



2011/12
ideas
innovation
impact



Everyone Makes a Mark



Research at Ryerson

**Rooted in what is.
Inspired by what can be.
A better world.**

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Message from the Vice President, Research and Innovation

We are pleased to report on Ryerson's continued progress on scholarly, research and creative (SRC) activities.

In addition to demonstrating excellence in research with funding increases from all the tri-council agencies – SSHRC, NSERC, and CIHR, Ryerson researchers continue to show that our university leads in solving real-world problems in collaboration with industry, government and communities.

Again this year, our faculty have been recognized for leading-edge research, winning prizes including renewals of two of our Canada Research Chairs, and expanding partnerships nationally and internationally. Cutting across disciplines, our strategic themes align with economic and social priorities: Civil Society; Digital Media; Energy, Sustainability, & the Environment; Health & Well Being; Design, Creative Expression and Cultural Industries; Innovation.

We remain committed to providing our students – both undergraduates and graduates, alike – with valuable experience, and the

demand for our programs continues to outpace other universities. Not only is our reputation as Canada's comprehensive innovation university firmly established nationally, but international recognition of our unique approach to research has led to a dramatic increase in partnerships with top ranked universities abroad.

We continue to strengthen the infrastructure to support our researchers and the investments are paying off. I would like to take this opportunity to acknowledge the hard work of our researchers and the continued support of our external collaborators and funders. We have had another great year full of accomplishments that are making a difference in society.



Wendy Cukier, Vice President, Research and Innovation



Growing Scholarly, Research and Creative Activity (SRC) at Ryerson

This report will provide an update on Ryerson's SRC achievements for 2011/12 and highlight the innovative contributions being made by our faculty and students in the following areas:

- Research funding
- Awards, honours and fellowships
- Knowledge transfer and commercialization
- Innovation and impact
- Publications and citations
- Internationalization
- Ryerson student successes – the next generation of excellence

While Ryerson assesses research intensity based on the amount of funding received by its faculty, the number of publications and citations, and the commercialization of Ryerson's expertise, we recognize that these traditional performance indicators do not accurately reflect the full breadth of our scholarly research and creative activities.

Research Funding

We are pleased to report that although the current funding environment poses a number of significant challenges, Ryerson has demonstrated continued success in obtaining research funding.

In 2011/12, total research funding reached \$28.6 million, down slightly from the previous year [**Figure 1**]. More than ever, the resources to support research and innovation at Ryerson come from a multitude of sources and programs, including government, private-sector partners, not-for-profit agencies, and other organizations in Canada and around the world.

According to statistics from Re\$earch Infosource Inc., Ryerson University experienced the largest growth in research support of any Ontario university for 2011. Ryerson's increase is particularly noteworthy given that, across the Ontario system as a whole, total research income dropped 2%.

Tri-Council Funding

Ryerson's faculty have been extremely successful in obtaining research funding from the three federal funding agencies: the Natural Sciences and Engineering Research Council of Canada (NSERC), the Social Sciences and Humanities Research Council (SSHRC) and the Canadian Institutes for Health Research (CIHR).

Despite increased competition for fewer research dollars, research funded at Ryerson by the Tri-Council reached approximately \$13 million, which represents an increase of \$2.3 million, or a growth of 22%, from 2010 [Figure 2].

In a funding environment where it is an achievement to maintain Tri-Council funding levels, Ryerson succeeded in increasing its funding from each of the agencies, and increased the University's share of total Tri-Council funding. Financial data provided by the Council of Ontario Universities (COFO) demonstrates that Ryerson's overall funding in 2011/12 grew by 14% from NSERC, 45% from CIHR, and 25% from SSHRC.

Our continued Tri-Council success supports the allocation of 13 Canada Research Chairs, affording Ryerson the opportunity to apply for one Canada Excellence Research Chair and an increase in the allocation of research dollars to indirect costs. **Figure 3** shows Ryerson's share of total Tri-Council funding by council.

Canada Research Chairs (CRC)

Tri-Council funding obtained by Ryerson researchers directly influences other programs, such as allocations of federal indirect costs and the University's Canada Research Chairs (CRC). The CRC program was introduced by the federal government in 2000 to help universities recruit and retain excellent faculty members. Ryerson's CRCs demonstrate

research excellence in the broad disciplines of natural sciences, engineering, health sciences, humanities, and social sciences. As leaders in their respective fields, these CRCs also help train the next generation of highly skilled people through student supervision and teaching.

In 2011/12, **Irene Gammel** successfully renewed her CRC in Modern Literature and Culture, receiving \$1.4 million in additional funding. Gammel's research explores the relationship between women's avant-garde art and popular cultures, contributing to an improved understanding of women's cultural production in the modernist era. In addition to this CRC support, Gammel also received funding from the Canada Foundation for Innovation (CFI).

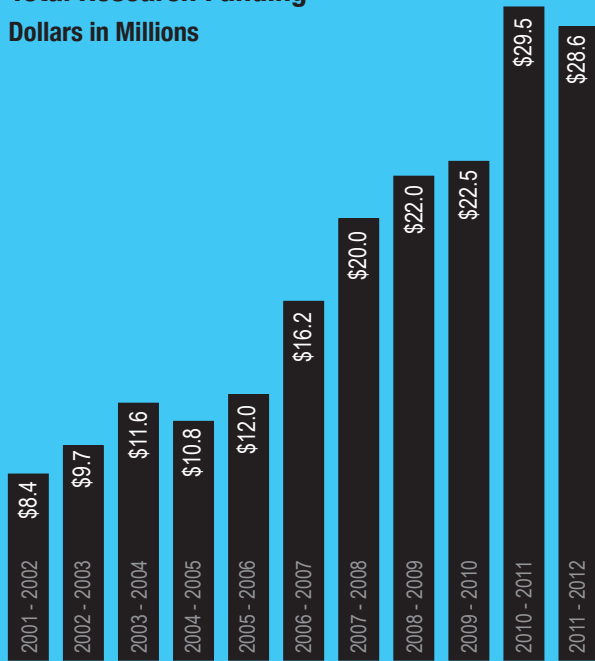
Guangjun Liu also renewed his CRC in Control Systems and Robotics in 2011/12. Liu will receive an additional \$500,000 over five years for his research on improving the accuracy and safety of robotics. He will work to develop new multi-mode control systems that enable robots to handle a wide range of physical interactions and learn from past encounters. This research will design robots that can work autonomously in unstructured environments, such as healthcare settings, high-level surveillance situations, and space exploration.

Other Canada Research Chairs at Ryerson include **Ling Guan** (Multimedia and Computer Technologies), **Michael Kolios** (Biomedical Applications of Ultrasound), **Sri Krishnan** (Biomedical Signal Analysis), **Krishna Kumar** (Space Systems Engineering), **Catherine Middleton** (Communication Technologies in the Information Society), **Marcello Papini** (Abrasive Jet Technology), **Souraya Sidani** (Design and Evaluation of Health Interventions), **Gideon Wolfardt** (Environmental Interfaces and Biofilms), and **Victor Yang** (Bioengineering and Biophotonics).



FIGURE 1

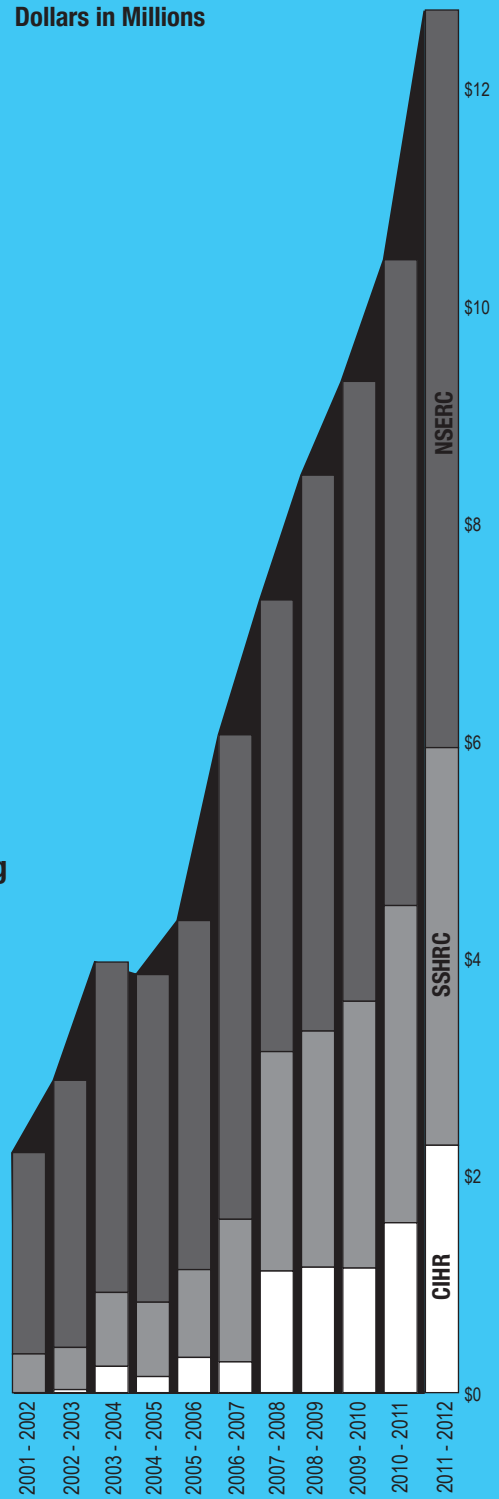
Total Research Funding
Dollars in Millions



