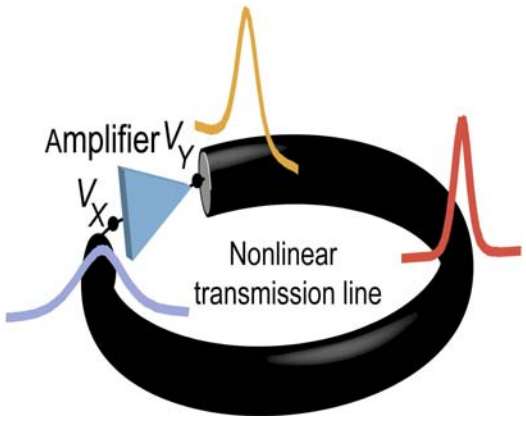
Electrical & Computer ENGINEERING

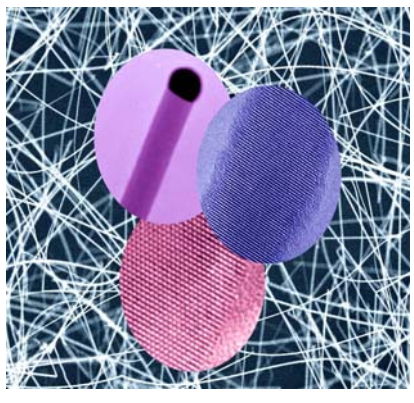
SEMINAR

THURSDAY
SEPTEMBER 14, 2006

Scaife Hall Auditorium
Room 125

4:30 p.m.
Refreshments—4:00 p.m





NEW DIRECTIONS IN HIGH-SPEED ELECTRONICS: ELECTRICAL SOLITON MODELOCKING & NANOWIRE FLEXIBLE CIRCUITS

DAVID RICKETTS

PROFESSOR
ELECTRICAL AND COMPUTER ENGINEERING

David Ricketts received the B. S. and M. S. degrees in electrical engineering from Worcester Polytechnic Institute and the PhD degree from Harvard University. He spent 8 years in industry developing a wide array of integrated circuits in bipolar and sub-micron CMOS, including high-speed wireline communication ICs, high efficiency DC-AC controllers and power management ICs for Intel and AMD microprocessors.

His research interests include ultrafast RF integrated circuits and devices, soliton electronics, and nanoscale electronics and quantum devices. Dr. Ricketts was awarded the Analog Devices Fellowship at Worcester Polytechnic Institute, was a 2004 Innovation Fellow at Harvard University, and was awarded the Analog Devices Outstanding Student Designer Award in 2006.

In this talk I will present the results of two research projects that offer intriguing new directions in high-speed electronics. The first combines the physics of the electrical soliton with a novel circuit design to create the first electrical soliton modelocked oscillator. This new oscillator self-generates a periodic train of sharp, electrical pulses to create a new paradigm for pulse generation in applications such as high-resolution sampling, TDR, and UWB radar and ranging systems.

The second project uses semiconductor nanowires to build low cost, high-speed macroelectronic circuits on glass and plastic substrates. Our latest results in the VHF frequency range demonstrate the viability of developing true RF nanowire circuits on transparent and flexible substrates, enabling the integration of high-performance RF electronics with everyday objects.

Radu Marculescu,
ECE Seminar Host:
radum@ece.cmu.edu

For more information:
http://www.ece.cmu.edu/seminar

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