PHYSICS AND ASTRONOMY COLLOQUIUM

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Molecular Motors – A Different Kind of Transport

Nature has generated sophisticated molecular motors, employed for nanoscale transport at the intracellular level. While these motors are at the core of a range of diseases of societal impact, they have also been envisioned for use in miniaturized transport devices. In preparation of this, the fundamental mechanisms governing these motors need to be understood and controlled. Because of the complexity of their functions inside the cell, this understanding is best acquired in an artificial setup, where functional parameters can be independently controlled. I will introduce the subject and report on work in my group that studies and harnesses the transport properties of molecular motors on functionalized structures of reduced dimensionality, such as carbon nanotubes, loop tracks, lithographically designed electrodes, and microwires. Furthermore, recent results on the self-assembly of active elements, as well as unpublished results with significant biomedical potential will be introduced.

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