

# Cuban-German Graduate School in Cellular Biophysics

## October 1 – 5, 2019, Havana

<http://www.fisica.uh.cu/school/>

### Pre-Meeting of organizers and school responsables:

**Sunday, Sept. 30, 2019**

14 – 18 h (place to be confirmed, check email!)

ends in ,a la carte'-dinner in town

**Monday, October 1**

### Active and passive transport in cells

Lectures		
9:00	Meeting at the Physics Building	All of us
9:15 - 10:00	Structure of motors	Franziska Lautenschläger
10:15 - 11:00	Function of motors	Franziska Lautenschläger
11:00 - 11:30	Coffee Break	
11:30 - 12:15	Diffusive Transport: Balancing Concentration Gradients	Ludger Santen
12:30 - 13:15	What is necessary to generate directed Transport?	Ludger Santen
13:15 - 14.30	Lunch Break	
Exercises and Applications		
14:30 - 15:30	How to interfere with motors experimentally, how to observe motors experimentally	Franziska Lautenschläger / Daniel Flormann
15:45 - 16:45	Diffusive Transport: Applications and some problems	Ludger Santen

**Tuesday, October 2**

**Mechanics and dynamics of the cytoskeleton**

Lectures		
9:15 - 10:00	Cell Mechanical Properties: Hopelessly Complex ?	Albrecht Ott
10:15 - 11:00	Structure and Function of Actin	Franziska Lautenschläger
11:00 - 11.30	Coffee Break	
11:30 - 12:15	Structure and Function of Microtubules and Intermediate Filaments	Franziska Lautenschläger
12:30 - 13:15	Modelling Filament Dynamics and Motor-driven Transport	Ludger Santen
13:15 - 14.30	Lunch Break	
Exercises and Applications		
14:30 - 15:30	How to observe the Dynamics of the Cytoskeleton experimentally (FRAP) - A Research Application - Dynamic Mechanical Properties of Cells and how to measure that.	Franziska Lautenschläger / Daniel Flormann
15:45 - 16:45	Filament Dynamics and Motor-driven Transport: Selected problems	Ludger Santen

Wednesday, October 3

**Adhesion and formation of biofilms**

<b>Lectures</b>		
9:15 - 10:45	Forces in Biophysics	Karin Jacobs
10:45 - 11:15	<i>Coffee Break</i>	
11:15 - 11:45	How van der Waals forces come into play in adhesion, adsorption and friction	Karin Jacobs
11:45 - 12:30	DNA Binding and Hybridization: Models, Experiments and Questions	Albrecht Ott
12:30 - 13:15	Cooperative Effects in Binding ? - The Introduction of Noncanonical Aminoacids into the Transcription Apparatus	Pirkko Wenzel
13:15 - 14.30	<i>Lunch Break</i>	
<b>Exercises and Applications</b>		
14:30 - 15:30	"Protein adhesion and self assembly: from salivary proteins to pure-protein, cell-like vesicles — Bacterial adhesion from a physics' point of view	Hendrik Hähl / Christian Spengler
15:45 - 16:45	Why Biological Physics Needs the Origin of Life Problem and How To (Maybe) Solve It 1h (Ott)	Albrecht Ott

Thursday, October 4

**Systems biology and biophysics of diseases**

Lectures		
9:00 - 9:45	Living on the edge: micro-swimmers in confined flows	Ernesto Altshuler
10:15 - 11:00	T-Cell Activation, Polarisation, Killing	Heiko Rieger
11:00 - 11:30	<i>Coffee Break</i>	
11:30 - 12:15	Stochastic models for T-Cell Activation, Polarisation and Killing	Heiko Rieger
12:30 - 13:30	Stochastic models for T-Cell Activation, Polarisation and Killing: Selected Problems	Heiko Rieger
13:30	<i>Departure for excursion</i>	

**Excursion:**

**For the lab visit, the organizers need your passport number, please contact them early in the morning!**

**Friday, October 5**

**Cell models: membrane processes and active motion**

<b>Lectures</b>		
9:15 - 10:00	Microfluidics and its Application in Biophysics to explore Phospholipid Bilayer	Ralf Seemann
10:15-11:00	Microfluidic Model System to Explore Exocytosis in Phospholipid Bilayer	Jean-Baptiste Fleury
11:00 - 11.30	<i>Coffee Break</i>	
11:30- 12:30	Poration Mechanism in Freestanding Phospholipid Bilayer	Jean-Baptiste Fleury
12:45 - 14.30	<i>Excursion</i>	

**Excursion:**

**For the lab visit, remember to wear long trousers!**

**Post-Meeting of organizers and school responsables:**

**Saturday, October 6, 2019**

9 – 12 h (place to be confirmed, check email!)

Please, bring all pptx-files of talks, animations, job offers and other materials that shall be posted on the school's internal server!!

It'll be difficult later to transfer large files to Havana!

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