The Montréal Photonics Networking event: lessons learned from online and in-person collaborative environments for graduate researchers.

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ABSTRACT

Montréal is home to over 100 companies and 6 universities with photonics activities that drive regional economic development. This paper provides an update on the Montréal Photonics Networking Event, an annual meeting heading into its' 8th edition in 2024. The event's stated mission is to build a collaborative environment for the development of student researchers, with the ambition to facilitate research synergies and connect with the industry to showcase research and career opportunities. Since 2015, online and in-person events have taken place, with a measured growth of 50% year-on-year, a cumulative reach of 600 participants, and the establishment of 30 partnerships with industry, photonics student chapters, research clusters, and socio-economic development partners. The event is coordinated by a network of volunteer students and professionals representative of the attendees and collaborators. Activities, promotional material, and marketing strategies to create audience engagement before, during, and after the event will be presented, along with lessons learned to enable peer-to-peer development online and in person across multiple academic research institutions.

Keywords: eLearning, Learning and Development, Technical upskilling, Photonics Training, Continuous Education.

1. INTRODUCTION

It is well documented in the optics education and outreach literature how ecosystems with education, research, innovation, and industrial stakeholders can influence local and regional economic development.[1] Montréal, home to over 100 companies and 6 universities with photonics activities,[2] is therefore well placed to experiment and implement programs to benefit the local population. For students, activities that are research-tutored and research-led are critical for professional development;[3] in addition, the opportunity to engage with industry professionals to communicate skills and habits developed as a trainee researcher is valuable for future career prospects.[4,5] This report adds to the recent literature published by renowned optics and photonics hubs, such as Jena, Germany[6,7] Cork, Ireland,[8] and Tucson, Arizona[9], that have developed programs as part of a holistic blended learning scenario for graduate student development. The Montréal Photonics Networking Event is used as an illustrative case study for the reader looking to emulate collaborative educational events for graduate students. This paper is organized as follows. Section 2 describes the event's history and implementation, with attention engagement methods and community building. Section 3 will offer a collection of lessons learned and perspectives for future editions.

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2. BACKGROUND

The Montréal Photonics Networking Event was launched in 2016, following the momentum to promote photonics channeled by the UNESCO 2015 International Year of Light. The event aims to provide a coordinated network for research student exchange, with a mission statement to connect graduate students to (1) share experiences as a photonics researcher, (2) enhance research synergies, and (3) network with the local industry and innovation ecosystem. This section presents the event's organization, program items, and marketing strategies,

2.1. Organization of the event

The event is open to the public and registration is free, with event costs covered entirely through sponsorship. The organizers invite keynote speakers in the local ecosystem to present on topics covering business strategies, personal career reflections, and technical areas. Dedicated poster sessions are offered to research students to present their research work, with both French and English contributions accepted. The submission process is minimalist, requiring contact details, affiliation, and a 100-word abstract. Work already presented at other conferences in the year preceding the conference is accepted; in 2022 and 2023, since this metric has been tracked, on average 50% of posters were presented for the first time at this event. To further incentivize submissions, cash prizes are offered for eligible contributions. A jury of local photonics experts is invited to be judges at the event, with a target that each judge will review 3-4 posters. The event budget covers catering, prizes and marketing items. The budget increase has been driven by the catering required for a growing number of participants, representing approximately 70% of costs since 2022. Venues have been accessible with no fee due to collaboration with local universities, with the exception of a fee to access the online platform Remo in 2020[10]. A summary of the event's history is presented in Table 1.

The organization committee is composed of student representatives from universities with photonics research, co-chairs from academia and industry, as well as a representative from the province's industry photonics cluster, Optonique. The Authors of this proceeding were members of the 2023 committee; all officers are named in the Acknowledgements section. The expectations are to participate in bi-monthly online organization meetings and attend the event in person. Supplementary tasks include nominating keynote speakers and judges, fundraising, and promoting the event to students within each individual networks. Beyond the university network, partnerships have been developed with local stakeholders involved in the development of graduate students. Funding is raised in the form of grants and sponsorships from professional organizations and student chapters (IEEE Montréal, IEEE Photonics Society, Optica, SPIE), provincial research consortiums (COPL, INTRIQ, STARaCOM, RQMP), and private and non-profit partners (DataFranca, Ansys, PreFab AI Photonics, Keysight Technologies, Excelitas Technologies, Fonex, Optonique, Numana, PRIMA Québec).

