



nano ontario

Annual Report 2019





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.
- Coordinate public outreach activities to advocate societal benefits enabled by nanoscience and nanotechnology.



MESSAGE FROM THE CHAIR



In 2019, several new members have joined NanoOntario confirming the necessity to have an overarching structure that defends Ontario's multiple interests in Nanotechnologies.

Spectra Plasmonics, Spectral Devices, SCATR, Ryan, Emerson and more recently, Ovensa all have joined NanoOntario.

I hope that we will continue evolving in this direction bringing in more small, medium and large companies being involved in the future of nanoscale science in Ontario.

Summarized in this report are the main events organized by NanoOntario, in 2019 as well as those in which NanoOntario members participated and represented our organization.

In 2019, we organized two events including a workshop to highlight our facilities and their interactions with companies. This one-day free workshop was organized at Western University in the presence of the main funding agencies.

The 10th NanoOntario conference took place at York University and was again a success, highlighting the high level of our scientific projects in nanoscale science together with the dedication of our students. Current large projects in Ontario such as the free-electron laser project led by Waterloo were also presented, providing new tools and capabilities to our community. Both events included a discussion panel with industry stakeholders.

Dr. François Laguné-Labarthet (Western University).



3rd NanoOntario Workshop (Nov 7, 2019)

Thin Film Technologies

Our third nanoOntario workshop was organized at Western University by F. Lagurné-Labarthe, M. Biesinger (Surface Science Western), E. Gillies (Center of Advanced Material and Biomaterials), John Dutcher (Guelph) and Hind Al-Abadleh (Laurier University). The Center of Advanced Material and Biomaterials (Western) was a sponsor of this free event together with NanoOntario.



The event gathered funding agencies NSERC (Sarah O'Neil), NGEN (Robbie McLeod), MITACS (Erin Azzopardi), and OCE (Jeff Van Heumen) who presented their grant programs and participated to the panel discussion. The major facilities in Ontario, i.e., the Waterloo Institute of Nanotechnologies (V. Logiudice), the Canadian Centre for Electron Microscopy (Nabil Bassim), Surface Science Western (Mark Biesinger) and the Toronto Nanofabrication Facility (Edward Xu) were represented by their scientific directors and provided talks about the functioning of and access to their facilities. CMC Microsystems who provides services and funding for nanofabrication was also represented by Graham Gibson.

Companies with interests in these technologies were also invited to give talks or to participate in the discussion panel: Spectra Plasmonics (Malcom Eade) , nanoPhyll (Mehdi Sanjari),



Plasmionique (Andranik Sarkissian), Angstrom engineering (Mike Miller), Horiba Scientific (Eric Teboul), Huawei (Peter Chun)

The discussion panel included Hamid Shirazi representing the Ontario Ministry of Economic Development, Job Creation and Trade. Mr Shirazi follows the actions of nanoOntario regularly and was invited to our two last AGMs.



The attendance included about 60 people in the rooms from companies interested by the event and the possibility to access the facilities and associated funding.

The observations from the Ministry of Innovation were excellent and it was suggested that we organize these workshops every year. McMaster has indicated their willingness to organize the next workshop.

10th NANOONTARIO ANNUAL CONFERENCE (Nov 22-23, 2019)

Understanding and Exploiting nanoscale science in novel materials and devices.

The 10th Nano Ontario Conference was hosted by Simone Pisana at York University. It included a keynote presentation, 12 invited speakers, 12 flash talks by students, 53 posters and a panel discussion on the topic of *“Translating nanoscale research to the marketplace”*. The conference hosted more than 90 attendees and featured exhibitions by the Canadian Centre for Electron Microscopy, McMaster’s Centre for Emerging Device Technologies, CMC Microsystems and SFR. Sponsorship by the Lassonde School of Engineering and the Office of the Vice-President, Research and Innovation is gratefully acknowledged.



The Keynote Lecture was given by Prof. **Tricia Carmichael**, University of Windsor, on *“How Wearable is Your Wearable? Solution Metallization for Conformable Electronics”*, complementing very nicely presentations by Prof. **Sideh Kabiri Ameri** from Queen’s University on *“Graphene Based Wearable Sensors”* and Prof. **Irene Goldthorpe**, University of Waterloo on *“Silver nanowires for printable, flexible transparent electrodes and e-textiles”*.



Other invited and contributed talks were given by Prof. **Gerd Grau**, York University, Prof. **Stefania Impellizzeri**, Ryerson University, Prof. **Ruby Sullan**, University of Toronto, Prof **German Sciani**, Waterloo, Prof **Giovanni Fanchini**, Western University, Prof **Cecile Malardier-Jugroot**, Royal Military college, Prof **Argya Paul**, Western University, Prof **Ozzy Mermut**, York University and Prof **Nazir Kherani**, University of Toronto. It also included a presentation by Prof **Scott Hopkins** about the large Canada Fund for Innovation project regarding the implementation of a free electron laser in Waterloo.

