

NDSU Physics Seminar

“Chemomechanical coupling and multiscale motility of molecular motors”

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South Engineering 221, NDSU

(refreshments at 3:45 p.m. in room 216)

All eukaryotic cells including those of our body contain a large variety of molecular machines that convert the chemical energy released from nucleotide hydrolysis into mechanical work. This talk will focus on cytoskeletal motors which walk with two motor heads and have been intensely studied by single molecule experiments. One such motor is conventional kinesin, for which each motor head contains a single domain for ATP binding and hydrolysis. Our theory for these motors starts with a network representation based on the different nucleotide states of the motor heads. The properties of single motors are then used to describe the cooperative behavior of many motors. The latter behavior includes uni-directional and bi-directional transport of cargo particles by small teams of motors as well as pattern formation and phase transitions in motor traffic.

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