nano ontario

Annual Report 2017

nano ontario is a not-for-profit corporation representing the interests of academic, industrial, government and financial community members in the development of Nanotechnologies in Ontario.

nano ontario members work together to raise the profile, increase the research, build the investment and drive economic returns from nanotechnology in the province and across Canada.

VISION

- The trusted source of information for nanotechnology activity in Ontario.
- The recognized authority to advise government on economic opportunities, policy, standards and regulations that enable Ontario to benefit and capitalize on its research, development and commercial capacity in nanotechnology.

OBJECTIVES

- Map Ontario's capacity in nanotechnology research development and commercialization.
- Promote and facilitate interaction between nanotechnology groups in universities, industry and government.
- Coordinates public outreach activities to advocate societal benefits enabled by nanoscience and nanotechnology.

MESSAGE FROM THE CHAIR

It is with great honor that I have accepted to become the Chair of NanoOntario and ensure a continuity of what has been built by my predecessors Arthur Carty and Walter Stewart, since 2008.

NanoOntario reflects the excellence of the science and engineering accomplished by our researchers and the R&D innovation driven by of our industry members. This dynamic field is supported by multiple Ontario-based facilities with complementary expertise in fabrication of devices, synthesis of advanced materials and characterization of surfaces and interfaces.

From an academic prospective, the field has consistently increased its impact in applications as diverse as photonics, drug delivery, sensing devices and green technologies. The number of specialized high impact scientific journals and conferences in this field is a key metric to gauge the increasing importance of nanoscale science in chemistry, physics and engineering.

It is therefore important for us to capitalize on these aspects together with Ontario investments made over the past two decades to initiate new funding models that support collaborative work between industry and academia.

As the new chair of NanoOntario, I will continue to enthusiastically promote the excellence of the science and engineering done in our Universities and Colleges and though our annual conference and industry workshops. I also want to involve more of our industry collaborators to be a part of NanoOntario and increase access to our facilities.

I will work with all members of NanoOntario as well with funding agencies to support industry-academic projects and increase the impact of our actions. We will work with the other provincial nano-consortiums and NanoCanada for a mutual benefit of our concerted actions.

I would like to thank you for your vote of confidence and I am looking forward to work with you during my term as chair.

Dr. François Lagugné-Labarthet (Western University)

INDUSTRY-UNVIERSITY SHOWCASE (May 11, 2017)

Nanofacilities for Emerging Automotive and Aerospace Technologies

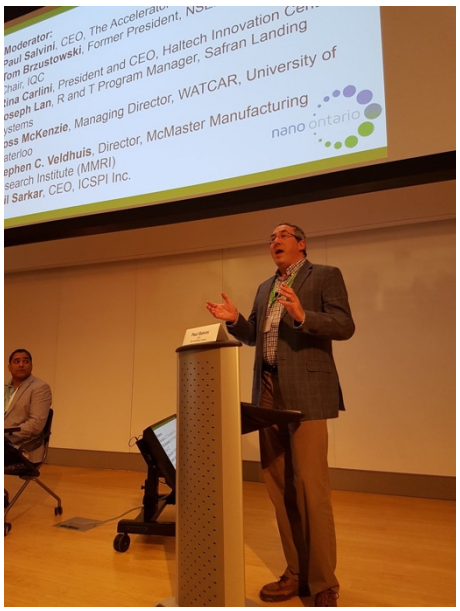
The quality of research infrastructure in Ontario Universities is world-class. Our annual Industry-University showcase connects state-of-the-art university facilities and researchers with industrial companies and customer problems to drive innovation in Ontario. This year, the showcase was held in the Lazaridis Quantum Nano Centre, and focused on emerging technologies for automotive and aerospace. Over 100 participants registered, with an even split between industry and academic attendees.

Top R&D Managers from General Motors, Magna International, COMDEV, Mitsubishi Heavy Industries. Shimco and IBM presented problems facing from their customers and provided insight into how advanced materials and manufacturing are driving their industry. With that understanding, Ontario's top university facilities showcased state-of-the-art laboratories for nano-fabrication, nano-characterization and nano-metrology that are open to industry collaboration.

