



DEPARTMENT OF MECHANICAL ENGINEERING

SEMINAR

Online

Title: Grain Boundary Dynamics: from atomistic mechanism to microstructure evolution

Speaker: Prof. David J. Srolovitz
Chair Professor, Materials Science and Engineering
Senior Fellow, Hong Kong Institute for Advanced Study
City University of Hong Kong

Date: 8 April, 2021 (Thursday)

Time: 10:30 am – 11:30 am

Zoom meeting: 1) Link to join the meeting:

<https://hku.zoom.us/j/99003104215?pwd=K0RZQUJrNnBRMkN6R2gwbEhKa0E5Zz09>

2) Meeting ID: 990 0310 4215

3) Password: 427214

Abstract:

The motion of grain boundaries (GB) is most commonly controlled by the formation and motion of line defects constrained to lie in the GB. These line defects, known, as disconnections have both a finite step height h and Burgers vector \mathbf{b} . The set of all possible combinations of h and \mathbf{b} are set by the bicrystallography (DSC lattice). I will present a crystallographic and statistical mechanics-based theory, molecular dynamics and Monte Carlo simulations results for GB dynamics (including GB migration, GB shear coupling, GB sliding,..). I will then show how we can use these insights to derive a crystallography and GB dynamics mechanism-respecting continuum equation of motion for GBs appropriate for both bicrystals and microstructures and apply these within a phase-field simulation formulation. The goal of this talk is to present a simple understanding of how GBs move and the consequences on the microstructural scale.

Biography:

David Srolovitz is the author of over 500 research papers on materials theory/simulations of defects, microstructure, deformation, and film growth and has an *h*-index of 95. He is a Member of the US National Academy of Engineering, Fellow of MRS, TMS, ASM, Institute of Physics and is the winner of the MRS Materials Theory Award. He was a staff member at Exxon Corporate Research and Los Alamos National Laboratory and the Executive Director of the Institute for High Performance Computing in Singapore. He has been a professor at the University of Michigan, Princeton University, Yeshiva University and the University of Pennsylvania. He has held faculty positions in Materials Science, Mechanical Engineering, Aerospace Engineering, Computer Science, Physics, and Applied Mathematics. He is currently Senior Fellow of the Hong Kong Institute for Advanced Study and Chair Professor at the City University of Hong Kong.

ALL INTERESTED ARE WELCOME

For further information, please contact Prof. D.Y.C. Leung at 3917 7911.