SEMINAR

Electrical & Computer ENGINEERING

THURSDAY
APRIL 26, 2007

Scaife Hall Auditorium
Room 125

4:30 p.m.
Refreshments—4:00 p.m.

YURII A. VLASOV

IBM TJ WATSON RESEARCH CENTER,
YORKTOWN HEIGHTS, NY

Dr. Yurii Vlasov is a Research Staff Member at the IBM TJ Watson Research Center; Yorktown Heights, NY where he is leading a team working on silicon integrated nanophotonics for on-chip optical interconnects. Before joining IBM in the late 2001 he held various research positions at the NEC Research Institute in Princeton, USA and at the Strasbourg Institute of Physics and Chemistry of Materials (IPCMS), France developing semiconductor photonic crystals. Prior to all these career moves he was Research Scientist with the Ioffe Institute of Physics and Technology in St.Petersburg, Russia for over 12 years. He received his MS from the University of St.Petersburg in 1988 and the PhD from the Ioffe Institute in 1994, both in physics. Yurii is an author of over 100 publications, holds over 12 US patents, and delivered over 100 invited and plenary talks in the area of nanophotonic structures and photonic crystals. He served on numerous organizing committees on nanophotonics under OSA, IEEE, LEOS, APS, etc. He is a fellow of OSA and WTN, and a member of the APS, IEEE, and MRS.

ECE Seminar Hosts:

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Silicon Integrated Nanophotonics - Advantages and Challenges

The current trend in the microelectronics industry is to increase the parallelism in computation by multi-threading, by building large-scale multi-chip systems and, more recently, by increasing the number of cores on a single chip. With such increase of parallelization the interconnect bandwidth between the racks, chips or different cores is becoming a limiting factor for the design of high performance computer systems. The on-chip ultrahigh-bandwidth silicon-based photonic network might provide an attractive solution to this bandwidth bottleneck.

We will review recent results on silicon nanophotonic circuits based on photonic wires and photonic crystals. Strong light confinement at the diffraction limit enables dramatic scaling of the device area and allows unprecedented control over optical signals. Silicon nanophotonic devices have immense capacity for low-loss, high-bandwidth data processing that might enable the design of ultra-compact on-chip optical networks. In particular we will show recent results on design and characterization of various ultra-compact SOI waveguide circuits for on-chip optical delay lines with footprints smaller than $0.03 mm^2$.

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