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Title: Artificial Nanosolids

Abstract: Artificial nanosolids, arrays of nanoscale grains interacting with each other through electron tunneling, offer rich new horizons of novel macroscopic behavior emerging from nanoscale structure and dynamics. Fundamental microscopic phenomena such as Coulomb correlation, disorder and coherence produce dramatically new and programmable bulk behavior when mediated by nanoscale granular structure. Each building block of these new materials can be viewed as a tiny cluster of atoms of metallic, semiconducting or superconducting elements. These clusters are not as small as molecules but not as large as macroscopic objects. I will review our progress made in the last several years in understanding the properties of artificial nanosolids.

Short Biography: Igor Beloborodov received his PhD from the Theoretical Physics Institute, Ruhr - University, Bochum, Germany and held postdoc positions at Bell Labs, Argonne National Lab, and University of Chicago before joining the Department of Physics and Astronomy at CSUN. His research is focused on theoretical condensed matter physics with an emphasis on granular electronic systems, nanoscale superconductors and magnets, quantum nanodevices, and strongly correlated electron systems.