26th Annual Conference on Quantum Information Processing

4-10 Feb, 2023 | Ghent, Belgium

CONFERENCE PROGRAM

Tutorials 4+5 February, 2023
Conference 6-10 February, 2023

Local organisers

GHENT UNIVERSITY

ULB UNIVERSITÉ LIBRE DE BRUXELLES

For more information, visit
qip2023.ugent.be

GHENT|2023

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About QIP

The international conference on Quantum Information Processing (QIP) is the premier annual meeting for quantum information research. Since the first meeting in Aarhus (Denmark) in 1998, the conference has featured breakthroughs by leaders in the disciplines of computing, cryptography, information theory, mathematics, and physics. The scientific objective of the series is to gather the theoretical quantum information community to present and discuss the latest groundbreaking work in the field.

Welcome word from the chairs

QIP is the annual High Mass of quantum computation, and we are thrilled to host it this year in the medieval city of Ghent. Belgium has a long tradition in organizing illustrious conferences in the quantum sciences, starting with the Solvay conferences in 1911, and we are convinced that you, as distinguished speakers and participants, will make for an equally memorable conference this year.

The quantum information sciences have evolved enormously during the last three decades, and its tentacles have now penetrated not just the field of computer science but also large areas of theoretical and experimental physics and of the data sciences. A main reason for this success can largely be attributed to the fact that the theory of quantum information provides a powerful new language for describing correlations. Its vocabulary consists of qubits and entanglement; its grammar is provided by quantum circuits, quantum complexity classes and quantum error correcting codes; and we are all gathered here to develop the semantics. The long-term viability of our field critically depends on our ability to reach out to different communities, and this mission is clearly mirrored in the programme of QIP.

The core activity of QIP is of course presenting the latest and greatest results in the field of quantum computation. Who could have predicted that 700 people would show up for a tutorial on quantum simulation? Who knew that so many new quantum algorithms would have been discovered during the last year that we had to schedule 7 sessions about it? Who could skip the plenary talk on the minimal canonical form of a tensor network? The diversity and breadth of the talks is mind-boggling, and we encourage all participants to take full advantage of the distinct company of so many accomplished researchers to interact as much as possible. QIP has a tradition of showcasing how open and welcoming our community is, and we are confident that everybody will embrace these core principles during the conference in Ghent and be respectful to all participants.

We wish all of you an extremely interesting and productive week at QIP2023, and hope that you will find some time to visit some of the cultural monuments such as the Sacred Lamb of Van Eyck in the Saint Bavo's cathedral. Special thanks go to the whole Ghent crew to make this event happen, and especially to Inge Van der Vennet for organizing the finances and logistics, to Céline for designing the QIP logo, to Chanel for help with designs and layouts, and to all of you for making this an unforgettable week. Het ga jullie goed!

Jacob Bridgeman & Frank Verstraete
Ghent, February 2023

Code of conduct

The open exchange of ideas and the freedom of thought and expression are central to the aims and goals of QIP; these require an environment that fosters dignity, understanding, and mutual respect, and that embraces diversity. The organizers of QIP 2023 are committed to an inclusive conference experience, respectful of all participants and free of discrimination, harassment, bullying, or retaliation. All attendees, speakers, sponsors, and volunteers at QIP 2023 are expected to read and agree with the following code of conduct. It applies to all event venues as well as event-related social activities. We expect all participants in QIP 2023 activities to:

- Exercise respect in your speech and actions.
- Refrain from demeaning, discriminatory, or harassing behavior and speech.
- Abstain from making use of sexual & sexualized imagery in talks and posters.
- Be mindful of your surroundings and your fellow participants: for example, other people may hear inappropriate comments even if they are not your intended audience.
- Alert community leaders and get involved (if safe and possible) when you notice a dangerous situation, someone in distress, or violations of this policy, even if they seem inconsequential.

Participants asked to stop any harassing behavior are expected to comply immediately. If a participant engages in unacceptable behavior, the event organizers retain the right to take any actions to keep the conference a welcoming environment for all participants. This includes warning the offender or expulsion from the conference.

Contact points

Emergency services (police, ambulance)

In Belgium, emergency services can be contacted at:

Phone	112 (In case of emergency)

Violations of code of conduct

The Ghent University service Trustpunt can provide support to any attendees in need. This service is confidential. To make an appointment, their contact details are:

Website	https://www.ugent.be/student/en/study-support/trustpunt
Email	trustpunt@ugent.be
Phone	+32 9 264 82 82, only available 9am to noon

You can also contact the local organizers at:

Phone	+32 471 99 44 93

In case of danger or crisis, you can contact the permanence center of UGent 24/7:

Phone	+32 9 264 88 88

For support outside of the UGent context, you can contact the Community Help Service. This service is confidential. The contact details are:

Website	https://www.chsbelgium.org/
Phone	+32 2 648 40 14

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Local information

Transport options

Ghent is well served by public transport, and is an easy train ride from Brussels airport, or a coach from Brussels South Charleroi airport.
Once you reach Gent-Sint-Pieters, the main station of Ghent, it's an easy walk or tram ride (number 1, towards Evergem) to the city center at the Korenmarkt. Tram tickets can be purchased from a machine on the platform.
We discourage driving: the central area of Ghent is a low emission zone, and cars must be registered to enter.
Once in the city center all conference venues are within easy walking distance.

Visiting Ghent in a nutshell

A wealth of information on things to do and places to visit during your stay in Ghent can be found at visit.gent.be.

Basic necessities

For basic shopping and supplies during the conference you can go to a convenient branch of any of the local supermarket chains:

- Okay
- Albert Heijn
- Carrefour
- Delhaize

These can be found within walking distance of the conference venues and your local accommodation.

Sights and tourist attractions

The historic city center of Ghent offers a wide variety of sights to see. A small selection of the essentials:

- The Korenmarkt, St Michael's Bridge, and the Graslei and Korenlei
- The 'three towers of Ghent': St Nicholas' Church, the Belfry and St Bavo's Cathedral
- The Adoration of the Mystic Lamb, painted in 1432 by the Van Eyck brothers
- The Castle of the Counts
- The Vrijdagmarkt
- Ghent's museums: MSK, SMAK, STAM, ...

Local bars and restaurants

Besides history and culture, Ghent boasts a large number of bars and restaurants where you can enjoy both local and not-so-local specialties. Be sure to try out some Belgian beers, help yourself to a portion of fries with accompanying snacks at a local 'frituur', and try our traditional stew at any restaurant that serves 'stoverij'. For a dining or drinking experience in the beautiful setting that is the Ghent city center, you can visit one of the many places near the Korenmarkt, the Vrijdagmarkt or Patershol.

