Biomechanics Seminar - סמינר בביומכניקה

הנך מוזמן/ת לסמינר משותף של הפקולטה להנדסת מכונות וביומכניקה, שיתקיים ביום ב׳ 22.06.15 (ה׳ בתמוז, תשע״ה), בבניין דן-קאהן, קומה 0, אודיטוריום 1, שעה 14:30.

Associate Prof. Oded Farago
Department of Biomedical Engineering
Ben Gurion University of the Negev

על הנושא:

Inertial Langevin dynamics in inhomogeneous media

להלן תקציר ההרצאה:

The diffusive dynamics of a particle in a medium with space-dependent friction coefficient is studied within the framework of the inertial Langevin equation. In this description, the ambiguous interpretation of the stochastic integral, known as the "Ito-Stratonovich dilemma", is avoided since all interpretations converge to the same solution in the limit of small time steps. The new framework sheds light on the tendency of a Brownian particle to drift toward the low friction end of the system even in the absence of any real physical force. This phenomenon, which has been previously studied in the context of dissipative Brownian dynamics, is termed "spurious drift", although the drift is real and stems from an inertial effect taking place at the short temporal scales. We demonstrate that the quantity characterizing stochastic dynamics with spatially varying friction coefficient, $\alpha(r)$, is not the displacement of the particle, Δr, but rather $\Delta A(r)$ - the variation in the primitive function of $\alpha(r)$. We derive expressions relating the mean and variance of $\Delta A(r)$ to the applied physical force, temperature, and the duration of the dynamics. For a constant friction coefficient, $\alpha(r) = \alpha$, these expressions reduce to the well-known forms of the force-drift and fluctuation–dissipation relations. We introduce a very accurate method for Langevin dynamics simulations in systems with spatially varying, and use the method to validate the newly derived expressions.

המארח: פרופ׳/מ ספי גבלי

בברכה,

פרופ׳/מ אמיר וקס
מרכז הסמינרים