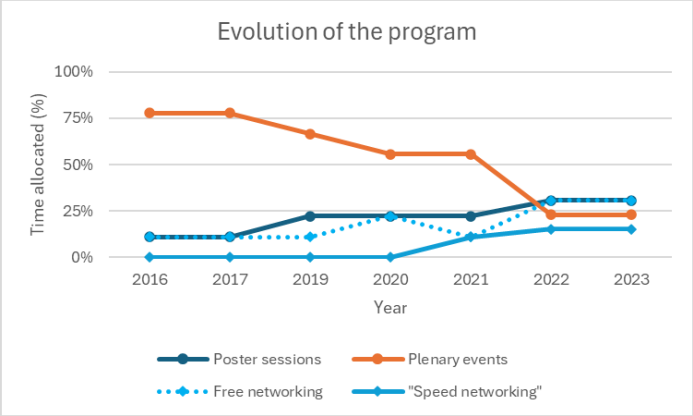
Table 1. Summary of the history of the Montréal Photonics Networking Event.

Year	Keynotes	Attendance	Posters	Judges	Budget ($CA)	Notes
2016	Prof. Michel Piché, Laval University.	43	15	5	2300	On-site
2017	Dr. David Rolston, CTO, Reflex Photonics. Prof. José Azana, INRS.	20	10	5	1200	On-site
2019	Dr. Sébastien Blais-Ouellette, CEO, Photon Etc. Prof. Caroline Boudoux, President, Castor Optics.	95	25	10	1000	On-site, co-located
2020	Jane Bachynski, President, MPB Communications. Dr. Chris Kent, CEO, ODS Medical.	86	20	15	2000	Online, Zoom, Remo[10]
2021	Dr. Helge Seetzen, CEO, Tandem Launch.	137	11	17	1000	Online, Zoom, GatherTown
2022	Philippe Babin, CEO, Aeponyx.	112	20	20	5000	On-site
2023	Marie-Josée Turgeon, CEO, C2MI.	175	61	30	9000	On-site

2.2. Program overview and engagement of attendees

An overview of the program for the Montréal Photonics Networking Event is listed in Figure 1 (a). As a guideline, each session has a duration of 45 to 60 minutes to maximize and vary the nature of the audience's engagement. The event duration was one half-day (4-5 hours) from 2016-21, with an increase to a full day (6-7 hours) in 2022-23 in response to participant and committee feedback to have more time to attend the poster session. In the transition from in-person (before 2019) to online events (2020, 2021), the organization committee engaged in a design process to engineer the interaction of the participants; the reader is referred to previous work for considerations to optimize interactions between researchers, with the poster presentations, and the audience[10]. Figure 1 (b) highlights the resulting trend of increased participant interaction time through poster sessions, free networking and structured "speed" networking events, with a significant reduction in the plenary presentations from early editions. The increase of participatory events was accentuated in 2022 with a return to an on-site event. The current format of the edition has a balanced time of engagement for free networking, structured networking, poster presentations, and plenary presentations.

- Poster session, morning*
- Networking lunch
- Plenary session
- Poster session, afternoon
- Speed networking
- Prizes and social networking



(a) (b)

Figure 1. (a) Overview of the event program. (b) Evolution of the time allocated to individual program items for the event. *A morning poster session was introduced at the 2022 event.

The organization of the poster session is as follows. Judges are allocated 3-4 posters to review and encouraged to spend 7-10 minutes with the researcher, who will present the poster and answer questions to assist in the judging. For each presentation, the judges are asked to score the quality of the presentation on a Likert scale of 1 to 5 using the rubric shown in Table 2 (a). A committee award is judged using the same rubric as Table 2 (a), with an additional criterion for the demonstration or potential for collaboration with the ecosystem in Montréal. A people's choice award is also available, and each attendee is permitted to cast one vote for their favourite presentation. For the speed networking event, participants are organized in pairs and asked to present their research work in 60 seconds each. Participants rotate 7-10 times in a session, meeting different people in each rotation cycle. Participants grade each other following the rubric in Table 2 (b) All of the grading is entered with an online form (Google Forms), which allowed to rapidly collect and process results. In the context of the 2023 speed networking event, close to 500 responses were collected in a 1-hour session.

Table 2. Rubrics for judged events: (a) poster session, and (b) speed networking session.

(a)	(b)
Significance of the problem in a photonics system.	
Explanation in the wider context.	Can you see the purpose of the work?
Clarity and quality of results (figures/tables).	Can you see the potential impact?
Are conclusions supported by data?	