Some suggested restaurants:

- Any fry shop of your choosing
  - Frituur Bij Filip
  - Stefano's place
  - ...
- Patrick Foleys (burgers)
- Uncle Babe's (burgers)
- Yalo (seasonal kitchen)
- Aba-jour (Belgian kitchen)

- Multatuli (Belgian kitchen)
- Pakhuis (Belgian kitchen)
- Eethuis De Fobie (Belgian kitchen)
- Tapasbar La Malcontenta (tapas)
- Miss Yu (Asian)
- Umamido Ghent (Asian)
- De Kastart (pasta)
- Firenze (Italian)
- Greenway Ghent (vegetarian)
- De Walrus (vegetarian)

Suggested bars:

Favorites of the group:

- Trollekelder
- Barazza café
- Café venTura
- Dulle Griet
- 't Dreupelkot
- Het Waterhuis aan de Bierkant
- Café Den Turk (the oldest bar in Ghent)
- Het Spijker
- ONA winebar

Close to UFO:

- Vooruit Café
- The Upside-down World
- Marimain
- Trappistenhuis
- De Ploeg
- Café Backdoor

More for the beer lovers:

- Brouwbar
- Jan Van Gent
- Ghent Gruut Brewery
- Dok Brewing Company

With music:

- Hot Club Gent (jazz)
- Missy Sippy (blues and roots)
- Misterioso (jazz)
- Minor Swing (jazz)

Cocktails:

- Jiggers
- The Drifter
- Uncle Babe's
- Pole Pole Café

Coffee:

- OR Coffee
- Full Circle
- Peaberry Coffeebar
- Cafe Labath
- Bar Bidon
- Take Five
- Mokabon
- Het Moment
- Take Five
- Koffeine

Conference venues & Schedule

Venues

QIP 2023 will take place between three main venues:

- UGent campus UFO & De Brug
  Sint-Pietersnieuwstraat 33, 9000 Gent
- UGent campus Blandijn
  Blandijnberg, 9000 Gent
- Oude Vismijn
  Sint Veerleplein 5, 9000 Gent

Session type	Venue
Registration	UFO
Tutorials	UFO
Invited plenary talks	UFO
Plenary talks	UFO
Short plenary talks	UFO
Poster sessions	UFO
Business meeting	UFO
Industry session	UFO
Parallel sessions	Blandijn
A	Auditorium 5
B	Auditorium 2
C	Auditorium 3
Conference dinner	Vismijn
Rump session	Vismijn
Lunch	De Brug

Parallel sessions will take place in the following rooms:

- All **A** sessions: Blandijn auditorium 5
- All **B** sessions: Blandijn auditorium 2
- All **C** sessions: Blandijn auditorium 3

Maps

Overview

An interactive map can be found here.

Scientific venues

All plenary talks, poster sessions, and the industry and business sessions will take place in the UFO campus of Ghent University (Sint-Pietersnieuwstraat 33, 9000 Gent). Parallel sessions will be held just down the road in the Blandijn building (Blandijnberg, 9000 Gent).

Conference dinner and rump session: Oude Vismijn

The dinner and rump session will be held in the Oude Vismijn in the center of Ghent.

Address: Sint Veerleplein 5, 9000 Gent

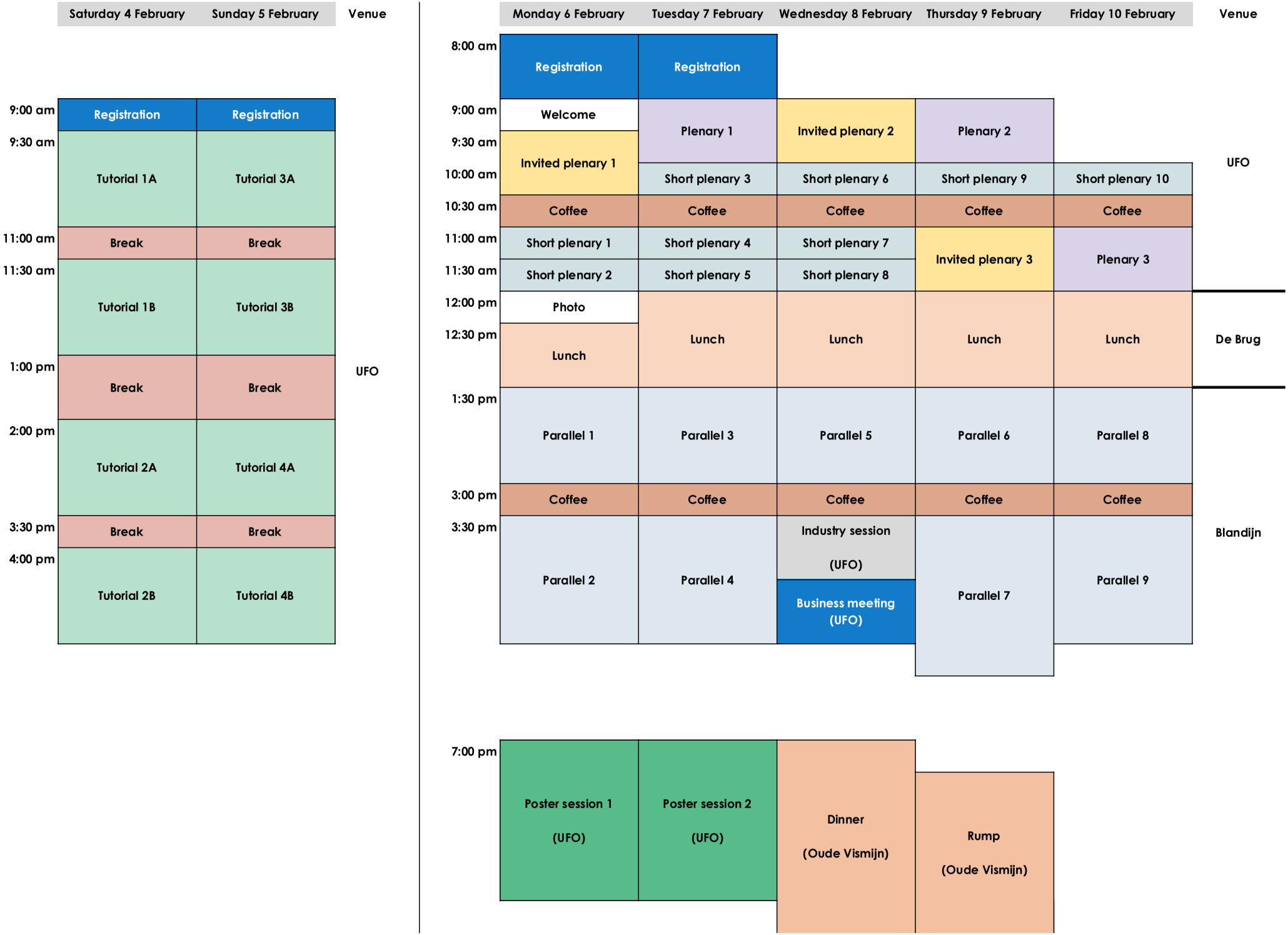
The Vismijn is located near the Gravensteen, the castle of the Counts of Flanders.

Timetable

Pre-recorded talks

A small number of authors were unable to attend. Their talks can be found on our YouTube channel, and will not be presented during the conference.

