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***Scalable Quantum Photonics with Single-Photon Emitters in  
Silicon Nitride***

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**BRK 1001**

**[Zoom Link](#)**

**Abstract**

We review the recent advances in quantum photonics and the unique applications they enable. Our group have recently discovered intrinsic quantum emitters in silicon nitride (SiN), which provide bright, high-purity single-photon emission at room temperature and the capability of seamless integration with SiN photonic waveguides. We also established methods of creation of these quantum emitters and performed foundational photophysical studies at room and cryogenic temperatures. Furthermore, we explore the possibility of generating indistinguishable photons at high repetition rates at cryo-temperatures and by using plasmonic metamaterials, which may enable broader applications of SiN quantum emitters. Plasmonic speed-up of spontaneous emission rate beyond the rate of detrimental decoherence processes may also enable the generation of indistinguishable photons even at non-cryogenic temperatures. We also provide outlook for exciting future developments in the field of quantum photonics.

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