The panel discussion on "Translating nanoscale research to the marketplace" covered various issues from IP to financing to regulations. L-R: Andrew Maxwell (Bergeron Entrepreneurs in Science and technology), Aarash Sofla (uFluidix), Keith Thomas (Vive Crop Protection), Robert Wang (AnalogX) and Gordon Harling (CMC microsystems). Moderator was Francois Lagugne-Labarthe.



Information about how to protect discoveries, how to commercialize them and how to finance a startup was provided for the next generation of Entrepreneurs. Enthusiastic questions were asked during the meeting highlighting the interest to move fundamental discoveries from the laboratory to the marketplace.



NanoOntario Conference: Student posters and Exhibitors

Top Talent and Awards

45 students competed for peer reviewed poster awards and talks. The conference was sponsored by the division of Surface Science (CIC) of the Microscopy Society of Canada , NanoCanada, CMC as well as industries Edge Scientific , OKYAY ALD and MEAglow.



Student Awards Winners !



Flash talk presentation winners: (top left) first prize **Hannah Ramsay**, Queen's and (top right) second prize **Taylor Stimpson**, McMaster. Poster presentation winners: (bottom left) first prize **Stephen Robinson-Enebeli**, Waterloo and (bottom right) second prize **Alexander Therien**, Western.



Ontario-Jiangsu Nanotechnology Innovation Centre- Dec 2019

Under the impulsion of NanoOntario and the Ontario Ministry of Economic Development, NanoOntario has enabled privileged links with NanoPolis, a nanotechnology hub in the province of Jiangsu in China. A NanoOntario office was created in 2015 with the goal to amplify economic development in nanotechnologies between Ontario and China.



The Waterloo Institute for Nanotechnology has committed in 2019 to physically host an Ontario office at the Centre for 3 years with the vision that another university will follow the steps

Parties collectively created a Commercialization Committee, which will include technology transfer and industry liaison personnel from the largest Ontario universities (UofT, McMaster, Western, and UW as a starting point) who work with spin-offs and startups

Oleg Stukalov, Waterloo Institute of Nanotechnologies' Business Development Manager, is serving as chair of the Commercialization Committee and works with the offices of the different universities interested in such connections with China.

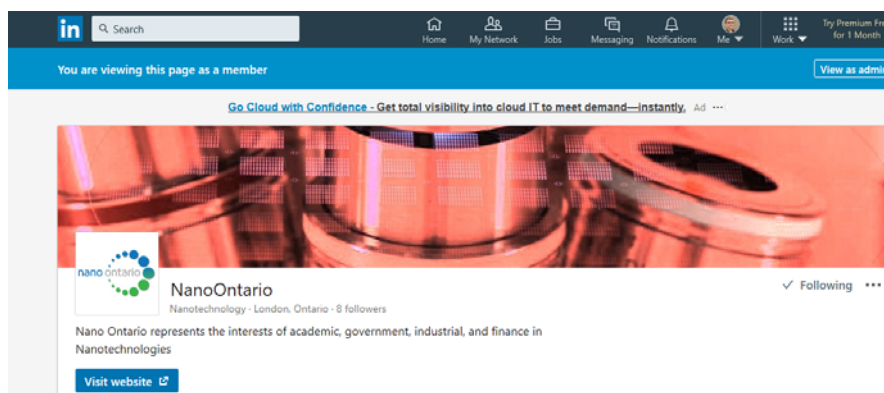


Communication, Web presence and Social media

Modernization of the NanoOntario Website (nanoontario.ca)



Creation of a NanoOntario LinkedIn profile

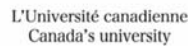


Regular Activity of our Twitter account (@nanoontario)

Twitter Feed



PRESENT MEMBERS (as per June 2020)



BOARD OF DIRECTORS 2020

Francois Lagugné-Labarthet (Western University) **(2019 Chair)**
Peter Mascher (McMaster) **(2019 Vice Chair)**
Hind Al-Abadleh (Wilfrid Laurier University) **(2019 Secretary and Treasurer)**
Muralee Murugesu (University of Ottawa)
Robert Crawhall (The Canadian Academy of Engineering))
Marie De Rosa (Carleton University)
John Dutcher (University of Guelph)
Taimur Qasim (Canadian Standards Association)
Hamdy Khalil (Woodbridge Foam Corp.)
Stefania Impellizzeri (Ryerson University)
Roman Maev (University of Windsor)
Babak Shokouhi (NDS Solutions)
Sushanta Mitra (Waterloo Institute for Nanotechnology)
Jean Michael Nunzi (Queens University)
Simone Pisana (York University)
Mehdi Sheikhzadeh (Lambton College)
Gary Economo (Graphoid)
Gilbert Walker (University of Toronto)
Gordon Harling (CMC microsystems)

Executive Directors 2019:

François Lagugne-Labarthet, Peter Masher, Gordon Harling, Gilbert Walker, John Dutcher, Hind Al-abadleh, Hamdy Khalil.

Members:

Phil Whitig (Mirexus Biotechnologies)
Malcom Eade (Spectra Plasmonics)
Jeff Carson (Spectral Devices)
Ari Forman (SCATR)
Mohamed Parpia (Ryan)
Stephane Gagné (Ovensa)
Wilson Ma (Emerson)





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