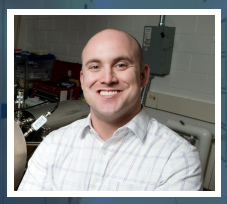
Making Smarter, More Efficient Materials



Lane Martin

Associate Professor, Materials Science and Engineering Faculty Scientist, Materials Science Division
Assistant Professor, Materials Science and Engineering

CURRENT RESEARCH

Developing materials that will revolutionize the way we live

When you analyze the rapid rate at which technology has advanced in recent years, it would seem as though it will continue almost indefinitely. Contrary to this assumption though, we are reaching maximized levels of efficiency and utility in many of the materials we currently use in manufacturing. Lane Martin, Associate Professor of Materials Science and Engineering at the University of California, Berkeley, is designing new, better, and exotic materials that will allow for more efficient and advanced new products. These new materials, many synthetic, are designed at the fundamental atomic level of structure to perform specific functions. These materials are applicable in many aspects of industry and can be slightly altered to execute several different processes.

Dr. Martin's research has the potential to revolutionize many industries and products. While many of the newly developed products can have several varying applications, three specific current research projects touch on energy and computational problems that will plague future innovation if alternative materials are not developed.

- Nearly 50-60% of all energy expended in the United States each year is lost as heat (a process otherwise known as entropy) due to inefficiencies in devices and processes. Harvesting even a small fraction of this wasted heat could be a game changing advance. Materials with strong responses to heat, including those that undergo fundamental electrical or magnetic changes when exposed to an external heat source, represent a novel way to collect and utilize this waste heat. In turn, using the exotic materials developed by Dr. Martin, one can create systems that convert this waste heat into usable...

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AFFILIATION

University of Illinois Urbana-Champaign

EDUCATION

- B.S., Materials Science and Engineering, 2003 , Carnegie Mellon University,
- M.S., in Materials Science and Engineering, University of California, Berkeley , 2006
- Ph.D., in Materials Science and Engineering, University of California, Berkeley , 2008

AWARDS

- Dean's Award for Excellence in Research, College of Engineering, University of Illinois, 2013
- National Science Foundation CAREER Award, 2012
- Army Research Office Young Investigator Program (YIP) Award Winner, 2010
- Intel Robert Noyce Fellow in Microelectronics, 2007 - 2008
- National Science Foundation IGERT Fellow in Nanoscience and Engineering, 2004 & 2007

RESEARCH AREAS

Technology, Materials Science / Physics, Clean Energy, Space

FUNDING REQUEST

Your contributions will be directed towards supporting the infrastructure - both in terms of people and hardware - associated with these innovative and cutting-edge pursuits as Dr. Martin and his team work to create new materials and phenomena that we can only dream of today. Most importantly, supporting the creative process, education and training, and livelihoods of a new generation of scientists, engineers, and inventors will be made possible through your contributions.