

Title:

**Stability and roughness of crack paths in 2D  
heterogeneous brittle materials**

**Eytan Katzav**

*The Racah Institute of Physics  
The Hebrew University of Jerusalem*

**Abstract:**

Prof. Katzav will present a recent study on the stability of propagating cracks in heterogeneous two-dimensional brittle materials and on the roughness of the surfaces created by this irreversible process. A stochastic model describing the propagation of the crack tip will be introduced. This model is based on an elastostatic description of crack growth in the framework of linear elastic fracture mechanics. The model recovers the stability of straight cracks (better known as the T-criterion of Rice) and allows for the study of the roughening of fracture surfaces. It turns out that in a certain limit, the problem becomes exactly solvable and yields analytic predictions for the power spectrum of the paths. This result suggests a surprising alternative to the conventional power law analysis often used in the analysis of experimental data and thus calls for a revised interpretation of the experimental results.

Future directions will be briefly discussed.

Date & Location:

**Tuesday, December 26, 2017, 11:00  
Lecture room, Physics Building (ground floor)**

