

Abstract Submitted
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Fabrication of All-Inorganic Nanocrystal Solids through Matrix Encapsulation of Nanocrystal Arrays¹ DAN ROTH, ERICH KINDER, Department of Physics, BGSU, PAVEL MOROZ, The Center for Photochemical Sciences and Department of Physics, BGSU, GEOFFREY DIEDERICH, Department of Physics, BGSU, ALEXA JOHNSON, MARIA KIRSANOVA, ALEXANDER NEMCHINOV, The Center for Photochemical Sciences and Department of Physics, BGSU, TIMOTHY O'CONNOR, Department of Physics, BGSU, MIKHAIL ZAMKOV, The Center for Photochemical Sciences and Department of Physics, BGSU — A general strategy for low-temperature processing of colloidal nanocrystals into all-inorganic films is reported. The present methodology goes beyond the traditional ligand-interlinking scheme and relies on encapsulation of morphologically-defined nanocrystal arrays into a matrix of a wide-band gap semiconductor, which preserves optoelectronic properties of individual nanoparticles while rendering the nanocrystal film photoconductive. Fabricated solids exhibit excellent thermal stability, which is attributed to the heteroepitaxial structure of nanocrystal-matrix interfaces, and show compelling light-harvesting performance in prototype solar cells.

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