



WEEKLY CALENDAR

2 MAY 2005

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GENERAL SEMINAR

3:40PM / Thursday, 5 May 2005 / Room 109, Nicholson Hall

Host: Dr. Jonathan Dowling

[Refreshments served at 3:15 PM in Room 229, Nicholson Hall]

ALL ABOUT EVE (and Secret Sharing Using Quantum Effects)

Dr. Deborah Jackson
Quantum Computing Technologies Group
Jet Propulsion Laboratory, NASA

ABSTRACT:

One of the chief weaknesses of current cryptographic schemes is the vulnerability presented when distributing the crypto-key among a group users. It has been found that quantum effects can be exploited to allow remotely separated parties to agree on a random sequence of bits in order to establish a crypto-key. This talk will explain both the physics behind Quantum Key Distribution (QKD) and how to use it in a practical scenario.



BIOGRAPHY:

Dr. Jackson has over twenty years experience in laboratory research covering a wide range of topics in electromagnetic phenomena, solid state integrated optics, and photonic systems development. Six of those years involved nonlinear optical research experiments with a specific emphasis on developing diagnostic techniques and detection schemes for photons from the visible through the mid-infrared. Another six years were in technology development, specifically developing optical devices that could be integrated onto high speed VHSIC and MMIC chips for advanced military applications. The next four years were spent at the RAND Corporation reviewing the state of the art photonics field, identifying where the technology has high impact potential, and also evolving a methodology for developing a photonic processor. The overall emphasis at RAND was on new concepts development at the systems level. At JPL, she has been involved in several flight missions: acting as the cognizant engineer for several RF subsystems in deep space projects, delivering the Mars Global Surveyor Ultra Stable Oscillator (USO) for launch in October 1996 and the Cassini Ultra Stable Oscillator (USO) for launch in October 1997. She has also served as Task Manager on the NSA funded task "Exploration of Optical Encryption for High Speed Digital Networks" from which a patent for a high speed optical XOR gate evolved. Currently, as a member of the Quantum Computing Technologies group, she has a long term interest in exploring how quantum networks can be exploited to aid autonomous decision making for sensor data fusion. Dr. Jackson received her B.S. Degree from MIT in 1974 and her Ph.D. in Physics from Stanford University in 1980.

PUBLICATIONS

"Gravitational-Wave Emission from Rotating Gravitational Collapse
in Three Dimensions." L. Baiotti, I. Hawke, L. Rezzolla, and E. Schnetter.
Phys. Rev. Lett. **94**, 131101(4) (8 April 2005).

REMINDER

There will be a Faculty Meeting at 3:40PM on Tuesday, 3 May 2005, in Room 109.