

Innovatis

Ernest C. Manning Awards Foundation



Awards Gala – October 17, 2012

(Ottawa Convention Centre 6:00pm)

Symposium – October 18, 2012

(Carleton University 8:30am-1:30pm FREE)

Registration essential

2013
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NOMINATIONS

Deadline for submissions
December 3, 2012

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Ernest C. Manning Awards Foundation

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Welcome to our 2012 Ernest C. Manning Innovation Award Winners!

This October in Ottawa, we celebrate a distinguished group of extraordinary Canadians, the 2012 Manning Innovation Awards winners.

Innovations created by this year's winners are a blood transfusion management system, now being used by two countries and many of the world's leading hospitals; a medical imaging scanner, developed in Sherbrooke, Quebec – which is being heralded as a break-through medical research tool; compostable utensils made from wood veneer manufactured in the BC interior; and, plant nutrition products developed in Manitoba, now sold all over the world, that are having a massive impact on crop production.

The four 2012 Young Canadian Innovation Awards winners are from British Columbia, Alberta and Ontario. All were high school students who competed in the Canada-Wide Science Fair earlier this year. Three of the recipients are now part of important research teams in their hometowns.

When David E. Mitchell established the Foundation, he was determined that all forms of innovation be recognized.

He understood that a unique idea can emerge as easily from a research lab as a home basement. The innovator of

a solution to sewage backup into homes and buildings should be celebrated alongside the doctor who pioneered the first total artificial knee replacement. This year, innovations were developed in well-equipped research laboratories, basements, classrooms, home offices and even a kitchen!

Manning Award winners are selected by a distinguished independent selection committee chaired by Dr. Robert Fournier, Professor of Oceanography at Dalhousie University. Selection committee members are established leaders and authorities from various disciplines. They are supported in the selection process by experts in fields, such as, genetics, engineering, industrial processes, and social entrepreneurship.

Creativity knows no professional, geographic or cultural boundaries. New ideas erupt everywhere. People of any age or walk of life, engaged in their personal and professional communities, generate world-changing ideas. But only those with the imagination to innovate and the stamina to succeed can bring them to life and make a difference.

See inside for profiles of the 2012 winners.

2012 Winners' Profiles

Sharing the imagination to innovate and the stamina to succeed.



Kerry G. Green
Geoffrey G. Gyles
Winnipeg, Manitoba

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Innovation Award: \$10,000

Wolf Trax DDP Micronutrient Technology

Micronutrient fertilizers are critical in maximizing crop production. For decades, farmers tried to correct their micronutrient deficiencies with existing products and had to settle for inconsistent performance caused by poor field distribution, and forms of micronutrients that were basically unavailable to the growing plant. In addition, there was little product innovation taking place in micronutrient fertilizer technologies.

In the late 1990s, Kerry Green and Geoff Gyles combined common sense thinking with scientific innovation to address these age-old challenges in micronutrient fertilization. They developed a family of Dry Dispersible Powder (DDP) Micronutrients, including zinc, boron, manganese, iron, copper, and calcium.

Their most significant innovation is their patented Wolf Trax DDP coating technology. When blended with dry macronutrient fertilizer, the DDP formulation thoroughly coats every prill of fertilizer in a blend. As the fertilizer is spread across the field, there are exponentially more micronutrient feeding sites for the developing seedling compared to traditional granular micronutrient fertilizers. With DDP technology, the farmer achieves even distribution of

micronutrient across the field, and more consistent, reliable plant uptake. The farmer requires less product, resulting in fewer trips across the field, saving time and energy costs. Lower required rates of DDP Micronutrients also reduce the amount of heavy metals and other contaminants being applied per acre.

The second significant innovation is the patented DUAL ACTION™ Availability. Growers achieve earlier uptake by the plant when nutrients are needed most, while also benefiting from continuous feeding. Unique to Wolf Trax, DUAL ACTION™ offers growers tremendous flexibility in spray timing.

DDP products have been scientifically designed and formulated to optimize plant availability and plant uptake, through optimized pH and particle size. In formulating DDP Micronutrients, Wolf Trax use only source materials suitable for feed and humans, ensuring lower heavy metals and other impurities that allow for greater user safety and cleaner fertilizer for crops.

