



## **Dr. Sudipto Muhuri**

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### **“Role of molecular motor kinetics in collective vesicular transport and structural stability in biofilaments“**

Molecular motor kinetics plays a crucial role in the regulation mechanism by which the cell is able to maintain the spatial organization of its constituents and transform itself in regulated fashion in response to specific signalling inputs. We analyse the role played by the motor kinetics in two different contexts. First we analyse a minimal model for bidirectional collective transport of cargo vesicles on microtubule (MT) where the competing motion is characterized by the cargo densities moving toward the opposite filament ends. The model incorporates excluded volume and active transport as well as motor regulation and environment interactions. From the current profiles we derive the nonequilibrium phase diagram. This approach captures qualitatively a number of features associated with bidirectional transport: current reversals due to internal regulation, boundary induced phase transitions and domain wall localization in the bulk. Vesicle polarization emerges naturally within the proposed framework. Finally we also discuss a model which analyses the role of kinetics of motor proteins in the structural stability of antiparallel arrays of polar biofilaments, such as mitotic spindles.

**Dienstag, 21. Oktober 2008, 14 Uhr c.t.**

**Gebäude E2 6, Seminarraum E.04**

**Alle Interessenten sind herzlich eingeladen.**

Die Sprecher des Graduiertenkollegs  
Manfred Lücke und Ludger Santen

**Strukturbildung und Transport  
in komplexen Systemen**