Abstract

Materials can self-organize themselves into patterns under certain external stimuli, which have many interesting and important applications in all aspects of science and engineering. In this talk, I will present our recent works in studying the self-organization behavior of metallic, soft, and biological materials with spatial length scale from several tens of nanometers to hundred micrometers using a variety of computer simulation tools. I will start with GPU-accelerated molecular dynamics simulation of self-fold nanostructures from focused ion beam machining; then, I will present morphology evolution of "soft matter" solar cells and photosynthetic membranes using coarse-grained molecular simulations, and our ongoing work in studying perovskite solar cells using neural network potential model with ab initio accuracy. Finally, I will present our ongoing work studying lithium "dendrite" growth during charging processes using micrometer-scale phase field model simulations.
About the Speaker

Dr. Chun-Wei Pao is currently an associate research fellow at the Research Center for Applied Sciences, Academia Sinica in Taiwan. Dr. Pao received his Ph.D. degree from Department of Mechanical and Aerospace Engineering, Princeton University in 2007. After finishing his Ph.D. study, he worked at the Theoretical Division in the Los Alamos National Lab as a post-doctoral research associate. He moved to Research Center for Applied Sciences, Academia Sinica as an assistant research fellow at the end of 2009 and was promoted to associate research fellow in May, 2014. Dr. Pao's research expertise is computational materials science, and has worked extensively on multiscale simulations of solid and soft materials for energy and electronics applications. Dr. Pao's research works have been published on top journals such as Nano Letters and Energy & Environmental Sciences, and he has received the Academia Sinica Career Development Award (2016) and the Young Theorist Award from the National Center for Theoretical Sciences in Taiwan (2014).

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All are Welcome!

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