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S E M I N A R

aus

Halbleiterphysik und Nanotechnologie

Di, 17.6.2014, 11:15 Uhr
Hörsaal für Physik

"From disorder, graphene and interacting quantum many-body systems to the rigidity and flexibility of PDI and HIV protease"

Prof. Dr. Rudolf A. Roemer
Department of Physics, University ofWarwick, UK

In this talk, I am giving an overview of some of our recent work based on 4 examples. First, I will explain how one can reach large system sizes in disordered quantum systems. Then I will show that this indeed can be crucial to get the physics right using the example of disordered graphene. Shifting emphasis, I will then switch to studies of proteins and show how application of fairly simple techniques can give rise to quick results for protein rigidity and flexibility, providing a great starting point for further MD simulations. Last, I will get back to disordered quantum systems, but now add the element of many-body interaction into the mix and present a novel approach to numerically obtaining correlation functions and entanglement entropies of a random magnet. The work as reviewed here is mostly based on 4 publications, i.e . (1) SIAM Reviews 50, 91-112 (2008) ,(2) EPL 104, 17012-6 (2013), (3) http ://arxiv.org/abs/ 1303.4591 , and (4) http :// arxiv.org/abs/ 1401.4874.