



DIRECTOR'S MESSAGE

The Research Laboratory of Electronics (RLE), founded in 1946, is the Institute's first interdisciplinary research laboratory. RLE grew out of the wartime MIT Radiation Laboratory and was formed to bring together physicists and electrical engineers to work on problems in electromagnetic radiation, circuits, and specialized vacuum tubes. Over the years, RLE's research interests have branched in many directions, so that today it is the most diverse of MIT's interdisciplinary research laboratories, with more than 50 affiliated faculty pursuing groundbreaking research across six research themes. Their achievements, during the 2008-2009 academic year, are described in this Progress Report.

The past year witnessed many important accomplishments for the Laboratory, as the chapters that follow amply attest, but I will take this opportunity to highlight some things that are less obvious from or not explicitly included in what follows. The 2008-2009 academic year marked a resurgence in RLE's

presence in communication and information theory, with Professors Vincent Chan, Robert Gallager, Muriel Médard, and Lizhong Zheng transferring into RLE from the Laboratory for Information and Decision Systems. Their research — from wireless communications to optical communications to network coding to network architecture — will blend with and energize the Laboratory's activities in devices, circuits, signals, and systems. In April 2009, RLE learned that it would play host to a multimillion-dollar Energy Frontier Research Center (EFRC). The EFRC program, which is sponsored by the Department of Energy, will provide \$19 million for the Center for Excitonics under the directorship of Professor Marc Baldo. The overarching theme of this new center is to supersede traditional electronics with devices that use excitons to mediate the flow of energy. Whereas the former rely on expensive and energy-intensive fabrication processes, the latter are far more suitable for the large-scale production that would be needed for the production of sufficient solar cells to have a significant impact on the world energy supply. The 2008-2009 academic year also marked negotiations leading to the Laboratory for Electromagnetic and Electronic Systems (LEES) becoming part of RLE in July 2010. The increasing central role of energy-related research — as represented by the Center for Excitonics and the energy research in LEES — will become quite evident in next year's Progress Report because, with the start of the 2009-2010 academic year, RLE has launched its seventh research theme: Electromagnetics, Power, and Energy.

I will close this message on a sad note. In June 2009 Professor Louis Smullin passed away. During World War II, Professor Smullin was a member of the Radiation Laboratory, where he served as Head of the Transmit-Receive and Duplexer section. After a brief post-war stint at the Federal Telecommunications Laboratory, he returned to MIT, joining the faculty in Electrical Engineering and RLE. In RLE he led the Active Plasmas Research Group. From 1966 until 1974 Professor Smullin was Head of the Electrical Engineering Department, where he had the great foresight to build up the department's computer science wing. Although he retired in 1986, Professor Smullin continued his daily bicycle rides to campus — along with his research on cold fusion — until his stroke in 2001.

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