הטכניון – מכון טכנולוגי לישראל
הפקולטה להנדסת מכונות

TECHNION – Israel Institute of Technology
Faculty of Mechanical Engineering

SEMINAR - סמינר

הנך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות, שתתקיים ביום ב׳ 27.04.15
(ח׳ באייר, תשע״ה), בבניין דן-קאהן, קומה 0, אודיטוריום 1, שעה 14:30.

<u>ירצה</u>:

Dr. W. Batson

Faculty of Mechanical Engineering
Technion

<u>על הנושא</u>:

Two-frequency excitation of single-mode Faraday waves

<u>להלן תקציר ההרצאה</u>:

In mechanical systems, parametric resonance is the means by which a large periodic response igenerated by a relatively small-amplitude periodic modulation of a natural frequency. Unless the system is non-dissipative and the frequency is precisely equal to the natural frequency, resonance occurs only when the amplitude surpasses a critical threshold. This is the underlying mechanism for Faraday's waves, which are characterized by the growth of a standing wave at a fluid interface when vertical vibrations of sufficient amplitude are imposed to the holding container. The high-frequency regime is now widely recognized for the ease by which a rich variety of container-independent patterns can be produced, and experimental agreement with the theoretical onset of instability is readily obtained. However, such agreement remains an open challenge in the less-studied regime of single-mode excitation[1] that is encountered at low frequencies, where the wave spectrum is discretized and sidewall effects such as contact line dynamics and Stokes layers are significant. This talk will first overview the work of Batson *et al* [2], who, by judicious choice of fluids, minimized these sidewall effects, and observed close agreement with the predictions of a linear theory that accounts for dissipation only in the bulk phases. Then, a novel study[3] of two-frequency excitation and its effect on the linear threshold, bifurcation structure, inhomogeneous excitation, and multi-mode excitations will be presented. Finally, microfluidic applications of single-mode excitation will be discussed.

[1] D. M. Henderson, J. W. Miles, Single-mode Faraday waves in small cylinders, J. Fluid Mech. 213, 95-109 (1990).
[2] W. Batson, F. Zoueshtiagh and R. Narayanan, The Faraday threshold in small cylinders and the sidewall nonideality, J. Fluid Mech. 729, 496–523 (2013).
[3] W. Batson, F. Zoueshtiagh and R. Narayanan, Two-frequency excitation of single-mode Faraday waves, J. Fluid Mech. 764, 496–523 (2015).

<u>המארח</u> : פרופ׳ אלכס אורון

בברכה,

פרופ'/מ אמיר גת
מרכז הסמינרים