

# IEEE KITCHENER-WATERLOO

## SECTION PRESENTATION

### IEEE Communications Society Distinguished Lecture

## Prof. Edward (Ted) H. Sargent

Nortel Networks - Canada Research Chair in Emerging Technologies

University of Toronto

## “Nanotechnology: Quantum Engineering for the Optical Internet”

### Abstract:

Nanotechnology harnesses physical phenomena, which arise on the nanometer lengthscale. It seeks to meet the functional requirements of information technology and communications by exploiting the regime of quantum confinement of electrons. Bottom-up nanotechnology implements these functions through advances in materials chemistry, including natural and stimulated self-organization. I will present our results, which demonstrate the use of quantum dots embedded in processible semi conducting polymers to produce light across the entire optical communications spectrum. I will discuss how we are combining these materials with three-dimensionally photon-lengthscale textured materials to control electrons and photons in tandem. I will discuss how this work may facilitate the realization of an agile optical network.

### Biography:

Ted Sargent received the B.Sc. Eng. (Engineering Physics) from Queen's University in 1995 and the Ph.D. in Electrical and Computer Engineering (Photonics) from the University of Toronto in 1998. In 2003 he was named “one of the world’s top young innovators” by MIT’s Technology Review. In 2002 the Canadian Institute honored him for Advanced Research as one of Canada’s top twenty researchers under age forty. In 2002 he won the Outstanding Engineer Award of the Institute of Electrical and Electronics Engineers (IEEE) of Canada "...For groundbreaking research in applying new phenomena and materials from nanotechnology towards transforming fibre-optic communications systems into agile optical networks." He was awarded a Canada Research Chair at the University of Toronto in 2000: “[Ted Sargent] has created a new type of laser that unites many sophisticated optical devices onto a single, integrated photonic chip. His research links the emerging concept of the photonic circuit with the exploding field of fibre optic networks. Ted Sargent's doctoral research on the lateral current injection laser won him the 1999 NSERC Silver Medal.

**DATE: Monday December 8, 2003**

**TIME: 2:30 p.m.**

**LOCATION: DC 1302 University of Waterloo**

**Invited by: Prof. Raouf Boutaba**

**IEEE ComSoc/VT Kitchener-Waterloo Chapter Chair**

**All are welcome  
refreshments served!**