- Collusion Resistant Copy-Protection for Watermarkable Functionalities
  Jiahui Liu, Qipeng Liu, Luowen Qian and Mark Zhandry
- Depth-Bounded Quantum Cryptography with Applications to One-Time Memory and More
  Qipeng Liu


Saturday 4 February
Sunday 5 February
Venue
9:00 am
9:30 am
11:00 am
11:30 am
1:00 pm
2:00 pm
3:30 pm
4:00 pm
Registration
Registration
Tutorial 1A
Tutorial 3A
Break
Break
Tutorial 1B
Tutorial 3B
Break
Break
UFO
Tutorial 2A
Tutorial 4A
Break
Break
Tutorial 2B
Tutorial 4B
Monday 6 February
Tuesday 7 February
Wednesday 8 February
Thursday 9 February
Friday 10 February
Venue
8:00 am
9:00 am
9:30 am
10:00 am
10:30 am
11:00 am
11:30 am
12:00 pm
12:30 pm
1:30 pm
3:00 pm
3:30 pm
Registration
Registration
Welcome
Invited plenary 1
Plenary 1
Invited plenary 2
Plenary 2
UFO
Short plenary 3
Short plenary 6
Short plenary 9
Short plenary 10
Coffee
Coffee
Coffee
Coffee
Coffee
Short plenary 1
Short plenary 2
Short plenary 4
Short plenary 5
Short plenary 7
Short plenary 8
Invited plenary 3
Plenary 3
Photo
Lunch
Lunch
Lunch
Lunch
Lunch
De Brug
Parallel 1
Parallel 3
Parallel 5
Parallel 6
Parallel 8
Coffee
Coffee
Coffee
Coffee
Coffee
Parallel 2
Parallel 4
Industry session
(UFO)
Business meeting
(UFO)
Parallel 7
Parallel 9
Blandijn
7:00 pm
Poster session 1
(UFO)
Poster session 2
(UFO)
Dinner
(Oude Vismijn)
Rump
(Oude Vismijn)

Tutorials

	Saturday 4 February	Sunday 5 February
8:30 am 9:00 am	Registration	Registration
9:30 am 10:00 am 10:30 am	Tutorial 1A: Quantum supremacy Bill Fefferman	Tutorial 3A: Fault tolerance Barbara Terhal
11:00 am	Break	Break
11:30 am 12:00 pm 12:30 pm	Tutorial 1B: Quantum supremacy Bill Fefferman	Tutorial 3B: Fault tolerance Barbara Terhal
1:00 pm 1:30 pm	Break	Break
2:00 pm 2:30 pm 3:00 pm	Tutorial 2A: Quantum simulation Ignacio Cirac	Tutorial 4A: Quantum architecture Fred Chong and Jonathan Baker
3:30 pm	Break	Break
4:00 pm 4:30 pm 5:00 pm	Tutorial 2B: Quantum simulation Ignacio Cirac	Tutorial 4B: Quantum architecture Fred Chong and Jonathan Baker

Mornings

	Monday 6 February	Tuesday 7 February	Wednesday 8 February	Thursday 9 February	Friday 10 February
8:00 am	Registration	Registration			
8:30 am					
9:00 am	Welcome	Plenary 1: Verifiable Quantum Advantage without Structure Takashi Yamakawa and Mark Zhandry	Invited plenary 2: Quantum Information Processing with Indefinite Causal Order Giulio Chiribella	Plenary 2: A polynomial-time classical algorithm for noisy random circuit sampling Dorit Aharonov, Xun Gao, Zeph Landau, Yunchao Liu and Umesh Vazirani	
9:30 am	Invited plenary 1: Clique Homology is QMA$_1$-hard Marcos Crichigno and Tamara Kohler				
10:00 am		Short plenary 3: Pseudorandom Quantum States, Revisited: New Properties, Variants, Constructions and Cryptographic Applications Prabhanjan Ananth, Aditya Gulati, Luowen Qian and Henry Yuen	Short plenary 6: The minimal canonical form of a tensor network Arturo Acuaviva, Visu Makam, Harold Nieuwboer, David Pérez-García, Friedrich Sittner, Michael Walter and Freek Witteveen	Short plenary 9: One-Way Ticket to Las Vegas and the Quantum Adversary Aleksandrs Belovs and Duyal Yolcu	Short plenary 10: Multidimensional Quantum Walks, with Application to k-Distinctness Stacey Jeffery and Sebastian Zur
10:30 am	Coffee	Coffee	Coffee	Coffee	Coffee
11:00 am	Short plenary 1: Generalised entropy accumulation Tony Metger, Omar Fawzi, David Sutter and Renato Renner	Short plenary 4: Time-Efficient Constant-Space-Overhead Fault-Tolerant Quantum Computation Hayata Yamasaki and Masato Koashi	Short plenary 7: Learning many-body Hamiltonians with Heisenberg-limited scaling Hsin-Yuan Huang, Yu Tong, Di Fang and Yuan Su	Invited plenary 3: Real-time quantum error correction beyond break-even V. V. Sivak, A. Eickbusch, B. Royer, S. Singh, I. Tsioutsios, S. Ganjam, A. Miano, B. L. Brock, A. Z. Ding, L. Frunzio, S. M. Girvin, R. J. Schoelkopf, M. H. Devoret	Plenary 3: NLTS Hamiltonians from good quantum codes Anurag Anshu, Nikolas Breuckmann and Chinmay Nirkhe
11:30 am	Short plenary 2: A Simple and Tighter Derivation of Achievability for Classical Communication over Quantum Channels Hao-Chung Cheng	Short plenary 5: A lower bound on the overhead of quantum error correction in low dimensions Nouédyn Baspin, Omar Fawzi and Ala Shayeghi	Short plenary 8: Sparse random Hamiltonians are quantumly easy Chi-Fang Chen, Alexander Dalzell, Mario Berta, Joel Tropp and Fernando Brandao		
12:00 pm	Photo	Lunch	Lunch	Lunch	Lunch
12:30 pm	Lunch				
1:00 pm					

