

## Identical Photons and Coherent Spins from Low-Noise GaAs Quantum Dots

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Quantum networks require quantum nodes with storage capabilities to process, store, and distribute quantum information. A key challenge is achieving a coherent light-matter interface. This report explores photonic and solid-state qubits in low-noise GaAs quantum dots. On the photonic side, we generate highly indistinguishable single photons and demonstrate high indistinguishability between photons from different quantum dots, supporting large-scale quantum applications. On the solid-state side, we achieve coherent control of quantum dot spin and orbital states. Additionally, feedback cooling of the nuclear spin ensemble significantly extends electron spin coherence. Our work advances the realization of a coherent light-matter interface in solid-state epitaxial quantum dot systems.



## Short Bio:

**Liang Zhai** received his MSc degree in quantum physics from the Niels Bohr Institute, University of Copenhagen, and subsequently completed his PhD at the University of Basel, Switzerland. He is currently a professor at the University of Electronic Science and Technology of China. His research focuses on quantum photonics and solid-state quantum emitters.