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 ה׳ 12.09.2019
(יב׳ באלול, תשע״ט), בניין דן קאהן, אודיטוריום 1, 13:45.

מרצה: אלעד הבר

מנחה: פרופ׳/ח טל כרמון

על הנושא:

Liquid-Mirror Resonator

The seminar will be given in English

תקציר ההרצאה :

We designed, fabricated, and experimentally demonstrated the first Fabry-Perot resonator where reflection is from a liquid-phase boundary.

A liquid phase boundary, such as the one in a cup of water, might look like the flattest interface in nature. Nevertheless, this interface actually looks like a stormy sea if monitored with an angstrom-scale resolution. These spontaneous water waves are the result of thermal (Brownian) fluctuation of the liquid-air interface, and are inherent to any liquid interface. Unique to the liquid phase, and in contrast to solids, the restoring force for such capillary waves is by interfacial tension. Interfacial tension is a force applied by a single-molecule layer at the liquid-phase boundary where cohesive forces between nearby molecules apply net force that minimizes gas-liquid interface, making the surface flat.

Here we design, fabricate and activate a device that experimentally detects capillary waves. Thermal fluctuations of liquid-phase boundaries are significant in surface science, and in particular in coalescence and fission of droplets.

Our capillary-waves detector is based on a Fabry-Perot resonator where one reflector is the total internal reflection from a liquid-phase boundary. Our system goes in and out of resonance according to the small changes in the liquid level due to the capillary waves.

These changes are optically detected, which might pave the way to filming thermal fluctuations in the future.

בברכה,

פרופ״מ מתי סאסו
מרכז הסמינרים