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Transformations and Reconstructions of DNA-directed colloidal crystals JOHN CROCKER, YIFAN WANG, IAN JENKINS, TALID SINNO, University of Pennsylvania — DNA is a versatile tool for directing the equilibrium self-assembly of nanoscopic and microscopic objects, but also for subsequently transforming them into new structures. In experiment, at high densities of long grafted DNA strands, and temperatures where the binding is reversible, these systems readily form colloidal crystals and colloidal clusters having a range of symmetries. For interactions that favor alloying between two differently-sized colloidal species, our experimental observations compare favorably to a simulation framework that predicts the equilibrium phase behavior, growth kinetics and solid-solid transitions. Overall, we find that this system recapitulates both ionic crystals and noble-metal alloys. We will discuss the crystallography of the alloy structures formed as well as the interesting Martensitic-type transformations and super-lattice reconstructions they undergo.

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