



## TEXPO 2017 attracts research talent and winners demonstrate Canada's future smart technologies

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A wireless brain-machine interface that uses light to study the microcircuits of the brain, and a novel, power-efficient optical switching solution for telecommunications were among the winning technology prototypes at this year's TEXPO Graduate Student Competition and Exposition.

TEXPO is a highlight of Innovation 360, Canada's largest annual gathering of micro-nano innovators from academia and industry, hosted this year by CMC Microsystems and NanoCanada. This year, 24 competitors from 14 postsecondary institutions across Canada's National Design Network presented their novel prototypes to judges from industry and academe.

"Every year we are amazed by the breadth and sophistication of these students' prototypes, and this year was exceptional," says Dan Gale, Vice-President and Chief Technology Officer, CMC Microsystems. "From the introduction of new materials to the focus on advancements in manufacturing processes, this was a strong field of competitors who are showing us what the future of smart technologies looks like."

This year's award recipients are as follows:

**Gabriel Gagnon-Turcotte** (Université Laval, supervisor Benoit Gosselin): Brian L. Barge Microsystems Integration Award for "High Resolution CMOS Neural Interface for Synchronized Electrophysiology and Optogenetics." Judges pointed to the high level of difficulty in his prototype of the first wireless "brain-machine interface", singling out his impressive integration of mixed analog/digital integrated circuits in a system with a wireless link and extensive signal processing, and to its strong commercial potential.

**Suraj Sharma** (École de Technologie Supérieure, supervisor Frederic Nabki ): Industrial Collaboration Award for "Rotating MEMS Platform For Optical Switching." His cost-effective switching solution using silicon nitride optical components and a simpler fabrication process was cited by judges for its clever design and its use of an existing technology to meet the needs of the telecommunications industry for more power-efficient, cost-effective solutions.

Honorable mention: **Mohammad Mahdi Honari** and **Rashid Mirzavand** (University of Alberta, supervisor Pedram Mousavi) for "Smart Direct-conversion Wireless/RFID Sensor."

**Siba Moussa** (McGill University, supervisor Prof. Janine Mauzeroll): Micro-Nanosystems Design Award for "A Micro-litre Temperature-Controlled Flow Cell for Small Scale Studies of CYP 3A4

Enzyme Behavior.” Ms Moussa’s technology enables electro-chemical monitoring of enzymes, leading to a better understanding of their role in disease development. Judges praised her full working prototype for its multidisciplinary breadth, and its use of cost-effective materials.

Honorable mention: **Mohammad Abdolrazzahi** (University of Alberta, supervisor Mojgan Daneshmand) for “Microwave Mixer-Sensor for Arbitrarily Shrinking Limit of Detection in Non-Invasive Sensors.”

**Thomas Jones** (University of Alberta, supervisor Mojgan Daneshmand): Award for Excellence in Nanofabrication for “Development of Monolithic Miniaturized Ridged Half-mode Waveguides for the Next Generation of Millimeter-wave Communication Systems.” His work, which has relevance in the design of components for next-generation wireless communications systems and other complex systems, was praised by judges for addressing the challenges in developing and fabricating a working prototype.

Established by CMC Microsystems in 1992, TEXPO offers graduate students in Canada’s National Design Network a unique opportunity to demonstrate their novel applications of microsystems technologies to industry representatives and academic peers. Projects are judged by academic and industry representatives, and each award offers a cash prize of up to \$3,500.

**Contact:**

Dan Gale

Vice-President and CTO

E: [gale@cmc.ca](mailto:gale@cmc.ca)

**About Canada’s National Design Network and CMC Microsystems**

CMC Microsystems works with researchers and industry across Canada’s National Design Network, providing access to world-class tools, technologies, expertise and industrial capabilities for designing, prototyping and manufacturing innovations in microsystems and nanotechnologies, and for training next-generation innovators.