Commercializing their new products included three years of product development research and thousands of trials. Today, Wolf Trax Innovative Micronutrients, whose motto is 'Growing Forward', operates from its headquarters on the corner of Research Road and Innovation Drive at the University of Manitoba's Smartpark. Their micronutrients are now sold in 14 countries and 75 regulatory jurisdictions as a significantly more effective and efficient fertilizer for growers. The company continues to develop new products for the agricultural and horticultural market.

Innovation Award: \$10,000

Aspenware® Laminated Compostable Utensils Made From Wood Veneers

Former second-generation industrial arts teacher Terry Bigsby, who once owned one of Canada's largest VW restoration companies in Vancouver, has a passion for wood, woodworking and everything mechanical. It took Terry 15 years to figure out how to use readily available and cheap wood – like Aspen and Birch – which are completely compostable and renewable to create disposable wooden cutlery.

Terry's kitchen was the lab as he tried to figure out a way to bond Aspen and Birch veneer using flour and water and a waffle iron. The next hurdle was how to eliminate the wood fiber feeling of the cutlery when in one's mouth. Then there was the challenge of designing the machinery to manufacture the idea.

Today, Terry has a thriving manufacturing business in the British Columbia interior with 20 full-time employees. He and his team have designed machinery to condition the wood and create maximum deflection over a very limited distance while still keeping the structural integrity of the fibers. The lamination gives the product amazing strength and shortens the press forming time to within 5 seconds, making commercialization possible. Terry's now patented commercial process and equipment has little or no human intervention in its manufacture once the veneers are made. Today, production is 35,000 units per hour. One telephone-pole sized log of laminated Aspen and Birch yields as many as 20,000 utensils and generates over \$1,000 in revenues.

Today, Aspenware® is sold in retail outlets across Canada. It was used at the 2010 Olympics and both the 2011 and 2012 Super Bowls. Terry's goal: to have Aspenware at every McDonalds and Starbucks and to eventually replace 150 billion pieces of plastic cutlery disposed of annually into landfills.



Terence J. S. Bigsby
Vernon, British Columbia

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The Arthur J. E. Child
Foundation



Dr. Roger Lecomte, Ph.D.
Dr. Réjean Fontaine, Ph.D.
Sherbrooke Québec

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David E. Mitchell Award of Distinction: \$25,000

The LabPET™ Digital PET Scanner

In the last few decades medical imaging has become one of the most important diagnostic tools. Among the various medical imaging modalities, Positron Emission Tomography (PET) is the tool of choice when physicians and biologists want to investigate the bioprocesses at the origin of life or resulting from a disease. The LabPET™ scanner developed by two Université de Sherbrooke professors has brought PET imaging capabilities one step forward.

Virtually all PET scanners today are based on photomultiplier tubes (PMT), a photodetector made of an electro-mechanical structure under vacuum that transforms light into an electrical pulse. These one-inch photodetectors are suitable for human-size scanners, but too bulky for imaging small animals, an essential step for today's biomedical research. All modern PMT-based scanners rely on some decoding schemes to estimate the position of interaction of the radiation emitted from the subject. This approach severely limits the spatial resolution required for small animal imaging.

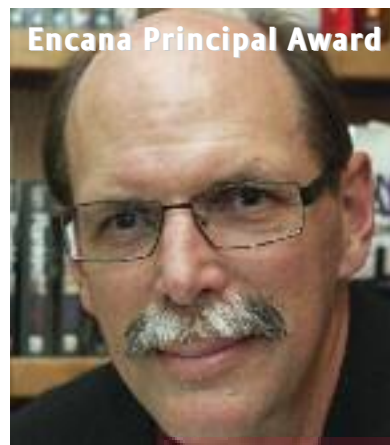
The LabPET™ scanner developed by professors Dr. Lecomte and Dr. Fontaine uses another kind of photodetector taking advantage of semiconductor technology: the avalanche photodiode. Unlike PMT, these photodetector devices can be made very small, down to a few millimeters.

Using the avalanche photodiode enables the measurement of the position of interaction of radiation in individual pixels with high accuracy, avoiding the need for any decoding effect.

However, new challenges had to be solved by the team with the explosion in the number of pixels that must be read out in parallel and the avalanche photodiode technology itself. Several innovative solutions were designed in the LabPET™ scanner to tackle these problems.

