10:30am  Welcome and Introduction  
Jewan Bae  
Program Director, MIT Corporate Relations/Industrial Liaison Program  

Jewan Bae comes to MIT Corporate Relations with more than 20 years of experience in the specialty chemicals and construction industries. He facilitates fruitful relationships between MIT and the industry, engaging with executive level managers to understand their business challenges and match them with resources within the MIT innovation ecosystem to help meet their business objectives.

Bae’s areas of expertise include new product commercialization stage gate process, portfolio management & resource planning, and strategic planning. He has held various business leadership positions at W.R. Grace & Co., the manufacturer of high-performance specialty chemicals and materials, including Director of Strategic Planning & Process, Director of Sales in the Americas, and Global Strategic Marketing Director. Bae is a recipient of the US Army Commendation Medal in 1986.

10:35am  MIT’s Interdisciplinary Materials Research Laboratory  
Carl V. Thompson  
Director, Materials Research Laboratory (MRL)  

Professor Thompson joined the MIT faculty in 1983. He is Director of MIT’s Materials Research Laboratory and co-Director of the Skoltech Center for Electrochemical Energy Storage. His research interests include processing of thin films and nanostructures for applications in microelectronic, microelectromechanical, and electrochemical systems. Current activities focus on development of thin film batteries for autonomous microsystems, IC interconnect and GaN-based device reliability, and morphological stability of thin films and nano-scale structures. Thompson holds an SB in materials science and engineering from MIT and a PhD in applied physics from Harvard University.
Mankind’s insatiable desire for connectivity, communication, computation, and improvement in standards of living will continue to drive transitions in integrated circuit technology, as it has done in the past. As increasing transistor density no longer delivers the required value, new directions will appear to build the future integrated circuits that continue to drive these holistic needs. Designing silicon integrated circuits enabled by inserting new devices is such a path of new value. III-V devices have been monolithically integrated into silicon manufacturing processes, demonstrating novel functionality in silicon circuits containing GaN LEDs and GaN transistors. The methods used for monolithic incorporation of III-V devices into silicon ICs are independent of a particular material or device, so such methods could continue to keep silicon great far into the future.
3D integration: above and beyond Moore’s Law

Jesús A. del Alamo
Director, Microsystems Technology Laboratories

Much has been written about “The End of Moore’s Law” for over a decade. The term evokes a picture of stalled computing performance. Reality is far from this doomsday scenario and the outlook of information processing technology appears brighter than ever. Certainly, as transistor footprint scaling is quickly approaching a regime in which “smaller is no longer better,” a radical redirection is mandatory. The new path is the third dimension, piling transistors on top of each other in a 3D construction. The promise goes beyond the integration of more transistors per unit area to keep the economic incentives behind Moore’s Law. The third dimension opens new possibilities to bring together logic and memory and break the “memory wall”, the current bottleneck for system performance. Intimate memory and logic integration will also enable artificial intelligence chips capable of efficiently processing very large data sets. This talk will outline opportunities and challenges for future IC technologies while showcasing relevant MIT research on new materials (i.e. magnetics, interconnects,..), devices (i.e. carbon nanotubes transistors, tunnel transistors, neuromorphic devices), process technology (monolithic 3D integration), etc.