

Shedding nano-light on quantum materials

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Lundi 24 octobre 2022 – 14h00
Amphithéâtre SOLEIL

Optical imaging is pervasive in daily life and in modern technology. Unfortunately, optics encounters problems when it comes to „seeing“ objects that are much smaller than the wavelength of light. And that is the task we are commonly facing in the physics of quantum materials hosting various unexplored quantum phases. Interesting effects in these systems often occur at nano-meter length scales that are much shorter than the wavelength of light. The wavelength obstacle in imaging is epitomized under the notion of „the diffraction limit“ and is particularly acute in infrared range where the wavelength is extremely long: 10-s or even 1000-s of microns.

Over the last decade, our group introduced and deployed a fundamentally different form of optical imaging well suited to extend infrared and optical experiments to the nano-scale. We no longer use free space photons to inquire into the new physics of quantum materials. Instead, our imaging agent is a hybrid quasiparticle known as a polariton that is comprised of a photon and material excitations. Polaritons are extremely compact beating the diffraction by several orders of magnitude. Yet they are mobile and can surf along the sample surfaces over macroscopic distances. As we track „nano-light“ polaritonic waves with home-built tools, we learn about the physics of quantum materials supporting these waves. In this talk, I will discuss several examples of progress with the understanding of the electronic phenomena and of topological effects in solids all empowered by nano-light.



Ce séminaire sera suivi d'une pause café

si les conditions le permettent...

Formalités d'entrée : accès libre dans l'amphi du pavillon d'Accueil.

Si la manifestation a lieu dans le Grand Amphi SOLEIL du Bâtiment Central merci de vous munir d'une pièce d'identité (à échanger à l'accueil contre un badge d'accès).

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