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Programmable Nanofabrication of Nanoparticle Assemblies of arbitrarily Shapes on DNA Templates MAURICIO PILO-PAIS, SARAH GOLDBERG, Duke University, ENRIQUE SAMANO, CNyN-UNAM, Ensenada, B.C., México, HENOK MEBRAHTU, THOMAS LABEAN, GLEB FINKELSTEIN, Duke University, GLEB FINKELSTEIN TEAM, THOMAS LABEAN TEAM — We present a method for producing metallic structures with nanoscale dimensions and programmable design. Rectangular "DNA origami" structures (∼90x70nm) were modified to have uniquely coded binding sites and adsorbed onto silicon dioxide substrates. Gold nanoparticles functionalized with a complimentary DNA sequence were attached to these binding sites in a highly controllable fashion. The seed nanoparticles were then enlarged (and even fused, if desired) by a silver reduction chemistry. Using this method we constructed a variety of metallic structures, including parallel wires, H-shapes, and rings. Due to the flexibility of the design and the multiply parallel nature of the method, these structures may offer great promise for plasmonic applications.

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