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Novel optical phenomena in time-varying media

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Abstract

Time-varying optical materials have attracted recent interest for their potential to enable frequency conversion, nonreciprocal and non-Hermitian physics, photonic time crystals, and more. However, the description of time-varying optical materials has been largely limited to regimes where material resonances (i.e., dispersion), can be neglected. In this talk, I will describe a general unifying framework for describing the optical properties of dispersive time-varying materials. I will show how this framework can be applied across a wide variety of platforms, including: few level systems that can be realized in atoms, spins, or qubits; strongly driven polar insulators; and even strongly driven gasses used for high harmonic generation. I will discuss several new physical phenomena that can be enabled by these systems. A special emphasis will be placed on using time-varying systems to create novel light sources, such as new types of lasers and entangled photon pair sources.

ההרצאה תתקיים ביום רביעי, ה-28.12.22 בשעה 12:30
באודיטוריום המכון למצב מוצק, קומת כניסה
The lecture will take place on Wednesday 28.12.22, at 12:30
at the Solid State Institute Auditorium, entrance floor

Host: Associate Professor Ido Kaminer