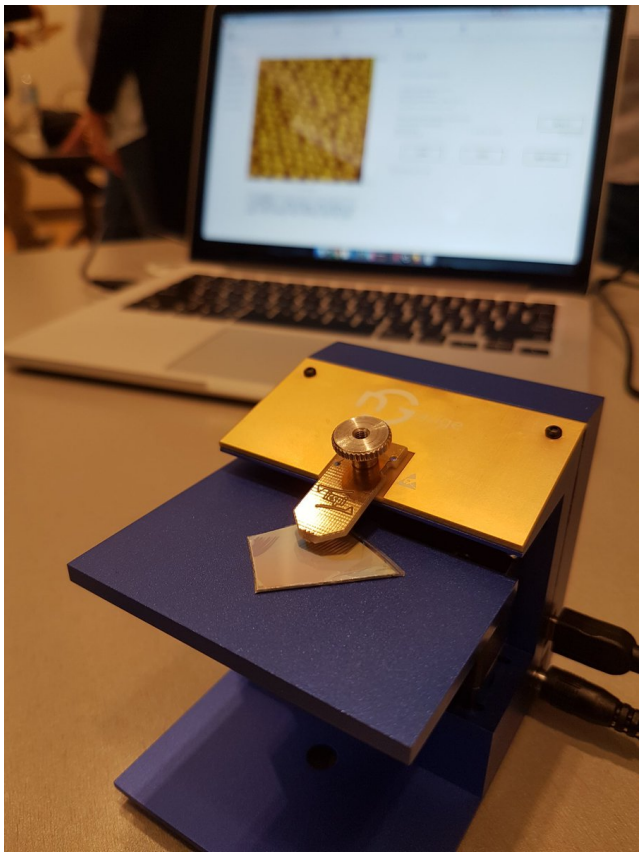
Toronto NanoFabrication Centre www.tnfc.utoronto.ca
Waterloo QuantumNanoFab https://fab.qnc.uwaterloo.ca
Western Surface Science Laboratory www.surfacesciencewestern.com
Windsor Institute for Diagnostics Imaging www.uwindsor.ca/idir

A engaging panel discussion was led by Dr. Paul Salvini (CEO, Accelerator Centre) to discuss best practices for industry-academic collaboration. Panel members included:

- **Tom Brzustowski**
  Former President, NSERC
- **Ross McKenzie**
  Managing Director, WATCAR
- **Stephen C. Veldhuis**
  Director, McMaster Mfg Research Institute (MMRI)
- **Rina Carlini**
  President and CEO, Haltech Innovation Centre
- **Joseph Lan**
  R& T Program Manager, Safran Landing Systems
- **Neil Sarkar**
  CEO, ICSPI Inc.



Representatives from the Natural Sciences and Engineering Research Council (NSERC), MITACS and the Ontario Centres of Excellence (OCE) were on hand to explain how their programs can be leveraged to engage, support and fund collaborative research projects between industry and universities. Networking sessions and exhibitor demonstrations allowed participants to tour facilities, test out new technologies, and explore new partnering opportunities.



8th NANOONTARIO ANNUAL CONFERENCE (Nov 9-10, 2017)

