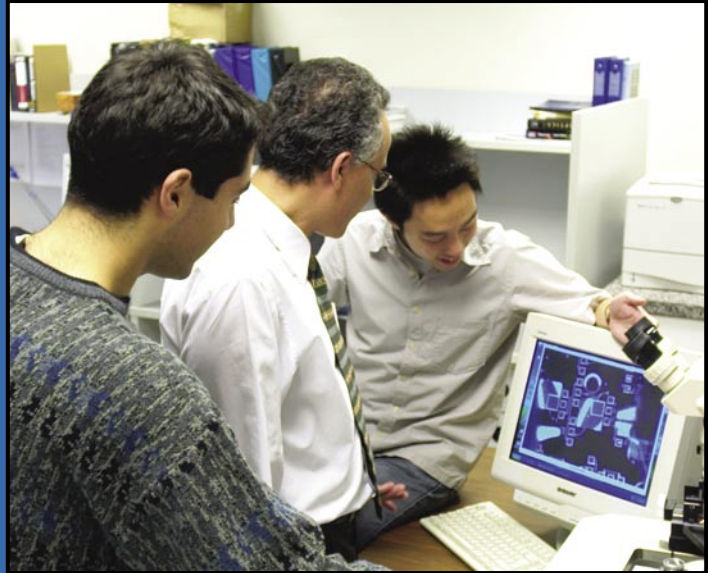


Ushering in the Next Wireless Revolution

McGill researchers target lower cost wireless devices that offer improved performance



Dr. Mourad El-Gamal (centre) is transforming bulky components in wireless devices into MEMS chips. The McGill RF-MEMS Research Team is comprised of (left to right) Frederic Nabki, Dr. Mourad El-Gamal, and Tommy Tsan (Missing from photo: Sareh Mahdavi).

Dr. Mourad El-Gamal is using micromachining, or MEMS (microelectromechanical systems) technology, to build radio frequency components directly onto silicon chips for cell phones and other wireless devices used in everyday society. The result: smaller, more cost-effective and compact systems that require less power.

McGill University researchers are capturing the attention of some of the world's largest telecom companies with new devices that could bring higher quality video streaming or data transmission to cell phones, without using more power.

Advances in micromachining or MEMS are fuelling the next revolution in radio frequency (RF) and microwave communications—one that not only reduces the size, weight, and power consumption of handheld wireless devices, but also boosts overall performance.

To get there, researchers like Dr. Mourad El-Gamal are transforming bulky components in wireless devices such as filters into tiny, light-weight electromechanical resonators, inductors, and capacitors. Next-generation mobile phones may need even more of these tiny components to take advantage of high-bandwidth data, without additional power.

Dr. El-Gamal shared his results publicly for the first time at the International VLSI Symposium on Microelectronics in Japan during June 2003. His research has since been reported in technical journals across Europe, prompting enquiries from companies and universities around the world.

Working through CMC, he has manufactured many RF-MEMS prototype devices using a technology that is commercially available and affordable. "CMC was the interface between our team and the foundry—they enabled the fabrication of a working prototype, and provided all the CAD tools and infrastructure necessary to design and test these devices."

The world's largest telecom companies are jumping on the RF-MEMS bandwagon. IBM has recently identified several cell phone components it plans to replace with their MEMS counterparts.

For Dr. El-Gamal, the next stage is to integrate RF-MEMS devices into larger wireless systems, "and then ultimately to have an entire transceiver built to maximize the high performance of MEMS." He predicts the technology will be on the market within three to five years. *cmc*