THE UNIVERSITY OF HONG KONG

DEPARTMENT OF MECHANICAL ENGINEERING

SEMINAR

Title: **Multi-scale Interfaces Design in Solids: Atomic Level Understanding of Interface Physics**

Speaker: **Dr. Jian Wang**
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Date: **20 July, 2017 (Thursday)**

Time: **2:30 p.m.**

Venue: **Room 7-37, Haking Wong Building, HKU**

Abstract:
Interfaces are common planar defects in solids. Interface can act as barriers, sinks and sources for other defects. By tailoring interface structures and properties, materials can be designed to achieve unusual structures and properties, such as high strength, good ductility, high toughness, and high irradiation tolerance. In addition, the motion of interfaces is associated with propagation and growth of shear transformation deformation domain, such as twinning, detwinning, and phase transformation. Understanding interfaces physics will enable us to design materials with desired properties and develop materials modelling tools that are capable for predicting mechanical response and texture evolution. This can be accomplished through two steps: (1) Discover unusual mechanical behavior (e.g., high strength and good ductility) of nanostructured composites, and Develop theory and fundamental understanding of unusual mechanical behavior. (2) Transform fundamental understanding of structural characters and deformation physics of nanostructured composites into a mesoscale capability of discovering, predicting, and designing superior nanostructured materials

(strength, ductility, toughness, radiation). To achieve this goal, multi-scale methods including experiment and theory and modeling are necessary. In this talk, I will present fundamental principles in studying interface physics and applying interface physics for designing materials and developing materials modeling tools at different scales.

Dr. Jian Wang is an Associate Professor at Mechanical and Materials Engineering at University of Nebraska-Lincoln. He received his first Ph.D in Solid Mechanics in Xi'an Jiao Tong University, in 1999. After He worked in Hong Kong for two years, he got his second PhD in Mechanical Engineering, Rensselaer Polytechnic Institute, Troy, NY, USA, in 2006. After that, He joined Los Alamos National Laboratory as Technical Staff Member for 9 years. Currently, his research interests are focused on more quantitative exploring the structure-properties relationships of structural and nanostructured materials. He received Outstanding Reviewer Awards in 2016 from two Journals (Scripta Materials and Modeling and Simulation in Materials Science and Engineering), International Journal of Plasticity Young Research Award, 2015; TMS MPMD Young Leader Professional Development Award, 2013; the LDRD/Early Career Award (2011); and the LANL Distinguished Postdoctoral Performance Award in 2009. He was leading two DoE BES Core programs with focus on (1) Deformation Physics of Ultra-fine Materials and (2) Multiscale Constitute Laws for HCP materials. He has more than 200 peer-reviewed publications (>6000 citations and H-index = 48, 25 papers selected as 25 Hottest Articles in Materials Science, five Journal covers), and 115 invited/keynote presentations. He is serving as Editorial Boards for International Journal of Plasticity, Scientific Reports, and several materials journals.

ALL INTERESTED ARE WELCOME

For further information, please contact Dr. M.X. Huang at 3917 7906.

Research area: Advanced Materials