Physics
AT QUEENS COLLEGE

Colloquium Notice

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Magnetic response of dielectric nanostructures: theory and applications

Dielectric nanostructures makes a new twist on light scattering phenomena. Subwavelength particles made of high-dielectric materials exhibit very strong magentic response in visible range, which has been recently demonstrated experimentally. The lower losses, compared to plasmonic counterparts, allow to employ dielectric nanostructures for a variety of applications spanning from optical nanotantennas towards metamaterials. We experimentally demonstrated the suppression of the backward scattering and enhancement of the forward scattering due to superposition of the electric and magnetic dipole excitations of a single element. Moreover, due to othognality of optically induced diplole modes, the scattering pattern is polarization independent. It results in azimuthally symmetric unidirectional scattering which can be achieved even for a single element. Furthermore, directionality can be further enhanced by forming a chain of such elements. Although there is a tradeoff between energy confinement and directionality for different inter-particle distances, the properties of vanishing backward scattering and azimuthal symmetry are always preserved even for random ensembles of such elements. It makes them the perfect candidates for compact low loss optical nanoatennas.

Wednesday
April 30, 2014
Starts at 12:15 PM
Coffee at 12:00 PM
Physics Conference Room, SB B326