Afternoons/Parallel sessions

Monday 6 February

	Parallel 1A (ALGORITHMS) Blandijn Aud 5	Parallel 1B (COMPLEXITY) Blandijn Aud 2	Parallel 1C (MANY-BODY SYSTEMS) Blandijn Aud 3
1:30-3:00			
1:30 pm	Limitations of VQAs: a quantum optimal transport approach Daniel Stilck França, Cambyse Rouze, Giacomo De Palma and Milad Marvian	Noisy Decoding by Shallow Circuits with Parities: Classical and Quantum Jop Briët, Harry Buhrman, Davi Castro-Silva and Niels Neumann	Lower Bounding Ground State Energies of Local Hamiltonians -- Tractable Relaxations of Many-Body problems Through the Renormalization Group Ilya Kull, Norbert Schuch, Ben Dive and Miguel Navascues
2:00 pm	A Convergence Theory for Over-parameterized Variational Quantum Eigensolvers Xuchen You, Shouvanik Chakrabarti, Boyang Chen and Xiaodi Wu	stateQIP = statePSPACE Tony Metger and Henry Yuen	General guarantees for randomized benchmarking with random quantum circuits Markus Heinrich, Martin Kliesch and Ingo Roth
2:30 pm	Solving boolean satisfiability problems with the quantum approximate optimization algorithm Sami Boulebnane and Ashley Montanaro	The Complexity of NISQ Sitan Chen, Jordan Cotler, Hsin-Yuan Huang and Jerry Li	
3:00 pm	Coffee (Blandijn)		
3:30-5:30	Parallel 2A (ALGORITHMS) Blandijn Aud 5	Parallel 2B (CRYPTOGRAPHY) Blandijn Aud 2	Parallel 2C (LEARNING AND OTHER TOPICS) Blandijn Aud 3
3:30 pm	Quantum tomography using state-preparation unitaries Joran van Apeldoorn, Arjan Cornelissen, Andras Gilyen and Giacomo Nannicini	Another Round of Breaking and Making Quantum Money: How to Not Build It from Lattices, and More Jiahui Liu, Hart Montgomery, and Mark Zhandry	Tight Bounds for Quantum State Certification with Incoherent Measurements Sitan Chen, Brice Huang, Jerry Li and Allen Liu merged with Tight Bounds for State Tomography with Incoherent Measurements Sitan Chen, Brice Huang, Jerry Li, Allen Liu and Mark Sellke
4:00 pm	A Complete Hierarchy of Linear Systems for Certifying Quantum Entanglement of Subspaces Nathaniel Johnston, Benjamin Lovitz and Aravindan Vijayaraghavan	Quantum Advice in the Quantum Random Oracle Model Qipeng Liu	Quantum Talagrand, KKL and Friedgut's theorems and the learnability of quantum observables Cambyse Rouzé, Melchior Wirth and Haonan Zhang
4:30 pm	Quantum Subroutine Composition Stacey Jeffery		Learning to predict arbitrary quantum processes Hsin-Yuan Huang, Sitan Chen and John Preskill
5:00 pm	Quantum Worst-Case to Average-Case Reductions for All Linear Problems Vahid Asadi, Alexander Golovnev, Tom Gur, Igor Shinkar and Sathyawageeswar Subramanian		Learning beyond Cliffords: circuits and states Srinivasan Arunachalam, Sergey Bravyi, Hao-Chung Cheng, Arkopal Dutt, Ching-Yi Lai and Ted Yoder
5:30 pm			
7:00-9:30 pm	Poster session 1 (UFO)		

	Tuesday 7 February		
1:30-3:00	**Parallel 3A (ALGORITHMS) Blandijn Aud 5**	**Parallel 3B (ERROR CORRECTION) Blandijn Aud 2**	**Parallel 3C (INFORMATION THEORY) Blandijn Aud 3**
1:30 pm	Mind the gap: Achieving a super-Grover quantum speedup by jumping to the end Alexander Dalzell, Nicola Pancotti, Earl Campbell and Fernando Brandao	Exponentially tighter bounds on error mitigation: hardness at log log (n) depth Yihui Quek, Daniel Stilck Franca, Sumeet Khatri, Johannes Jakob Meyer and Jens Eisert	Joint State-Channel Decoupling and One-Shot Quantum Coding Theorem Hao-Chung Cheng, Frédéric Dupuis and Li Gao merged with Optimal Second-Order Rates for Quantum Information Decoupling and Privacy Amplification Yu-Chen Shen, Li Gao and Hao-Chung Cheng
2:00 pm	Quantum speedups for solving linear regression problems Ashley Montanaro and Changpeng Shao	Pauli topological codes from Abelian anyon theories Tyler Ellison, Yu-An Chen, Arpit Dua, Wilbur Shirley, Nathanan Tantivasadakarn and Dominic Williamson	Exact solution for the quantum and private capacities of bosonic dephasing channels Ludovico Lami and Mark Wilde
2:30 pm	Testing and Learning Quantum Juntas Nearly Optimally Thomas Chen, Shivam Nadimpalli and Henry Yuen	Long-range data transmission in a fault-tolerant quantum bus architecture Shin Ho Choe and Robert Koenig	On generalised quantum Stein's lemmata and the reversibility of quantum resources Mario Berta, Fernando Brandao, Gilad Gour, Ludovico Lami, Martin Plenio, Bartosz Regula and Marco Tomamichel
3:00 pm	Coffee (Blandijn)		
3:30-5:30	**Parallel 4A (ALGORITHMS) Blandijn Aud 5**	**Parallel 4B (CRYPTOGRAPHY) Blandijn Aud 2**	**Parallel 4C (FOUNDATIONS) Blandijn Aud 3**
3:30 pm	Optimizing quantum circuit parameters via SDP Eunou Lee merged with An Improved Approximation Algorithm for Quantum Max-Cut Robbie King	Cryptography with Certified Deletion James Bartusek and Dakshita Khurana merged with Blind Delegation with Certified Deletion James Bartusek, Sanjam Garg, Dakshita Khurana and Bhaskar Roberts	Quantum networks self-test all entangled states Ivan Supic, Joseph Bowles, Marc-Olivier Renou, Matty Hoban and Antonio Acin
4:00 pm	Unique Games hardness of Quantum Max-Cut, and a conjectured vector-valued Borell's inequality Yeongwoo Hwang, Joe Neeman, Ojas Parekh, Kevin Thompson and John Wright	Quantum Commitments and Signatures without One-Way Functions Tomoyuki Morimae and Takashi Yamakawa	Universal trade-off structure between symmetry, irreversibility and quantum coherence for quantum processes Hiroyasu Tajima, Ryuji Takagi, Yui Kuramochi and Keiji Saito
4:30 pm	Matchgate Shadows for Fermionic Quantum Simulation Kianna Wan, William J. Huggins, Joonho Lee and Ryan Babbush	Quantum Cryptography in Algorithmica William Kretschmer, Luowen Qian, Makrand Sinha and Avishay Tal	Why interference phenomena do not capture the essence of quantum theory Lorenzo Catani, Matthew Leifer, David Schmid and Robert Spekkens
5:00 pm	Classical shadows of fermions with particle number symmetry Guang Hao Low	On the Feasibility of Unclonable Encryption, and More Prabhanjan Ananth, Fatih Kaleoglu, Xingjian Li, Qipeng Liu and Mark Zhandry	Simulating qubit correlations with classical communication Martin Johannes Renner, Armin Tavakoli and Marco Túlio Quintino
5:30 pm			
7:00-9:30 pm	Poster session 1 (UFO)		

