



# nano ontario

Annual Report 2020



**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

- To be the trusted source of information for nanotechnology activity in Ontario.
- To be 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



2020 has been a very special year for all of us. Even though it started well for NanoOntario with the annual Japan nanotech conference followed by the mission in Korea in February where fruitful contacts were established with companies and with local Universities, the world went virtual in mid-March.

Because of the global pandemic, our annual NanoOntario conference scheduled at Ryerson and workshop scheduled at McMaster had to be cancelled.

On a brighter side, NanoOntario organized virtual award lectures highlighting the excellence in Nanoscience and Nanotechnologies by Women researchers, including the new postdoctoral award.

Ontario-based companies have joined NanoOntario in 2020 including Ovensa (Stéphane Gagné), Zen Graphene (Peter Wood and Monique Manaigre) and FlowJem (Jesse Greener). Ontario Ministry of Economic, Development, Job Creation and Trade (Hamid Shirazi) has also joined NanoOntario as a member at large, highlighting their interest in the application of Nanoscience and providing the support of their team.

As the chair of the board of directors, I will continue to work towards the expansion of our not-for-profit organization attracting more small, medium and large companies who are, together with the academic researchers, defining the future of nanoscale science in Ontario. Together we will continue to amplify the excellence of our research in nanoscience and of its critical impact in a post pandemic era.

Summarized in this report are the main events organized by NanoOntario in 2020, as well those in which NanoOntario members participated and represented our organization.

Dr. François Laguné-Labarthet (Western University)



## NanoOntario In Japan (Jan 29<sup>th</sup> - 31<sup>st</sup> 2020)

For the fourth time, 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 Tokyo. The Canadian delegation was composed of 21 members. Delegates had opportunities to present their nanotechnology facilities, products, and initiatives to Japanese stakeholders at both the Canadian Embassy and the Nanotech exhibit with the support of trade commissioners and translators. NanoOntario representatives (F. Lagugné, P. Mascher, S. Mitra) also had the possibility to meet with institutes with which they currently collaborate and explore new possibilities with Japanese Universities who are open for researcher exchanges.



The delegation had the opportunity of site visits of FujiFilm Open Innovation hub and the national Institute of Advanced Industrial Science and Technology (AIST) in Tsukuba. These fruitful meetings and visits provided a direct line into top Japanese Institutes that would not be possible without the professional organization by the Canadian Embassy, and NanoOntario's participation in this mission organized by NanoCanada. Noteworthy key contacts were established with Keio University and with Kanazawa University including the Nano Life Science Institute (NanoLSI), two Universities



that have programs to invite foreign researchers. More information can be found on their respective websites:



<https://nanolsi.kanazawa-u.ac.jp/n/research/researchers/>



<https://www.keio.ac.jp/en/>

The primary activity for NanoOntario was participation in Japan's NanoTech 2020 Conference and Exhibition. Considered one of the largest events in the world, the tradeshow floor sees over 50,000 registrants visiting hundreds of booths set up by many companies and countries.

The NanoCanada booth was the home to all Canadian delegates and an ideal environment to conduct business-to-business meetings with other international partners.

During this mission, NanoOntario interacted with many companies and institutes, including several who expressed interest in becoming members of NanoOntario. NanoCanada indicates that the Canadian companies who participated in this event have made many promising connections and that some positive outcomes were materializing as a 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 Canadian stakeholders representing other provinces excellence in nanotechnologies. It has allowed for better coordination and planning between provincial and national organizations. NanoOntario was represented by François Lagurné-Labarhet (Western), Peter Mascher (McMaster) and Sushanta Mitra (WIN, Waterloo). Noteworthy, Stéphane Gagné (Ovensa), one of the Canadian delegates in Japan and Korea, became a new member of NanoOntario.





## NanoOntario In Korea (Feb 2<sup>nd</sup> - 4<sup>th</sup> 2020)

For the first time, NanoOntario (F.Lagugné) joined the mission to Seoul, Korea, following the Japan Nanotech exhibit. Site visits at CEKO and EVERCHEMTECH were organized to these companies specializing in the development of high-tech polymer coatings with hydrophobic, antistatic, antireflection coatings. These coatings are used in a variety of applications including but not limited to electronic devices. CEKO for example provided the screen coatings on Samsung cell phones. These companies are interested in expanding their market beyond Korea.



Meeting at the Canadian Embassy to Korea was also organized with trade commissioners working for the different Canadian provinces and with representation of the main Korea funding agency. A session on the commercialization of research outcomes in nanotechnologies, funding and exchange of researcher possibilities was given by the Nano-Convergence Foundation.

Possibility to meet Korean companies and distributors is facilitated by the trade commissioners working at the Embassies. They have an excellent knowledge of the market and know how to approach the Korean counterparts.



# Virtual Poster exhibit in Korea (July 2020)

In lieu of the nanotech meeting scheduled in July 2020, a virtual event was organized. Under the umbrella of NanoCanada, NanoOntario participated in the conference providing a poster of our members and flyers with all our contact information.



