## Collection and Concentration of Light by Touching Spheres: A Transformation Optics Approach

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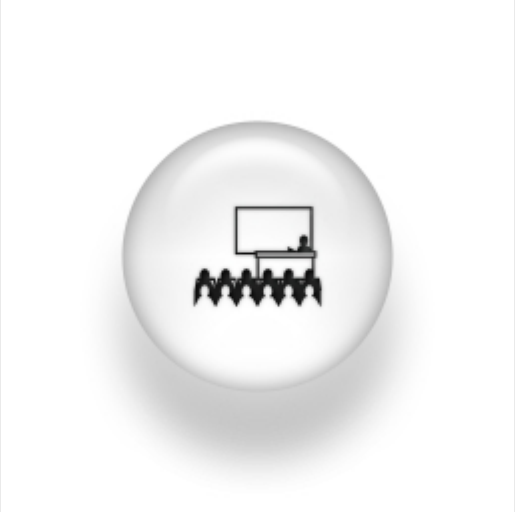

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ABSTRACT:
During the last decade, transformation optics has become the theoretical framework driving the development of metamaterial science. In this context, this elegant tool, which exploits the invariance of Maxwell's equations under coordinate transformations, provides the link between a desired electromagnetic effect and the material properties required for its occurrence. However, in the last year, several works have recovered the original purpose of this technique, first thought as a strategy to ease the solution of Maxwell's equations, by applying it to the study of the interaction of light with metal nanoparticles. In this talk, I will present a general three-dimensional transformation optics approach that yields analytical expressions for the relevant electromagnetic magnitudes in plasmonic phenomena at singular geometries. Specifically, I will focus on the study of the broadband response and superfocusing properties of touching metal nanospheres, and the prominent field enhancement that takes place at the point of contact between a spherical nanoparticle and a flat metal surface.