metal nanowires, in particular silver nanowire (AgNWs), have emerged as a promising soft electronic material. In this talk, I will discuss the recent advances in AgNW-based soft electronics and soft robotics. I will start with highly conductive and stretchable electrodes made of nanocomposites containing AgNW percolation network, followed with a variety of wearable sensors for monitoring of human physiology and motions (e.g., strain, pressure, temperature, hydration, ECG, and EMG) and their application in personal healthcare and sports. Next, I will discuss the AgNW-based soft heater and bimorph actuator and their application in soft robotics. I will highlight programmable thermal actuation and mechanical instability that can realize bidirectional locomotion and significantly increase the speed of the thermally actuated soft robots. I will conclude my talk with our recent efforts in scalable and sustainable nanomanufacturing of such electronics and robotics.

Biography:
Yong Zhu is the Andrew Adams Distinguished Professor in the Department of Mechanical and Aerospace Engineering at North Carolina State University. He received his PhD degree from Northwestern University and conducted his postdoctoral training at the University of Texas at Austin. His group conducts research at the intersection of mechanics of materials and micro/nano-engineering, including nanomaterial-enabled flexible and stretchable electronics. His work has been recognized with a number of awards including James R. Rice Medal from the Society of Engineering Science (SES), Bessel Research Award from the Alexander von Humboldt Foundation, ASME Gustus L. Larson Memorial Award and Sia Nemat-Nasser Early Career Award, and Best Wearable Material/Component Development Award at IDTechEx Wearable USA. He has served as the Chair of the ASME Materials Division. He is currently serving on the Board of Directors for SES and as an Associate Editor for Journal of Applied Mechanics.

ALL INTERESTED ARE WELCOME

For further information, please contact Prof. Yang Lu at 3910 2155.