

Recent Advances in High-Order Simulations for Electromagnetics

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This talk will present high-performance high-order simulation techniques in solving the Maxwell's equations for analyzing optical systems that are required to perform massive parameter studies for phase analysis to predict optimal structure.

Considering a new class of high-index metamaterials for ultrathin flat lenses and graphene-based two-dimensional materials, my talk will focus on the challenges required to accurately predict and analyze the optical properties of these new materials in order to reduce development costs and risks arising from complicated fabrication processes and experimental limitations.

I will discuss robust and rapidly convergent numerical methods based on spectral element discontinuous Galerkin approaches and demonstrate simulations of nanoresonators in a disk array with phase analysis.