



LUDWIG-
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MÜNCHEN

ARNOLD SOMMERFELD
CENTER FOR THEORETICAL PHYSICS



Sommerfeld Theory Colloquium

Prof. Reinhard Lipowsky

MPI Potsdam

Chemomechanical coupling and multi-scale motility of molecular motors

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.

A unified description of all single-motor experiments is provided by a network representation based on the different nucleotide states of the motor. This representation also reveals novel balance conditions that provide relations between the kinetic and the thermodynamic parameters of the motors. The single motor properties are then used to develop a theoretical description for the cooperative behavior of motor teams or large motor ensembles.

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.

Wednesday, 13th January 2010, 10:30 h, Room 348 / 349, Theresienstr. 37 / III