



# 学术报告会

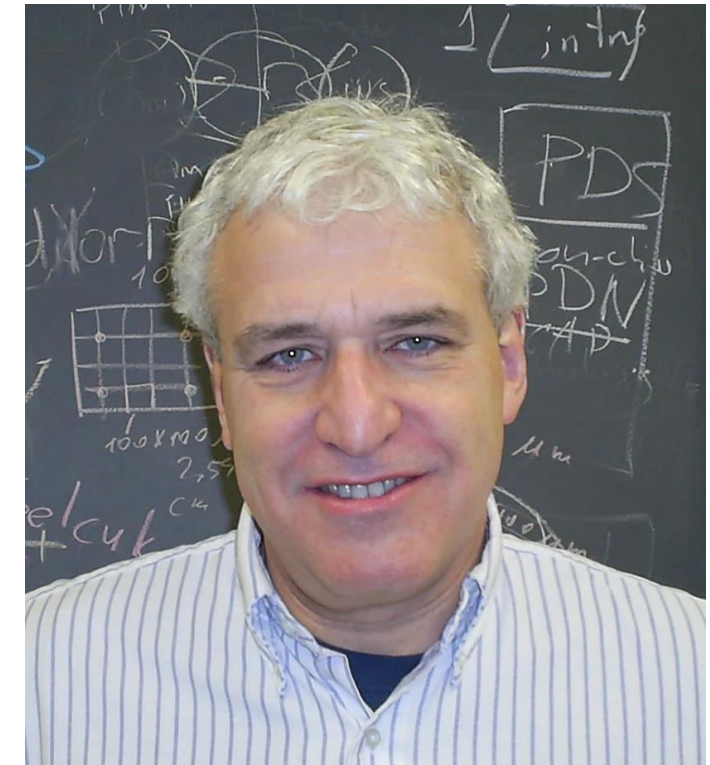
## Seminar Announcement

**题目: Research Challenges in High Performance VLSI Circuits**

**日期: 2018-4-24 (周二) 下午 2:00-4:00**

**地址: 微电子楼401会议室**

**报告人: Prof. Eby G. Friedman  
IEEE Fellow**



### Abstract:

The intention of this presentation is to provide an overview of the different projects of current focus in the high performance integrated circuit design research laboratory at the University of Rochester. Each of these topics considers different aspects of the systems integration process, with a focus on lower physical and circuit level aspects. Emphasis is placed on those fundamental challenges in delivering performance to high speed, high complexity heterogeneous integrated circuits. Technologies range from deeply scaled CMOS to emerging devices and circuits such as spintronic, photonic, and superconductive behaviors.

Delivering high quality power to on-chip circuitry with minimum energy loss is a fundamental objective of all modern integrated circuits (ICs). Circuits, algorithms, and design methodologies are being developed to fundamentally change the manner in which power is delivered on-chip. Three-dimensional (3-D) integration is changing the path for device scaling, supporting the delivery of multi-faceted heterogeneous systems. Several test circuits have been developed to evaluate some of the key issues in 3-D system integration. Spintronic circuits have the potential to enhance CMOS in several dimensions, particularly as non-volatile memory and novel non-von Neumann structures. A variety of models and circuits will be described and placed within a CMOS perspective. The energy expended in server farms has become an issue of seminal significance. An ultra-low energy technology is needed. One possible technology is superconductive single flux quantum (SFQ) circuits. This technology will be briefly reviewed, and novel design methodologies will be described to support the development of large scale Josephson junction based integrated systems.

### Biography:

Eby G. Friedman received the B.S. degree from Lafayette College in 1979, and the M.S. and Ph.D. degrees from the University of California, Irvine, in 1981 and 1989, respectively, all in electrical engineering.

From 1979 to 1991, he was with Hughes Aircraft Company, rising to the position of manager of the Signal Processing Design and Test Department, responsible for the design and test of high performance digital and analog integrated circuits. He has been with the Department of Electrical and Computer Engineering at the University of Rochester since 1991, where he is a Distinguished Professor, and the Director of the High Performance VLSI/IC Design and Analysis Laboratory. He is also a Visiting Professor at the Technion - Israel Institute of Technology. His current research and teaching interests are in high performance synchronous digital and mixed-signal microelectronic design and analysis with application to high speed portable processors, low power wireless communications, and power efficient server farms.

He is the author of more than 500 papers and book chapters, 16 patents, and the author or editor of 18 books in the fields of high speed and low power CMOS design techniques, 3-D design methodologies, high speed interconnect, and the theory and application of synchronous clock and power distribution networks. Dr. Friedman is a Senior Fulbright Fellow and an IEEE Fellow.