	Wednesday 8 February		
1:30-3:00	Parallel 5A (ALGORITHMS) Blandijn Aud 5	Parallel 5B (COMPLEXITY) Blandijn Aud 2	Parallel 5C (INFORMATION THEORY) Blandijn Aud 3
1:30 pm	A Sublinear-Time Quantum Algorithm for Approximating Partition Functions Arjan Cornelissen and Yassine Hamoudi	Improved Hardness Results for the Guided Local Hamiltonian Problem Chris Cade, Marten Folkertsma, Sevag Gharibian, Ryu Hayakawa, Francois Le Gall, Tomoyuki Morimae and Jordi Weggemans	Super-exponential distinguishability of correlated quantum states Gergely Bunth, Gábor Maróti, Milán Mosonyi and Zoltán Zimborás
2:00 pm	Quantum Algorithms for Sampling Log-Concave Distributions and Estimating Normalizing Constants Andrew M. Childs, Tongyang Li, Jin-Peng Liu, Chunhao Wang and Ruizhe Zhang	Influence in Completely Bounded Block-multilinear Forms and Classical Simulation of Quantum Algorithms Nikhil Bansal, Makrand Sinha and Ronald de Wolf	Testing quantumness without entanglement Ludovico Lami and Martin Plenio
2:30 pm	Improved Quantum Speedups for Zero-Sum Games via Dynamic Gibbs Sampling Adam Bouland, Yosheb Getachew, Yujia Jin, Aaron Sidford and Kevin Tian	Quantum Pseudoentanglement Adam Bouland, Bill Fefferman, Soumik Ghosh, Umesh Vazirani and Zixin Zhou	Continuous-variable quantum state designs: theory and applications Joseph Iosue, Kunal Sharma, Michael Gullans and Victor Albert
3:00 pm	Coffee (UFO)		
3:30 pm 4:00 pm	Industry session (UFO)		
4:30 pm 5:00 pm	Business meeting (UFO)		
5:30 pm			
7:00 pm until late	Dinner (Oude Vismijn)		

Thursday 9 February

	Parallel 6A (ALGORITHMS) Blandijn Aud 5	Parallel 6B (CRYPTOGRAPHY) Blandijn Aud 2	Parallel 6C (INFORMATION THEORY) Blandijn Aud 3
1:30-3:00			
1:30 pm	The Quantum and Classical Streaming Complexity of Quantum and Classical Max-Cut John Kallaugher and Ojas Parekh	From the Hardness of Detecting Superpositions to Cryptography: Quantum Public Key Encryption and Commitments Minki Hhan, Tomoyuki Morimae and Takashi Yamakawa	Complete order implies tight relative entropy decay rate Li Gao, Marius Junge, Nicholas Laracuente and Haojian Li
2:00 pm	Mean estimation when you have the source code; or, quantum Monte Carlo methods Robin Kothari and Ryan O'Donnell	Commitments to Quantum States Sam Gunn, Nathan Ju, Fermi Ma and Mark Zhandry	Generating k EPR-pairs from an n-party resource state Sergey Bravyi, Yash Sharma, Mario Szegedy and Ronald de Wolf
2:30 pm	Quantum divide and conquer Andrew Childs, Robin Kothari, Matt Kovacs-Deak, Aarthi Sundaram and Daochen Wang	Post-Quantum Zero Knowledge, Revisited (or: How to Do Quantum Rewinding Undetectably) Alex Lombardi, Fermi Ma and Nicholas Spooner	Circuit knitting with classical communication Christophe Piveteau and David Sutter
3:00 pm	Coffee		
3:30-6:00	Parallel 7A (COMPLEXITY) Blandijn Aud 5	Parallel 7B (MANY-BODY SYSTEMS) Blandijn Aud 2	Parallel 7C (LEARNING AND OTHER TOPICS) Blandijn Aud 3
3:30 pm	Memory-Sample Lower Bounds for Learning with Classical-Quantum Hybrid Memory Qipeng Liu, Ran Raz and Wei Zhan	Long-range entanglement from finite-depth circuits and measurements: from theory to quantum devices Nathanan Tantivasadakarn, Ryan Thorngren, Ruben Verresen and Ashvin Vishwanath	An operator-algebraic formulation of self-testing Connor Paddock, William Slofstra, Yuming Zhao and Yangchen Zhou
4:00 pm	On reductions from weak to strong simulation Sergey Bravyi, Giuseppe Carleo, David Gosset and Yinchen Liu	Topological phases of unitary dynamics: Classification in Clifford category Jeongwan Haah	Experimental quantum key distribution certified by Bell's theorem David Nadlinger, Peter Drmota, Bethan Nichol, Gabriel Araneda, Dougal Main, Raghavendra Srinivas, David Lucas, Chris Ballance, Kirill Ivanov, Ernest Tan, Pavel Sekatski, Rüdiger Urbanke, Renato Renner, Nicolas Sangouard and Jean-Daniel Bancal
4:30 pm	Hybrid Quantum-Classical Search Algorithms Ansis Rosmanis	Dualities in one-dimensional quantum lattice models: symmetric Hamiltonians and matrix product operator intertwiners Laurens Lootens, Clement Delcamp, Gerardo Ortiz and Frank Verstraete	Improved machine learning algorithm for predicting ground state properties Laura Lewis, Hsin-Yuan Huang and John Preskill
5:00 pm	Unitary property testing lower bounds by polynomials Adrian She and Henry Yuen	Universal lower bound on topological entanglement entropy Isaac Kim, Michael Levin, Ting-Chun Lin, Daniel Ranard and Bowen Shi	Linear programming with unitary-equivariant constraints Dmitry Grinko and Maris Ozols
5:30 pm		Entanglement area law for 1D gauge theories and bosonic systems Nilin Abrahamsen, Ning Bao, Yuan Su, Yu Tong and Nathan Wiebe	
8:00 pm until late	Rump (Oude Vismijn)		