SOURCE: Council of Ontario Universities - Council of Finance Officers (COFO)

FIGURE 2

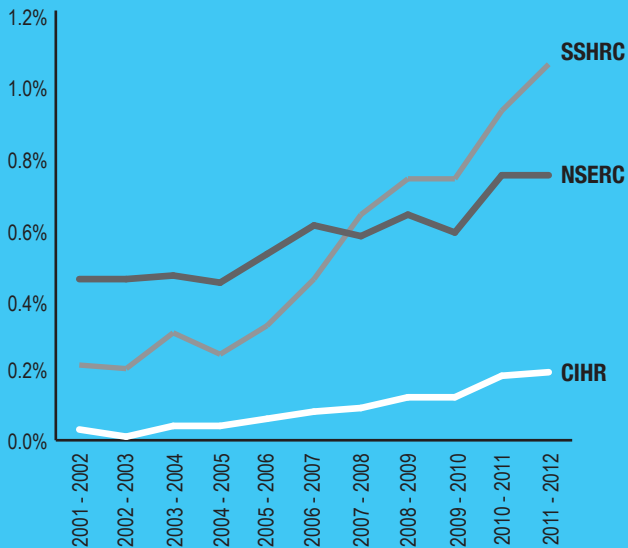
Federal Granting Council Funding
Dollars in Millions



SOURCE: Council of Ontario Universities - Council of Finance Officers (COFO)

FIGURE 3

Ryerson's Share of Federal Granting Council Funding
Percentage Share of Total Funding



SOURCE: NSERC Facts & Figures 2010-11 reports, SSHRC Payments by Program Activity Architecture, Region, Province & Institution 2004-05 to 2011-12 reports, CIHR Funded Research Database: Funding by Institution 2001-02 to 2011-12.

Natural Sciences and Engineering Research Council of Canada (NSERC)

Building on Canada's long tradition of excellence in science and engineering, NSERC promotes original discoveries, supports university students in their advanced studies, and fosters innovation by encouraging Canadian companies to participate and invest in postsecondary research projects. This year saw both an overall improvement in Ryerson's NSERC application success rate as well as continued achievements in research programs involving community and industry partners. For example, owing in large part to targeted initiatives by the Faculty of Engineering and Architectural Science, Ryerson's NSERC Discovery Grant success rate increased dramatically, with 56% of applications receiving funding compared to 47% in 2010/11. Overall, in 2011/12 NSERC awarded Ryerson \$7.1 million for 83 new research grants, an increase from the \$5.9 million provided in support of 76 new research grants in 2010/11.

Examples of Ryerson research funded by NSERC are outlined below.

NSERC Industrial Research Chair

NSERC's Industrial Research Chairs (IRC) assist universities in building research strengths that meet the demands of industry. The *NSERC/Rockwell Automation Senior Industrial Research Chair in Power Electronics and Electric Drives* is held by **Bin Wu** (Electrical and Computer Engineering), and was renewed in 2012. This Chair focuses on research and development of innovative technologies for high-power converters and advanced controls, with a range of industrial applications.

NSERC Discovery Grants and Discovery Accelerator Supplements (DAS)

The Discovery Grants Program supports the creativity and innovation at the heart of all research advances. As mentioned, in 2011/12 Ryerson enjoyed an unprecedented application success rate to this program and a total of \$4.2 million in new funding for 35 different projects was awarded to our researchers. Here is an example of a Ryerson research project funded by this program.

Soosan Beheshti's (Electrical and Computer Engineering) research into *Signal and Information Processing in Analysis and Modeling of Complex Structures* focuses on Hyperspectral Imaging (HSI), which separates visible and invisible light into a series of small bands. This data can then be processed to identify materials based on their spectral fingerprints. In addition to its broad benefits for industries that conduct data analysis and structural modeling, this research has the potential to discover new, less invasive ways of detecting and identifying cancerous conditions without a biopsy.

The Discovery Accelerator Supplements (DAS) Program provides substantial and timely additional resources to accelerate the progress and maximize the impact of superior research programs that have been awarded funds through the Discovery Grants Program. Only 123 of these prestigious awards were granted across Canada in 2011/12 and two of these were received by Ryerson researchers.

Through his project *Development of Smart Self-healing Cementitious Materials for Sustainable Infrastructure*, **Mohamed Lachemi** (Civil Engineering) is developing crack-and maintenance-free construction materials that offer enhanced durability at a reduced cost. The long-term objective is to design new forms of concrete that prevent further damage to infrastructure and enable its repair.



Patrick Neumann (Mechanical and Industrial Engineering) leads the research project *Embedding Human Factors into Dynamic Simulations of Operations – Discrete Event and Agent Based Modelling*, which develops advanced simulation tools with a number of applications in industry. These technologies enable engineers and managers to better understand the impact of human factors on the systems they design, as well as on the front-line employees who will operate them.

NSERC Research Tools and Instruments Grants (RTI)

RTI grants foster and enhance the discovery, innovation, and training capability of university researchers in the natural sciences and engineering by supporting the purchase of research equipment and installations.

Kathryn Woodcock (Occupational and Public Health), along with her colleagues **Joon Chung** (Aerospace Engineering) and **Kristiina McConville** (Electrical and Computer Engineering), are recreating visual and vestibular effects that simulate the experience of moving in any real or imaginary 3D space using their Mixed-reality Immersive Motion Simulator Facility. This equipment will enable researchers and engineers to improve amusement ride safety by anticipating rider error, as well as to enhance aircraft design. The facility will also be used by EDGELab Director **Jason Nolan** (Early Childhood Education) to design simulated environments for education, experiential learning, rehabilitation, and play involving children and people with disabilities.

Through the project *In situ Quantification of Gold Nanoparticles Using the Total Reflection X-ray Fluorescence*, **Ana Pejović-Milić** (Physics) investigates how ultrasound-microbubbles can be combined with gold nanoparticles to potentially create more effective forms of radiotherapy and laser-mediated thermal therapy for cancer treatment.

NSERC Engage Grants

Engage Grants give Canada-based companies access to the unique knowledge and expertise available at Canadian universities by fostering the development of new short-term research collaborations between an academic researcher and a business in the natural sciences or engineering fields. In 2011/12, NSERC awarded 30 Engage Grants to Ryerson totalling \$747,053. During the same period, on the basis of the number of eligible researchers per university, Ryerson received the highest proportion of NSERC Engage Grants awarded in Ontario. Some examples of the innovative research supported by this funding are included here.

Responding to the challenge of current and future fresh water shortages, **Russell Richman's** (Architectural Science) project *Development and Validation of a Residential Grey Water Recovery System* is developing a residential grey water recovery system that collects used water from household sinks and showers and distributes it to toilets for reuse. The benefits of grey water recovery systems include less waste of potable water, lower fresh water extraction from rivers and aquifers, and reduced energy use and chemical pollution from treatment and groundwater recharge.

Jelena Mistic (Computer Science) is leading a team from Ryerson and JBB Mobile Inc. in the project *Performance Modeling, Scheduling and Optimization of JBB Mobile Field Cloud*. This research investigates how performance and optimization modeling can help minimize bandwidth usage on mobile networks, reducing network response time and improving system availability.

Social Sciences and Humanities Research Council (SSHRC)

SSHRC is the federal agency that supports post-secondary research and training in the humanities and social sciences. Researchers who are awarded this funding share knowledge and collaborate across research disciplines, universities, and all sectors of society. In 2011/12, Ryerson earned 31 new grants totalling more than \$2 million, compared to the 22 new grants totalling almost \$1.9 million awarded by SSHRC in 2010/11. Some of the funding received by Ryerson researchers includes the following grants.

SSHRC Insight Grant

The objectives of SSHRC's Insight Grants program are to build knowledge and understanding from disciplinary, interdisciplinary, and/or cross-sector perspectives; to support new approaches to research on complex and important topics, including those that transcend the capacity of any one scholar, institution, or discipline; and to provide high-quality research training experiences for students.

Insight Grant holder **Greg Elmer** (Radio and Television Arts) is conducting a five-year international study, *Social Media Campaigns: Tracking Digital Politics Across Web 2.0*, to develop software code that analyzes emerging forms of political campaigning across Web 2.0 platforms (i.e. Facebook, YouTube, Twitter). The project will also provide organizations with open-source software and diagnostic tools for managing their social media presence, allowing them to strategically decide where and when to deploy their political campaigns online.

SSHRC Partnership Development Grants

Partnership Development Grants promote direct collaboration between academic researchers and partners in academia, government, or private industry, in the social sciences and humanities. These grants design and test new approaches to research partnerships that have the potential to be scaled up to a regional, national, or international level, and support the meaningful involvement of students and new scholars.

Carolyn Johns (Politics and Public Administration) is bringing together Canadian and American social science researchers and non-academic partners to generate guidelines for environmental governance in the Great Lakes region through her project, *Towards a Great Lakes Policy Research Partnership*. The aim of this research is to create a new set of tools and an interactive digital infrastructure that will help scholars and policymakers take a more informed approach to environmental issues in the region.

