

סמינר - SEMINAR

הנדך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות, שתתקיים ביום ב' 3.02.2020
(ח' בשבט תש"פ), בניין דן קאהן, אודיטוריום 1, 14:30.

מרצה:

Dr. Victor Yashunsky

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Institut Curie, Paris

על הנושא:

Multicellular Systems Organize as Active Nematic Liquid Crystals

The seminar will be given in English

להלן תקציר ההרצאה:

An important feature of materials made of active particles is the emergence of coherent collective motion, examples ranging from fish schools down to biopolymer solutions. In mammalian cells the collective dynamics give rise to tissue self-shaping during development, regeneration, cancer invasion and etc.

Accumulating experimental evidence shows that various cell types organized as nematic liquid crystal. Cells in bidimensional cultures tend to align together and form well-oriented domains of finite size separated by nematic defects of charge $\pm 1/2$. However, unlike passive liquid crystals cells move creating complex dynamic patterns.

I will show spontaneously emerging turbulence in epithelial cell cultures that occurs at low Reynolds numbers [1] in the absence of external forces. By analyzing a large population of vortices, we establish that topological defects serve as a template for turbulent flows. In another example, I will show left-right symmetry breaking and emergence of spontaneous shear flows of spindle-shaped cells plated in stripes, which interpreted as a Fréedericksz transition controlled by the activity of the cells [2].

[1] Physical Review Letters, (2018), 120(20): 208101

[2] Nature Physics, (2018), 14(7): 728-732

website: sites.google.com/view/yashunsky

מאת: פרופ' אולג גנדלמן

בברכה,

פרופ' א' אתי סאס

מרכז הסמינרים