

18TH INTERNATIONAL CONFERENCE ON  
QUANTUM PHYSICS AND LOGIC

QPL 2021 – 7 TO 11 JUNE – UNIVERSITY OF GDAŃSK



Sculpture Title: Rozbitkowie. Artist: Czesława Podleśnego. Photo Credit: Ana Belén Sainz

WHERE  
QUANTUM PHYSICS MEETS  
COMPUTER SCIENCE AND MATHEMATICS  
AND  
ACADEMIA MEETS INDUSTRY

---

## CONTENTS

<b>The QPL International Series</b>	<b>3</b>
<b>QPL 2021 Edition</b>	<b>4</b>
<b>Host Institution</b>	<b>4</b>
<b>Organising Team</b>	<b>5</b>
<b>Academic and Industry Sessions</b>	<b>6</b>
<b>Sponsorship Opportunities</b>	<b>7</b>
<b>COVID-19 Contingency Plan</b>	<b>8</b>

## THE QPL INTERNATIONAL SERIES

**Quantum Physics and Logic (QPL)** is an annual conference that brings together researchers working on mathematical foundations of quantum physics, quantum computing, and related areas. Formally, it focuses on structural perspectives and the use of logical tools, ordered algebraic and category-theoretic structures, formal languages, semantical methods, and other computer science techniques applied to the study of physical behaviour in general. Work that applies structures and methods inspired by quantum theory to other fields (including computer science) is also featured.

QPL has been historically attended by members of the academic community, as well as by employees of the private sector. The research that flourishes within the QPL community includes the development of the next generation of **quantum software** (including quantum computation and error correction), as well as quantum **natural language processing** on near-term quantum computers.

The **QPL community** is a diverse group of researchers, ranging from MSc students to established scientists, both in the academic and the private sectors. In the last few years the community has diversified substantially into industry, with the rise of quantum technology start-ups. The QPL conference has historically been attended by members of the QPL community, and now typically welcomes around 100 participants, with the 2020 Virtual edition featuring 400 attendees. In the last few editions, about 15% of the attendees consisted of students, and 10% of researchers from the private sector.

**Previous QPL events** were held in Paris (2020 – online), Orange CA (2019), Halifax (2018), Nijmegen (2017), Glasgow (2016), Oxford (2015), Kyoto (2014), Barcelona (2013), Brussels (2012), Nijmegen (2011), Oxford (2010), Oxford (2009), Reykjavik (2008), Oxford (2006), Chicago (2005), Turku (2004), and Ottawa (2003).



Group picture from QPL 2016, Glasgow, UK.

## QPL 2021 EDITION

The 18th edition of QPL will be hosted by the **International Centre for Theory of Quantum Technologies (ICTQT)**, at the University of Gdańsk, Poland. The provisional dates are the 7th to 11th of June, 2021.

The conference consists of five days of **scheduled talks** by invited speakers and contributed speakers. Contributed talks are selected through a rigorous anonymous peer review process. In addition, the conference will feature a **poster session**, an **industry session**, a **conference dinner**, and a **welcome reception**.

QPL 2021 will also feature a **virtual component**, following the success of QPL 2020. Main motivations for this include (i) the implementation of a platform for scientific discussions for during and after the event, which complements in-person debates, (ii) broadening the participation, to include scientists with restricted travel opportunities, and (iii) community building. Physical attendance to the event will be encouraged, but virtual participation through particular portals will be possible — also for physical attendees.

All information relevant to the event will be collected in the **conference website**. The website will also include urls to all the recorded presentations by speakers, conditioned on speakers' consent. Virtual interaction among physical and virtual attendees will be encouraged through official channels, yet to be determined (e.g., QPL 2020 had a designated Slack workspace and conference Zoom meetings).

## HOST INSTITUTION

The University of Gdańsk is located in the cities of Gdańsk and Sopot (Poland), in the coast of the Baltic sea. The **International Centre for Theory of Quantum Technologies (ICTQT)** is a newly created research institute, funded by the Foundation for Polish Science, and hosted by the University of Gdańsk, and has become a **pioneering and leading center of quantum information** research in Poland. The founders of ICTQT are Prof. Marek Żukowski as the director, and Prof. Paweł Horodecki as a co-applicant, and the Centre's official foreign partner is IQOQI-Vienna of the Austrian Academy of Sciences.

ICTQT aims to address the central theoretical problems of **quantum technologies**, with emphasis on communication methods and quantum computation. The Centre consists of 6 groups, which cover different aspects of quantum resources, quantum computation, and quantum cybersecurity.

ICTQT is the theoretical part of a quantum information technologies duo, with its experimental counterpart in Warsaw -- the Centre for Quantum Optical Technologies (CQOT). ICTQT and CQOT form, together with the network Near-term Quantum Computers, a **novel research structure on quantum technologies** established in Poland.

## ORGANISING TEAM

### MAIN ORGANISERS

**Dr. John H. Selby** — Post-doctoral researcher at ICTQT, Gdańsk.  
[ictqt.ug.edu.pl/ictqt/researchers/](http://ictqt.ug.edu.pl/ictqt/researchers/)

**Dr. Ana Belén Sainz** — Group leader at ICTQT, Gdańsk.  
[absainz.com](http://absainz.com)

**Ewa Kaszewska** — Head of Administrative and Finance Office, ICTQT, Gdańsk.  
[ictqt.ug.edu.pl/ictqt/administration/](http://ictqt.ug.edu.pl/ictqt/administration/)

**Marcin Górzny** — R&D Section Manager, ICTQT, Gdańsk.  
[ictqt.ug.edu.pl/ictqt/administration/](http://ictqt.ug.edu.pl/ictqt/administration/)

### STEERING COMMITTEE

**Prof. Bob Coecke** — University of Oxford, UK.

**Prof. Prakash Panangaden** — McGill University, Canada.

**Prof. Peter Selinger** — Dalhousie University, Canada.

### PROGRAMME COMMITTEE CHAIRS

**Dr. Miriam Backens** — University of Birmingham, UK.

**Dr. Chris Heunen** — University of Edinburgh, UK.

### EXPERIENCE

The organisers have broad and comprehensive experience coordinating conferences, and have been the main organisers of several high-profile successful international conferences, including QPL 2013 Barcelona as well as various events hosted in Gdańsk.

