



Illinois Wesleyan University
Digital Commons @ IWU

John Wesley Powell Student Research
Conference

2016, 27th Annual JWP Conference

Apr 16th, 2:00 PM - 3:00 PM

Quantum Optics and Single Photon Quantum Information Processing

Zhenghao Ding
Illinois Wesleyan University

Lunjun Liu
Illinois Wesleyan University

Gabriel Spalding, Faculty Advisor
Illinois Wesleyan University

Follow this and additional works at: <https://digitalcommons.iwu.edu/jwprc>



Part of the [Education Commons](#), and the [Physics Commons](#)

Ding, Zhenghao; Liu, Lunjun; and Spalding, Faculty Advisor, Gabriel, "Quantum Optics and Single Photon Quantum Information Processing" (2016). *John Wesley Powell Student Research Conference*. 12.

<https://digitalcommons.iwu.edu/jwprc/2016/posters2/12>

This Event is protected by copyright and/or related rights. It has been brought to you by Digital Commons @ IWU with permission from the rights-holder(s). You are free to use this material in any way that is permitted by the copyright and related rights legislation that applies to your use. For other uses you need to obtain permission from the rights-holder(s) directly, unless additional rights are indicated by a Creative Commons license in the record and/ or on the work itself. This material has been accepted for inclusion by faculty at Illinois Wesleyan University. For more information, please contact digitalcommons@iwu.edu.

©Copyright is owned by the author of this document.

Poster Presentation P24

QUANTUM OPTICS AND SINGLE PHOTON QUANTUM INFORMATION PROCESSING

Zhenghao Ding, Lunjun Liu, and Gabriel Spalding
Physics Department, Illinois Wesleyan University

The possibility of using elementary particles, such as photons and electrons, to do information processing has been recognized for a long time, using quantum parallelism and quantum entanglement for information storage, computation and quantum key distribution. Recent advances, such as single-ion logic gates, nitrogen-vacancy diamond-based quantum logic gates and even the birth of the first silicone quantum processor, each offer distinct advantages and challenges. We begin our study of quantum information processing by studying quantum optics. We have performed experiments such as spontaneous parametric down conversion, for production of entangled photon pairs, as well as initial explorations of single-photon interference.