WATERLOO INSTITUTE FOR NANOTECHNOLOGY

Raafat Mansour

Professor, Electrical and Computer Engineering; Canada Research Chair in Micro and Nano Integrated RF Systems

Research interests: RF MEMS/NEMS; atomically precise manufacturing; scanning probe microscopy; RF-CMOS technology; multiplexers; superconductive microwave devices

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Biography

Professor Raafat Mansour is a Professor of Electrical & Computer Engineering at the University of Waterloo and holds an Natural Sciences and Engineering Research Council of Canada (NSERC) Industrial Research Chair on Radio Frequencies (RF) Engineering. In 2010, Mansour was appointed a Tier I Canada Research Chair Holder. He is the founding Director of the Center for Integrated RF Engineering (CIRFE) at the University of Waterloo. Mansour currently leads a research group consisting of 25 PhD, MSc graduate students and postdoctoral fellows. Prior to joining the University of Waterloo in 1999. Mansour was with COM DEV Cambridge, Ontario, over the period 1986-1999, where he progressed through various technical and management positions in COM DEV's Corporate R&D Department. He has been a pioneer in employing emerging materials and technologies such as high temperature superconductor and Micro-Electro-Mechanical System (MEMS) to build novel devices with unprecedented performance.

Mansour holds 29 U.S. and Canadian patents to his credit (25 awarded and 4 pending) and has published has more than 200 papers. He is a co-author of a 20-chapter Wiley book published in July 2007, and has contributed 4 chapters to other two books. He has received several Best Paper Awards and outstanding research performance awards from both COM DEV and the University of Waterloo. Mansour's excellence in research has been recognized internationally through Fellowship in the Institute of Electrical and Electronics Engineers (IEEE). He is a registered Professional Engineer in Ontario and is a Fellow of the Engineering Institute of Canada (EIC).

Mansour established a MEMS infrastructure facility funded by Canada Foundation for Innovation (CFI) and Ontario Innovation Trust (OIT) at the University of Waterloo. The facility houses a dedicated clean room for MEMS fabrication and a characterization laboratory having state-of-the-art RF and MEMS test equipment.

Education

- PhD, Electrical Engineering, University of Waterloo, 1986
- MSc, Electrical Engineering, Ain Shams University, Cairo, Egypt, 1981
- BSc, Electrical Engineering, Ain Shams University, Cairo, Egypt, 1977

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RESEARCH

Successful exploitation of nanotechnology-enabled products requires new advances in instrumentation for measurement, characterization, and fabrication of nano-scale structures.

Scanning Probe Microscopy is the most widely used technique for imaging surfaces and studying their atomic structure. More recently, SPM's have emerged as tools that enable the fabrication of nanostructures. These tip-based SPM instruments are the most promising candidates for attaining atomically precise manufacturing (APM) and are the keys to unlocking the full potential of nanotechnology. Part of Dr. Mansour's research is to investigate "bottom-up" manufacturing techniques that rely heavily on chip-scale Scanning Probe Microscopes (SPMs).

Professor Mansour leads a large group in emerging RF technologies including RF Micro-Electro-Mechanical Systems (MEMS), miniature RFID, wireless intelligent systems, filters & multiplexers, superconductivity, novel materials, computer-aided circuit diagnosis, simulation and modeling.

Research interests

- MEMS technology
- RF devices and intelligent adaptive RF integrated systems
- Integrated MEMS/CMOS circuits
- Wireless sensors for industrial and biomedical applications
- Microelectrodes for Deep Brain Stimulation (DBS) Systems
- Superconductive devices
- RF-CMOS components
- Electromagnetic band gap structures
- Analysis of integrated RF systems (components, packaging and interconnect)

PUBLICATIONS

CONTACT