

## סמינר - SEMINAR

הנך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות, שתתקיים ביום ב' 27.01.2020  
(א' בשבט תש"פ), בניין דן קאהן, אודיטוריום 1, 14:30.

מרצה:

**Dr. Gaddiel Ouaknin**  
Department of Chemical Engineering  
Stanford University

על הנושא:

### Shape structure coupling of inhomogeneous polymers

The seminar will be given in English

להלן תקציר ההרצאה:

Polymeric materials have tunable engineering properties that can be applied to a myriad of applications from nano-lithography to drug delivery. The flexibility to architect polymer chains enables to design complex materials with desired properties. Polymer field theory is a mathematically rich and physically deep framework to model the self-assembly of inhomogeneous polymers at equilibrium. Translated into a computational tool, it is able to predict and compute the equilibrium structure of polymeric materials. Given only the polymer chain architecture, the interaction between its components, polymer field theory decouples the chain-chain interactions through a self-consistent field and is able to predict elastic, optical and electrical properties of the self-assembled material. Most of the studies have been focused on either periodic domains or prescribed shapes. However, where the enveloping shape of the polymeric material is also a degree of freedom, the shape and the phase are coupled. This coupling, can be leveraged to formulate direct and inverse problems. In this talk, we will discuss, the theoretical and computational challenges and especially how to efficiently embed the level set formalism within polymer field theory. We will discuss as well future research avenues and potential applications. We will then briefly discuss, opportunities to embed deep learning and reinforcement learning into shape optimization within a level set framework in the context of soft robot navigation.

מארח: פרופ' אולג גנדלמן

בברכה,

פ"פ א"מ איתי סאס  
מרכז הסמינרים