



NANOENGINEERING

UCSD NANOENGINEERING SEMINAR

Wednesday, May 25, 2016

Seminar Presentation: 11:00am - Noon

SME 248 - Cymer Conference Center

Information-driven approach to materials discovery and design

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Abstract:

There has been considerable interest over the last few years in accelerating the process of materials design and discovery. After all, finding new materials with targeted properties has largely been guided by intuition and trial and error, and with increasing complexity (e.g. chemical), the number of possibilities becomes exceedingly large. The Materials Genome Initiative (MGI) initiative has spurred considerable activity and brought new researchers into the nascent field of materials informatics. The activity has also highlighted some of the open questions in this emerging area, including identifying key features, guiding the next experiment to aid the learning process, and incorporating domain knowledge to make better predictions. After a perspective of where the field is, I will review some of the work we have been doing related to design, using uncertainties to explore the vast search space for better materials.

Xue D, Balachandran PV, Hogden J, Theiler J, Xue D, Lookman T. Accelerated search for materials with targeted properties by adaptive design. *Nature Communications*, 160415, 11241, 2016

<https://www.sciencedaily.com/releases/2016/05/160509132833.htm>

<http://phys.org/news/2016-05-machine-discovery-materials.html>

Biosketch:

Turab Lookman did his undergraduate and graduate studies at Kings College, University of London. He joined Los Alamos National Laboratory (LANL) in 1999 and in 2009 received the LANL Fellows Prize for Outstanding Research in Science or Engineering. He is a recipient of the Japan Society for the Promotion of Science award, and became a Fellow of the American Physical Society in 2012. His interests and expertise span hard and soft condensed matter including materials physics, nonlinear dynamics and computational physics.