The Surprises of a Nanochannel –

The Gigantic Success Story of Tininess

Speaker: Yoav Green

On his PhD research in the Faculty of Mechanical Engineering under the supervision of Assistant Prof. Gilad Yossifon.

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Butler Auditorium

In recent years numerous studies have shown that systems that include a nanochannel can be used for a wide range of applications. The most prominent attribute of a nanochannel is its permselectivity ability – the ability to filter ions based on their electrical charge – similar to nanoporous membranes used for desalination. Unlike the complex geometry of the membrane which is comprised of many nanopores, a nanochannel is produced by means of photolithography which allows for the ultimate control of its geometry. This makes the nanochannel a simple and ideal model towards understanding the complicated phenomena occurring within the membrane.

I will present to you the results of my research which deals with bridging the understanding of the phenomena observed in membrane systems and single and/or multiple nanochannel systems. In membrane systems communications between neighboring pores is responsible for macroscopic process. In contrast, by controlling the spacing between neighboring channels one can control the degree of communication. We will show that the different governing mechanisms of ion transport through the permselective medium are strongly dependent on the geometry. Bridging the gap of understanding is of utmost importance for the design of smarter and more efficient desalination systems (especially in our small and arid country), but at the same time we also have the opportunity to probe physics at the small scale.

The talk is for the general public and does not require previous knowledge
Refreshments will be served prior to the lecture
The lecture will be given in English