Abstract Submitted
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Fabrication of Ultralow Density Interconnected Pure Metal Foams[1] EDWARD C. BURKS, DUSTIN A. GILBERT, KAI LIU, University of California, Davis, SERGEI O. KUCHEYEV, JEFFREY D. COLVIN, Lawrence Livermore National Laboratory, THOMAS E. FELTER, Sandia National Laboratory — Ultra-low density metallic nanostructures have been shown to possess interesting thermal, electrical, magnetic, chemical and mechanical properties due to their extremely high surface areas, nanoscale geometries and high porosities. Here we report the synthesis of pure metal foams using interconnected metallic nanowires with densities as low as 0.1% of their bulk density that are still mechanically stable. The highly porous monoliths are macroscopic in size (several mm) and can be created in a wide variety of shapes for application-specific needs. Preliminary studies of such metal foams have already revealed fascinating mechanical and magnetic properties, since the physical dimensions of the foams are below some of the basic length scales that govern the material properties. These foams have been used as targets for ultrabright x-ray sources. They also have a wide variety of other potential applications such as photovoltaic devices, supercapacitors, catalysts, coatings, fuel cells, etc.

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Edward C. Burks
University of California, Davis

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