Deborah Fels (IT Management) is investigating technologies that will enable people with disabilities to experience new forms of intimate interaction in the project *Intimate interfaces for Persons with Disabilities*. This research will develop a proof-of-concept prototype that integrates off-the-shelf appliances with new vibration and touch-based technologies.

SSHRC Insight Development Grants

Insight Development Grants support early-stage research, advancing the development of new research questions and promoting experimentation with innovative methods, theoretical approaches, and ideas.

Building on his ongoing inquiries into digital technologies and artistic production, **Bruno Lessard** (Image Arts) is developing a new



theoretical approach to the avant-garde filmmaking movement Dogme 95 in *Cynic Cinema: Dogme 95, Authenticity, and Digital Video*. Lessard suggests that a revisionist theory of cynicism is crucial to film studies because of the emphasis on truth, authenticity, emotional intensity, and rawness in Dogme 95 productions, and also because of the dramatic change in filmmaking practice that digital video cameras brought about in the 1990s.

Margaret Moulson (Psychology) is researching *Cross-cultural Recognition of Emotions in Children and Adults* to enhance our understanding of emotion recognition across cultures and, more broadly, to refine theoretical perspectives on the universality of facial expressions. Findings from this research will have important implications for multicultural societies like our own by identifying potential barriers to nonverbal communication among members of different cultural groups.

Through his project *Maps and "Pictures in Our Heads" - The Political Effects of Perceptions of Communities*, **Daniel Rubenson** (Politics and Public Administration) is developing high-quality open source software to capture the "maps" that exist in the minds of ordinary people. This free software will extend the reach of existing mental mapping tools to explore how ordinary people understand and alter their perceptions of their community in response to changes in their environments.

Frank Russo (Psychology) is working to create a music database in order to compare and evaluate the potential therapeutic benefits of film music as an alternative to classical music. As part of his project *Improving Musical Mood Induction*, this research will also develop a broader set of principles and a computational model for improving music selections in future studies.

In *Behaviour Toward Risk and Ambiguity: Biological Determinants and Impact on the Incentive Effect of Pay-for-Performance*, **Fei**

Song (HR and Organizational Behaviour) is investigating a new methodology for the study of human behaviour that combines experimental principles from both economics and biology. Through this interdisciplinary approach, Song aims to define the nature and determinants of individuals' attitudes toward risk and ambiguity, as well as the behaviour that follows a potentially risky decision.

SSHRC Public Outreach Grant

Public Outreach Grants are designed to mobilize and/or leverage existing and ongoing research in the social sciences and humanities for a range of audiences beyond the university.

In their project *Promoting Diverse Leadership in Media: an Imperative for Social Inclusion and Shaping*, **Wendy Cukier** (IT Management) and **Charles Davis** (Radio and Television Arts) are exploring and assessing leading practices for encouraging more inclusive representations in the media. The study addresses the sector, workplace technology, and entrepreneurial skills required to develop and adapt new products, processes, and services in both the STEM fields and other content-related disciplines. This research is part of a larger project led by Cukier that investigates ways of promoting diversity in leadership.

SSHRC Knowledge Synthesis Grant

Knowledge Synthesis Grants aim to support the synthesis of existing research knowledge and the identification of knowledge gaps in a format that promotes engagement between researchers and specific communities beyond the university – in this case, government policy-makers. Under this program, **Wendy Cukier** (IT Management) and **Catherine Middleton** (IT Management) received funding for their project *Assessing Impact: Incubators, Accelerators and the Culture of Innovation*, which evaluates current strategies for cultivating values and practices associated with innovation and entrepreneurship.

SSHRC Aid to Research Workshops and Conferences in Canada Grants

This program advances scholarship on issues of intellectual, cultural, and social importance by facilitating direct interaction among researchers and students from Canada and abroad. Funding from these grants supports events that promote research development, enhance the visibility and profile of social sciences and humanities research, and encourage knowledge mobilization across research disciplines, institutions, sectors, linguistic groups, and regions.

Led by **Rachel Dodds** (Hospitality), researchers at Ryerson University and the University of Quebec at Montreal have joined forces to present *Sharing Innovations in Sustainable Tourism*. This workshop brings faculty and graduate students together to share worldwide research learning from successful sustainable and innovative tourism initiatives.

John Caruana (Philosophy) co-organized the conference *Varieties of Continental Thought and Religion*, which connect an interdisciplinary

array of scholars from Canada and abroad to explore the deep religious and theological roots of key modern political concepts, the continued fascination with religion and spirituality in the arts, and the future of religion.

The workshop *Critical Perspectives on Canadian Anti-Trafficking Policy*, organized by **Emily van der Meulen** (Criminal Justice), offers a unique opportunity for academics, sex workers, migrant labourers, and front-line service providers to advance critical dialogue and research on the contemporary realities and dilemmas of human trafficking in Canada.

Marco Fiola (French & Spanish) led the multidisciplinary workshop *Traduction, textes, médias/ Translation, Texts, Media*, which seeks to build on the traditional idea of translation as a professional practice by considering its capacity as a tool for media democratization. In particular, the workshop examines the rapidly changing role of translation in audiovisual works and other forms of new media.



Canadian Institutes of Health Research (CIHR)

CIHR is Canada's primary federal agency for health research. The agency creates and translates new knowledge into improved health for Canadians, more effective health services and products, and a strengthened Canadian healthcare system. In 2011/12, Ryerson researchers were successfully awarded 11 new CIHR grants totalling more than \$2.1 million, an increase from approximately \$1.6 million awarded the previous year. Here is a sample of Ryerson research funded by CIHR.

CIHR Operating Grants

The Operating Grants Program contributes to the creation, dissemination, and use of health-related knowledge. These grants support original, high-quality projects in all fields to help develop and maintain Canadian health research capacity. Several innovative research projects at Ryerson were funded by this program in 2011/12.

In partnership with the Aboriginal Sport Circle, **Lynn Lavallée** (Social Work) is exploring how a youth-driven development approach that focuses on physical activity, sport, and recreation can provide an effective strategy for promoting positive youth development (PYD), community capacity, and youth holistic health. Lavallée's project, *Youth Driven Development in Aboriginal Communities*, investigates the impact of the Active Circle initiative, which was developed by Motivate Canada to address the barriers to involvement in recreational programming often faced by Aboriginal youth and communities. The study's potential dividends to Aboriginal communities are significant, with researchers working directly alongside community members to gain a better understanding of how programs like Active Circle improve youth and community-level health, development, and capacity.

China-Canada Joint Health Research Initiative Grant

Jointly funded by CIHR and the National Natural Science Foundation of China (NSFC), this program aims to promote joint Canadian-Chinese research initiatives. For example, **Michael Kolios** (Physics) is collaborating with **Zhigang Wang** at the Chongqing Medical University on the project *Nanoparticle Emulsions for Targeted Ultrasound and Photoacoustic Molecular Imaging of Cancer*, which will address the limited accuracy of current ultrasound-based imaging technologies by designing special nanoparticles that increase the sensitivity of ultrasound scans to the presence and location of tumors.

CIHR Partnership for Health System Improvement (PHSI) Grant

This program aims to strengthen Canada's healthcare system through collaborative, applied, and policy-relevant research. PHSI places a strong emphasis on partnerships and knowledge translation, making it an important resource for managers and policy-makers who seek relevant research to inform decision-making.

In the project *Increasing Access to Mental Health Services for Street-involved Youth: the Effectiveness of a Theory-based Multi-component Resilience and Motivational Intervention*, **Elizabeth McCay** (Nursing) is addressing the societal challenge of connecting with at-risk and vulnerable youth who are far less likely to seek healthcare and/or social services. This disengagement occurs for a variety of complex reasons, including stigma, discrimination, and barriers to access. McCay and her research team will implement and evaluate intervention strategies to engage youth in Toronto, Calgary, and Philadelphia and to facilitate their successful exit from street life.

International Research Funding

The expertise and knowledge of Ryerson's faculty has global applications and recent projects have attracted new international funding from a wide range of agencies in areas such as healthcare, culture, and the environment.

For example, **Candice Monson** (Psychology) was awarded a two-year research contract by the United States Department of the Army to investigate *Individual Prolonged Exposure versus Couples' Cognitive-Behavioral Therapy for Combat-Related Posttraumatic Stress Disorder (PTSD)*. Supported by an Army Medical Research Acquisition Activity Research Grant, this project is designing and testing new, more effective techniques for treating PTSD and minimizing associated relationship distress.

Ravi Ravindran (Mechanical and Industrial Engineering) received funding from the American Foundry Society for his project *Magnesium Melt Cleanliness*, which investigates ways in which magnesium, as the lightest structural alloy, can help reduce industrial fuel consumption and emission levels. In the long term, the project aims to provide a better understanding of the origin of defects and inclusions in magnesium in order to improve melt cleanliness, enhance foundry competitiveness, and minimize the environmental impact of industrial activities.

Funded by the U.S. Environmental Protection Agency, **Christopher DeSousa's** (Urban and Regional Planning) project *Best Management Practices and Benefits of Sustainable Redevelopment of Brownfield Sites* draws on a range of case studies to identify best practices for the sustainable redevelopment of brownfield sites (land previously used for intensive industrial or commercial purposes). This study is part of DeSousa's broader research program, which also focuses on urban issues such as foreclosure prevention, comprehensive planning, and green building.



