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Latest News

- College-Industry R&D Funding Programs Now Open for Business
- Industry Reports Positive Business Impact from NSERC Partnership Initiative
- NSERC's R&D New Target Areas Reflect Business Priorities
- 2010 Synergy Awards for Innovation Highlight Partnerships that Foster Economic Growth

Successful Partnerships

- Testing Their Metal - Better processes, better products
- Lightening the Load - New alloys save fuel
- Bridging the Gap - Composites extend infrastructure life

College-Industry R&D Funding Programs Now Open for Business

Funding is now available for applied R&D partnerships involving businesses and college experts working on company-specific challenges. On October 12, NSERC officially launched the new elements of the College and Community Innovation Program, which includes three types of Applied Research and Development grants specifically geared to generate economic benefits for small and medium-sized enterprises in Canada.

Industry Reports Positive Business Impact from NSERC Partnership Initiative

Canadian businesses and their university research partners consider NSERC's Collaborative Research and Development (CRD) Grants program "an effective means to initiate and support university-industry" R&D linkages. This is one of many key findings from a recently completed Evaluation of the CRD Grants Program conducted by Science-Metrix of Montréal. The evaluation, which covers the period from 1998 to 2007, found that "80 percent of industrial partners have observed concrete impacts stemming from CRD projects," such as new products or services, new or improved processes, and access

to highly qualified employees. Of the 1,500 grants examined, 40 percent of all CRD partners reported an improvement to their business competitiveness and productivity.

NSERC's R&D New Target Areas Reflect Business Priorities

Canadian industry has played an important role in helping NSERC define new research investment priorities for its Strategic Partnerships programs (SPP)—initiatives that support early-stage, high-risk research in universities conducted in collaboration with end users in industry or government.

The four new priority areas for SPP investment are environmental science and technologies; information and communications technologies; natural resources and energy; and manufacturing. Research in these target areas has the potential for high rewards and is an important part of NSERC's new Strategy for Partnerships and Innovation.

The target areas, which NSERC renews every five years, were determined through consultations with over 570 stakeholders in industry, academia and government as well as follow-up focus groups involving an additional 42 representatives of the same. More information is available on NSERC's website. The research topics for the new target areas will apply to next year's SPP competitions.

2010 Synergy Awards for Innovation Highlight Partnerships that Foster Economic Growth

The winners of NSERC's 2010 Synergy Awards for Innovation were announced in November. Presented annually, these awards recognize excellence in university-industry research and development collaborations. This year's winning collaborations included research on lightweight materials for automobiles, technology to reinforce concrete structures, phosphorus recovery from wastewater, and applied technologies to enhance the processing of liquid and solid metals. Read NSERC's news release.

Read more about these successful partnerships below.

Successful Partnerships

Testing Their Metal - Better processes, better products

A McGill University research centre has become the facility of choice for metal processing companies from around the world that are looking to improve the quality of their products.

The McGill Metals Processing Centre (MMPC) has developed new ways to process and produce advanced metallurgical materials since its formation in 1990. Led by Director Roderick Guthrie and Research Manager Mihaiela Isac, the MMPC has partnered with some 20 industry leaders, notably Hatch, Novelis, Heraeus Electro-Nite, and QIT Fer and Titane/Rio Tinto.

For its valuable contributions and its model of university-industry partnership, the MMPC has received the 2010 Leo Derikx Award from the Natural Sciences and Engineering Research Council of Canada (NSERC).

Researchers and students at the Centre's state-of-the-art facilities focus on advancing the sustainable processing, production and characterization of advanced materials used by the ferrous and light metals industries.

Partner companies support the research, sharing resources and information. In return, they gain the benefits of high-level fundamental and applied research programs, and find out first about cutting-edge industry developments.

Among its many achievements, the MMPC developed the Liquid Metal Cleanliness Analyzer (LiMCA) technique. LiMCA measures impurities in liquid metals, and has been adopted worldwide in aluminum smelters for melt quality assurance. It allows the aluminum producers to meet the exacting requirements demanded by the manufacturers who buy their products. This quality assurance is vital because downtime on a manufacturing line can be very expensive.

The partnership also provides a unique training experience for students, who acquire the skills, experience and expertise that enable them to excel in the competitive business world and pursue careers in academia.