	Friday 10 February		
1:30-3:00	**Parallel 8A (ALGORITHMS) Blandijn Aud 5**	**Parallel 8B (TOPOLOGICAL DATA ANALYSIS) Blandijn Aud 2**	**Parallel 8C (FOUNDATIONS) Blandijn Aud 3**
1:30 pm	**Breaking the cubic barrier in the Solovay-Kitaev algorithm** **Greg Kuperberg**	**Quantifying Quantum Advantage in Topological Data Analysis** **Dominic Berry, Yuan Su, Casper Gyurik, Robbie King, Joao Basso, Alexander Barba, Abhishek Rajput, Nathan Wiebe, Vedran Dunjko and Ryan Babbush**	**Information processing in causal networks from AdS/CFT** **Alex May, Jonathan Sorce and Beni Yoshida**
2:00 pm	**Shorter Quantum Circuits via Single-Qubit Gate Approximation** **Romy Minko, Adam Paetznick, Vadym Kliuchnikov, Kristin Lauter and Christophe Petit**	**A streamlined quantum algorithm for topological data analysis with exponentially fewer qubits** **Sam McArdle, András Gilyén and Mario Berta**	**Inevitability of knowing less than nothing** **Gilad Gour, Mark Wilde, Sarah Brandsen and Isabelle Jianing Geng**
2:30 pm	**Quantum algorithms from fluctuation theorems: Thermal-state preparation** **Zoe Holmes, Gopikrishnan Muraleedharan, Yigit Subasi, Rolando Somma and Burak Sahinoglu**		**A Computational Separation Between Quantum No-cloning and No-teleportation** **Barak Nehoran and Mark Zhandry**
3:00 pm	**Coffee**		
3:30-5:00	**Parallel 9A (COMPLEXITY) Blandijn Aud 5**	**Parallel 9B (ERROR CORRECTION) Blandijn Aud 2**	**Parallel 9C (MANY-BODY SYSTEMS) Blandijn Aud 3**
3:30 pm	**Hay from the haystack: explicit examples of exponential quantum circuit complexity** **Yifan Jia and Michael Wolf**	**An efficient decoder for a linear distance quantum LDPC code** **Shouzhen Gu, Christopher Pattison and Eugene Tang**	**Optimal time-periodic Hamiltonian simulation** **Kaoru Mizuta and Keisuke Fujii**
4:00 pm	**Optimizing the depth of variational quantum algorithms is strongly QCMA-hard to approximate** **Lennart Bittel, Sevag Gharibian and Martin Kliesch**	**Good Quantum LDPC Codes with Linear Time Decoders** **Irit Dinur, Min-Hsiu Hsieh, Ting-Chun Lin and Thomas Vidick**	**A subpolynomial-time algorithm for the free energy of one-dimensional quantum systems in the thermodynamic limit** **Hamza Fawzi, Omar Fawzi and Samuel Scalet**
4:30 pm	**Decidability of fully quantum nonlocal games with noisy maximally entangled states** **Minglong Qin and Penghui Yao**	**Quantum Locally Testable Code with Exotic Parameters** **Andrew Cross, Zhiyang He, Anand Natarajan, Mario Szegedy and Guanyu Zhu**	**Optimizing sparse fermionic Hamiltonians** **Yaroslav Herasymenko, Maarten Stroeks, Jonas Helsen and Barbara Terhal**
5:00 pm	**Quantum free games** **Anand Natarajan and Tina Zhang**	**Floquet codes without parent subsystem codes** **Margarita Davydova, Nathanan Tantivasadakarn and Shankar Balasubramanian**	**Circuit complexity and classical simulation of Many-Body Localized Systems** **Adam Ehrenberg, Abhinav Deshpande, Christopher L. Baldwin, Dmitry A. Abanin and Alexey V. Gorshkov**
5:30 pm			

The QIP 2023
Best Student Paper Prize

is awarded to

Chi-Fang Chen

for their paper

"Sparse random Hamiltonians are quantumly easy"

GHENT|2023

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Accepted posters

All posters must be presented in the assigned session. **No session changes can be made**. They should be hung on the board numbered with the submission ID, and **must be removed at the end of the session**. All posters remaining after the session will be removed and **discarded**.
Posters must fit on a **portrait, A0** poster board.
A selection of posters have been highlighted by the Program Committee.

Monday session

ID	Title	Authors
7	Relation between nonclassical features through logical qudits	Sooryansh Asthana and V. Ravishankar
8	BBM92 quantum key distribution over a free space dusty channel of 200 meters	Sarika Mishra, Ayan Biswas and R.P. Singh
11	The vacuum provides quantum advantage to otherwise simulatable architectures	Cameron Calcluth, Alessandro Ferraro and Giulia Ferrini
13	Fault-Tolerant Preparation of Quantum Polar Codes Encoding One Logical Qubit	Ashutosh Kumar Goswami, Mehdi Mhalla and Valentin Savin
15	Multipartite Entanglement Detection via Correlation Minor Norm	Rain Lenny, Amit Te'Eni, Bar Peled and Eliahu Cohen
16	The energetic cost of large-scale quantum computing	Marco Fellous-Asiani, Jing Hao Chai, Yvain Thonnart, Hui Khoon Ng, Robert Whitney and Alexia Auffèves
18	Out-of-distribution generalization for learning quantum dynamics and dynamical simulation	Matthias C. Caro, Hsin-Yuan Huang, Joe Gibbs, Nic Ezzell, Andrew Sornborger, Lukasz Cincio, Patrick Coles and Zoe Holmes
27	Quantum Regularized Least Squares	Shantanav Chakraborty, Aditya Morolia and Anurudh Peduri
39	Finite speed of quantum information in models of interacting bosons at finite density	Chao Yin and Andrew Lucas
40	Privacy and correctness trade-offs for information-theoretically secure quantum homomorphic encryption	Yanglin Hu, Yingkai Ouyang and Marco Tomamichel
45	Entanglement transitivity problems	Gelo Noel Tabia, Kai-Siang Chen, Chung-Yun Hsieh, Yu-Chun Yin and Yeong-Cherng Liang
46	Transformation of an unknown unitary operation: complex conjugation	Tomasz Młynik
49	Phase Estimation of Local Hamiltonians on NISQ Hardware	Laura Clinton, Johannes Bausch, Toby Cubitt and Joel Klassen
50	Creating quantum-resistant classical-classical OWFs from quantum-classical OWFs	Wei Zheng Teo, Marco Carmosino and Lior Horesh
52	Tailored cluster states with high threshold under biased noise	Jahan Claes, Eli Bourassa and Shruti Puri
53	Communication with Unreliable Entanglement Assistance	Uzi Pereg, Christian Deppe and Holger Boche
56	Optimal input states for quantifying the performance of continuous-variable unidirectional and bidirectional teleportation	Hemant Mishra, Samad Oskouei and Mark Wilde
57	Pseudo standard entanglement structure cannot be distinguished from standard entanglement structure	Hayato Arai and Masahito Hayashi
58	Detecting entanglement in quantum many-body systems via permutation moments	Zhenhuan Liu, Yifan Tang, Hao Dai, Pengyu Liu, Shu Chen and Xiongfeng Ma
61	Contextuality as a precondition for entanglement	Martin Plávala and Otfried Gühne
63	Avoiding barren plateaus using classical shadows	Stefan Sack, Raimel Medina, Richard Kueng, Alexios Michailidis and Maksym Serbyn
64	Transition states and greedy exploration of the QAOA optimization landscape	Raimel A. Medina Ramos, Stefan Sack, Richard Kueng and Maksym Serbyn
67	State-dependent Trotter Limits and their approximations	Daniel Burgarth, Niklas Galke, Alexander Hahn and Lauritz van Luijk
69	Variational quantum algorithms for real time evolution of quantum systems	Stefano Barison, Filippo Vicentini, Ignacio Cirac and Giuseppe Carleo
71	Avoiding barren plateaus via transferability of smooth solutions in Hamiltonian Variational Ansatz	Antonio Anna Mele, Glen Bigan Mbeng, Giuseppe Ernesto Santoro, Mario Collura and Pietro Torta
72	Universal Parity Quantum Computing	Michael Fellner, Anette Messinger, Kilian Ender and Wolfgang Lechner

