



Solid State Institute  
המכון למחצב מוצק

TECHNION  
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הטכניון  
מכון טכנולוגי  
לישראל

**SPECIAL SEMINAR**

**סמינר מיוחד**

## **Coherently-driven exciton polaritons and cavity - QED effects in a coupled quantum dot-micropillar system**

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### Abstract

Cavity quantum electrodynamics (c-QED) systems have attracted extensive research interest in the past decades as the main driving force of quantum optics. Corresponding milestone experiments paved the way towards the realization of a wide variety of non-classical light sources bringing the concept of photonic quantum networks to a practical level. In view of future applications in the quantum information technology, the solid state platform of microcavities with embedded quantum emitters is very attractive as it promises low-cost mass production as well as interoperability with the integrated electronic circuit technology of today. The presented work includes studies of the quantum dots (QD)-micropillar system in both the weak and strong coupling regime using coherent and incoherent excitation. For this purpose an advanced  $90^\circ$  excitation and detection scheme, suitable for efficient wavelength-independent driving of the coupled exciton and cavity mode system, was implemented. This flexible and powerful technique enables access to the three-dimensional emission characteristics of QD-micropillars providing new insight into single exciton – cavity QED effects. One primary result is the observation and description of the transformation of the Jaynes-Cummings into the Autler-Townes ladder under coherent excitation of a polariton through the matter component.

**ההרצאה תתקיים ביום שני, ה-20.2.2017 בשעה 11:30  
בבניין פיסיקה, חדר סמינרים (502)**

**The lecture will take place on Monday, 20.2.2017 at 11:30  
at the Physics Building, Seminar Room (502)**

**Host: Professor David Gershoni**