Séminaire Général de Physique

Quantum fluids of light in semiconductor lattice

Jacqueline Bloch

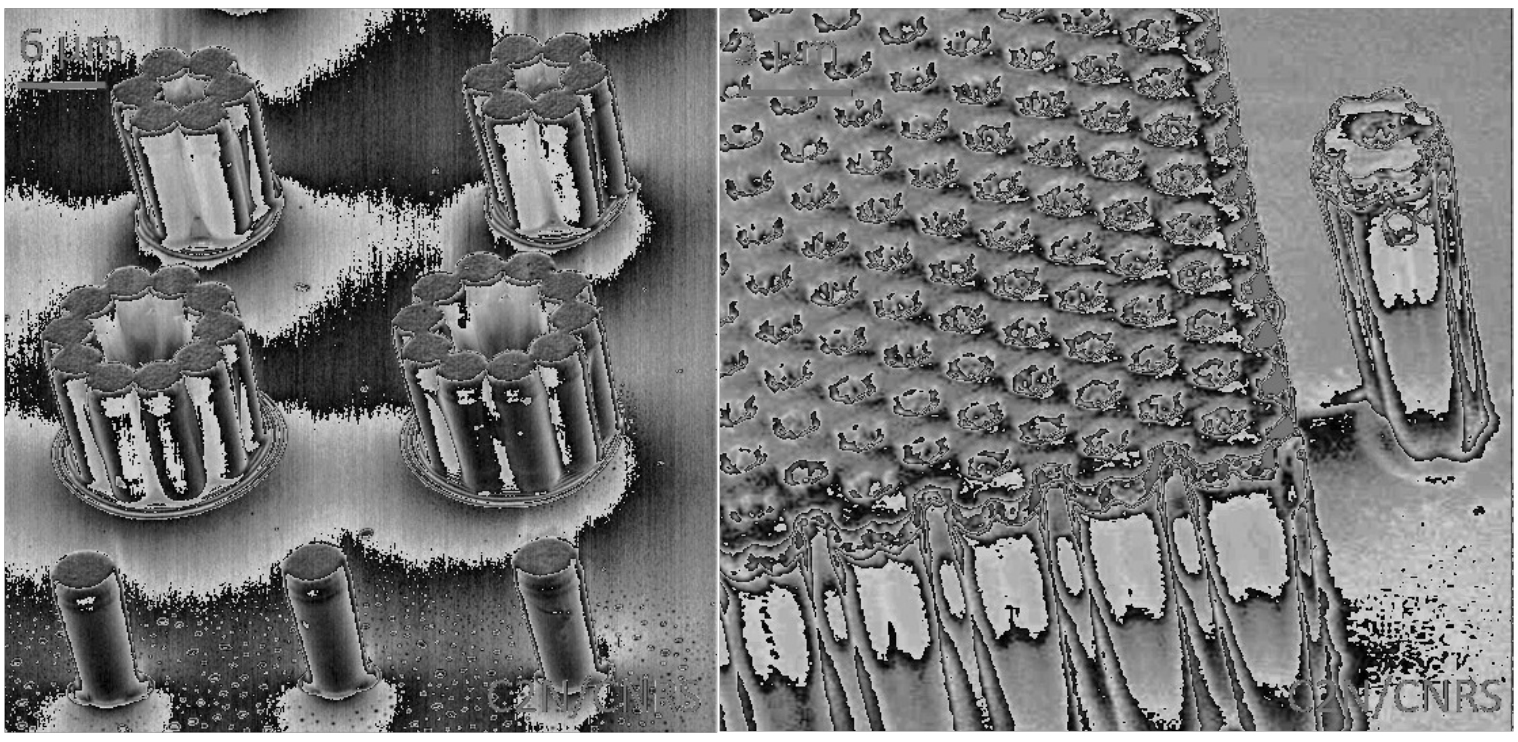
(C2N, Université Paris Saclay/CNRS)

Amphi PGG, vendredi 24 janvier 2020, 10h

(café-croissants à partir de 9h40)

When confining photons in semiconductor lattices, it is possible to strongly modify their physical properties and explore the physics of a variety of Hamiltonians. Photons can behave as finite or even infinite mass particles, photons can propagate along topological edge states without back scattering, photons can become superfluid and behave as massive interacting particles. These are just a few examples of exotic properties that we can imprint into quantum fluids of light in semiconductor lattices. Such manipulation of light present not only potential for applications in photonics, but great promise for fundamental studies of driven dissipative systems.

After a detailed introduction to quantum fluids of light, I will illustrate the variety of physical systems we can emulate with this photonic platform by presenting a few recent experiments: a photonic benzene molecule that emits helical photons, a photonic 1D lattice with topological edge states and photonic graphene with exotic Dirac cones. Perspectives in terms of quantum correlations will be discussed.



PHYSIQUE
Sciences
Université de Paris