Other Federal Investments in Ryerson SRC

In addition to grants received through the Tri-Councils, the research work of Ryerson's faculty has been supported by funds from other Canadian federal agencies that promote innovation in research related to science and technology, business, the environment, and socio-economic issues.

With funding from the Canadian Space Agency, **Ziad Saghir** (Mechanical and Industrial Engineering) is leading an international team of researchers from seven countries in the project *Diffusion and Thermodiffusion Coefficients Measurement*. This research aims to test existing theories of diffusion and thermodiffusion, and to develop new physical and mathematical models of their characteristics. The findings of this project have applications beyond space-related research. For example, these phenomena also play a role in crystal growth and in important industrial processes such as material processing and oil recovery." A change such as this helps keep the length more in line with other examples from the section.

Songnian Li's (Civil Engineering) project *CanICE – A Sea Ice Information Database and Web-based Portal with Novel, Interactive Knowledge Discovery Tools* is one of 17

research projects funded by Aboriginal Affairs and Northern Development Canada. This research works to gather new detailed regional information that will assist regulators and Inuvialuit communities in understanding how the environment of the Beaufort Sea, part of the Western Canadian Arctic, may be affected by offshore oil and gas exploration and development.

In response to the growing need for small and medium-sized enterprises (SMEs) to effectively manage their intellectual property (IP) assets, **Avner Levin's** (Law) project *Canadian SMEs and the Commercialization of Intellectual Property* seeks to identify the level of awareness of IP rights among Canadian SMEs. Supported by Industry Canada, the study will also assess the challenges these enterprises face in acquiring and maintaining IP protections both in Canada and in foreign jurisdictions.

Funded by Human Resources and Skills Development Canada, **Margaret Yap** (HR and Organizational Behaviour) is investigating ways to improve organizations' ability to deliver a *Racism-Free Workplace Strategy in Labour Market Barriers Facing Visible Minorities – A Subgroup Analysis*. Recognizing that visible minorities are not a homogeneous group, this analysis addresses specific barriers faced by the most disadvantaged sub-groups.

Provincial Investments in Ryerson SRC

The provincial government promotes scientific excellence through a wide variety of programs and grants, by supporting research discoveries that can be developed into innovative goods and services, with the power to boost Ontario's economy. Here are two examples.

Supported by the Ontario Ministry of Economic Development and Innovation's Research Excellence award, **Bala Venkatesh** (Electrical and Computer Engineering / Centre for Urban Energy) is the lead researcher on the five-year *Future Urban Electric Systems* project. Other collaborators on this research include **Ling Guan, Bin Wu** and **David Xi**, all members of Ryerson's Department of Electrical and Computer Engineering. The initiative addresses the most significant obstacles to a sustainable economy by targeting six core research themes: Smart Grid Technology, Plug-in Hybrid Electric Vehicle (PHEV) Chargers, Urban Solar Farms (USF), Large-Scale Energy Storage, Development of Urban Electric Systems (UES), and Intelligent System Applications to Power Engineering.

Led by **Lori Schindel Martin** (Nursing), the project *Maintaining Competency in Managing Dementia-related Aggression* using an Activity-based Educational Approach in Long Term Care is a pilot for a focused refresher course on dementia-related aggression that serves as part of an educational program for caregivers in long term care homes. Schindel Martin's research receives support from Bridging the Gap, a program organized by the Workplace Safety and Insurance Board of Ontario.

Community-based and Industry Investments in SRC

Ryerson has been ahead of the curve in undertaking research that addresses real-world problems in the community, in government, and in the private sector. Ryerson has enjoyed great success in securing funded research collaborations with industry and community partners, with industry support representing 12% of the University's total research dollars.

Hossein Rahnama (Digital Media Zone) is working with the Ontario transportation agency Metrolinx to design mobile, context-aware software applications for passengers on public transit systems. In the project *Applied Research in Mobile Device Applications for GO Transit Customers*, Rahnama collaborated with students from the Flybits research team to develop GO Transit's first official mobile application, GO Mobile. The application eliminates the need for paper schedules, locates the nearest station, bookmarks frequently travelled routes, and provides real-time track-level information from Union Station.

In partnership with TD Bank Group, **Cory Searcy's** (Industrial Engineering) project *Measuring Sustainability in the Supply Chain at TD Bank Group* is helping the company implement and improve its corporate social responsibility (CSR) strategy by evaluating the environmental, social, and/or economic sustainability of its suppliers. Responding to the increasing pressure for Canadian companies to address the real-world impact of their activities, this research will generate an original model for assessing supply-chain decisions that provides detailed information on supplier performance, enhances transparency and accountability to stakeholders, and promotes more sustainable business practices across the organization as a whole.



Elizabeth McCay (Nursing) and Kristin Cleverley, director of practice research and innovation at CAMH, are leading a pilot study to examine how healthcare providers across professions can more effectively collaborate with each other as well as with clients and their families, to refine treatment processes and enhance the quality of care. As co-directors of the Ryerson-CAMH Collaborative for Client-Centred Care, they will assemble an interprofessional team of clinicians, educators, researchers, students, and community stakeholders to improve the lives of individuals and families living with mental illness and addiction. The partnership is established with support from Andrew and Valerie Pringle.

Industry, Government, and Ryerson Come Together to Innovate

One of the immediate benefits of community and industry-based partnerships is the availability of matching funds from government programs. In recent years, these collaborations have increased due to a large number of government initiatives that aim to promote industry-university engagement. Ryerson has received support for these partnerships from a wide range of organizations, including the Tri-Council agencies, the National Centres of Excellence, the Ontario Media Development Corporation, the Ontario Centres of Excellence, the Federal Economic Development Agency of Southern Ontario, and Mitacs.

Here are some examples of the innovative research emerging from industry-government-university partnerships at Ryerson.

Ryerson and Toronto Hydro Partner to Build a Strong Energy Sector

NSERC's Collaborative Research and Development (CRD) grants are intended to give companies that operate from a Canadian base access to the unique knowledge, expertise, and educational resources available at postsecondary institutions, creating economic benefits for the collaborators and for the Canadian economy. Under this program, **Ling Guan's** (Electrical and Computer Engineering) research is helping Toronto Hydro modernize its delivery and service network in the development of a smart grid supported by advanced communications architecture. In the project *Secure and Reliable Data Communications for Smart Grid: the Toronto Hydro Electrical System Limited*, Guan and his team will investigate new types of network architecture and algorithms to

improve the reliability, security, and efficiency of the electrical system, which translates into savings for consumers.

Mobile Climate Control Joins with Ryerson to Design Fuel-Efficient Transportation

Established by the provincial government in 1987, the Ontario Centres of Excellence (OCE) program seeks to strengthen research linkages between academia and industry. Ryerson's **Lian Zhao** (Electrical and Computer Engineering) has joined with the company Mobile Climate Control to develop superior vehicular wiring components that will lead to increased profits for businesses while also providing quieter, more comfortable riding experiences for consumers. Although the project *Robust Power Line Communication (PLC) for Automotive Applications* focuses primarily on cars and trucks, the benefits of this technology also extend to other industries where data communication is required. For example, in the airline industry power line communication can be applied to HVAC, entertainment, and seat adjusting systems. Moreover, decreasing the wiring harness weight for automobiles and airplanes will significantly reduce fuel consumption and minimize environmental impact across all sectors.

Ryerson and TIFF Bring Interactive Digital Worlds to Toronto

The Ontario Media Development Corporation (OMDC) helps the province's creative industries produce film, television, music, books, magazines and interactive digital media for a global audience. With funding from OMDC, lead researcher **Richard Lachman** (Radio and Television Arts), along with **Lori Beckstead** (Radio and Television Arts) and **David Bouchard** (School of Image Arts), is partnering with the Toronto International Film Festival (TIFF) on *TIFF.nexus*, a digital media project aimed at overcoming barriers

in the world of game development. Each researcher plays a unique role on specific elements of the project, such as the Difference Engine, a video game incubator to help women get involved in game design and creation, and the Peripherals Initiative, which pairs hardware hackers with artists to create new games, objects, and interfaces. Other partners involved in *TIFF.nexus* include the Hand Eye Society, Interactive Ontario, Women in Film and Television-Toronto, and George Brown College-Digifest.

Vision Coaters Canada and Ryerson Help Local Industry Go Green

The Federal Economic Development Agency of Southern Ontario's (FedDev Ontario) Applied Research and Commercialization (ARC) initiative addresses the gap between research and commercialization in Southern Ontario by encouraging collaboration between small and medium-sized enterprises (SMEs) and post-secondary institutions. Under this program, **Huu Doan** (Chemical Engineering) is partnering with Vision Coaters Canada Ltd on the project *Bioadsorption of Heavy Metals*, which investigates how the automotive industry can reduce its production of potentially harmful solid waste by decreasing the amount of chemicals used in sedimentation processes. Doan is designing a packed bed containing inert organic particles, which act as a bio-adsorber to remove metal ions and other contaminants from wastewater.

Faculty Honours and Awards

Ryerson takes great pride in the scholarly contributions of its faculty, and we strive to recognize their research achievements by encouraging nominations for awards of excellence. In addition to the many external awards, honours, and fellowships received by faculty members, Ryerson's own research awards include the Sarwan Sahota Distinguished Scholar Award and the Faculty SRC Awards, which recognize Ryerson faculty for outstanding achievement in scholarly, research and creative activities as well as for their broader impact on their respective disciplines. Here is a sample of the honours received by our faculty in recognition of their research contributions.

