

MAR16-2015-030175

Abstract for an Invited Paper
for the MAR16 Meeting of
the American Physical Society

Dielectric metasurfaces

JASON VALENTINE, Vanderbilt University

While plasmonics metasurfaces have seen much development over the past several years, they still face throughput limitations due to ohmic losses. On the other hand, dielectric resonators and associated metasurfaces can eliminate the issue of ohmic loss while still providing the freedom to engineer the optical properties of the composite. In this talk, I will present our recent efforts to harness this freedom using metasurfaces formed from silicon and fabricated using CMOS-compatible techniques. Operating in the telecommunications band, I will discuss how we have used this platform to realize a number of novel functionalities including wavefront control, near-perfect reflection, and high quality factor resonances. In many cases the optical performance of these silicon-based metasurfaces can surpass their plasmonic counterparts. Furthermore, for some cases the surfaces are more amenable to large-area fabrication techniques.