Nanomedicine Developments and Clinical Challenges

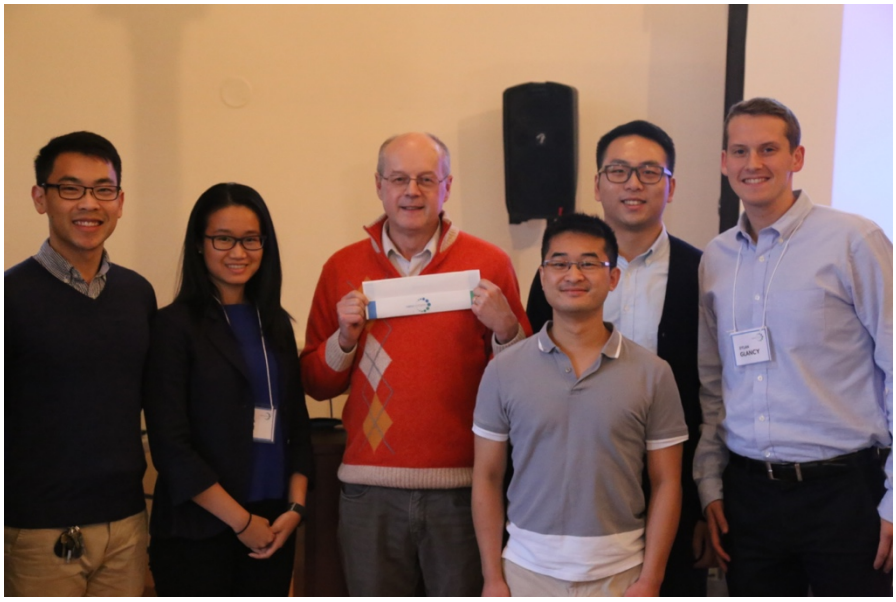
The 8th NanoOntario Conference was hosted by Dr. Gilbert Walker and the University of Toronto in the historic Enoch Turner school house. The focus of the conference was *"Nanomedicine Developments and Clinical Challenges".* A pre-clinical imaging workshop was held at MaRS by the STTARR Team (Spatio-Temporal Targeting and Amplification of Radiation Response). Also, seizing the opportunity at the Conference, 25 faculty, government and industry representatives participated in a discussion about the creation of a National Centre of Excellence (NCE) in nanomedicine. As per April 2018, This NCE proposal has been invited for the full proposal application. This highlights the importance of these meetings that help identifying the strengths in specific fields.

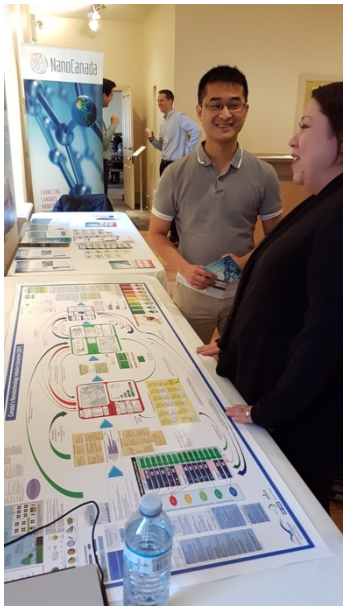
The two-day program welcomed over 100 attendees and delivered 16 riveting presentations by Ontario's top researchers on topics in Drug Delivery, Theranostics and Nanoparticle Toxicity. On day two, an industry panel featuring Molly Shoichet (Toronto), Andrew Sinclair (NSERC), Brian Haydon (CSA) discussed the challenges of "Moving to the Clinic and Enhancing Nanomedical Manufacturing in Ontario".

STUDENT POSTERS AND EXHIBITORS

Top Talent, Industry Experts, Tours, and Awards

31 students competed for peer reviewed poster awards, and participated in an engaging research “Conga Line” pitch session. Tours were available at the Toronto NanoFab and exhibitors Systems For Research (SFR) and NanoCanada were on hand to discuss technology and national and international nanotechnology initiatives.





NANOONTARIO IN JAPAN (Feb 13-17, 2017)

Going Global and Representing Ontario on an International Stage

For the second year in a row, NanoOntario represented the interests of its Members at the NanoTech Conference and Exhibition at Tokyo Big Sight in Japan.

The Mission was organized by NanoCanada and included a meeting at the Canadian Embassy in Japan. Over a dozen delegates from Canada presented their nanotechnology research, products and initiatives to Japanese stakeholders. We learned about Embassy services for Canadian organizations and industrial opportunities in Japan for nano-instruments, new energy materials and cleantech. A key outcome is that we raised the profile of NanoOntario member organizations as leaders and international partners in Science, Technology and Innovation.

The Canadian delegation was composed of NanoCanada, NanoOntario, PrimaQuebec (formerly NanoQuebec), Alberta Innovates (nanocrystalline cellulose), WIN, NRC, NINDT and 12 other Canadian companies, including one from Ontario. (Grafoid).

Canadian participants travelled to the National Institute for Advanced Industrial Science and Technology (AIST). The group was introduced to the TIA-nano open innovation hub. The TIA-nano is Japan's largest nanotechnology research and education center in Japan and was enabled under the leadership of AIST, the University of Tsukuba and the High Energy Accelerator Research organization. The delegation also visited the National Institute for Material Science and the International Centre for Materials NanoArchitectonics (MANA), one of the top research facilities that emphasizes internationalization for training young researchers.

