



## Looking for Signs of Life on Mars

**DALSA-built chips deliver stunning imagery of Martian landscape today; CMC ignited the passion of the project engineer 20 years ago**

*"The opportunity to participate in CMC's program—to build and fabricate an integrated circuit as a university student in the early 1980's—was a truly unique experience for that time. It sparked my passion in microelectronics design and fabrication, and set me on my chosen career path."*

**Robert Groulx**  
Product Manager  
DALSA Semiconductor

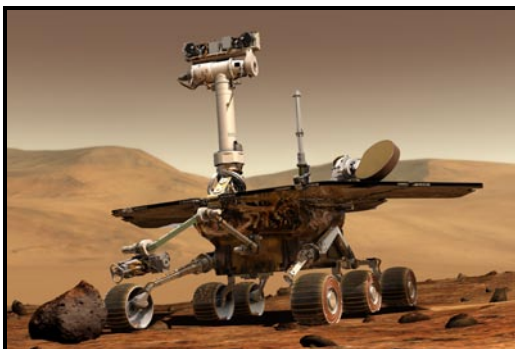


Robert Groulx, Product Manager for DALSA Semiconductor, examines a wafer at his lab in Bromont, Québec. The engineer managed production of the image sensors at DALSA Semiconductor for the twin rovers, *Spirit* and *Opportunity*. His passion for microelectronics was sparked by CMC when he was a student at the Université de Sherbrooke.

**A**s an engineering student at the Université de Sherbrooke in 1983-84, Robert Groulx was among the first to hone his skills on microelectronics design and test equipment, provided by CMC.

Twenty-one years later, he is a Product Manager at one of the world's leading microsystems companies, DALSA Semiconductor (formerly MITEL Semiconductor Division) located in Bromont, Québec. He recently joined millions around the world who watched in awe as two NASA rovers beamed back high-resolution panoramic images of the surface of Mars using image sensors he helped to build. It all started with CMC.

"I participated in the first microelectronics design events that lead to CMC's brokered manufacturing of prototypes for researchers at Sherbrooke," says Groulx, who managed production of the image sensors for the twin rovers, *Spirit* and *Opportunity* at DALSA Semiconductor in Bromont. "So many people were lining up to work on CMC's computer-aided design stations that I would go in at 3 or 4 AM just to get an opportunity. Working at that station was like magic. From that moment, I was committed to working for a wafer fab."



DALSA-built chips deliver stunning imagery of the Martian landscape from the twin rovers, *Spirit* and *Opportunity*.  
PHOTO : NASA/JPL/Cornell

The demand for advanced research and trained engineers with experience using industry-grade tools and technologies were the key drivers for a joint Nortel Networks and NSERC investment in the formation of CMC over two decades ago. It's an investment that continues to pay dividends.

NASA's Jet Propulsion Laboratory (JPL) approached Groulx and his team at DALSA's Bromont facility in 1997 because it was one of the few companies with a semiconductor foundry and expertise that could manufacture "charge coupled devices" (CCDs) for space missions. After working closely with NASA on the development specifications, DALSA met an aggressive three-month deadline and rigorous quality standards to produce the required CCDs in 2000. They surpassed the expectations of JPL on the very first run.

The CCDs are critical photonics components in the nine electronic cameras aboard each of the two rovers. The chips convert light or photons to electrical signals, giving the cameras human-like vision to search for geological evidence of past water, and possibly previous life on Mars. [cmc](http://www.cmc.ca)