



Center for Nanoscale
Chemical-Electrical-Mechanical
Manufacturing Systems

The Flexibility Window in Materials

Many interesting phenomena occur in material structures that are poised between rigid and flexible. In this talk, we describe the modern theory of rigidity and show how it can be used to analyze networks of constraints. These results can be used as input to geometrical simulation, where the various rigid parts of a system are moved, while maintaining all the constraints; both equalities and inequalities. This results in complex structures involving atomic re-arrangements at the nanoscale. This approach is applied to explain various recent experiments in zeolites that are important for cracking petroleum, manganites that exhibit colossal magnetoresistance, and proteins where flexibility is often associated with function.



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4:00 pm

1000 Micro and Nanotechnology Laboratory

Michael F. Thorpe

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Michael Thorpe joined the Arizona State University as Foundation Professor in 2003. He previously had faculty appointments at Yale University and Michigan State University where he was University Distinguished Professor. He received his PhD from Oxford University in 1968 in condensed matter physics. His research interests are in the theory of disordered systems, with a special emphasis on properties that are determined by geometry and topology. His most recent work has been in biological physics. The aim of this research work is to find underlying principles and unifying concepts, to better understand the evolution and function of proteins and protein complexes.