#### Contact:

Dr. John H. Selby  
80-308 Gdansk, Wita Stwosza 63, building F, third floor, room F318  
qpl2021@gmail.com

## ACADEMIC AND INDUSTRY SESSIONS

### ACADEMIC SESSION

The academic session will consist of **invited talks and tutorials** (by 5 invited speakers), and approximately 40 **contributed talks**, distributed among five days of conference. A two hour **poster session** will also be scheduled one evening, immediately after the industry session's presentation.

The contributed scientific presentations are selected through a rigorous anonymous peer review process conducted by a **Programme Committee**.

A selection of the contributed scientific work presented at QPL appears in the **conference proceedings**. The proceedings of the QPL series are published in the open access electronic journal Electronic Proceedings in Theoretical Computer Science (EPTCS).

### INDUSTRY SESSION

In the past decade, following the advent of the ZX-calculus back in 2007, the research produced by the QPL community, as well as some of its members, have found their way into the industry sector. From quantum start-ups to well established companies, different sectors are **harnessing the output of the QPL research**. The time is right and ripe for the QPL series to formally **acknowledge and consolidate this connection to industry**. QPL 2021 will embrace this and become the first conference in the QPL series that features a dedicated industry session.

The industry session will consist of an evening event, where selected companies<sup>†</sup> will present their relevant activities, and possibly their research, to the QPL community. The session will begin with a one-hour-long<sup>‡</sup> **presentation session** shared by all the companies, which will be broadcast to the virtual participants, and subsequently hosted on the QPL2021 YouTube channel. These presentations will be followed by an **industry fair**, where each company will have a stand to encourage direct interaction and network with the QPL community.

<sup>†</sup> Companies may participate by either becoming a Platinum tier sponsor, or by receiving an invitation by the Steering committee of the QPL series.

<sup>‡</sup> The duration of the session may be adjusted to accommodate the number of companies.



## SPONSORSHIP OPPORTUNITIES

We have four categories of sponsorship for the event: **Platinum**, **Gold**, **Silver** and **Bronze**. We appreciate any contribution, and encourage early-stage start-ups with exclusive opportunities.

Tiers	Platinum	Gold	Silver	Bronze
	>12000 EUR	> 6500 EUR	> 3000 EUR	> 1000 EUR
<b>Company Logo on the webpage, programme, and printed documents</b>	X	X	X	X
<b>Company Logo on posters and screen savers during the event</b>	X	X		
<b>Advert of your choosing in the programme</b>	1/2 page	1/4 page	Job Advert	Job Advert★
<b>Your promotional material in our welcome pack</b>	X	X		
<b>Promotional space at the Poster Session</b>	Stand	Poster	Poster	Poster★
<b>Presentation slot at the industry session</b>	X			
<b>Registration fee waiver (# people)</b>	3	2	1	1

★ Option available for early-stage start-ups only

These sponsorship opportunities can be tailored to better suit your institution's interest. We are happy to discuss your proposal.

The collected funds will be dedicated to covering the running costs of the conference, as well as to provide travel support for students, childcare support, and other **inclusivity initiatives**.

There is also the option of **directly sponsoring** one of the following events:

- Welcome Reception: 10000 PLN ( ~2300 EUR) — Bronze tier
- Poster and Industry Sessions: 14000 PLN ( ~3200 EUR) — Silver tier
- Conference Dinner: 20000 PLN ( ~4500 EUR) — Silver tier
- Coffee breaks: 30000 PLN ( ~6800 EUR) — Gold tier
- Virtual component: 35000 PLN ( ~8000 EUR) — Gold tier

## COVID-19 CONTINGENCY PLAN

The inconveniences that may arise from the current COVID-19 pandemic will not prevent QPL 2021 from taking place. Should it not be possible to host the workshop on-site, it will be hosted virtually (such as the successful virtual edition of QPL 2020) by expanding the scope of the already planned virtual component of QPL 2021. The impact on the Industry Session and Sponsorship Opportunities is as follows.

### INDUSTRY SESSION – VIRTUAL EVENT

The presentations by the companies will be delivered online in a dedicated session, using the same software platform as for academic talks.

The industry fair will be hosted together with the poster session, using a suitable software platform. Attendees will have the opportunity to virtually “walk” to the stands of each company, as well as to the scientific posters, and interact with presenters and other attendees.

### SPONSORSHIP OPPORTUNITIES – VIRTUAL EVENT

In a virtual-only format event, some funds might not be spent. Sponsors would then have the choice of:

- Pass on the remaining funds to QPL 2022, becoming a sponsor of next QPL as well.
- Change their contribution to QPL 2021 according to the updated Tier system:

Tiers – Virtual Event	Platinum >6000 EUR	Gold > 4000 EUR	Silver > 2000 EUR	Bronze > 1000 EUR
Company Logo on the webpage, programme, and digital documents	X	X	X	X
Company Logo on screen savers during the event	X	X		
Advert of your choosing in the programme	1/2 page	1/4 page	Job Advert	Job Advert★
Promotional “stand” at the Poster Session	X	X	X	X★
Presentation slot at the industry session	X			

★ Option available for early-stage start-ups only