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Bijan Davari, Strategic Technology Leader, to Receive 2010 IEEE Andrew S. Grove Award

Pioneering Work in Miniaturization of Semiconductor Devices Changed the World of Computing and Enabled New Applications Greatly Affecting Our Lives

PISCATAWAY, N.J., 23 November 2010 – Bijan Davari, a researcher whose efforts led to the first generation of high-performance, low-voltage deep-submicron complementary metal oxide semiconductor (CMOS) technology enabling higher-speed computers, is being honored by IEEE with the 2010 IEEE Andrew S. Grove Award. IEEE is the world's largest technical professional association.

The award, sponsored by the IEEE Electron Devices Society, recognizes Davari for contributions to high-performance deep-submicron CMOS technology. The award will be presented on 7 December 2010 at the IEEE International Electron Devices Meeting (IEDM) in San Francisco, Calif.

CMOS technology is used in microprocessors, microcontrollers, static random-access memory (RAM) and digital logic circuits. It features low power consumption, high noise immunity and the ability to place a high density of logic functions a chip, which today enables the powerful computers that run the Internet, portable computers and battery-powered handheld electronics. Prior to the advances in CMOS technology, high-speed computers were driven with bipolar integrated circuits, which had power-consumption issues and lack of integration capability. In the mid 1980s, Davari led the research efforts that produced the first generation of high-performance, low-voltage deep-submicron CMOS technology. This accomplishment displaced bipolar technology in IBM mainframes and enabled new high-speed UNIX servers, and it set the standard for performance-optimized, low-power CMOS and led to adoption of low-voltage standards by the industry.

Davari and his team at IBM also demonstrated the first shallow-trench-isolation process, which he named "STI" in 1989. STI helps prevent electrical current leakage between semiconductor devices on an integrated circuit. He did not just show the feasibility of the process but personally ensured its transition to manufacturing. The process was first used in IBM's 0.5-micrometer technology node for high-performance CMOS logic and in 16-Megabit dynamic RAM . It is now used throughout the industry.

To create faster, higher-function and low-power microprocessor chips, Davari and his research team at IBM spearheaded critical changes in chip design to take advantage of new semiconductor materials and processes. He led the development of innovations such as low-voltage switches, copper interconnect, silicon-on-insulator technology and high-performance logic-based embedded memory, making possible the computer installations that serve as the backbone of Internet data centers. These technological advances were also applied to switches that exponentially increased the flow of information over the Internet at rapid speeds.

An IEEE Fellow and IBM Fellow, Davari has authored or co-authored over 70 publications in various aspects of semiconductor devices and technology, and he was the IEDM Device Technology Committee chairman and short course chairman from 1990 to 1995. His awards include the IEEE J.J. Ebers Award (2005). Davari received his bachelor's degree in electrical engineering from Sharif University of Technology, Tehran, Iran, and his master's and doctorate degrees in electrical engineering from Rensselaer Polytechnic Institute, Troy, N.Y. Davari is currently vice president of Next Generation Computing Systems/Technology at the IBM T.J. Watson Research Center, Yorktown Heights, N.Y., where he leads efforts for the definition and development of IBM's future generation systems.

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