SEMINAR - סמינר

הנך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות, שתתקיים ביום ד' 17.05.2017 (כא' באייר, תשע"ז), בבניין דן קאהן, אודיטוריום 1, 13:30.

תרצה:

פרופ"מ שמואל אוסובסקי
הפקולטה להנדסת מכונות
הטכניון

על הנושא:

Ductile fracture at the microscale

The seminar will be presented in English

להלן תקציר ההרצאה:

One of the most challenging fields in computational mechanics, is the prediction of ductile failure. The ability to successfully predict a component's failure envelope under working conditions is of utmost importance at various fields of engineering, covering the full life cycle of the material from fabrication and design all the way to the component's performance under various extreme scenarios (e.g. safety assessments). As such, it has been a problem of longstanding research and investigation aiming at gaining a better grasp of the physical mechanism involved, as well as improving the prediction capabilities through sophisticated numerical methods. Most ductile structural alloys have been observed to fail through a mechanism involving the nucleation, growth and coalescence of voids. The damage evolution resulting from those mechanisms is highly dependent on the material's underlying microstructure as well as on the applied boundary conditions. Structural components are undergoing complex loading paths and large deformations in their forming stage, and later on are exposed to multi-axial non-monotonic loading. The prediction of ductile failure under such circumstances requires understanding of the damage accumulation mechanisms at the micro-scale level, to be carried up to the component scale simulations, also known as high-level models. Understanding the role of various microstructural features in the ductile failure process, will pave the way to application tailored materials. In this presentation, I will address some of the recent experimental and computational results regarding the microstructural origin of ductile fracture in Advanced High Strength Steels (AHSS). A second set of experiments, aimed at identifying the effect of strain hardening on crack growth mechanisms will be presented, to shed light on the observation made regarding AHSS. Finally, I will demonstrate how the coupling of experiments and simulations can be used to design a new material with enhanced toughness while maintaining its strength.

בברכה,

פרופ"מ שמואל אוסובסקי
מרכז הסמינרים