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**DNA Regulated Clusters: Structure and Self-limiting Assembly**[1] CHENG CHI, Center for Functional Nanomaterials, Brookhaven National Laboratory, FERNANDO VARGAS LARA, FRANCIS STARR, Physics Department, Wesleyan University, ALEXEI TKACHENKO, OLEG GANG, Center for Functional Nanomaterials, Brookhaven National Laboratory — We have investigated the structural details of nanoparticle clusters assembled by flexible DNA linkers in dimer clusters using electron microscopy, in-situ x-ray scattering and optical methods. The observed dependence of interparticle distance on a DNA length significantly deviates from the predictions for single chain linkages and previous measurements for superlattices. The observed effect is attributed to a large solid angle of interparticle contact, in agreement with computational results. Our studies further reveal the non-monotonic decrease of interparticle distance for the longer linkers; that suggests nanoparticles confinement by hybridized linkers from opposite particles' hemispheres. The effect is accompanied by inhibited development of nanoclusters and results in a self-limited cluster assembly. The mechanism of dimer formation was investigated in details using the optical methods.

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[X] Prefer Oral Session
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