

University of Minnesota
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presents the

The Donaldson Lecture Series

On interdisciplinary topics in Chemistry, Chemical Engineering Materials Science
and Mechanical Engineering

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2-650 Moos Tower

a reception will follow in the Dale Shephard Room of the Campus Club

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“Technology and Global Population: Is the World Really Flat?”

ABSTRACT — If one asks the question: What was the most important invention of the 20th century, the predictable answer may come as airplanes, computers, television, nuclear energy etc. They are certainly the ones that catch the headlines and affect people like you and me. At the turn of the century, however, an analysis by Nature suggested that if the criterion is based on human well being of the whole world population, the answer is quite different. Hence, if we accept this criterion, one may ask as to what are the demographics of the world population now and, say 50 years from now, and do the icons of modern technology really address the needs of the world. Clearly information technology has made the world flatter as some have correctly claimed, but that is only part of the story. There are many other technologies where the world is far from flat because people just don't have access to them due to a variety of reasons. However, if we project ourselves into the future and understand the mismatch between current technologies and the needs of the world population, one can identify both business and scientific opportunities beyond the obvious humanitarian aspects. In this talk, I will attempt to make this case using nanotechnology as an example.

BIO — Professor Arun Majumdar received a B.Tech in Mechanical Engineering from the Indian Institute of Technology, Bombay (IIT-B) in 1985, and a PhD in Mechanical Engineering from the University of California, Berkeley in 1989, for research conducted in the laboratory of Professor Chang-Lin Tien. After being on the faculty of Arizona State University (1989-92) and University of California, Santa Barbara (1992-96), he began his faculty appointment in the Department of Mechanical Engineering at the University of California, Berkeley. He currently holds the Almy and Agnes Maynard Chair in the College of Engineering. In addition, Professor Majumdar serves as the Director of the Berkeley Nanosciences and Nanoengineering Institute. He is also a member of the Nanotechnology Technical Advisory Group to the President's Council of Advisors on Science and Technology (PCAST). He served as the founding chair of the ASME Nanotechnology Institute, and is currently a member of the Council of Materials Science and Engineering at the Department of Energy. He also serves on the editorial board of the International Journal of Heat and Mass Transfer, Molecular and Cellular Biomechanics, and is the editor in chief of Micro/Nanoscale Thermophysical Engineering. Professor Majumdar is a recipient of the Institute Silver Medal (IIT-B) (1985), ASME Melville Medal (1992), Gustus Larson Memorial Award of the ASME (2001), and Distinguished Alumni Award from IIT-B (2002). He is a fellow of ASME and AAAS, and is a member of the US National Academy of Engineering. Professor Majumdar's research interests are in the broad area of mechanics and transport in nanostructured materials. Of particular current interest are phonon dynamics and transport in low-dimensional materials, materials and devices for thermoelectric energy conversion, transport and reactions in confined liquids (nanofluidics), chemomechanics of small and macromolecules with applications in chem/biosensing, and nanoscale imaging.