Quantum Optics with Semiconductors and Dirac Materials

TOBIAS GRASS

February 04, 2020
10:15 to 11:15
Blue Lecture Room

Lectures, January 14, 21, and 28, and February 4, 2020, 10:15. ICFO's Blue Lecture Room

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Quantum Optics Theory Research Group ICFO-The Institute of Photonic Sciences

In this series of four introductory lectures, topics at the interface of quantum optics and electronic materials will be discussed. The first lecture will introduce the concept of bandstructure and k.p theory. In the second lecture, these concepts will be applied to free optical transitions, and as an example, I will discuss optical selection rules in Dirac materials. The third lecture will introduce the concept of excitons, including Dirac excitons in relativistic materials, as well as excitons-polaritons. As a general framework for treating optical transitions in electronic materials, I will introduce the semiconductor Bloch equations in the fourth lecture.

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