

Title **Micro and Nano-scale Transport Processes for Energy Applications**

Speaker Prof. Sushanta Mitra
Professor
Department of Mechanical Engineering
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Date & Time Friday, Sept. 7, 2012 4:00p.m.

Place INAMORI Hall, Ito campus, Kyushu University

Abstract

A number of engineering applications, like oil recovery and fuel cells, involves the transport of fluid (liquid and gases) through narrow confinements, often in the order of μm and nm dimensions. In order to understand the transport through such complex porous media, it is important to first characterize the pore-geometry. Dr. Mitra's research group has pioneered the use of Focused Ion Beam – Scanning Electron Microscopy (FIB-SEM) to understand the porous geometry of natural reservoir rock. Based on such understanding, the research group has developed a novel microfluidics device – “Reservoir-on-a-Chip (ROC)”, which allows to perform oil recovery studies in a miniaturized platform. In case of gas flow, the research group has developed a new mass transport model to characterize the diffusion processes within the gas diffusion layer (GDL) of a fuel cell electrode. Also, mass transport experiments are conducted to validate multi-component diffusion models.

About the Speaker

Prof. Sushanta Mitra received his PhD in Mechanical Engineering from the University of Waterloo, Canada. He is currently a Professor in Mechanical Engineering and Assistant Vice-President (Research) at the University of Alberta, Canada. He is the Director of Micro and Nano-scale Transport Lab (www.mece.ualberta.ca/mntl) and the Team Leader for Nano-Bio-Energy Network (www.mece.ualberta.ca/nben). He has published more than 145 papers in peer-reviewed journals and conference proceedings. He is also the Editor of Microfluidics and Nanofluidics Handbook. For his contribution in the field of mechanical engineering, he has been awarded the fellow of the American Society of Mechanical Engineers (ASME) and the Canadian Society of Mechanical Engineers (CSME).

Host: Professor Yasuyuki TAKATA

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