



Solid State Institute
המכון למצב מוצק

TECHNION
Israel Institute
of Technology



הטכניון
מכון טכנולוגי
לישראל

SEMINAR

סמינר

Quantum phases and dynamics of a single atom coupled to many degrees of freedom

Gal Ness

Department of Physics and The Solid State Institute,
Technion

Abstract

Ultracold gas experiments offer a perfect testbed to explore quantum dynamics and phase transitions. Even in the simplest case of a single particle, new and complex physics emerge when the number of coupled degrees of freedom is increased. In this talk, I will present two experimental studies I conducted during my PhD which illustrate this phenomenon. The first study was done with a single atom in a multi-level lattice potential, leveraging fast atomic interferometry. There, we discovered a novel crossover between two quantum speed limits. A second experiment investigated the quantum state of a fermionic impurity particle immersed in a bath of different fermionic particles. In this scenario, we revealed a continuous transition between two distinct ground states – a polaron quasi-particle and a molecule. There is a first-order transition in the limit of a single impurity; however, when many impurities are introduced, we find that it is smoothed due to the quantum statistics of the involved quasi-particles.

ההרצאה תתקיים ביום רביעי, ה-30.3.22 בשעה 12:30
באודיטוריום המכון למצב מוצק, קומת כניסה

The lecture will take place on Wednesday, 30.3.22 at 12:30
at the Solid State Institute auditorium, entrance floor

Join Zoom Meeting <https://technion.zoom.us/j/94688374220>

Ph.D. Student of Associate Professor Yoav Sagi