

Foreword

We are pleased to bring to you the 2021 Microsystems Annual Research Report.

The core mission of Microsystems Technology Laboratories (MTL) has always been to foster interdisciplinary research and education as well as strong industrial relation in microsystems and technology. MTL has maintained a wide footprint of research that encompasses broad areas of disciplines. They include nanoscale technology and materials as well as nano and microscale devices and systems. MTL's research portfolio includes a diverse array of novel devices including electronic, magnetic, field emitter, thermal, fluidic, superconducting and quantum devices, as well as integrated circuits and systems, machine learning and neuromorphic computing, biological and medical devices and systems, photonics, and energy.

Since MTL's research has been at the forefront of technology, an advanced, flexible fabrication facility has always been a central element of MTL. The ultramodern MIT.nano facility was completed in 2018, replacing the aging facility at MTL. The availability of such an advanced, grand-scale fabrication facility is dramatically improving not only MTL's position in cutting-edge research but also that of the entire MIT community. MTL has been closely collaborating with and financially supporting MIT.nano since 2016. The Microsystems Annual Research Conference (MARC), MTL's flagship student-organized technical conference, was administered and sponsored jointly by MTL and MIT.nano for the first time in 2020, then again in 2021. Also, since 2020, Microsystems Annual Research Report has become a joint effort between MTL and MIT.nano.

This year's MTL/MIT.nano joint Microsystems Annual Research Report represents a broad cross-section of the MIT community, with 37+ faculty, 118 students, postdoctoral associates, and research staff participating. As the pages ahead demonstrate, an astonishing range of insights and innovations emerge from the MTL community and users of MIT's shared facilities. It is a privilege to serve these remarkable communities. On behalf MTL and MIT.nano, we thank every contributor to this year's Microsystems Annual Research Report, as well as the staff of both organizations who worked tirelessly to produce such a beautiful volume. We hope you thoroughly enjoy the 2021 Microsystems Annual Research Report.

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