External Awards

Frank Russo (Psychology) received the Early Career Award from the Canadian Society for Brain, Behaviour and Cognitive Science (CSBBCS). This award recognizes the exceptional quality and importance of the contributions of a new researcher to knowledge in brain, behaviour, and cognitive science in Canada.

Charles Falzon's (Radio and Television Arts) television series *Artzooka* was recognized with a Gemini Award for Best Host and an Award of Excellence from the Youth Media Alliance. The innovative series, aimed at children aged 6-9 years, blends live action, animation, and interactive web elements.

Martin Antony (Psychology) is internationally recognized for his research into anxiety disorders and their treatments. The Canadian Alliance for Mental Illness acknowledged Antony's contributions to scholarship by

making him the first psychologist to receive the Champion of Mental Health Research Award.

Recognizing her efforts to advance important new home care delivery systems that focus on supporting children, **Karen LeGrow** (Nursing) has been chosen as the Janis Rotman Fellow in Home Care Innovation Research.

Janice Neil's (Journalism) and **Ivor Shapiro's** (Journalism) Canadian Journalism Project received the Canadian Association of Journalism President's Award for exceptional journalistic contribution.

Tony Hernandez's (Centre for the Study of Commercial Activity and Geography) decade-long engagement with the International Council of Shopping Centers (ICSC) has earned him the honour of an ICSC Researcher Award for Outstanding Service.

David Tucker (Radio and Television Arts) was named Writer-in-Residence for the month of August by Open Book Toronto, a prestigious online literary forum showcasing noted Canadian authors.

Sandra Tullio-Pow (Fashion), along with Ryerson MA student **Kirsten Schaefer** and Princess Margaret Hospital colleague Joyce Nyhof-Young, is the recipient of an International Textile and Apparel Association (ITAA) Target Market Award in the Professional Category for their winning submission *Inclusive Post-Mastectomy Sleepwear: Toward Sweet Dreams for All*.

The University of Toronto has awarded **Maurice Mazerolle** (Business Management) the Morley Gunderson Prize in recognition of his outstanding contributions to the fields of industrial relations and human resources.

Chosen as the best book about the Caribbean published over the last three years in Spanish, English, French, or Dutch, **Anne-Marie**

Lee-Loy's (English) *Searching for Mr. Chin: Constructions of Nation and the Chinese in West Indian Literature* won the Caribbean Studies Association's Gordon K. and Sybil Lewis Award.

Kathryn Woodcock (Occupational and Public Health), a researcher of human factors in engineering, has been named a fellow of the Association of Canadian Ergonomists. These fellowships are awarded for career achievements as well as for service to the association and to the profession.

Xavier Fernando (Electrical and Computer Engineering) was selected as an Institute of Electrical and Electronics Engineers (IEEE) Communications Society Distinguished Lecturer for 2012 and 2013.

The British Psychological Society has made **Alasdair Goodwill** (Psychology) an Associate Fellow for his work in the areas of forensic psychology, criminology, behavioural investigative advice, offender profiling, and geographical profiling.

Krishna Kumar (Aerospace Engineering) has been appointed as an Associate Fellow of the American Institute of Aeronautics and Astronautics (AIAA) in recognition of his outstanding original accomplishments in the field of engineering.

Acknowledging his distinguished international standing in the profession of material science and engineering, **Ravi Ravindran** (Mechanical and Industrial Engineering) has been selected as a Distinguished Life Member of the Alpha Sigma Mu International Professional Honor Society.

For his contributions to satellite sensor modeling and remote sensing applications, **Ahmed Shaker** (Civil Engineering) was awarded the Bronze Medal from the Canadian Remote Sensing Society.

Marsha Barber (Journalism) won the top prize at the Ontario Poetry Society's Open Heart Writing Competition. Barber's poetry book, *What is the Sound of Someone Unraveling*, was recently published by Ottawa's Borealis Press.

The International Textile & Apparel Association (ITAA) awarded **Lucia Dell'Agnese** (Fashion) the Lectra Innovation Award for Faculty Research for her research into Wearable Technology.

Pamela Palmater (Politics and Public Administration) received a YWCA Woman of Distinction Award in the category of Social Justice. This award was given in recognition of her efforts to empower Indigenous women and build more inclusive communities.

In recognition of her academic excellence and leadership at the university, national, and international levels, **Usha George** (Community Services) received the Indo-Canada Chamber of Commerce 2011 Professional Female of the Year Award. This honour also acknowledged her contributions as the Chair of the Community Engagement and Research Committee of the Board for the United Way of York Region.

Margaret Yap (Business Management) was chosen as HR Academic of the Year by the Human Resources Professional Association, in recognition of her outstanding contributions to the human resources profession and the business community.

Mohamed Lachemi and **Said Easa** (Civil Engineering) were named Fellows of the Canadian Academy of Engineering, one of the highest academic honours for Canadian engineers, for their pioneering research and career-long service to the profession.



Ryerson Awards

Sarwan Sahota Distinguished Scholar Award

This award is presented annually to Ryerson faculty members who have made an outstanding contribution to knowledge or artistic activity in their area of expertise. In 2011/12 **Sri Krishnan** (Electrical and Computer Engineering) was honoured for his work in biomedical signal analysis. His research provides a powerful alternative tool for physicians to use when diagnosing underlying medical problems, helping to ensure medical conditions are properly treated and giving patients peace of mind about the accuracy of their diagnosis. Krishnan's work is also highly multidisciplinary, bringing together approaches and technologies from the natural sciences, engineering, and health sciences.

Faculty Scholarly Research and Creative (SRC) Awards

The Faculty SRC Awards recognize individual faculty members for outstanding achievement in scholarly, research, and creative activity that has had an impact on their discipline during the previous academic year. This year's recipients are:

Arts

Martin Antony (Psychology)
Leslie Atkinson (Psychology)
Irene Gammel (English)
Graham Hudson (Criminal Justice and Criminology)
Margaret Moulson (Psychology)
Daniel Rubenson (Politics and Public Administration)
Frank Russo (Psychology)

Communication and Design

Marta Braun (Image Arts)
Richard Grunberg (Radio and Television Arts)
Richard Lachman (Radio and Television Arts)
April Lindgren (Journalism)
Sandra Tullio-Pow (Fashion)

Community Services

Pamela Robinson (Urban and Regional Planning)
Kathryn Underwood (Early Childhood Education)
Yvonne Yuan (Nutrition)

Engineering, Architecture and Science

Antony Bonato (Mathematics)
Habiba Bougherara (Mechanical and Industrial Engineering)
Daolun Chen (Mechanical and Industrial Engineering)
Marcello Papini (Mechanical and Industrial Engineering)
Bo Tan (Aerospace Engineering)
Karthikeyan Umopathy (Electrical and Computer Engineering)

Ted Rogers School of Management

Ayse Bener (IT Management)
Guoping Liu (Accounting)
Farid Shirazi (IT Management)
Fei Song (HR Management and Organizational Behaviour)



Knowledge Transfer and Commercialization, Innovation and Impact

Whether in Canada or around the world, one of the most important outcomes of research is its societal benefits. These may be improvements in education, social well-being, health, education, energy efficiency, or technology, to name only a few. Increasingly, such societal benefits are being used to measure the impact of research.

Knowledge mobilization, or the application of research results for maximum societal benefit, is deeply embedded in Ryerson's daily activities. We strive to extend the ideas and innovations of our researchers beyond the borders of the University, developing partnerships with the public and private sectors to ensure that academic discoveries are continually transmitted to – and enriched by – the surrounding community.

Our approach to market-driven and community-based innovation has attracted international attention and opened doors to a vast range of new partnerships. For example, Ryerson's Digital Media Zone (DMZ) is a hub of innovation, collaboration, and commercialization that provides a home to

both entrepreneurial ventures and established industry solution-providers. The University is also collaborating with health care institutions on a number of initiatives and working with other community organizations to create inclusive, multi-stakeholder partnerships.

From Idea to Market Place

To maximize the return on public investments, both the Ontario and federal governments strongly emphasize the importance of knowledge and technology transfer and commercialization. Ontario's research and innovation strategy notes that these factors are critical to creating and sustaining the next generation of high-knowledge, high-value jobs and to ensuring the continued prosperity and competitiveness of the province.

Innovation through the Entrepreneurial Zones – Ryerson’s Experiential Learning Model

Our commitment to integrating theory and practice into real-world challenges through innovative, experiential learning opportunities is a key component of Ryerson’s educational culture. Building on the highly successful DMZ, which launched in 2010, Ryerson is expanding the Zone model to a number of other sectors, including health and wellness, industrial design, and social innovation. Students and companies focusing on these sectors will leverage each other’s expertise and collaborate, both creatively and intellectually, to improve the enterprises, products, and/or services being developed. The DMZ benefits from the interdisciplinary contributions of Ryerson students and alumni of programs in engineering, business, the arts, and fashion. Its collaborations are also international in scope, involving students from top worldwide universities such as IIT Delhi, IIT Chennai, the Indian School of Business (Hyderabad), Communication University of China, and Nanjing University.

