



**CLARK UNIVERSITY
DEPARTMENT OF PHYSICS
COLLOQUIUM**

**Donny Pearson
Department of Physics
University of Maryland, College Park**

**“Quantum Information, Quantum Memory, and
Applications in Rare-Earth Solid Atomic Systems”**

Abstract: As the demand for global and secure information transfer increases, quantum optical systems have been suggested as an excellent solution. Quantum optical systems and networks have demonstrated the potential for powerful computing, security based on the fundamental laws of physics, and precision measurements. However, long-range transmission of photonic quantum information is impracticable as the losses increase exponentially; therefore, there is a need for quantum repeaters. These quantum repeaters will implement quantum memory - a device that stores single photons, coupled to an atomic system, that can be recovered or processed on demand. Designing such a device has proven to be quite difficult. An efficient quantum memory device needs to be robust, broadband, and have long storage times. The properties of rare-earth atoms suggest that they are strong candidates for these devices due to their long-lived optical and spin lifetimes.

Biography: Donny Pearson is a graduate research assistant and Joint Quantum Institute graduate fellow at the University of Maryland, College Park. He graduated from Clark University in 2017 with a double major in chemistry and physics and wrote his honors thesis on scanning tunneling microscopy, scanning electron microscopy, and nanoparticle self-assembly under Dr. Michael Boyer. He also conducted research under Dr. Luis Smith in the chemistry department with development of NMR hardware. Donny matriculated at the University of Maryland, College Park in the fall of 2017 and has since joined the physics department graduate committee and the Joint Quantum Institute. He began his PhD research with Dr. Elizabeth Goldschmidt in the summer of 2018 in quantum memory in rare-earth atomic systems.

Tuesday, March 12, 2019

3:00 pm - Room S-122, Sackler Sciences Center