The MMPC continues to position Canada as a home to industry-leading researchers in metallurgical processing and to lay the groundwork for future growth in the steel and light metals industries that contribute billions to Canada's economy each year.

Lightening the Load - New alloys save fuel

Research into new metal alloys for engines and other automotive components is helping General Motors of Canada (GM Canada) produce lighter vehicles that get better mileage. Ahmet Alpas, a professor with the Department of Mechanical, Automotive and Materials Engineering at the University of Windsor, partnered with GM Canada to develop this new generation of internal combustion engines and environmentally friendly manufacturing techniques for lightweight alloys.

The research has earned the team a 2010 Synergy Award for Innovation from the Natural Sciences and Engineering Research Council of Canada (NSERC).

Dr. Alpas' team and GM scientists worked together on a new generation of linerless, aluminum-silicon alloy internal combustion engines. The engine they developed provides exceptional durability, can be manufactured at a reasonable cost, and weighs 40 per cent less than those that use traditional cast iron blocks.

Automakers have long tried to find lighter materials that are both durable and cost effective. Every 10 per cent reduction in weight is estimated to provide a vehicle with an eight per cent boost in fuel efficiency, helping drivers save money and reducing air pollution.

In addition to new engine technology, Dr. Alpas' research team helped improve the efficiency and environmental sustainability of GM's manufacturing processes. This includes finding ways to protect tool surfaces with diamond-like carbon coatings, greatly reducing the need for metal cutting fluid and for the large amounts of coolant used in traditional flooded machining. This "near dry-machining" method also extends the life of tools used in manufacturing. Other work has led to new technology to prevent magnesium and aluminum parts from sticking to die surfaces.

The fundamental advances in materials science and engineering generated by Dr. Alpas and his team have garnered widespread attention in the scientific community. For example, to ensure the consistent performance of new alloys, the team conducted groundbreaking, microscopic examinations of the physical mechanisms that occur when aluminum contacts another moving hard surface, such as a piston ring or a cutting tool. Their findings, extensively published in prominent scientific journals, are helping usher in the next generation of lightweight vehicles as successive engineers build on the fundamental research into lightweight alloys, composite materials and wear-resistant coatings.

Bridging the Gap - Composites extend infrastructure life

A partnership between the Université de Sherbrooke and Pultrall Inc. has developed ways to more than double the normal life span of bridges, tunnels and parking garages from 30 to 50 years to 100 years. Led by civil engineer Brahim Benmokrane, the research helps lower maintenance costs and potentially saves lives by preventing collapses.

The technology uses fibreglass and carbon-fibre composites to reinforce concrete, rather than the traditional steel, and has earned the partners a 2010 Synergy Award for Innovation from the Natural Sciences and Engineering Research Council of Canada (NSERC).

The introduction of these new materials, the product of a 20-year university-industry collaboration, comes at an opportune moment. There are currently an estimated $74 billion in repairs needed to existing Canadian bridges and other concrete structures.

In 2006, Statistics Canada released a report estimating that Canada's bridges had reached the halfway point of their useful lives. Bridges built between the 1950s and the 1970s were designed to last 50 years, therefore many of these structures will require maintenance or replacement over the next two decades. Exposure to road salt is a leading factor in the corrosion of steel reinforcing bars and this could cause structures to start crumbling, sometimes without warning, after only 30 years.

Pultrall's composite materials are virtually immune to salt corrosion and other chemicals. They have twice the strength of steel at one-quarter of the weight. The result is safer structures with a longer life span that require less maintenance.

With demand increasing for cost-effective infrastructure solutions, the composite reinforcing bar, called V-ROD, has become Pultrall's flagship product. In 2001, it gained immediate industry attention when V-ROD was first used to reinforce a bridge built in Wotton, Quebec. It has now been used in hundreds of projects around the world, increasing sales to more than $10 million and helping the company grow to 75 employees.

Receive Recognition for your business success.

Read more about NSERC's synergy awards.

Business Success Stories

- Waste Not, Want Not – Dr. Mavinic from UBC and Ostara Nutrient Recovery celebrate successful collaboration
- BDC eProfit$ explores an SME Engage Grant Partnership

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