The 14th Condensed Matter Physics Seminar of the 2015/2016 Series

will be presented in the James Fletcher Building (JFB), room 334 on Thursday, January 07, 2015 at 4pm by

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Deterministic Generation of a Cluster State of Polarization-Entangled Single Photons

I will report on deterministic generation of a highly entangled, one dimensional state of many photons. The quantum state generated, called a “cluster state,” is an important resource for quantum information processing. Our demonstration follows the proposal of Lindner and Rudolph, which suggested repeated optical excitations of an electronic spin confined in a single semiconductor quantum dot. We use a dark exciton, instead of the electron, and demonstrate a practical realization of the proposal. Our demonstration therefore presents a possible breakthrough in quantum technology: we realize a deterministic source of many entangled photons, greatly reducing the resources needed for quantum information processing.