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המכון למצב מוצק

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New opportunities in quantum simulation with trapped ions

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Abstract

Engineered, highly controlled quantum machines can be used to simulate the behavior of quantum many-body systems, potentially providing insight into a variety of complex quantum phenomena. Of these systems, those in which time-reversal symmetry is broken present a particularly interesting class of emergent behaviors (e.g. the quantum Hall effect) and are an important target for future quantum simulators. One-dimensional arrays of ions held in linear RF traps are one of the most (if not the most) highly controlled quantum platforms available, making them excellent and accomplished quantum simulators; however, the range of models that are typically simulated using these platforms is limited. I will discuss ways of significantly broadening the scope of ion quantum simulators, allowing them to transcend their natural 1d geometry and to incorporate time-reversal symmetry breaking features, including all salient ingredients for observing some interesting many body phenomena. I will also present our recent realizations of such quantum simulations, including simulation of interacting excitations in a frustrated, time-reversal broken system and measurement of persistent current in the ground state.

ההרצאה תתקיים ביום רביעי, ה-6.10.21 בשעה 12:30

באודיטוריום המכון למצב מוצק, קומת כניסה

**The lecture will take place on Wednesday, 6.10.21 at 12:30
at the Solid State Institute auditorium, entrance floor**

Host: Associate Professor Yoav Sagi