The LabPET™ scanner developed by Dr. Lecomte and Dr. Fontaine, originally manufactured in Sherbrooke, has gained notoriety for its improved molecular imaging performance and ability to provide better diagnosis in fields such as cancer research and detection. The research conducted to develop the LabPET™ innovation was published in more than 150 peer-reviewed articles. The patented scanner has now captured a quarter of the world's pre-clinical PET market share in 40 of the world's largest and best-known universities and research centers.

Encana Principal Award: \$100,000



Geoffrey Auchinleck
Vancouver,
British Columbia

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BloodTrack® Blood Transfusion Management System

It took Geof Auchinleck 15 years to change the way blood is managed in hospitals. This fifth generation British Columbian, who is a graduate of UBC's Engineering Physics program, led a team of Canadian engineers in Vancouver to develop BloodTrack®.

BloodTrack® tracks and controls the movement and transfusion of blood all the way from the blood bank to the patient's vein – using barcodes and mobile computers to ensure that the right blood gets to the right patient in the right way.

Geof's BloodTrack® On Demand System uses automated blood matching and HemoSafe® easy to operate 'blood dispensing machines' (they look like large wine coolers) to provide just-in-time delivery of blood directly to operating rooms. This has increased patient safety and significantly reduced wastage of precious donor blood and vastly reduced staff time.

BloodTrack® is rapidly gaining acceptance throughout the world. It is in daily use in Canada, the United States, United Kingdom, Ireland, Australia, and throughout the European Union. More than 180 large hospitals have the system and two countries, Republic of Ireland and Wales have adopted it on a national basis.

Geof's patented system has received many awards in the United Kingdom and has been cited in many peer reviewed medical publications. The BloodTrack® team still operates from Vancouver. Thanks to Geoffrey's ideas and his perseverance in creating the delivery system, more than 100 person-years of employment have been created. Now the serial innovator's system is being tested in hospitals for the storage of breast milk and tissue for transplantation. Meanwhile Geof, who claims to never have been qualified for any job he has had, has a new venture, Claris Healthcare Inc., which provides Internet communications devices for seniors.

*Read more about these
innovations in the October 15th
edition of Maclean's Magazine*

MACLEAN'S

2012 Young Canadian Winners



Kelcie Miller-Anderson
Calgary, Alberta

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Synocrude

Innovation Award: \$4,000

Mycoremediation of the Oil Sands

A healthy dandelion sprouting through road pavement triggered curiosity in Kelcie Miller-Anderson about the potential of a different approach to remediating tailings ponds of Canada's oilsands industry. The dandelion led this Calgary high school student me to question why it would thrive in a hydrocarbon-based environment, and that led her to consider a Science Fair project that might create a novel remediation method with the potential to treat both mature fine tailings, and the tailings water that result from oilsands production in northern Alberta.

Oilsands tailings ponds cover some 170,000 square kilometres in northern Alberta, but an assured, effective and economic method of treatment has not been established.

Kelcie's research was literally a basement-lab approach in her home. Using sample tailings and associated water supplied by an oilsands producer, she treated the industrial waste with a residual fungus from the production of Oyster mushrooms. The mycelium (vegetative part of a fungus) would release enzymes that enable the breakdown of hydrocarbons, which will then be absorbed by fungi hyphae and transformed into fungal sugars. Her research showed a substantial reduction of petroleum hydrocarbons, naphthenic acids and pH levels and an enhanced sodium absorption ratio of both the tailings and the tailings pond water— all major challenges to successful remediation.



Carlos Xu
Vancouver, British Columbia

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Synocrude

Innovation Award: \$4,000

Gravito-Meissner Effect in Neutron Star Systems

This tri-lingual student from Vancouver's St. George School developed mathematical models of the gravitomagnetic current, and field, inside a neutron star and challenged previous research that suggested gravitomagnetic fields (gravity that behaves like magnets) from companion stars will be repelled.

It turns out that the field generates a current that induces another field in the same direction as the previous one such that the net effect is magnified attraction, not repulsion.

His research exemplifies an efficient manner of solving a complicated general relativity problem through analogies with a known solution in another framework, namely electrodynamics. He exploited the similarities in the mathematical formalism in the two different fields, applying techniques of known solutions to unsolved problems.

2012 Young Canadian Winners



Adelina Cozma
Richmond Hill Ontario

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Eric LeGresley
Chilliwack British Columbia

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The Jim McEwen
Family

Innovation Award: \$4,000

Novel Learning in the Brain: Insights from Neuroimaging & Augmentative Training

This young researcher, who is part of the Department of Neurology at Toronto's world-famous Hospital for Sick Children, has a growing passion for neuroscience research.

