



Solid State Institute
המכון למצב מוצק

TECHNION
Israel Institute
of Technology



הטכניון
מכון טכנולוגי
לישראל

SPECIAL SEMINAR

סמינר מיוחד

Realizing Shortcuts to Adiabaticity in optical transfer of ultracold atoms

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Shortcuts to Adiabaticity (STA) refers to a class of schemes enabling the fast variation of a system Hamiltonian while still reaching a specific target state. They are based on cleverly tailoring the fast driving protocol such that the system reaches the desired final state without being adiabatic. Yet, the experimental implementation of STA suffers from an inherent problem arising from the fact that these driving profiles are suited for the atoms trajectory as in practice the trap coordinate is the controlled one. In this seminar I will present the experimental realization of these STA schemes for optical transfer of ultracold atoms. I will show that in order to lift conflicting boundary conditions or to cope with non-ideal spatial control, it is necessary to increase the number of degrees of freedom in the trajectory. We develop and demonstrate two complementary methods to achieve this; the first acts as a “correction” to the original trajectory, while in the second approach the trajectory is redesigned to account for all boundary conditions. Using both methods we demonstrate successful transports of cold atoms in highly nonadiabatic regime.

ההרצאה תתקיים ביום ראשון, ה-8.4.18 בשעה 12:30

באודיטוריום המכון למצב מוצק, קומת כניסה

**The lecture will take place on Sunday, 8.4.18 at 12:30
at the Solid State Institute auditorium, entrance floor**

M.Sc. Student of Assistant Professor Yoav Sagi