SEMINAR ANNOUNCEMENT

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
COLLEGE OF DESIGN AND ENGINEERING
Website: https://cde.nus.edu.sg/ece

Area: Microelectronic Technologies & Devices

Host: Dr. Hong Zhou

TOPIC	:	**Metasurface-Enhanced Vibrational Circular Dichroism for Spectroscopic Mid-Infrared Nanosensor**
SPEAKER	:	**Mr. Xu Cheng** **Graduate Student, ECE Dept, NUS**
DATE	:	**Tuesday, 27 September 2022**
TIME	:	**10.00AM to 10.30AM**
WEBINAR	:	**Join Zoom Meeting:** **https://nus-sg.zoom.us/j/4114413926?pwd=bCtzV2VhY0RCcjh3L3hqN09LNjBhdz09** **Meeting ID: 411 441 3926** **Passcode: 710126**

ABSTRACT

Chiroptical spectroscopies study asymmetric light-matter interactions, which offer unique information for anisotropic materials, enantiomers, and nanostructures. Compared with circular dichroism (CD) and optical rotation (OR), vibrational circular dichroism (VCD) spectroscopy not only reveals the absorption difference for circularly polarized light, but also merges the information of molecule vibrational transition at infrared (IR) regime. Nevertheless, only few attentions were paid to enhancing the VCD spectroscopic signal using chiral metasurfaces with anisotropic absorption of circularly polarized light. Meanwhile, none of these works have experimentally illustrated the methodology to achieve enhanced molecule signals. Here, we report an infrared chiral plasmonic metasurface (IRCPM) based on perpendicular positioned nanorods. Leveraging both planarly and vertically induced geometric asymmetry, the coupling and loss coefficients are varied, resulting in enhanced molecule signals. Furthermore, we demonstrate the detection of a small volume of chiral samples down to zeptomole level, which show an enhancement of 6 magnitudes compared with traditional VCD spectroscopy. Our findings pave the way toward label-free, compact, small-volume chiral molecule recognition for chemical and biological applications.

BIOGRAPHY

Xu Cheng received his B.S degree from School of Electronic Engineering, Xidian University, China, in 2019. After that he received his M.Sc degree from Department of Electrical and Computer Engineering (ECE) at National University of Singapore (NUS) in 2020. He is currently a PhD student at the Department of ECE, NUS. His research interests focus mainly on mid IR plasmonic sensors.