



School of Nano Science



IPM Condensed Matter &
Statistical Physics Group

Weekly Seminar

Single bio-molecule sensing: Beyond nanopores in graphene

Invited Speaker:

Dr. Hadi Arjmandi Tash

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Abstract:

DNA sequencing is the ultimate target in nanopore research. In typical nanopores in free standing 30nm thick silicon nitride membranes numerous bases (100 and more) are present in the channel simultaneously; hence the reading of such sensors is just an average over the signatures of the whole strand. Consequently such long channel nanopores are not capable to sense and detect single bases in a DNA. As the thinnest possible materials with thicknesses comparable to the spacing between the bases, monolayers of two-dimensional materials e.g. graphene can play a central role in this field. The challenges, however are numerous. In this talk, I will present the competence of graphene nanopores in single molecule sensing. I will cover the pros and cons and introduced the concept of “interfacial nanopores” as the replacement for nanopores in graphene. With effective thicknesses even shorter than graphene, week-long signal stability, orders of magnitude slower translocation time per nucleotide, and lower electronic and ionic noise compared to existing nanopores, our findings establish 2D interfacial nanopores as a scalable platform for realizing precise nanofluidic systems able of single-molecule detection.

Wednesday, 8th of Day (1395) (December 28th, 2016), 14:00-15:00

Farmaniyeh seminar room