2.3. Marketing and community-building

The marketing costs associated with the event are approximately 10% of the total cost and can be inferred from amounts listed in Table 1; these costs are limited to stationary items (name badges, certificates of appreciation, signage, etc.) The outreach effort is mainly based on in-kind and volunteer efforts to raise the profile of the event: the importance of the committee members cannot be understated in the recruitment of research presenters, attendees, judges, funders, and speakers. Event communication is done via email through each institutions' representative, allowing for organic growth of participants. Partnerships with professional networks (IEEE, Optica, SPIE, Optonique, COPL, etc.) have been important for further impressions of the event; these, however, cannot readily be quantified because of the lack of resources to assess marketing metrics.

In August 2023, the creation of a LinkedIn Page "Montreal Photonics Networking" and a logo served to centralize the visibility and communications on social media. In the three months leading up to the 2023 event, 18,660 impressions were counted, compared to 5,000 impressions in a similar period for previous events[10]. The page has grown to over 1,100 followers as of August 2024, with 45% from the Greater Montréal Metropolitan Region. The LinkedIn page content, which was initially event oriented, evolved to ad hoc and rapid dissemination of news and events linked to the geographic network. A regular feature is the publication each term of education opportunities for photonics, such as the photonics course list document shown in Figure 2 (b), available to all graduate students in Montréal via the provincial university cooperation office. Content related to the 2024 event will be published in a period of 5 months surrounding the event, i.e. September 2024 to January 2025.

(a) (b)

Figure 2. (a) The Montreal Photonics Networking logo was created in 2023. Credit Dr. M. Rilling. (b) Excerpt of graduate photonics courses in Montréal for the Fall 2023 session.

3. CONCLUSIONS AND OUTLOOK

The Montréal Photonics Networking event has grown and established itself as a regular annual event, as demonstrated by the increase in participation of attendees, budgets, and partners. The retention of committee members has been very high, with typical tenures of 2-3 years and rotation of approximately 20-30% year-on-year. The dynamics in the committee have allowed for stability and energy to be enthused into the organization. In addition, the organization committee has a record of reflections on what went well and what could be improved. These lessons learned are shared in the following section and the outlook for future events.

3.1. Lessons learned

A selection of qualitative feedback is recorded in Table 3 in relation to the program outline of Figure 1 (a). The reader is advised to treat these as practical guidelines, which ought to be adapted to reflect their own situation for efficiently engaging graduate research students in collaborative environments. It is left as an exercise for the reader to consider how to transfer the lessons learned from online and on-site events, with the intention to creating an inclusive space.

Table 3. Qualitative feedback from the 2020-2023 event organization committees.

	What went well	What could be improved.
Free networking	"There is a recognized need for more engagement between industry and academia, which participants appreciated."	"Booths were under-visited; dedicating a specific session to them could improve interaction with sponsors."
Plenary session(s)	"The discussions were well-received, with the plenary speaker making a positive impact." "Participants […] enjoyed less technical talks that offered broader learning opportunities."	
Poster session(s)	"The enthusiasm of participants, particularly during the poster sessions and group discussions, was a highlight." "45-second video abstracts were effective in grabbing attention and generating interest."	"Consideration of the large [61] number of posters accepted, though reducing them might lower attendance."
Speed networking		"The pitch event could be scheduled before the second poster session to allow for better networking opportunities. Extending the pitch duration slightly might also enhance the experience."
General feedback	"The event was rejuvenating for faculty members, highlighting the spirit of graduate students." "The genuine, lively atmosphere set the event apart from other similar conferences in Montréal."	"A single, streamlined registration/submission link is needed to avoid confusion and ensure all poster presenters are properly registered." "More formalized procedures for food delivery are needed to ensure timeliness. Better organization of the food space was suggested."
Online event (2020, 2021)	"Emphasizing the effectiveness of not overthinking and focusing on simple, clear ideas." "The event provided valuable learning opportunities, reinforcing the importance of having a plan and being adaptable."	"Participants had difficulty navigating the platform, suggesting the need for tutorials or a quick guide on how the platform works." "There was feedback about motion sickness from moving between tables on the virtual platform."

3.2. Future perspectives

The Montréal Photonics Networking Event provides insights into the leadership and opportunities in the photonics industry. The organization of such an event requires substantial effort, but having a large, collaborative team makes a significant difference. To further facilitate this process, the organization committee is consolidating agreements with Optonique, the Québec Photonics Industry Cluster, and its' sister research cluster, the Centre Optique Photonique et Laser (COPL), to offer administrative and financial support. Future partnerships will be necessary to continue cohesive engagement, which will enable stakeholders in the education, research, innovation, and industrial sectors to positively influence the graduate student experience as well as local and regional economic development.

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