Physics Colloquium

Thursday Feb 21st, 2013, 4:10 – 5:00 pm, Reid 101

"How to catch a photon"

Dr. Wolfgang Tittel, Associate Professor and NSERC/GDC/iCORE Industrial Research Chair in Quantum Cryptography and Communication, University of Calgary, Calgary, Alberta

Abstract:
The use of light to carry information, and the reversible transfer of information between light and a stationary carrier, e.g. a computer hard disk, are necessary ingredients for modern Information and Communications Technology (ICT). Quantum communications rely on similar primitives, however, with significantly more severe constraints stemming from the impossibility to amplify encoded quantum information.

After a brief introduction into some of the key constituents of quantum communications, I will present recent work that has allowed us to reversibly transfer the quantum state encoded into a photon into an excitation in a thulium-doped lithium-niobate waveguide cooled to 3K. The possibility "to catch a photon" is interesting from a fundamental point of view and paves the path towards the quantum repeater, which will ultimately allow quantum communications over arbitrary distances.

Bio:

Wolfgang Tittel joined the University of Calgary and the Department of Physics and Astronomy in 2006 as Associate Professor and Industrial Research Chair. He is also affiliated with the Institute for Quantum Information Science, and is a steering committee member of the Institute for Security, Privacy, and Information Assurance. Dr. Tittel engaged in groundbreaking research in the field of quantum communication from the early stages on, which was seminal in bringing quantum cryptography out of the laboratory and into the real world.

Department of Physics and Astronomy and Institute for Quantum Information Science, http://www.iqst.ca/people/home/wtittel/

Host: Rufus Cone

Refreshments 3:45 p.m., EPS 2nd Floor Atrium