Abstract Submitted
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Assembly of tetrahedral gold nanoclusters from binary colloidal mixtures[1] NICHOLAS B. SCHADE, Harvard University, DAZHI "PETER" SUN, Brookhaven National Laboratory, MIRANDA C. HOLMES-CERFON, ELIZABETH R. CHEN, EMILY W. GEHRELS, JONATHAN A. FAN, Harvard University, OLEG GANG, Brookhaven National Laboratory, VINOTHAN N. MANOHARAN, Harvard University — We experimentally investigate the structures that form when colloidal gold nanospheres cluster around smaller spheres. We use nanoparticles coated with complementary DNA sequences to assemble the clusters, and we observe them under electron microscopy. Previous experiments using polystyrene microspheres indicate that a 90% yield of tetrahedral clusters is possible near a critical diameter ratio; random sphere parking serves as a useful model for understanding this phenomenon. Here we examine how this approach can be scaled down by an order of magnitude in size, using gold building blocks. We study how this method can be used to assemble tetrahedral plasmonic resonators in order to create a bulk, isotropic, optical metamaterial.

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Nicholas Schade
Harvard University

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