PHYSICS SEMINAR SERIES

TOPIC: Excitations of polariton superfluids

SPEAKER: Dario Ballarini,
National Research Council Institute of Nanotechnology (Italy)

TIME: 2:00-3:00pm, Tuesday, May 22, 2018

VENUE: Room 264, Geography Building, Zhongbei Campus
(华东师范大学中山北路校区，地理楼 264 室)

HOST: Tim Byrnes, NYU Shanghai

ABSTRACT OF THE TALK

Exciton-polaritons in semiconductor microcavities are composite bosons with the unique capability of forming driven-dissipative condensates. Recently, a new generation of high-quality samples have enabled the realization of spatially extended and long-lived polariton condensates, opening the door to the measurement of correlation functions over large distances and long delay times. Here we show that topological excitations can be induced in a polariton superfluid by imposing a twisted-phase boundary pinned to external lasers. A wide range of new dynamical responses of the condensate is shown, spanning from the formation of a long phase-slip line to the nucleation of Josephson vortices, until the recovering of the superfluid behavior at higher densities.

BIOGRAPHY

Dario Ballarini, Italian. After receiving the Bachelor degree in Physics at University of Pavia, Italy, D.B. moved to Spain (Universidad Autonoma de Madrid) where he obtained the Ph.D. in Physics in 2008 for the study of the collective behavior of quantum fluids of exciton-polaritons. Back to Italy at IIT (Italian Institute of Technology), his research activity was directed toward the experimental investigation of the electro-optical properties of polariton condensates and their realization with hybrid semiconductors for room-temperature devices. In 2016, he was appointed with a permanent position as a Researcher at CNR-NANOTEC, Institute of Nanotechnology of the National Research Council (Italy), where he is involved at present in the investigation of light-matter interaction in a variety of structures and materials for fundamental and technological purposes.