

Meta-Materials:

Creating the Materials Properties That Do Not Exist In the Nature

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Hosted by: Arvind Narayanaswamy

Columbia-Berkeley Seminar Series in Micro/Nanotechnology

Metamaterials are a new class of composite structures made of engineered meta “atoms” and “molecules” which enable the unprecedented electromagnetic or acoustic properties that do not exist in the nature such as optical magnetism and artificial plasma. Especially, the predicted superlens made of metamaterials breaks the fundamental diffraction limit, which may have profound impact in wide range of applications such as nano-scale imaging, nanolithography, and ultra-density data storage. I’ll present a few recent experiments that demonstrated these intriguing physics derived from structure design. We created the first bulk optical metamaterials that show the negative refractions. We demonstrated the unique superlens and hyperlens that breaks diffraction limit, as well as an invisibility cloak. I will further discuss device applications such as nano-scale lithography that may transform the next generation of nano-manufacturing, and the world’s smallest semiconductor laser and bio-sensor. I will conclude with a brief introduction of our NSF Nano-manufacturing center.



Prof. Xiang Zhang is Chancellor’s Professor at UC Berkeley and the Director of NSF Nano-scale Science and Engineering Center (NSEC). He also served as Director of Department of Defense MURI Center on Metamaterials and Devices that includes Berkeley-MIT- UCLA-UCSD-Duke-Imperial College (UK). He is also a Faculty Scientist at Materials Science Division at Lawrence Berkeley National Laboratory (LBNL) of US Department of Energy. Professor Zhang’s research has been selected to be one of *Top Ten Nanotechnology Breakthroughs* in 2005, and *Fast Breaking Papers*, as one of the most cited recent papers in Physics in 2006, and *R&D Magazine’s top 25 the Most Innovative Products of 2006*.

Thursday, December 3, 2009

10:00 am Seminar in Interschool Lab 7th floor CEPSSR

Breakfast will be served at 9:30am in Interschool