

**SUPERFLUID-INSULATOR TRANSITION IN A MOVING SYSTEM OF
INTERACTING BOSONS**

Ehud Altman

*Department of Cond. Matter Physics
Weizmann Institute of Science
Rehovot, 76100, Israel*

I will present a generalization of the superfluid-Mott insulator transition of interacting bosons to the non equilibrium situation where a supercurrent is flowing in the lattice. For a three dimensional lattice we predict a sharp transition at a critical interaction strength beyond which the current is dynamically unstable. In one and two dimensions on the other hand, quantum phase slips induce significant current decay well before the critical interaction strength is reached, leading to broadening of the transition. I will discuss implications of our results to interpretation of current and future experiments in optical lattices.