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Plasmonics for Nanowaveguides, Nanoantennas, and Imaging

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There has been significant interest and development in the field of plasmonic optics in recent years due to the numerous breakthroughs in the areas of nanotechnology, nanooptics and exciting potentials for merging of nanooptics and nanoelectronics. By combining the plasmonic phenomena with the notion of metamaterials, in my group we have been developing the concept of 'metactronics' in which properly arranged collections of plasmonic and non-plasmonic nanostructures can provide a platform for tailoring and manipulating optical signals at the nanoscale. This paradigm can provide 'circuits with light at the nanoscale', bringing some of the concepts of microwaves, such as waveguiding, antennas, and imaging into the nanoscale optics, thus providing nanostructures that function as nanowaveguides, nanoantennas, etc. In my group, we have been extensively exploring these topics and some of their exciting potential applications. In this talk, we will give an overview of our recent results on this topic.