The following day the Canadian Embassy hosted a Canada-Japan nanotechnology seminar with over 85 guests, followed by a networking reception. The event was a joint effort supported by NanoCanada, Alberta Innovates, the Alberta Japan office, the British Columbia Trade and Investment Office and the Quebec Delegation office.

These fruitful meeting and visits provided a direct line into top Japanese institutes that would not be possible without the credibility of the Canadian Embassy and NanoOntario's participation in the pan-Canadian delegation organized by NanoCanada.

The primary activity for NanoOntario was participation in Japan's NanoTech 2017 Conference and Exhibition. Considered one of the largest events in the world, the tradeshow floor sees over 50,000 registrants visiting 100's of booths set up by companies and countries. The NanoCanada booth, was the home to all Canadian delegates to attract business and conduct meetings with partners and industrial participants at the show.

The event cost over $40,000 and NanoCanada was given support from Alberta Economic Development and Trade, Alberta Innovates, the Canadian Embassy in Japan, the Alberta-Japan office, the Quebec Delegation office and the British Columbia Trade and Investment office. NanoOntario set up a corner of the booth to represent and raise the profile of its members.

NanoCanada was invited to participate in the 9th Annual Nanotech Association Conference. Nanotechnology leaders from across the globe gave an overview of their countries priorities, objectives and policies regarding nanotechnology. There was a lot of interest in cooperation on educational activities as these are general non-competitive and often have limited budgets.

During this Mission, NanoOntario interacted with many companies and institutes, including several who expressed interest in becoming members of NanoOntario. NanoCanada indicates the Canadian companies who participated in this event have made over $1.5 million dollars in sales as the result of their meetings in the NanoCanada pavilion.

In conclusion, NanoOntario's participation in this mission and tradeshow is key to raising the profile of its members and representing the interests of Ontario on the national and international scene. It was highly insightful and productive to meet the other key stakeholder in Canada representing and working nanotechnology. It has allowed for better coordination and planning between provincial and national organizations.

ADVOCACY FOR NANOTECHNOLGY IN ONTARIO

Government Relations and Ontario-China NanoInnovation Centre

NanoOntario is the recognized voice for nanotechnology in Ontario. We were selected by the Province of Ontario to establish a Nanotechnology Innovation Centre in Suzhou, China. In 2015, we opened an office for Ontario companies and researchers interested in accessing the Chinese market and using the facilities and program in China's "nanocity", NanoPolis. www.nanotech-ic.com

Ontario Ministry of Research, Innovation and Science

Ontario Ministry of Economic Development and Growth

In 2017, Executives from NanoOntario were invited to the Ministry of Research, Innovation and Science (MRIS) and the Ministry of Economic Development and Growth (MEDG) to present on the state of nanotechnology in Ontario. We made a case for stronger provincial funding and support for nanotechnology, by showcasing Ontario's research and innovation capacity. The Executive Committee met with several Provincial Ministry operating units, including the *Analytics and Advanced Technology Branch/Disruptive Technologies Unit; Transformative Technology Adoption Unit; and the New Economy Regulation Unit.* A roundtable was held with technology scouts, industry innovation directors and government leaders responsible for advanced manufacturing, automotive and aerospace, quantum computing and advanced materials.

NanoCanada

NanoOntario is a founding member and signatory to the agreement creating NanoCanada as the National body uniting nanotechnology organizations across Canada.

Ontario Nanotechnology Innovation Centre In Suzhou, China

WOMEN IN NANOTECHNOLOGY / DIVERSITY STATEMENT

Recognizing Diversity and Raising the Profile of Excellence in Ontario

Led by Board Members, Dr. Hind Al-Abadleh, Dr. Rina Carlini and Dr. Maria DeRosa, NanoOntario took steps toward recognizing diversity and raising the profile and accomplishment of Ontario women in nanotechnology.

