SEMINAR ANNOUNCEMENT

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

Area: Microwave & Radio Frequency

Host: Assoc Prof Qiu Cheng Wei

TOPIC	:	**Negative Reflection And Negative Refraction In Biaxial Vdw Materials**
SPEAKER	:	**Mr. Zhang Tan** **Graduate Student, ECE Dept, NUS**
DATE	:	**Thursday, 16 June 2022**
TIME	:	**9.30AM to 10.00AM**
WEBINAR	:	**Join Zoom Meeting** **https://nus-sg.zoom.us/j/82537353508?pwd=OUZYUWNycXV5WVY4VTBrUmJBa0tZQT09** **Meeting ID: 825 3735 3508** **Passcode: 476415**

ABSTRACT

Negative reflection and negative refraction are exotic phenomena that can be achieved by platforms such as double-negative metamaterial, hyperbolic metamaterial, and phase-discontinuity metasurface. Recently, natural biaxial van der Waals (vdW) materials, which support extremely anisotropic, low-loss, and highly confined polaritons from infrared to visible regime, are emerging as promising candidates for planar reflective and refractive optics. Here, we introduce three degrees of freedom, namely interface, crystal direction, and electric tunability to manipulate the reflection and refraction of the polaritons. With broken in-plane symmetry contributed by the interface and crystal direction, distinguished reflection and refraction such as negative and backward reflection, positive and negative refraction could exist simultaneously and exhibit high tunability. The numerical simulations show good consistency with the theoretical analysis. Our findings provide a robust recipe for the realization of negative reflection and refraction in biaxial vdW materials, paving the way for the polaritonics and on-chip integrated circuits.

BIOGRAPHY

Mr. Zhang Tan Received the B.S. degree from Nanjing University of China in 2020. He is now the Ph.D. candidate of ECE, NUS, supervised by Prof. Qiu Cheng Wei. His research interests include the study of two-dimensional materials and polaritonics.