



Solid State Institute
המכון למצב מוצק

TECHNION
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of Technology



הטכניון
מכון טכנולוגי
לישראל

SPECIAL SEMINAR

סמינר מיוחד

Quantum Design of Coherent X-rays

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Abstract

Nonlinear optics revolutionized the ability to create directed, laser-like light particularly in the regions where lasers based on conventional population inversion are not practical. New breakthroughs in attosecond extreme nonlinear optics promise a similar revolution in the X-ray regime. In this talk, I will discuss the fundamental quantum physics and the phase matching limits of high order harmonic generation in the context of designing coherent X-ray waveforms in the soft X-ray region which can be tailored in the moment of generation. Such a versatile light source is ideal for 4D studies of various bio- and nano-systems with attosecond temporal and nanometer spatial resolution, as well as with element and chemical specificity. I will also discuss the path forward for generating bright coherent X-ray beams from a laboratory-scale apparatus at photon energies of 10 keV and greater with unprecedented attosecond-to-zzeptosecond pulse durations, and with arbitrary spectral, temporal shapes, and spin and orbital angular momentum. A fully spatially and temporally coherent version of the Roentgen X-ray tube with exquisite quantum control of the properties of the soft and hard X-ray light may be possible.

ההרצאה תתקיים ביום חמישי, ה - 14.12.2017 בשעה 13:30
באודיטוריום המכון למצב מוצק, קומת כניסה

The lecture will take place on Thursday, 14.12.17 at 13:30
at the Solid State Institute auditorium, entrance floor

Host: Associate Professor Oren Cohen