NanoOntario recognizes that human diversity is central to realizing the vision and objectives of the organization. To this end, NanoOntario is an all-inclusive organization that encourages and supports the participation of all members actively engaged in nanoscience and nanotechnology in the province, including women and members of traditionally under-represented groups in science, technology, engineering and mathematics.

As an organization committed to serving and celebrating the accomplishments of its diverse members, NanoOntario commemorated International Women's Day on March 8 by launching a new initiative called **"Meet Ontario Women in Nanotechnology"**, profiling on a monthly basis the activities of accomplished female scientists, engineers, business leaders, government and private employees from across the province of Ontario.

nanoontario.ca/meet-ontario-women-in-nanoscience

Dr. Hind Al-Badleh and Dr. Marianna Foldvari

NanoOntario also introduced the inaugural **Nano Ontario Awards for female scientists and engineers** engaged in nano-related R&D at a university or company in Ontario. Awards were presented at the 2017 NanoOntario Conference.

Professor Marianna Foldvari (Waterloo) Outstanding Lifetime Achievement

Professor Jin Zhang (Western) Award for Outstanding Mid- career Achievement

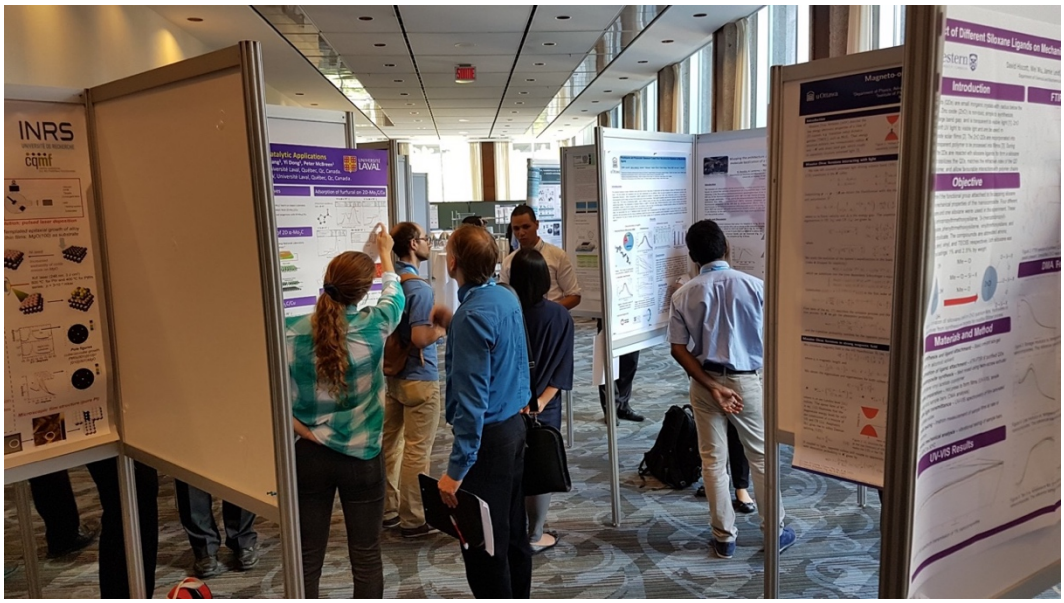
Professor Jaclyn Brusso (Ottawa) Award for Outstanding Early- career Achievement

Awards Committee: Hind Al-Abadleh (Wilfrid Laurier), Maria DeRosa (Carleton), Michael Kolios (Ryerson), François Lagugné-Labarthet (Western), Hamdy Khalil (Woodbridge).

NanoCanada and CMC Microsystems held a national 360 Innovation Conference in Montreal to connect Canada's nanotechnology community with industry and government and highlight how technologies can be integrated and scaled-up for product development.

As a founding member of NanoCanada, NanoOntario plays an anchor role in connecting and promoting Ontario research, commerce and talent across Canada and internationally. In support of our Ontario members, we sponsored **9 Ontario students** to submit posters and represent Ontario research at the Conference.

NanoOntario also sponsored the poster session and NanoOntario Board Member, Alain Francq and CMC Director, Lynda Moore, were the Masters of Ceremonies for the Banquet, featuring Keynote Speaker, Bob McDonald, host of CBC's science program, Quirks and Quarks.



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