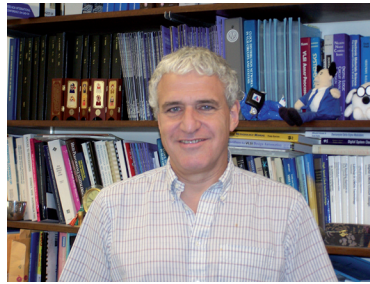


# Keynote Speakers

## Keynote 1

### *“Interconnect-Based Design Challenges in High Performance Two- and Three-Dimensional Integrated Circuits and Systems”*



**Distinguished Professor Eby G. Friedman,**  
*University of Rochester, USA*

#### **Abstract**

The presentation is composed of three parts. The initial focus will be on reviewing the fundamental trends specific to high speed, high complexity integrated systems, emphasizing interconnect-based challenges that constrain the design of two- and three-dimensional digital and mixed-signal integrated systems-on-chip.

The second portion of the presentation will review specific interconnect challenges that drive the design of these 2-D and 3-D circuit and systems. Topics such as on-chip interconnect noise, determined by the local nature of the circuit structures, will be compared and contrasted with research problems that focus on the global nature of systems-on-chip such as synchronization and clock and power distribution networks.

Finally, recent research results developed at the presenter's laboratory in response to these challenges will be reviewed and summarized. Specific interconnect related research results will be described, such as power distribution networks for high speed, high complexity applications, clock tree synthesis for increased tolerance to delay uncertainty, resonant clocking design methodologies, design methodologies for on-chip decoupling capacitors, shielding methodologies for high speed interconnect, substrate coupling in mixed-signal systems, design methodologies for inductive interconnect, 3-D networks-on-chip topologies, 3-D design methodologies and algorithms, and related 3-D test circuit results.

#### **Short CV**

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. He has been with the Department of Electrical and Computer Engineering at the University of Rochester since 1991, where he is a Distinguished Professor, the Director of the High Performance VLSI/IC Design and Analysis Laboratory, and the Director of the Center for Electronic Imaging Systems. 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.

He is the author of more than 300 papers and book chapters, several patents, and the author or editor of nine books in the fields of high speed and low power CMOS design techniques, high speed interconnect, and the theory and application of synchronous clock and power distribution networks. He previously was the Editor-in-Chief of the IEEE Transactions on Very Large Scale Integration (VLSI) Systems, and a recipient of the University of Rochester Graduate Teaching Award, and a College of Engineering Teaching Excellence Award.

Dr. Friedman is a Senior Fulbright Fellow and an IEEE Fellow.