

# Room-temperature low-threshold exciton polariton condensation in perovskite microcavities

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In this talk, I will discuss the exciton polaritons of semiconductor microcavities towards low-threshold, high coherence laser sources. First, we achieved continuous-wave optically pumped polariton condensation with an exceptionally low threshold of approximately  $0.53 \text{ W cm}^{-2}$  in DBR/semiconductors with potential landscapes/DBR microcavities. We also unveil that the potential landscapes leads to discrete energy levels with narrow linewidths and enhanced polariton relaxation, contributing to the reduction of the condensation threshold. Second, we realized two-dimensional bound state in the continuum (BIC) exciton polariton condensation and vortex laser at room temperature. We further demonstrated an all-optical switch operating on the 10-picosecond timescale, enabled by the intrinsic nonlinearity of BIC polaritons.

## **Short Bio:**



**Qing Zhang** is an tenured Associate Professor at the School of Materials Science and Engineering, Peking University, China. She is National High-level Young Talent, Beijing Outstanding Young Scientist, and Principal Investigator of Key R&D Program Project NSFC Joint Fund Key Project. She received her bachelor's degree from the University of Science and Technology of China in 2005, and her Ph.D. in Physics from Tsinghua University in 2010. From 2011 to 2016, she conducted postdoctoral research at Nanyang Technological University, Singapore. She began her independent academic career at Peking University in 2016. Her research focuses on light-matter interactions in optoelectronic materials at the nanoscale and their applications in nanophotonics and optoelectronic devices.