Her project investigated the brain's spatio-temporal learning dynamics, using magnetoencephalography and magnetic resonance imaging, and correlated the findings with results from augmentative training, which had been accomplished through her three innovatively developed software programs.

The insights of Adelina's work have the potential to further improve language abilities and provide progressive feedback that can track the learning process.

This system may also be a key in assisting persons recuperating from stroke and brain injury or with disabilities like autism, dyslexia and Alzheimer's disease.

Adelina is a recipient of the Ontario Principals' Council Award for Student Leadership.

Innovation Award: \$4,000

Computational Methods for the Screening of Novel Neuraminidase Inhibitors

Eric LeGresley, a grade 11 high school student wants to find a solution to what he considers the most pressing scientific issue of the day – the threat of a flu pandemic due to the H1N1 virus.

Eric, who is part of a Simon Fraser University research team, developed an algorithm that provides accurate, cost-efficient pre-screening of proposed antivirals, thereby significantly reducing the 'speculative advance phase' that leads to the mandatory testing trials and eventual approvals process. This is critical when attempting to deliver an antiviral to prevent a pandemic like H1N1.

Foundation News

New Chapter Chair in Saskatchewan

Welcome **Dr. Wilf Keller**, President and CEO, Ag-West Bio Inc. Saskatoon, is the new Chapter Chair of the Foundation's Saskatchewan Chapter. Dr. Keller oversees Ag-West Bio's bioeconomy catalyst's mandate to support the growth and development of a vibrant agriculture-based bioeconomy in Saskatchewan. Dr. Keller has been actively involved in the development and application of biotechnologies for the genetic modification of crops. He has collaborated with numerous government, university and industry groups and has provided training for researchers in plant biotechnology. He has led major research initiatives on the application of genomics in canola improvement, the development of industrial bio-products from vegetable oils, and production of bioactive natural products in plants. Dr. Keller also presents and lectures on aspects of biotechnology, including public awareness and public education.

New Chapter in Northern Ontario

The Foundation's hard working former Toronto Chapter Chair, **Don Duval**, CEO of The Northern Centre for Advanced Technology (NORCAT), has created a Northern Ontario Chapter in Sudbury. The Foundation looks forward to seeing many more nominations come in from this innovative part of Ontario.

New Chapter Chair in Toronto

Welcome **Earl Miller**, Director of Strategic Partnerships MaRS Discovery District, who takes over as chair of the Manning Awards Toronto Chapter. At MaRS, Earl heads the Toronto Regional Innovation Centre, and is responsible for government relations and strategic partnerships with industry groups, professional associations, and non-profit organizations with a strong stake in commercialization and entrepreneurship. He monitors issues and trends in innovation policy and contributes to discussions on the importance of the knowledge economy.

New Chapter Chair in Atlantic Canada

Welcome **David A. Regan**, Executive Vice President, Corporate Development and Investor Relations of DHX Media Ltd. David is the new Chair of the Foundation's Atlantic Chapter, responsible for DHX Media Ltd.'s capital markets and M&A activities. Mr. Regan also serves as Chairman of Watts Wind Energy Inc. and as a director of Katalyst Wind Inc.

A fond farewell and many thanks to Saskatchewan Chapter Chair Austin Beggs, Vice President, Corporate Relations at Innovation Place, Regina and to **Atlantic Canada Chair and Manning Laureate Wayd McNally**, President & CEO of Sensor Wireless Inc, for their leadership and dedicated commitment to innovation and the Foundation.

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The Foundation thanks its Regional Chapter Chairs

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The Foundation thanks its Selection Committee

Committee chair: Dr. Robert O. Fournier, Professor of Oceanography, Dalhousie University
Committee members: Michel David, P.Eng., Consultant, Hudson, PQ • Dr. Morley Hollenberg, Professor, Faculty of Medicine, University of Calgary • Jessie Inman MBA Chief Executive Officer, Confederation Centre of the Arts in Charlottetown, PEI., • Dr. Philippe Kruchten, P.Eng., Professor, Dept. of Electrical and Computer Engineering, University of British Columbia • Dr. Janet Ronsky, P.Eng., director of the Centre for Bioengineering Research and Education, Schulich School of Engineering and Canada Research Chair in Biomedical Engineering, University of Calgary.

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