Commercialization with Societal Benefits

Federal and provincial agencies have recently sharpened the focus of their funding initiatives to promote the transfer of specialized research findings from universities to surrounding communities, with the goal of boosting the economic, social, and environmental benefits of their investments. Ryerson’s research strategy is founded on this goal of translating knowledge into commercial applications that spur economic growth while improving quality of life for people in Canada and the world.

Ontario Partnership for Innovation and Commercialization

Funded through the OCE’s Technology Transfer Partnership Program, the Ontario Partnership for Innovation and Commercialization (OPIC) is a virtual network of specialized technology transfer experts at nine member institutions, including Ryerson. This network aims to enhance knowledge and technology transfer capacity by sharing expertise, providing educational resources, and partnering with clients both within each institution and in the surrounding communities. In 2011/12, Ryerson was granted nine OPIC Proof of Principle (PoP) grants representing a total of \$115,000 in funding.

In one of these supported projects, *babyvibe: Development of a New Vibrotactile System to Support the Development of Attention and Communication in Infants with Special Needs*, **Frank Russo** (Psychology) is developing a jumper-style garment designed to convert auditory input signals into temporally synchronized vibrations, allowing individuals who are deaf to detect and interpret sounds through their sense of touch. The *babyvibe* receives acoustic input wirelessly from a lapel microphone worn by the caregiver, passes it through a filter bank, and directs the output to separate voice coils, which provide light vibro-tactile stimulation that reinforces the caregiver’s voice when pressed against the infant’s skin.

MaRS Innovation

MaRS Innovation (MI) is the official commercialization agent for the intellectual property created by a research consortium made up of Toronto’s top institutions. The Ryerson innovations disclosed through MI include therapeutics, medical devices and diagnostic imaging, information and



communications technologies, and advanced manufacturing and clean technologies.

A recent example of innovation taken on by MI to help commercialization is the project *High Level Synthesis Design Space Exploration Automation with Multi-Parametric Optimization*, led by **Reza Sedaghat** (Electrical and Computer Engineering). Sedaghat's research combines a complex series of mathematical algorithms to create a new software platform for testing circuits, such as those used in computers. This technology is intended for use by engineers designing semiconductor devices, allowing them to develop computing technologies that can handle more demanding and complex processes. Sedaghat's innovative software has the potential to attract additional investment to semiconductor manufacturers in a southern Ontario cluster of chip design expertise.

Idea to Innovation (I2I)

NSERC's Idea to Innovation (I2I) program accelerates the pre-competitive development of promising technology originating from the university and college sector and promotes its transfer to a new or established Canadian company. In 2011/12, Ryerson received two of these grants, including one in support of **Xiao-Ping Zhang's** (Electrical and Computer Engineering) An Intelligent Information Retrieval and Processing System for Financial Database. In collaboration with EidoSearch Inc., Zhang and his research team will work with financial marketing experts to refine and commercialize a powerful search engine and discovery tool that uses signal processing to analyze financial data, enabling financial industry professionals to make more informed, flexible investment decisions.

Invention Disclosures

The Office of the Vice President, Research and Innovation (OVPRI) serves as a portal for private sector collaboration as well as a launch pad for commercially viable inventions and concepts. Each year the Research Innovation and Partnerships unit actively promotes Ryerson's technology and expertise by negotiating industrial contracts, filing patents, and by building relationships between the University and potential partners. The unit's success is evidenced by the number of invention disclosures in 2011/12, which almost doubled from 2010/11 [Figure 4].

Publications and Citations

The total number of SRC publications produced by Ryerson faculty members, and the number of times they are cited in other publications, are two indicators of successful SRC performance. Publications and citations are indexed by a number of organizations including Thomson Reuters, whose data have been used in preparing this report. Ryerson's remarkable growth in publications over the last decade is shown in Figure 5. According to a recent ReSearch Infosource report, in the undergraduate category Ryerson is first in Canada in terms of the total number of publications and fifth in publication intensity for the fiscal year 2011. In addition to publication productivity, citations by other scholars also provide important evidence of research impact. Ryerson's growth in citations has grown steadily, and in 2011 the University had 4,533 citations compared to just five in 2001.

FIGURE 4

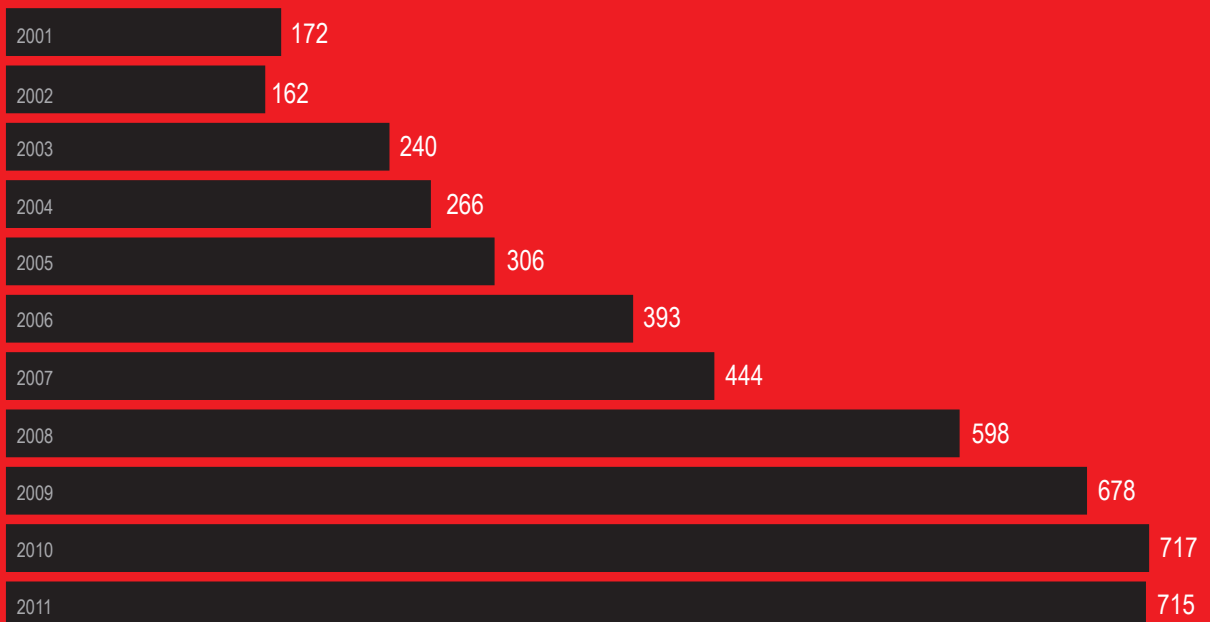
Invention Disclosures per Year In Number of Disclosures



SOURCE: Ryerson University Data

FIGURE 5

Publications by Year In Number of Publications



SOURCE: Thomson Reuters, ISI Web Of Knowledge, as of February 28, 2013

Research Centres and Institutes

Ryerson University has over 24 centres and institutes as well as a wide range of specialized laboratories. These collaborative environments provide valuable platforms for the exchange of ideas amongst researchers, fueling the advancement of multidisciplinary research and innovation, and providing a common point of focus for students and faculty members.

University-Based Centres

- Centre for Immigration and Settlement (RCIS)
- Centre for Labour Management Relations (CLMR)
- Centre for the Study of Commercial Activity (CSCA)
- Law Research Centre
- Ryerson University Analytical Centre (RUAC)

Faculty-Based Centres

Arts

- Institute for Stress and Wellbeing Research
- Modern Literature and Culture Research Centre (MLC)
- Psychology Research & Training Centre (PRTC)

Communication and Design

- Transmedia Research Centre
- Journalism Research Centre (RJRC)
- Image Centre (RIC)

Community Services

- Centre for the Advancement of the Scholarship of Teaching & Learning
- Ryerson Centre for Children, Youth and Families (RCCYF)
- Nursing Centre for Education and Research on Violence Against Women and Children (NCREV)
- Centre for Studies in Food Security (CSFS)
- Centre for Global Health and Health Equity
- Centre for Health in at Risk Populations (CHIRP)
- Centre for Nutrition Communications

Engineering, Architecture and Science

- Computer Networks Centre
- Centre for Urban Energy (CUE)
- Ryerson Institute for Aerospace Design and Innovation (RIADI)

Ted Rogers School of Management

- Centre for Learning Technologies (CLT)
- Centre for Voluntary Sector Studies (CVSS)
- The Diversity Institute



3117 Paris
171 Barcelona
05 London
5 London
Rome
Zurich
London
Vienna
Catania
Frankfurt
Amsterdam

International Engagement at Ryerson

Ryerson's international strategy has supported key elements in the University's academic plan, *Shaping our Future*.

As Ryerson's reputation grows, interest in our programs, our researchers, and our distinctive approaches to experiential learning and innovation is increasing. More and more international organizations and institutions are visiting Ryerson and extending offers to partner. Ryerson is involved in many more multi-university international proposals than ever before. And we have dramatically increased the level of international engagement.