73	Modular Parity Quantum Approximate Optimization	Kilian Ender, Anette Messinger, Michael Fellner, Clemens Dlaska and Wolfgang Lechner
75	Quantum variational learning for quantum error-correcting codes	Chenfeng Cao, Chao Zhang, Zipeng Wu, Markus Grassl and Bei Zeng
77	Quantum Entanglement with Self-stabilizing Token Ring for Fault-tolerant Distributed Quantum Computing System	Jehn-Ruey Jiang
80	An Entropic Lens on Stabilizer States	William Munizzi, Cynthia Keeler and Jason Pollack
81	Distilling nonlocality in quantum correlations	Sahil Gopalkrishna Naik, Govind Lal Sidhardh, Samrat Sen, Arup Roy, Ashutosh Rai and Manik Banik
82	Your spectra don't fit: SDP refutations for the quantum marginal problem	Felix Huber and Nikolai Wyderka
87	Equivalence between the exact bosonization and fermion-to-qubit mappings in two spatial dimensions	Yu-An Chen and Yijia Xu
88	Learning quantum phases via single-qubit disentanglement	Zheng An, Chenfeng Cao, Chengqian Xu and Duanlu Zhou
90	Universal cost bound of quantum error mitigation based on quantum estimation theory	Kento Tsubouchi, Takahiro Sagawa and Nobuyuki Yoshioka
97	Partial self-testing and randomness certification in networks	Pavel Sekatski, Sadra Boreiri and Nicolas Brunner
99	Bound on local minimum-error discrimination of bipartite quantum states	Donghoon Ha and Jeong San Kim
104	Observing ground-state properties of the Fermi-Hubbard model using a scalable algorithm on a quantum computer	Jan Lukas Bosse, Ashley Montanaro, Stasja Stanisic, Filippo Maria Gambetta, Raul A. Santos, Wojciech Mruczkiewicz, Thomas E. O'Brien and Eric Ostby
105	Variational quantum simulation of the imaginary-time Lyapunov control for accelerating the ground-state preparation	Yu-Cheng Chen, Alice Hu and Qian Wang
108	Task-dependent semi-quantum secure communication in layered networks with OAM states of light	Rajni Bala, Sooryansh Asthana and V. Ravishankar
109	Restoring quantum communication efficiency over high loss optical fibres	Francesco Anna Mele, Ludovico Lami and Vittorio Giovannetti
110	Uncertainty relations from graph theory	Carlos de Gois, Kiara Hansenne and Otfried Gühne
112	Quantum Differential Privacy: An Information Theory Perspective	Christoph Hirche, Cambyse Rouze and Daniel Stilck França
113	Quantum optimization with Instantaneous Quantum Polynomial circuits	Sebastian Leontica and David Amaro
116	Multivariable quantum signal processing (M-QSP): prophecies of the two-headed oracle	Zane Rossi and Isaac Chuang
118	Quantum Analysis of Continuous Time Stochastic Process	Xi-Ning Zhuang, Zhao-Yun Chen, Cheng Xue, Yu-Chun Wu and Guo-Ping Guo
119	Induced on-demand revival in coined quantum walks on infinite d-dimensional lattices	Mahesh N. Jayakody, Ismael L. Paiva, Asiri Nanayakkara and Eliahu Cohen
120	Detecting entanglement by pure bosonic extension	Xuanran Zhu, Chao Zhang, Chenfeng Cao, Youning Li and Bei Zeng
121	Characterizing Symmetry-Protected Thermal Equilibrium by Work Extraction	Yosuke Mitsuhashi, Kazuya Kaneko and Takahiro Sagawa
122	(No) Quantum ST tradeoff for USTCON	Simon Apers, Stacey Jeffery, Galina Pass and Michael Walter
124	Advantages of adaptive and general strategies for discrimination of unitary channels beyond group-theoretical methods	Jessica Bavaresco, Mio Murao and Marco Túlio Quintino
125	Quantum error correction using squeezed Schrödinger cat states	David Schlegel, Fabrizio Minganti and Vincenzo Savona
127	Composition of Multipartite Quantum Systems: Perspective from Timelike Paradigm	Sahil Gopalkrishna Naik, Edwin Peter Lobo, Samrat Sen, Ram Krishna Patra, Alimuddin Mir, Tamal Guha, Some Sankar Bhattacharya and Manik Banik
128	Improved maximum-likelihood quantum amplitude estimation	Adam Callison and Dan Browne
129	Divide-and-conquer verification method for noisy intermediate-scale quantum computation	Yuki Takeuchi, Yasuhiro Takahashi, Tomoyuki Morimae and Seiichiro Tani
131	Generalized resource theory of purity: One-shot purity distillation with local noisy operations and one way classical communication	Sayantan Chakraborty, Aditya Nema and Francesco Buscemi
132	Testing of quantum nonlocal correlations under constrained free will and imperfect detectors	Abhishek Sadhu and Siddhartha Das
133	Continuity of quantum entropic quantities via almost convexity	Andreas Bluhm, Ángela Capel, Paul Gondolf and Antonio Pérez Hernández