## Enabling Sustainable Nanoscale Science in Ontario, Canada



[nanoontario.ca](http://nanoontario.ca)

[info@nanoontario.ca](mailto:info@nanoontario.ca)

[@nanoontario](https://twitter.com/nanoontario)

**Nano Ontario's Mission :** NanoOntario is a trusted source of information for all nanoscience and nanotechnology activity in Ontario. Nano Ontario can advise government organizations on economic opportunity, policy, standards & regulations that nanotechnology can offer, to enable Ontario to benefit and capitalize from its nano research, development and commercial capacity.

**Our Objectives:** Mapping Ontario's capacity in nanotechnology research, development, and commercialization. Serve as the main point of contact for Ontario's community of practice in nanoscience & nanotechnology. Builds and facilitates new connections between nanotechnology groups in universities, government organizations and industries within Ontario, across Canada, and internationally. NanoOntario coordinates public outreach activities to advocate the societal benefits enabled by nanoscience and nanotechnology.

NanoOntario is represented and administered by 26 members from Academia and Industry who are working together to further expand the use of Nanoscale technologies, Devices and Advanced Materials and Biomaterials in Ontario and internationally. Contact us for any request. For specific interest in our members, Websites and linkedin profiles of all members are available at <https://nanoontario.ca/>




Dr. Laganoff-Caballero is a Professor of Chemistry at Western University. He is the scientific director of the NanoBioMedicine facility at Western, an open-access facility that aims at training the next generation of nanoscale scientists. He is the current chair of NanoOntario Inc.




Dr. Peter Macdonald holds the Wilkins Distinguished Chair in Optoelectronics and leads active research groups involved in the fabrication and characterization of thin film optoelectronic applications. He is currently the Vice-Chair of Nano Ontario.





Dr. Mitra is the Executive Director of Canada's largest nanotechnology institute – the Materials Institute for Nanotechnology (MIRN).




Dr. Shirov Ponce is a Professor of Nanoelectronics at York University. His research has focused on discovering paths to improve dissipation and energy efficiency of electronic devices through the study of nanoscale transport phenomena.




Mr. Gary Scrimmon is currently CEO, President, and COO of Grafoid Inc., a company he founded with Jeff York. Over the span of his business career, Mr. Scrimmon provided strategic consulting and implementation services to technology companies in North America and Asia.





Dr. Delphine is a Professor in the Department of Chemistry at Carleton University. Her research examines a family of supramolecular systems in aqueous solution that can fold into 3D nanoscale structures capable of binding tightly to a specific molecular target.




Dr. Stefania Impellizzeri is a Professor of Chemistry at Ryerson University, where she directs the Laboratory for Nanomaterials & Molecular Plasmonics. She has researched and experimented with different fields of chemistry ranging from organic chemistry to supramolecular chemistry, photochemistry and materials and nanomaterials chemistry.





Jen Michael Russell is a professor of Chemistry at Queen's University. He studies self-organization, Organic and inorganic Photonics, Instrumentation, Processing and Physics of nanomaterials and devices as well as their use for life, energy and sustainable development.


Dr. Merel Stokkelaar is Vice President, Research & Innovation at Lambton College. His areas of research include process systems, advanced process control, customer consulting, and fine optimization, process analysis and design subjects.





Mr. Mohamed Farouk is a PhD level industrial expert with over 10 years of experience. He uses his broad science background and capability to provide the activities of his clients to reveal all SaaS opportunities.





Dr. Mary is the founding Director-General of the Institute for Diagnostic Imaging Research, University of Windsor – a multidisciplinary collaborative research and innovation consortium.




Dr. Hani Al-Khalil is a Professor of Chemistry at Wilfrid Laurier University. Her research interests focus on the environmental impacts of nanomaterials on the chemical behavior of atmospheric and geochemical systems.





Art Korman and partner have founded SCATR, a company that develops and uses laser nanoscopy and machine learning to detect dangerous opioids such as fentanyl and heroin analogs.


Dr. Murgues is a Professor of Chemistry and the Research Chair in Nanotechnology at the University of Ottawa. Dr. Murgues's work with nanoscale materials, molecular magnetic systems and porous materials.




Prof. Walter is the Canada Research Chair in Nanobiophysics at the University of Toronto. Combining optics and nanotechnology, Walter has developed new nanoscale techniques for chemical imaging and molecular mapping with nanoscale resolution.


Mr. Shokri is the founder of Nanoscale Solutions Inc. (NSI) and chairmen, Nanoscale Solutions has developed an innovative patented technology that allows for the batch manufacturing of high aspect ratio at a fraction of the cost.


Dr. Duncan is a Professor of Physics and Director of the Nanoscience program at the University of Guelph. His research program focuses on the physical properties and applications of one-dimensional nanosystems.




William Ma is Director of Strategy & Corporate Development at Emerson (NYSE: EMR). He focuses on working with an ecosystem of partners to drive new to the business and industry innovation.

