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	**:**	**Relative-Phase Simulated Annealing For Time-Efficient And Large-Scale Inverse Design Of Achromatic Thin Lenses**
SPEAKER	**:**	**Ms. Liu Xingsi** **Graduate Student, ECE Dept, NUS**
DATE	**:**	**Thursday, 16 June 2022**
TIME	**:**	**9.00AM to 9.30AM**
WEBINAR	**:**	**Join Zoom Meeting** **https://nus-sg.zoom.us/j/82537353508?pwd=OUZYUWNycXV5WVY4VTBrUmJBa0tZQT09** **Meeting ID: 825 3735 3508** **Passcode: 476415**

ABSTRACT

High-efficiency, broadband, wafer-size, and ultra-thin lenses are highly demanded, due to its great potential in abundant applications such as compact imaging modules. It is usually conceived that this target might be attainable given the advancement in nanofabrication, computation power and emerging algorithms, though challenging. Here, we reveal the inconvenient truth that for ultra-thin lenses, there actually exists intrinsic check-and-balance between size, broadband and performance. Unveiled by our inverse design algorithm, Relative-Phase Simulated Annealing (RPSA), focusing efficiency inevitably drops with refining wavelength intervals for better achromatic broadband features in optimized lens; and drops exponentially with increasing diameter and bandwidth, supported by our empirical formula. Meanwhile, with a slightly compromised goal, the powerfulness of RPSA is unlocked since it could provide a globally optimized design recipe whose time complexity relates to lens scale linearly rather than exponentially. This work, as a fast search engine for optimal solutions, paves the way towards practical large-scale achromatic ultra-thin lenses.

BIOGRAPHY

Liu Xingsi received her B.Eng. degree at NUS in 2020. She is now a Ph.D. candidate at ECE of NUS. Her research interests mainly focus on metasurface and diffractive lenses.