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**Research Summary:**

The central theme of my research program is to understand a broad range of novel physical, chemical and biological properties of novel materials using nanocrystal as building blocks. We focus not only on properties on the single particle as a result of quantum confinement and surface/interface effects, but also on collective phenomena resulting from the coupling between different nanocrystals. My vision is to combine synthesis, self-assembly and characterization in a single research program to address challenges resulting from the complexity of the materials.

**Selected Recent Publications:**

T. B. Tran, I. S. Beloborodov, Jingshi Hu, X. M. Lin, T. F. Rosenbaum and H. M. Jaeger, Sequential tunneling and inelastic cotunneling in nanoparticle arrays, *Phys. Rev. B.* 78, 075437 (2008).

Klara E. Mueggenburg, Xiao-Min Lin, Rodney H. Goldsmith, Heinrich M. Jaeger, Elastic Properties of Close-packed, Free-standing Nanoparticles Arrays, *Nature Materials*, 6, 656-660, (2007).

Michael G. Constantinides, Heinrich Jaeger, Xuefa Li, Jin Wang, Xiao-Min Lin, The Formation and Characterization of Three-Dimensional Gold Nanocrystal Superlattices, (invited), *Zeitschrift fur Kristallographi*, 222, 595-600, (2007).

Binhua Lin, David G. Schultz, Xiao-Min Lin, Dongxu Li, Jeff Gebhardt, Mati Meron, P.J. Viccaro, Langmuir Monolayers of Gold Nanoparticles, *Thin Solid Films*, 515, 5669-5673, (2007).

Kenneth J. Klabunde, Christopher M. Sorensen, Savka I. Stoeva, B.L.V. Prasad, Alexander B. Smetana, Xiao-Min Lin, Digestive Ripening, or “Nanomachining,” to Achieve Nanocrystal Size Control, book chapter in *Metal Nanoclusters in Catalysis and Material Science: The Issue of Size Control—Part II: “Methodologies”* edited by B. Corain, G. Schmid, and N. Toshima, Elsevier Science B.V. Amsterdam, (2007).

Xiao-Min Lin, Helmut Claus, Ulrich Welp, Igor S. Beloborodov, Wai-Kwong Kwok, George W. Crabtree, Heinrich M. Jaeger, Growth and Properties of Superconducting Anisotropic Lead Nanoprisms, *J. Phys. Chem. C. (Letter)*, 111, 3548-3550, (2007).