Dr. Randy Shull is the Senior Global Director for Advanced Technologies Research and Product Development and Innovation at The Woodbridge Group. He pioneered the introduction and commercialization of nanoscale materials into the polyurethane chemistry used in the interior automotive parts manufacturing which is now the benchmark for the industry.





Mr. Wilfrid is currently CEO of Mirexus. Mirexus is a company that has developed a nanoscale delivery platform focusing on fighting tough-to-treat diseases such as cancer and dementia.






Dr. Jeffrey Caruso co-developed multispectral Raman spectroscopy used in compact multimodal cameras and co-founded Spectral Devices Inc. to commercialize the technology.




Mr. Kyle is the CEO and Co-founder of Spectra Plasmonics, a company that develops chemical analysis products based on proprietary SERS technology. Mr. Kyle's academic background is in chemical sciences where he gained direct research experience with Raman using SERS.




Tahira Qazi is a Project Manager within the Health and Safety Standards team at CSA Group.

Nelson Harding is the CEO of CMC Microsystems, a not-for-profit which provides software and services to US colleges and universities across Canada.




Mr. Mahesh is currently the CEO of Ovensa, President and CEO of Ovensa Inc., a private company that has developed a nanoscale delivery platform focusing on fighting tough-to-treat diseases such as cancer and dementia.



## 2020 NanoOntario Awards in Nanosciences for Scientists and Engineers (Nov 2020 - Feb 2021)

Even though the planned 11<sup>th</sup> NanoOntario Conference was cancelled due to Covid 19, the call for Awards in NanoScience for minority groups was maintained and all recipients gave a virtual lecture. Each lecture was attended by 30 to 50 attendees. The recipients of the 2020 NanoOntario awards were:

-Professor **Eugenia Kumacheva** (University of Toronto), Honorary Award for Outstanding Lifetime Achievements in Nanoscience and Nanotechnology in Ontario.

-Dr **Eve Tsai**, neurosurgeon and scientist at Ottawa Hospital, Outstanding Mid-career achievements in Nanoscience and nanotechnology in Ontario.

-Professor **Eva Hemmer**, University of Ottawa for outstanding early career achievements in Nanoscience and Nanotechnology in Ontario

-Dr **Erin Mc Connell**, (Mc Master University), Postdoctoral Award for achievements in Nanoscience and nanotechnology in Ontario.



**Eugenia Kumacheva**  
University of Toronto

Honorary Award  
for Outstanding  
Lifetime  
Achievements

**November 6**  
**3-4 pm**

**“Bridging the  
gap between  
molecules and  
nanoparticles”**



**Eve Tsai**  
University of Ottawa

Award for  
Outstanding Mid-  
career  
Achievements

**December 2**  
**3-4 pm**

**“ How to  
advance  
Nanotechnology  
in the Medical  
Field?”**



**Eva Hemmer**  
Univeristy of Ottawa

Award for  
Outstanding  
Early career  
Achievements

**January 21, 2021**  
**3-4 pm**

**“ Trends and  
Challenges in  
Rare-Earth-  
Based Opto-  
Magnetic  
Nanoprobes”**



**Erin McConnell**  
McMaster

Postdoctoral  
Award

**February 18, 2021**  
**3-4 pm**

**“ DNA as a tool  
to build  
molecular  
recognition  
elements for  
biosensing,  
diagnostics, and  
therapeutics”**





## New NanoOntario Website: <https://nanoontario.ca/>

The NanoOntario Website was redesigned in 2020 highlighting better Ontario's facilities in nanoscale fabrication and characterization, funding opportunities and our researchers. Noteworthy, students looking for a job or a postdoctoral position can have their profiles added to our pool of talent section. All annual reports and programs of our most recent conferences are accessible.





## BOARD OF DIRECTORS 2021

Francois Lagugné-Labarthet (Western University) (2020 Chair)  
Peter Mascher (McMaster) (2020 Vice Chair)  
Hind Al-Abadleh (Wilfrid Laurier University) (Secretary/ 2020 Secretary and Treasurer)  
Muralee Murugesu (University of Ottawa)  
Robert Crawhall (Canadian Academy of Engineering)  
Marie De Rosa (Carleton University)  
John Dutcher (University of Guelph)  
Taimu 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)

### Executive Directors 2020

F.Lagugné-Labarthet, Peter Mascher, Gordon Harling, Gilbert Walker, John Dutcher,  
Hind Al-Abadleh, Hamdy Khalil.

### Members 2020

Ari Forman (SCATR)  
Malcom Eade (Spectra Plasmonic)  
Phil Whiting (Mirexus)  
Jeff Carson (Spectral Devices)  
Sami Aslam (Emerson)  
Mohamed Parpia (Ryan)

### New members 2020

Stéphane Gagné (Ovensa)  
Peter Wood and Monique Managire (Zen Graphene)  
Jesse Greener (FlowJem)  
Hamid Shirazi (Ministry of Economic Development, Job Creation and Trade-Strategic Industry  
Intelligence Branch)





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