Technion-Israel Institute of Technology
Faculty of Mechanical Engineering

הטכניון-מכון טכנולוגי לישראל
הפקולטה להנדסת מכונות

סמינריון

הנך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות, שתתקיים ביום ב' 25.06.2018 (יב' בתמוז, תשע"ח), בניין דן קאהן, אודיטוריום 1, 14:30.

מרצה: ולרי פרומקין

מנחה: פרופ'/ח מורן ברקוביץ'

על הנושא:

Thermocapillary flow actuation and control

The seminar will be given in Hebrew

תקציר ההרצאה :

Thermocapillary flow describes the motion of a liquid in response to temperature gradients induced on its interface with another fluid. While thermocapillary flows have been extensively studied, their potential as a driving mechanism for microscale flows has not been tapped. In this talk I will present our experimental work, aimed at leveraging the thermocapillary effect for actuation and manipulation of liquids in microfluidic devices. First, I will consider a thermocapillary dipole induced in a Hele-Shaw cell under a steady temperature gradient. I will demonstrate how such dipole flow can act as a thermocapillary motor for driving fluids in microfluidic circuits. In addition, I will show how the principles behind the thermocapillary dipole can be applied in order to drive thermocapillary swimmers on fluid-liquid interfaces. Second, I will demonstrate how thermocapillary flows can be induced in closed channels, by means of super-hydrophobic surfaces.

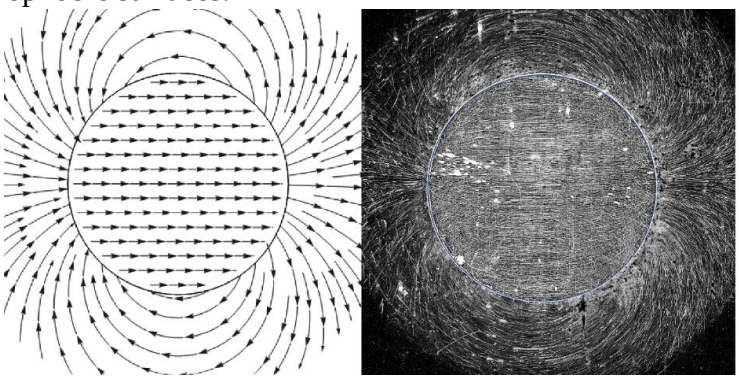

Figure 1: Left: Theoretically predicted streamlines for a thermocapillary dipole in a Hele-Shaw cell. Right: An experimental measurement of a doublet flow obtained by stacking multiple images taken with one second interval between each two images. The diameter of the circular reservoir is 5 mm, the depth is 0.5 mm, and the temperature difference between the hot and the cold sides of the reservoir is 0.5 degrees Celsius .

בברכה,

פרופ"א אתי סאס
מרכז הסמינרים