Northwestern | McCORMICK SCHOOL OF ENGINEERING
Materials Science and Engineering

Save the Date

The Department of Materials Science & Engineering will be hosting the Jerome B. Cohen Distinguished Lecture presented by

Daan Frenkel

1968 Professor of Theoretical Chemistry,
University of Cambridge

Daan Frenkel (1948) received his PhD in experimental Physical Chemistry from the University of Amsterdam (NL). Subsequently, he worked as a postdoctoral research associate in Chemistry at the University of California at Los Angeles. After that, he worked at Shell Research (Amsterdam), the Universities of Utrecht and Amsterdam and the FOM Institute for Atomic and Molecular Physics in Amsterdam. In 2007, he was appointed to the 1968 Chair of Theoretical Chemistry at Cambridge (UK). His research focuses on numerical simulations of many-body systems, with a special emphasis on problems relating to ordering and self-assembly. He is a member of the Dutch Academy of Science, the Royal Society of London, the American Academy of Arts and Sciences and the US National Academy of Science.

Monday, October 16, 2017 - 4 pm, Pancoe Auditorium

Talk 1: From Self-assembly to Recognition.

Reception to follow in Pancoe Café at 5 pm

Abstract: A holy grail of nano-technology is to create truly complex, multi-component structures by self-assembly. Most self-assembly has focused on the creation of "structural complexity". In my talk, I will discuss "Addressable Complexity": the creation of structures that contain hundreds or thousands of distinct building blocks that all have to find their place in a 3D structure. Experiments have demonstrated the feasibility of making such structures. Simulation and theory yield surprising insights that can inform the design of novel structures and materials. Surprisingly, the design principles for addressable self-assembly may provide a tool to distinguish different cell surfaces

Tuesday, October 17, 2017 - 4 pm, Pancoe Auditorium

Talk 2: The Disorder Created by Entropy Is In the Mind.

Abstract: So much has been said about entropy that it is probably best to remain silent on the subject. Somewhat unwisely, I will nevertheless talk about this dangerous subject because in numerical simulations one is confronted very directly with what entropy is – and, more importantly, with what it is not. I will talk about entropy from the perspective of numerical simulations. Specifically, I will discuss (well known) examples where entropy increases with increasing order, I will briefly touch on Gibbs' paradox and I will discuss how recent numerical tools allow us to compute close and distant relatives of the Statistical Mechanical entropy.

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