Building International Partnerships

Ryerson seeks out partnerships with leading institutions and organizations worldwide to increase opportunities for faculty and student engagement, and to enhance Ryerson's profile. Countries identified by Ryerson for strategic collaboration include China, India, Brazil, Russia, South Africa, Kenya, among others. Many of these nations are currently investing heavily in broadening access to higher education and expanding research activity, particularly in science and technology

fields that lead to opportunities for innovation and commercialization. Ryerson missions to China, India, Russia and Israel over the past year have led to the formation of new partnerships with top ranked institutions. **Figure 6** shows some of our key strategic partnerships established in 2011/12.

Ryerson has partnered with Canadian and international institutions on various large international research and development proposals. This has led to the establishment of partnerships with leading universities and organizations in India which are highly valuable and will positively contribute to future opportunities.

Visiting Researchers

As a mark of Ryerson's increasing reputation and international profile, our institution has become a destination of choice for visiting faculty, and for visiting research students, who support the research of our faculty members. In 2011/12 Ryerson was home to visiting students from more than 18 countries in the last year alone [**Figure 7**].

Ryerson Student Engagement

Ryerson places a strong emphasis on experiential learning, including education that takes place overseas. We provide a variety of opportunities, ranging from academic exchanges for undergraduates (who can choose among over 60 partners in 18 countries) to research attachments for graduates. We have also recently added a *cotutelle* agreement, allowing for co-supervision of doctoral students at multiple institutions. An increasing number of students are also taking part in internships and placements abroad, building both their resume and their global outlook in the process. Figure 8 shows the range and participation level of student activity.

Ryerson has continued to provide encouragement for students to engage internationally through a range of funding programs which supported more than 241 students studying abroad including 119 graduates and 122 undergraduates, as shown in **Figure 9**.

Ryerson also sponsored a host of innovative study trips. For example, TRSM faculty members **Elizabeth Evans** and **Hong Yu** (Retail Management) led a group of 16 students on a study trip to China in May 2012, including stops in Beijing, Shanghai and Hangzhou to visit a variety of Chinese universities, companies and markets as well as a visit to the Canadian Tire sourcing office. In March 2012, students from the Immigration, Settlement and Diaspora Policies stream of the PhD program in Policy Studies attended a one-week training program on migrations studies at the Centre for Development Studies in Kerala, India, where a research project on Indian diaspora is underway.

Ryerson students also were recognized for their international achievements.

Monika Erzsebet Berenyi, MFA Student, Documentary Media received support to undertake research towards her Master of Fine Arts in Documentary Media thesis project at the Library of Congress in Washington, DC. She was asked to present her work on the historic United States Farm Security Administration-Office of War Information Photographic Archive at the Smithsonian Archives, the National Museum of American History and the National Portrait Gallery.

Building Ryerson's Reputation and Profile

Increasingly Ryerson is invited to speak at international conferences and seminars that provide opportunities to profile the university. These have included, but are not limited to, the "Think IndiaThink Innovation" FICCI R&D 2011 Industry and Academia Linkages Conference, the "Entrepreneurship and Innovation in Universities" event in Moscow during February of 2012, the Mumbai-based "FICCI Frames" conference in March 2012, the "**2012 MLeague Education Forum**" in October in Beijing and the "SENAI Innovation Conference for Industry in Brazil" in November. Media interest generated by the University's participation in these events and others serves to effectively highlight Ryerson's international engagement to Canadian and international audiences.



FIGURE 6

Strategic Partnerships Established in 2011-2012

Institutional Partnerships	
1. Beijing Jiaotong University	
2. Communication University of China	
3. Danish School of Media and Journalism	
4. Harbin Institute of Technology	
5. Jindal Global University, India	
6. Northwestern Polytechnical University	
7. Shanghai Finance University	
8. The Foundation of Experimental Cinematography Center (GSC-Milan), Italy	
9. Universidad Carlos III de Madrid	
10. University of California, LA (UCLA)	
Other Partnerships	
1. COMAC Shanghai Aircraft Customer Service Co., Ltd.	
2. Indo-Canadian Business Chamber	
3. Institutions of the National Confederation of Industry-Brazil (CNI)	
4. Sao Paulo Research Foundation	
5. Center for Development and Human Rights (CDHR), India	
6. The Hatch, India	

SOURCE: Thomson Reuters, ISI Web Of Knowledge

FIGURE 8

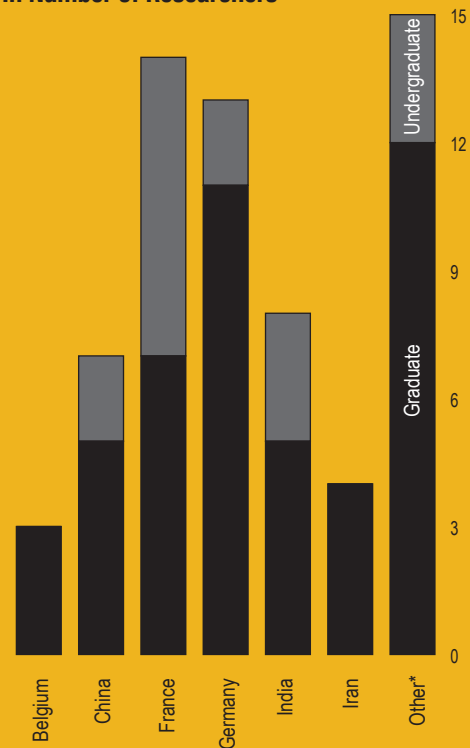
Student Mobility Activity: May 2011 – April 2012

Activity Type	Ryerson Students (OUT)	Partner Students (IN)
Academic Exchange	151	199
Placements & Internships	82	-
Conference Participation	99	-
Field Trip Participation	209	-
Visiting	-	64
TOTAL	541	263

SOURCE: Ryerson International Partnerships database

FIGURE 7

**Visiting Researchers at Ryerson 2011-2012
In Number of Researchers**

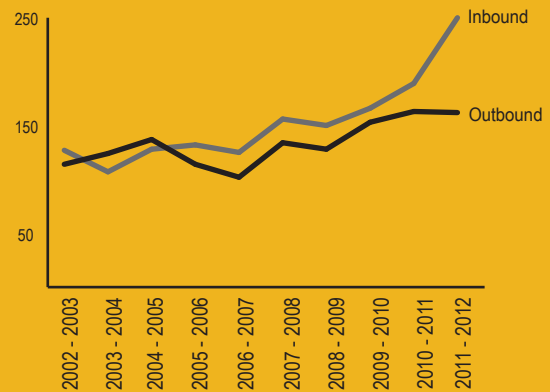


*Includes Brazil, Chile, Egypt, Italy, Mexico, Morocco, Poland, South Korea, Spain, Sweden, the Netherlands, Trinidad & Tobago

SOURCE: Ryerson International Partnerships database

FIGURE 9

**Participation in International Academic Exchanges
In Number of Exchange Students**



SOURCE: Ryerson International Partnerships database



R U

To see these young people
and the transformation
that is their journey through
volunteer work.

Kevin Johnson
Student President

CSU



R U

To see these young people
and the transformation
that is their journey through
volunteer work.

Kevin Johnson
Student President

CSU

The Next Generation

Ryerson is committed to creating meaningful research experiences for students and postdoctoral fellows, providing them with intensive scholarly training as well as opportunities to participate in faculty-mentored research projects in collaboration with industry partners. With support from a wide range of programs offered by the federal and provincial governments, these talented individuals develop essential academic and business skills while addressing real-world social, economic, and environmental issues. Students at Ryerson have also earned a number of achievements that demonstrate their deep engagement with emerging research questions, both within the university and in surrounding communities.

Federal Economic Development Agency for Southern Ontario (FedDev Ontario)

As Canada's most populous region – home to 12.3 million residents living in 288 communities – Southern Ontario is an essential contributor to the Canadian economy. FedDev Ontario was established in August 2009 to help Southern Ontario's economy mitigate and overcome regional and global economic challenges. Two programs sponsored by FedDev that support the next generation of researchers and innovators in the region are the Graduate Enterprise Internship and the Scientists and Engineers in Business program.

Graduate Enterprise Internship (GEI)

FedDev Ontario's GEI program supports the development of highly skilled workers in Southern Ontario by providing graduate students and recent alumni of science, technology, engineering, and mathematics (STEM) programs with business and management experience in small and medium-sized enterprises (SMEs). Below is a list of some of the positions that have been established for new Ryerson graduates at these companies through the program.

- Mechanical Design Engineer, **Boerhof Welding Ltd.**
- Business Analyst, **Eeare Management Inc.**
- Chemical Engineer, **Enviroshake Inc.**
- Software Developer, **Financial Sharp Inc.**
- Software Developer, **Greengauge Inc. (DMZ)**
- Animator, **Huge Monster Inc. (DMZ)**
- Innovation Strategist, **Idea Couture Inc.**
- Developer, **Maintenance Assistant Inc.**
- Project Engineer, **Pacline Corporation**
- Field Electrical Engineer, **Pipetel Technologies Inc.**
- Experience Designer, **Winston Inc. (DMZ)**
- Marketing Associate, **XMG Studios Inc.**

Scientists and Engineers in Business (SEB)

Scientists and Engineers in Business is designed to enhance the entrepreneurial skills of graduate students and recent graduates in the fields of science, technology, engineering and math (STEM) by improving access to financing and providing support services to successfully launch and manage start-up businesses in Southern Ontario. Under this program, in 2011/12 FedDev awarded

Ryerson \$315,000 in new funding for 10 commercialization fellowships.

