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' 3.10.2019 (ד' בתשרי, תש"פ), בניין דן קאהן, אודיטוריום 1, 13:45.

מרצה: גיל גור-אריה

מנחה: פרופ'/ח דן מרדכי

מנחה שותף: פרופ' דורון שילה

על הנושא:

A General Model for Relations between Material Properties and Barriers for Twin Boundary Motion

The seminar will be given in Hebrew

תקציר ההרצאה :

Twinning is a common mode of plastic deformation that takes place via the motion of material interfaces called twin boundaries. In a previous work of our group, a discrete "atomistic" model, based on the continuous Landau-Ginzburg (LG) model was demonstrated. The model was simulated using Molecular Dynamics and other energy minimization algorithms and provided analytical expressions for static properties and motion barriers for twin boundaries. The calculated results described well the behavior of ferroelectric and ferroelastic materials.

In this work, we expand the aforementioned discrete LG model to account for both shear and axial deformations in the vicinity of the twin boundary. We found that the expanded non-constrained model describes several configurations/topologies of the twin boundary, and specifically some low-width configurations which are typical for twin boundaries in metallic alloys. In other words, we found a very general model that well-describes static and dynamic properties of twin boundaries both in ceramic materials and metallic alloys. Thus, analytical expressions obtained based on the model calculations provide general relations between bulk material properties and nanoscale twin boundary properties.

בברכה,

פרופ"א אתי סאס
מרכז הסמינרים