



**Seminar Topic:
Advanced Multi-material Optoelectronic and
Electronic Fiber Devices and Textiles**

Nanyang Assistant Professor Wei Yan

Abstract

Fibers, ancient yet largely underdeveloped forms, are the common building blocks of a broad spectrum of product forms from textiles to air craft constructs. While ubiquitous, these fibers are produced at scale from essentially single materials. The integration of a variety of electronic and optoelectronic materials within thermally-drawn fibers has emerged as an unprecedentedly compelling platform for enabling fibers to evolve into functional devices and smart systems. This approach exploits the thermal drawing of a macroscopic preform, where functional materials or prefabricated devices are arranged at a prescribed position, yielding kilometers of functional fibers with a sophisticated architecture and complex functionalities in a very simple and scalable manner. A single strand of fiber that incorporates materials with disparate electronic, optoelectronics, thermomechanical, rheological and acoustic properties can see objects, hear sound, sense stimuli, communicate, store and convert energy, modulate temperature, monitor health and dissect brains. Integrating these fibers into fabrics, ancient yet largely underdeveloped forms, is setting a stage for fabrics to be the next frontier in computation and Artificial Intelligence. In this talk, I will present the recent progress of smart optoelectronic and electronic fiber devices, and elaborate their unique applications in the fields of sensing, healthcare, robotics, textiles and neuron science as well as their fundamental research in materials science and physics.

Biography

Dr Wei Yan is a joint Nanyang Assistant Professor at the School of Electrical and Electronic Engineering (EEE) and the School of Materials Science and Engineering (MSE) at the Nanyang Technological University (NTU), Singapore. Prior to his appointment at NTU, he was a postdoctoral associate at the Research Laboratory of Electronics at the Massachusetts Institute of Technology (MIT), USA from September 2018 to December 2021, and a Scientist at the École Polytechnique Fédérale de Lausanne (EPFL), Switzerland from November 2017 to August 2018. He holds a PhD in Materials Science and Engineering from EPFL (2017). He has published many articles in high-profile international journals, such as Nature (1), Nature Nanotechnology (2), Advanced Materials (4), Nature Communications (2), National Science Review (1). He is a co-inventor of 4 US patents. His research work has been highlighted by many prestigious media and journals, such as Nature, Science, Nature Nanotechnology, National Science Review, MIT, EPFL, US Army, Chinese Academy of Sciences, Science and Technology Daily, China, China Science Daily. He has been selected as a finalist for the Falling Walls Science Breakthroughs of the Year 2022 in Engineering and Technology, the recipient of Professor René Wasserman Award in 2019 and IEEE Best Young Scientist Award in 2021. He serves as Editorial Advisory Board of "Nanotechnology" (IOP Science) and Editorial Board member of "Advanced Fiber Materials" (Springer Nature). His research interests focus on human-interfaced fiber electronics and optoelectronics as well as wearable electronics enabling solutions to challenges in various fields such as healthcare, medicine, energy, neuroscience, robotics and textiles.

**Wednesday, 31 August 2022 || Time: 2:00 PM – 3:00 PM ||
MSE Meeting Room 1 (N4.1-01-28)**

Please register [here](#)

Hosted by: Nanyang Assistant Professor Yu Jing