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 ד׳ 5.04.17 (ט׳ בניסן, תשע״ז), בניין דן-קאהן, קומה 0, אודיטוריום 1 , 13:30.

יוצג: עוז רז

מנחה: פרופ׳/ח גלעד יוסיפון

על הנושא:

אקטואציה אלקטרו-קינטית של מיקרו-חלקיקים אקטיביים

Electrokinetic actuation of active colloids

The seminar will be given in Hebrew

להלן תקציר ההרצאה:

Electrokinetically driven metallo-dielectric Janus particles (JP) represent a unique platform, lying at the intersection of the traditional fields of self-propulsion and phoresis, since although the particles will only move in the presence of an externally applied field (similar to phoretically driven colloids), their direction of motion is not restricted by this field and they are free to translate along individual pathlines and also exhibit group behavior, hence may best be classified as active colloids. Within this work, we focus on two important nonlinear mechanisms, which govern the mobility of symmetry-broken Janus spheres subject to AC electric fields; induced-charge electroosmosis (ICEO) and dielectrophoresis (DEP). While at low frequencies the JPs are shown to travel with their dielectric hemisphere forward (ICEO dominated), at high frequencies, well beyond the charge relaxation time of the induced electric double layer, the JPs reverse direction, traveling with their metallic hemisphere forward (DEP dominated). Within this body of work, we aim to experimentally characterize the electric field frequency and amplitude response of these particles in terms of their mobility and in particular the orientation of the metallo-dielectric interface while traversing along either insulating or conducting walls. These are explained by the competition between ICEO, electro-orientation and gravity. It is also demonstrated that these Au half-coated JP can further enhance electro-rheological effect relative to their homogenous dielectric counterparts.

בברכה,

פרופ״א שאול אושפיז׳

מרכז הסמינרים