**Title**: Solid-state quantum emitters for integrated quantum photonics

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**Abstract**:

Future quantum information processing would rely on solid-state quantum systems that integrate multiple quantum emitters, waveguides, beamsplitters, and detectors on the same chip, and therefore all quantum operations are efficiently possible on-a-chip. Semiconductor quantum dots have attracted much attention as a bright source of quantum light with high single photon purity and indistinguishability. However, these man-made quantum structures also have many problems such as a low photon collection efficiency, randomness in their frequency and position, and strong interaction with environment, limiting them to be used for practical applications. In this seminar, I present recent research on the quantum dots in photonic crystal structures for quantum photonics applications. Quantum dots serve a source of single photons, and photonic crystal structures provide an excellent platform for integrated quantum emitters by enhancing both spontaneous emission rate and coupling efficiency. By combining these two engineered electronic and photonic structures, *i.e.,* quantum dots and photonic crystals, we demonstrate multiple, identical quantum emitters on-a-chip that generate indistinguishable single photons. Also, we show on-chip interaction between quantum emitters on-a-chip. Finally, I show a strong potential of these solid-state quantum systems for future scalable, integrated quantum photonic devices.