

INTRODUCTION



Anantha P. Chandrakasan
Director, MTL

Welcome to the 2007 MTL Annual Report. This report summarizes the research from faculty and senior research staff associated with the MTL. The report covers diverse research areas related to electronic device fabrication, integrated circuits and systems, photonics, micro-electromechanical systems (MEMS), as well as molecular and nano-technologies. These investigators come from more than 38 different departments, labs, and centers across the Institute.

The MIT Microsystems Technology Laboratories (MTL) is an interdepartmental laboratory with a mission to foster research and education in semiconductor process and device technology, and integrated circuits and systems design. MTL provides micro- and nano-fabrication and computer aided design (CAD) infrastructure to the entire campus. Last year, more than 500 researchers, primarily graduate students, conducted research using the MTL infrastructure.

MTL's fabrication environment includes three clean rooms: the Class 10 Integrated Circuits Laboratory, the Class 100 Technology Research Laboratory, and the flexible Exploratory Materials Laboratory. The computational environment provides access to advanced electronic design automation (EDA) for device, circuit and system design. The fabrication and computation facilities of MTL are maintained and operated by approximately 20 full-time technical staff members.

MTL partners with industry through the Microsystems Industrial Group (MIG). MTL research and operation is significantly subsidized by the MIG consortium. This year, two new members, NEC and Cadence, have joined the MIG. The members of the Industrial Advisory Board (one member from each of our MIG companies) provide significant guidance in shaping the vision of MTL.

There are significant changes in MTL over the past year. Several new committees have been established for setting strategic directions as well as dealing with operations issues. A new website with significant new content was launched in January of 2007 (www-mtl.mit.edu). The newly formed MTL Seminar Committee has put together an outstanding seminar series open to the public.

The flagship technical event of MTL is our annual research conference (MARC) held annually in Waterville Valley, New Hampshire. The conference is run by MTL graduate students in collaboration with a steering committee. The conference has grown significantly over the past few years and is widely attended by industry, faculty, students and staff. MARC 2007 had more than 200 attendees. We have also initiated an MTL visit day to companies where MTL graduate students present leading-edge results to our MIG companies.

Research conducted at MTL (as organized in the Annual Report) can be broadly classified into five categories: Circuits and Systems, Electronic Devices, MEMS and BioMEMS, Molecular and Nanotechnology and Photonics. MTL has four affiliated industrial research centers with more focused interests: the Center for Integrated Circuits and Systems (CICS), Intelligent Transportation Research Center (ITRC), MEMS@MIT, and the Center for Integrated Photonic Systems (CIPS).