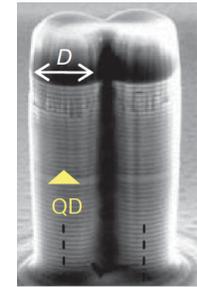


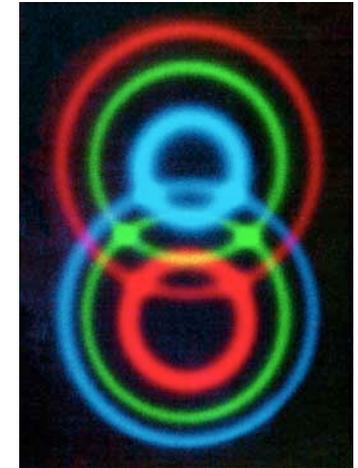
# Quantum Optics in Condensed Matter

Cristiano CIUTI and Sara DUCCI



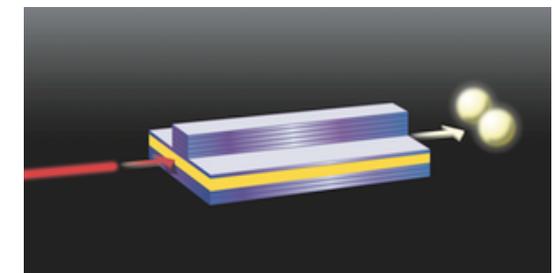
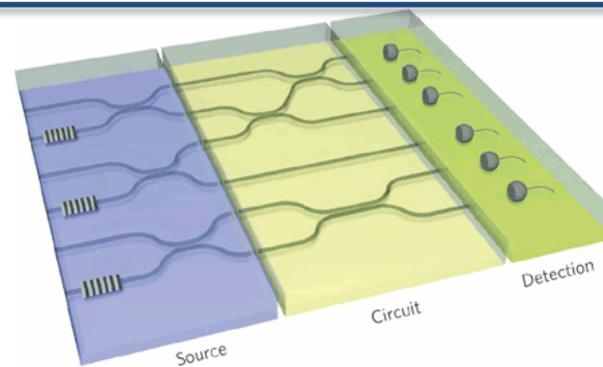
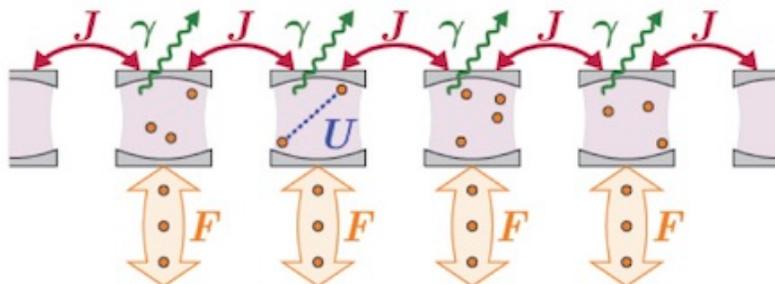
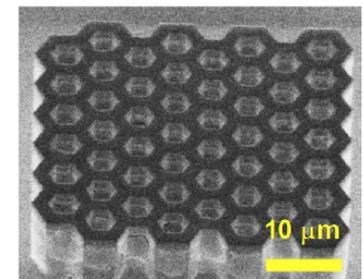
## Overview:

- Paradigmatic models of nonlinear quantum optics
- Fundamental experimental techniques and protocols
- **Solid-state quantum optical devices**
- **Quantum fluids of light**
- **Topological photonics and quantum photonics**



## Written exam:

- Questions on 4 articles about different topics of the course. The articles will be given to the students two weeks before the exam.



# Plan of the lectures

- 16/1: Introduction & overview of the course  
Quantum platforms  
(semiconductor structures, superconducting circuits, ....)
- 23/1: Open quantum systems and reservoir-engineering  
Ultrastrong light-matter coupling  
Giant optical nonlinearities and photon blockade
- 30/1: Quantum optical measurement techniques (SD)
- 6/2: Quantum fluids of light and topological photonics
- 13/2: Panorama of solid-state single-photon sources  
(single emitters, parametric nonlinear processes, .... ) (SD)
- 20/2: Dissipative quantum phase transitions
- 13/3: Semiconductor sources of entangled photons (SD)
- 20/3: Quantum photonic circuits (SD)

3/4: Written exam