

The Condensed Matter Theory / Computational Materials Science Seminar

CMT/CMS seminar

Co-organized by iSM seminar

Date & Time: Sept. 27th, 14:00 ~

Place: 8F large seminar room, Sengen main bldg

Speaker: Dr. Cenk KOCER, Univ. Sydney

Title: A vacuum insulating window; concept, design and performance

Abstract: Most of us in the developed world spend almost 90% of our time indoors, and we have grown accustomed to a well regulated indoor climate. This is of concern since a large portion of energy consumption in buildings is wasted through uncontrolled heat-flow to the outside. In particular, heat loss through windows accounts for most of this waste. Vacuum insulating windows, developed at the University of Sydney, are thermally insulating and constructed from two glass panes separated by a sub-millimeter vacuum gap. This technology offers a unique method of increasing the thermal performance of our commercial and residential buildings. In this talk the concept, design features, and performance of the vacuum insulating window will be discussed.

Speaker: Prof. Shigenobu OGATA, Osaka Univ.

Title: Modeling of Solute Atom Behavior and Effects in Iron

Abstract: Atomistic modeling is one of the most promising ways to reveal and predict the solute atom effects on mechanical properties of steel, along with recent atomistic scale experimental observation techniques. In this seminar, I would introduce our recent molecular dynamics (MD) analyses of hydrogen's diffusion behavior and microscopic phase field modeling of hydrogen-dislocation collective dynamics in alpha-iron. I also introduce accelerated MD analyses of carbon's diffusion behavior in alpha-iron, such as carbon diffusion dynamics in bulk, carbon-dislocation collective dynamics and a fast carbon diffusion channel on the slip plane in the dislocation core. Eventually, a theoretical prediction of the critical resolved shear stress of Fe-C and Fe-Si steels will be discussed.

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