

Seminar^{99th}



November 6, 2025 (Thu)

10:00 - 11:00

Speaker:

Prof. Michael M. Kozlov

Gray Faculty of Medical and Health Sciences
Tel Aviv University, Tel Aviv, Israel

**Title: Model for tension propagation in
crumpled compartmentalised cell membranes**

Propagation of membrane tension mediates mechanical signal transduction along surfaces of live cells and sets the time scale of mechanical equilibration of cell membranes. In stark contrast to the earlier expectations, studies in several cell types and under different conditions revealed a strikingly wide range of the tension propagation speeds, including extremely low ones. The latter suggests a possibility of long-living inhomogeneities of membrane tension crucially affecting mechano-sensitive membrane processes.

Prof. Michael Kozlov proposes a general principle of tension propagation in cell membranes which are compartmentalised by the underlying cortical cytoskeleton according to the picket-fence model and crumpled within each compartment. He suggests that the tension propagation is mediated by the 2D membrane flow between the compartments. He predicts the pace of the tension propagation to be controlled by the relationship between the compartment's membrane tension and the excess area stored in the crumples. He considers the realization of this principle for several specific mechanisms of the membrane crumpling.

Venue: Lab4 E01

Contact: OIST Membrane Cooperativity Unit, Aki Kusumi
Visit: <https://groups.oist.jp/mcu/>
e-mail: akihiro.kusumi<at>oist.jp

Short Bio

Dr. Michael (Misha) M. Kozlov is a Full Professor at Tel Aviv University, the Gray School of Medical Sciences. He received his Ph.D. in Physics from Lomonosov University, Moscow, Russia, in 1984 and Habilitation in Physics from Freie Universität Berlin, Germany, in 1996. He has authored more than 180 publications. The topic of his research is Theoretical Mechanobiology of Cell with focus on modelling the mechanical properties, structural rearrangements, and dynamics of cell membranes and cytoskeleton.