The iCORE Lectures

Quantum Fuel for Quantum Informatics

Barry Sanders

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University of Calgary

Wednesday March 24 at 4 pm

Host Location: Telus Centre Tiered Classroom, University of Alberta
Reception to follow

Interactive videolinked locations

Lethbridge: PE256, University of Lethbridge

Edmonton: Biosciences 587, University of Calgary

Abstract

Quantum information science provides an opportunity to revolutionize communication and computation by exploiting the principles of quantum physics and technological advances with light and new materials. We will begin with an accessible introduction to quantum physics and the foundations of quantum information science and then use video simulations to explain how quantum information protocols are realized optically. Finally we consider Calgary's program of concept-to-realization of quantum information protocols including two examples: sharing quantum secrets and quantum fingerprinting.

Biography

Barry Sanders obtained his Bachelor degree in physics from the University of Calgary and his doctorate from Imperial College, London, and was a postdoctoral researcher at the Australian National University and the Universities of Waikato and Queensland. For twelve years, he was at Macquarie University where he was Head of the Deparment of Physics for over six years. Now Sanders is iCORE Professor of Quantum Information Science at the University of Calgary and Director of Calgary's new Institute for Quantum Information Science. He is also an adjunct professor at Macquarie University where he continues to be a partner in Australia's Centre for Quantum Computer Technology, an Australian partner of the European program QUPRODIS (quantum properties of distributed systems), and President of the Australian Optical Society.

Barry Sanders conducts research in theoretical physics mainly in three areas: quantum information science, quantum optics and photonic crystals. He has over 100 refereed journal articles plus numerous conference papers and is best known for his work on practical quantum cryptography, simulatibility of quantum computation with continuous variables, nonlinear atom optics, the theory of entangled coherent states, and methods for observing nonclassical field dynamics in cavity quantum electrodynamics.