Mitacs Inc.

Mitacs is developing the next generation of innovators by linking universities with industry partners through unique research and training programs. The three main funding programs available to universities from Mitacs are Mitacs-Accelerate, Elevate, and Globalink. During 2011/12, Mitacs-Accelerate funded over 41 internships for masters and doctoral students at Ryerson, totalling \$480,000 in new research funding.

These are two examples of the research projects made possible through partnership collaborations supported by Mitacs-Accelerate.

In collaboration with Newspapers Canada, **Edward Tubb** is working under the direction of his supervisor **Ivor Shapiro** (Journalism) to gather information about Canadian press councils. In his project *Press Councils in Canada: Models of Practice and Prospects for Alternatives*, he is assessing their activities and exploring how those involved in and affected by these procedures view their success.

Kernaghan Webb (Law) and masters student **Andrei Iovu** have partnered with the Canadian Standards Association (CSA) on the project *Practical Recommendations for Effective Engagement of Canadian Standards Association with Non-governmental Organizations in the Standard Development Process*, which explores ways of increasing the involvement of non-governmental organizations (NGOs) in the development of institutional standards.

Mitacs Elevate funding supports recent postdoctoral fellows as they pursue cutting-edge research and develop business, entrepreneurship, and scientific management skills through collaboration with local industry. In the process, companies also gain access to highly qualified and uniquely trained talent.



Ryerson was awarded eight Mitacs Elevate Strategic Fellowships in 2011/12, including the following examples.

Supervised by **Ali Miri** (Computer Science), postdoctoral fellow **Behzad Malek** is developing a solution to reduce fraud losses at payment processing centres by adapting the existing infrastructure through his project Secure Context-aware Mobile Payment. This new technology will boost the confidence of merchants and customers in each transaction, as well as decreasing the operating costs of current point-of-sale systems by removing the need for paper receipts and eliminating mechanical parts.

Postdoctoral fellow **Ibrahim Hassan Mustafa** (Chemical Engineering) is working under the supervision of Ali Lohi to develop a holistic approach to the design of integrated bio-refineries that run on virtually all types of renewable raw materials. This project, Sustainable Development Through the Effective Production and Use of Bio-Fuels and Integrated Bio-Refineries, will contribute to Canada's goal of reducing greenhouse gases by achieving net zero CO2 emissions while also reducing operational costs, thereby benefiting industries and municipalities in Ontario and across Canada.

Undergraduate Research Opportunities (URO) Scholars

The URO Scholars program provides the opportunity for undergraduates to participate in faculty-mentored summer research at Ryerson. In continued support of Summer 2011 participants in the program, five URO scholars were given the opportunity to participate in academic conferences through OVPRI sponsorship in the fall of 2011.

Linda Yau Lin Liu (Nursing) delivered a poster presentation of her work, *Music as an Interpretive Lens: Patient Experiences of Discharge Following Heart Surgery*, at the Society of the Arts in Healthcare's 23rd Annual International Conference in Detroit, Michigan.

Ahmad Al-Qinneh (IT Management) presented his research on the Empathetic Coefficient: Widespread Empathy Crucial to Economic Sustainability at the International Journal of Arts and Sciences conference in Gottenheim, Germany.

Former URO Scholar **Chuck Howard** (Economics) was also selected as one of 10 inaugural recipients of the 3M National Student Fellowship, which recognizes outstanding student leaders.

More Outstanding Student Achievements

Faculty of Arts

BA student **Dana Greenbaum** and PhD student **Andrea Wilkinson** won the first-place prize in the Psychology Foundation of Canada's "There is No Health Without Mental Health" video contest. Their video, *The role of attachment in infancy on later mental and physical health outcomes*, has been viewed by over 5000 people in over 40 countries and has been featured on the websites of the Canadian Psychological Association and the Toronto Star.

MA student **Danielle MacDonald** received the New Investigator Research Award in the category of Women's Issues in Behavior Therapy Special Interest Group from the Association for Behavioral and Cognitive Therapies.

PhD student **Stéphanie Marion** was the recipient of a Student Grant-in-Aid from the American Psychology and Law Society (Division 41 of the American Psychological Association).

At the meeting of the NorthEastern Evolutionary Psychology Society in Plymouth, New Hampshire, the Feminist Evolutionary Psychology Society presented PhD student **Sarah Radtke** with the Best Student Talk award for *Lesbian Pulp Fiction: an Analysis of Women's Mate Preferences*.

Faculty of Communication and Design

Ryerson masters students **Brigitte Noel** and **David Thurton** and undergraduate student **Calvin To** (Journalism) were among the eight recipients of the CBC Joan Donaldson News

Scholarship, chosen based on their academic standing, their journalistic potential, and their active engagement in the world around them.

Fourth-year student **Stephen Dunn** (Film Production) won the award for Best Live Action Film at the Toronto International Film Festival (TIFF) 2012 Student Film Showcase.

Jayson Araja (Fashion) was awarded the 2011 Triumph Inspiration Award Canada for his female undergarment design, entitled *Elizabethan Goddess*. As the Canadian winner, Araja's classic and elegant design will compete against 30 other garments from around the world in an international competition.

Third-year student **Ana Cop** (Image Arts) took second place in the Fine Art category of conceptual photography at the Sony World Photography Awards, held in London, England. Over 40 awards were given to photographers from around the world, with Cop being the sole Canadian winner.

Faculty of Community Services

Ruth Stackhouse (Disability Studies) received the City of Toronto's Access Award in recognition of her contributions to community theatre, as well as her engagement with community workers to address issues facing persons with a psychiatric history, a disability, or who have experienced violence against women. Stackhouse was also honoured with a Queen Elizabeth II Diamond Jubilee Medal.

Michelle Kwan (Nutrition) is the winner of the Ontario Home Economics Association (OHEA) Student Media Release Competition. The award was presented at the OHEA Conference, held at Ryerson on March 24th, 2012. Kwan's winning submission addresses the importance of adequate sleep to maintaining a healthy mind and body.



Diana Huey (Nutrition) won the first-place prize at both the provincial and national levels for the Mission:ImPULSEible food development competition, which invites students to use pulses as an ingredient in the development of new food products.

Corina Becker (Disability Studies) received the Autistic Self Advocacy Network's 1st Annual Award for Exceptional Services to the Autistic Community. The award was created to spotlight people who have helped to break boundaries and build community for Autistic people.

Faculty of Engineering and Architectural Science

PhD student **Anthony Lombardi** (Mechanical and Industrial Engineering) placed second in the AUTO21 testDRIVE competition and was awarded a scholarship of \$5,000 for his work on reducing distortion in aluminum engine blocks.

PhD student **Lakshmi Sugavaneswaran** (Electrical and Computer Engineering) received third prize at the Ministry of Health and Long-Term Care conference for her paper Risk Assessment for Long-term Care: Participation in Strategies for Neuromuscular Disorder Prediction.

PhD student **Wai Yeung Yan** (Geomatics Engineering) won the best paper award at the Canadian Association of Geographers Ontario Division's annual meeting, as well as the best poster award for his work presented at the Ontario Association for Impact Assessment's annual conference.

Graduate students **Mahmoud Abdel-Rahman, Akram Afifi, Annie Chow, Hassan Ibrahim, Neda Poursaeid, and Wai Yeung Yan** (Geomatics Engineering) won top prizes for the second year in a row at the Annual Research Poster Competition of

the Association of Ontario Land Surveyors Conference.

Faculty of Science

Eno Hysi (Biomedical Physics) received the Alexander Graham Bell Canada Graduate Scholarship for his research on how photoacoustic imaging can help detect cancer. Hysi's studies of photoacoustics and red blood cell aggregation have been presented at ten international conferences and published in several journals and conference proceedings.

Sonal Bhadane (MSc, Physics) was awarded Best Student Oral Presentation Prize at the conference of the Canadian Acoustical Association, in October, 2011, for her talk on "High Intensity Focused Ultrasound and Microbubble Induced Tissue Ablation: Effect of Treatment Exposure on Thermal Lesion Volume and Temperature."

BSc student **Carolyn Khalil** (Department of Chemistry and Biology) received a Centre for Urban Energy (CUE) Toronto Hydro MITACS Accelerate Scholarship of \$5,000 for her work on designing next-generation solar cells.

Avery Raess (BSc, Physics) was awarded first prize at the scientific poster presentation in the Department of Physics at Ryerson University in April, 2012 (Supervised by Dr. Raffi Karshafian of Ryerson University and Dr. Ori Rotstein of St. Michael Hospital).

Ted Rogers School of Management



Scholarly, Research and Creative (SRC) Activity Advisory Committee

Terms of Reference

- The SRC Activity Advisory Committee shall be representative of the research enterprise across Ryerson.
- Appointments are made by the Vice-President, Research and Innovation, and include the Associate Deans of all faculties. The Committee is advisory to the OVPRI.
- The Committee will be the leading venue for discussion, advice and guidance of the strategic research issues and directions of the university.
- The Committee will address all aspects of the research enterprise across Ryerson, including basic and applied research, knowledge translation, commercialization and industry.
- The Committee will advise on the use of effective performance indicators that describe and reflect the diversity of Ryerson and its research breadth.
- The Committee will strike subcommittees, task forces and specialty groups of various types, from time to time, to facilitate the implementation of its activities.

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