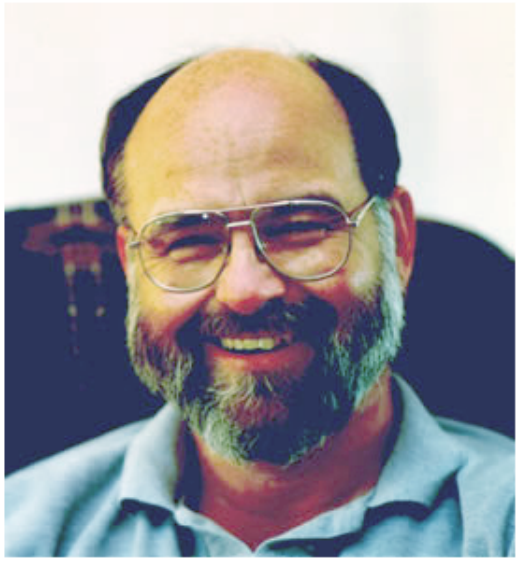
The Institute of OPTICS

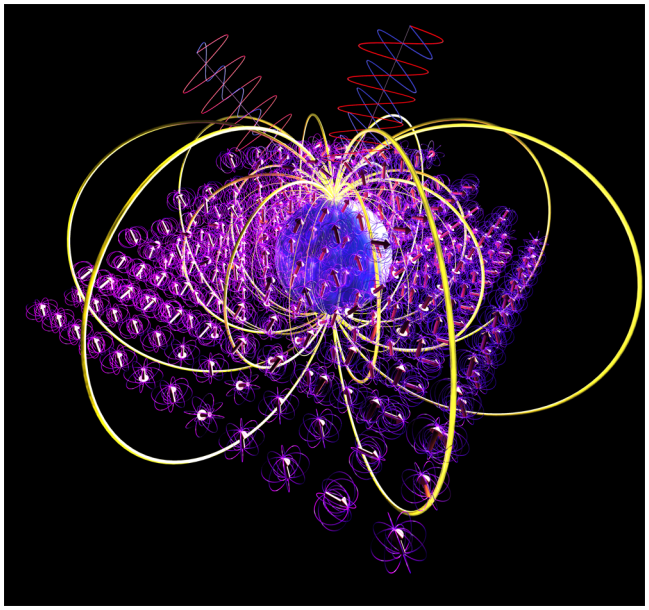
Colloquium

UNIVERSITY OF ROCHESTER

Semiconductor Quantum Dots for Quantum Photonics



Duncan G. Steel
The Robert J. Hiller Professor
EECS, Physics, and Biophysics
The University of Michigan



3:00 pm Monday, Feb 6, 2012
Sloan Auditorium, Goergen 101
Refreshments served

We will show a number of atomic-like properties such as dark state formation and gain without inversion on single quantum dots. An unexpected and still not entirely explained interaction is also shown that suppresses nuclear spin fluctuations and extends the electron spin coherence.

HAJIM
SCHOOL OF ENGINEERING
& APPLIED SCIENCES

Semiconductor Quantum Dots for Quantum Photonics

Duncan Steel
Department of Electrical Engineering and Computer Science
University of Michigan

Abstract:

The quantum confinement provided by a semiconductor quantum dot suppresses much of the many body physics associated with the coherent nonlinear optical response observed in higher dimensional systems. This makes them attractive for potential device applications where atomic like properties, such as high Q resonances, strong optical interactions, or long quantum coherence times, could be important. In this talk, we show a number of atomic-like properties such as dark state formation and gain without inversion on single quantum dots. An unexpected and still not entirely explained interaction is also shown that suppresses nuclear spin
fluctuations and extends the electron spin coherence.

Biography:

BA: UNC-Chapel
Ph.D. Univ. Michigan 1976.
Member of the Technical Staff, Hughes Research Labs (1975-1985)
University of Michigan faculty, EECS, Physics and Biopnhysics (1985-)

Honors/Awards
Robert J. Hiller Professor
U. Michigan Graduate Mentor Award
Isakson Prize from APS, ("For seminal contributions to nonlinear optical spectroscopy and coherent control of semiconductor heterostructures.")
Guggenheim Award
Fellow, APS, OSA, IEEE