134	Exponential concentration and untrainability in quantum kernel methods	Supanut Thanasilp, Samson Wang, Marco Vinicio Sebastian de la Roca and Zoe Holmes
138	Digital adiabatic state preparation error scales better than you might expect	Lucas Kocia, Fernando Calderon-Vargas, Matthew Grace, Alicia Magann, James Larsen, Andrew Baczewski and Mohan Sarovar
142	Going beyond the scale: Uniform observable error bounds for Trotter formulae in the semiclassical regime	Yonah Borns-Weil and Di Fang
146	Fundamental Limitation on the Detectability of Entanglement	Pengyu Liu, Zhenhuan Liu, Shu Chen and Xiongfeng Ma
149	Multipartite Entanglement Measures via Bell Basis Measurements	Jacob Beckey, Gerard Pelegrí, Steph Foulds and Natalie Pearson
152	The Complexity of Approximating Critical Points of Quantum Phase Transitions	James Watson and Johannes Bausch
154	Federated Learning with Quantum Secure Aggregation	Yichi Zhang, Chao Zhang, Cai Zhang, Bei Zeng, Qiang Yang and Lixin Fan
156	Single-qubit gate teleportation provides a quantum advantage	Libor Caha, Xavier Coiteux-Roy and Robert Koenig
160	Quantum leap in pattern recognition	Doğa Veske, Cenk Tüysüz, Mirko Amico, Nicholas Bronn, Olivia Lanes, Imre Bartos, Zsuzsa Marka, Sebastian Will and Szabolcs Marka
162	Geometric structure of (thermo)majorization cones	Alexssandre de Oliveira Junior, Jakub Czartowski, Kamil Korzekwa and Karol Życzkowski
163	Observation of the Entanglement Barrier with Classical Shadows	Aniket Rath, Vittorio Vitale, Sara Murciano, Matteo Votto, Jerome Dubail, Richard Kueng, Cyril Branciard, Pasquale Calabrese and Benoit Vermersch
168	Revealing multi-point temporal quantum statistics without measurement back-action	Pengfei Wang, Hyukjoon Kwon, Chun-Yang Luan, Wentao Chen, Mu Qiao, Zinan Zhou, Kaizhao Wang, Myungshik Kim and Kihwan Kim
169	Certifying Temporal Correlations	Harshank Shrotriya, Leong Chuan Kwek and Kishor Bharti
170	Adaptive syndrome measurements for Shor-style error correction	Theerapat Tansuwannont and Kenneth R. Brown
176	Barren plateaus in quantum tensor network optimization	Enrique Cervero, Kirill Plekhanov and Michael Lubasch
177	Certified Everlasting Functional Encryption	Taiga Hiroka, Tomoyuki Morimae, Ryo Nishimaki and Takashi Yamakawa
178	Quantum algorithm for ground state energy estimation using circuit depth with exponentially improved dependence on precision	Guoming Wang, Daniel Stilck França, Ruizhe Zhang, Shuchen Zhu and Peter Johnson
182	Quantum correlations on the no-signaling boundary: self-testing and more	Kai-Siang Chen, Gelo Noel M. Tabia, Jebaratnam Chellasamy, Shiladitya Mal, Jun-Yi Wu and Yeong-Cherng Liang
187	Efficient measures of magic for quantum computers and matrix product states	Tobias Haug, Myungshik Kim and Lorenzo Piroli
188	Universal decoding of a single qubit information: deterministic and exact protocol	Satoshi Yoshida, Akihito Soeda and Mio Murao
189	Non-Pauli Errors in the Three-Dimensional Surface Code	Tom Scruby, Michael Vasmer and Dan Browne
191	Logarithmic Quantum Forking	Alessandro Berti
200	Quantum State Preparation with Optimal Circuit Depth: Implementations and Applications	Xiao-Ming Zhang, Tongyang Li and Xiao Yuan
206	Nonlocal Network Coding in Multiple Access Channels	Jiyoung Yun, Ashutosh Rai and Joonwoo Bae
207	Trading causal order for locality	Ravi Kunjwal and Ämin Baumeler
210	Grothendieck inequalities characterize converses to the polynomial method	Jop Briët, Francisco Escudero Gutiérrez and Sander Gribiling
211	Quantum operations with indefinite time direction	Giulio Chiribella and Zixuan Liu
214	Tight analytic bound on the trade-off between device-independent randomness and nonlocality	Lewis Wooltorton, Peter Brown and Roger Colbeck
215	Quantum realization of extreme points - from hybrid correlations to channel assemblages	Michal Banacki, Piotr Mironowicz, Ravishankar Ramanathan and Pawel Horodecki
222	Sequential Methods in Quantum Hypothesis Testing	John Calsamiglia, Marco Fanizza, Christoph Hirche, Yonglong Li, Esteban Martínez Vargas, Ramon Muñoz-Tapia, Gael Sentis, Michalis Skotiniotis, Vincent Tan and Marco Tomamichel
223	Learning Quantum Processes with Memory - Quantum Recurrent Neural Networks	Dmytro Bondarenko, Tobias Osborne, Robert Salzmann and Viktoria-Sophie Schmiesing
224	Parameterized Complexity of Weighted Local Hamiltonian Problems and Quantum Exponential Time Hypothesis	Michael Bremner, Zhengfeng Ji, Luke Mathieson and Mauro Morales
227	Training variational quantum circuits with CoVaR: covariance root finding with classical shadows	Gregory Boyd and Balint Koczor

230	Universal sample lower bounds for quantum error mitigation	Ryuji Takagi, Hiroyasu Tajima and Mile Gu
232	Near-optimal circuit design for variational quantum optimization	Bence Bakó, Adam Glos, Özlem Salehi and Zoltán Zimborás
234	What is nonclassical about uncertainty relations?	Lorenzo Catani, Matthew Leifer, Giovanni Scala, David Schmid and Robert Spekkens
236	Variational learning algorithms for quantum query complexity	Zipeng Wu, Shi-Yao Hou, Chao Zhang, Bei Zeng and Lvzhou Li
239	Tensor Network Assisted Variational Quantum Algorithm	Junxiang Huang, Wenhao He, Yukun Zhang, Yusen Wu, Bujiao Wu and Xiao Yuan
242	Efficient and robust estimation of many-qubit Hamiltonians	Daniel Stilck França, Johannes Borregaard, Albert H. Werner, Liubov Markovich and Slava Dobrovitski
243	Fault-tolerant error correction for a universal non-Abelian topological quantum computer at finite temperature	Alexis Schotte, Lander Burgelman and Guanyu Zhu
244	Deep Circuit QAOA	Gereon Koßmann, Lennart Binkowski, Lauritz van Luijk, Timo Ziegler and René Schwonnek
245	A Graphical Formalism for Entanglement Purification	Lina Vandré and Otfried Gühne
246	Symmetries in quantum networks lead to no-go theorems for entanglement distribution and to verification techniques	Kiara Hansenne, Zhen-Peng Xu, Tristan Kraft and Otfried Gühne
248	Fast erasure decoder for a class of quantum LDPC codes	Nicholas Connolly, Vivien Londe, Anthony Leverrier and Nicolas Delfosse
252	A single T-gate makes distribution learning hard	Marcel Hinsche, Marios Ioannou, Alexander Nietner, Ryan Sweke, Jonas Haferkamp, Yihui Quek, Dominik Hangleiter, Jean-Pierre Seifert and Jens Eisert
254	Magic: a new perspective on quantum chaos	Lorenzo Leone, Salvatore F.E. Oliviero, Alioscia Hamma and Seth Lloyd
255	Transitions in quantum complexity in random circuits	Salvatore F.E. Oliviero, Lorenzo Leone, You Zhou, Stefano Piemontese, Sarah True and Alioscia Hamma
256	Testing quantum theory with generalized noncontextuality	Markus P. Mueller and Andrew J. P. Garner
257	A mathematical framework for quantum Hamiltonian simulation and duality	Harriet Apel and Toby Cubitt
258	Quantifying the intrinsic randomness of quantum measurements	Gabriel Ignacio Senno, Antonio Acín and Thomas Strohm
259	Predicting Gibbs State Expectation Values with Pure Thermal Shadows	Luuk Coopmans, Yuta Kikuchi and Marcello Benedetti
260	Uncloneable Cryptographic Primitives with Interaction	Anne Broadbent and Eric Culf
263	Entanglement renormalization of thermofield double states	Cheng-Ju Lin, Zhi Li and Tim Hsieh
266	Probing sign structure using measurement-induced entanglement	Cheng-Ju Lin, Weicheng Ye, Yijian Zou, Shengqi Sang and Timothy Hsieh
269	Equivalence in delegated quantum computing	Fabian Wiesner, Jens Eisert and Anna Pappa
271	Self-testing Arbitrary Projective Measurement	Ranyiliu Chen, Jurij Volčič and Laura Mančinska
272	Manifold search in the quantum machine learning realm: a computational approach to quantum symmetry discovery	Jonathan Lu, Rodrigo Bravo, Kaiying Hou, Gebremedhin Dagnew, Susanne Yelin and Khadijeh Najafi
274	Correlation between PQC Descriptors and Training Accuracy in Hybrid Quantum-Classical Model for Earth Observation Image Classification	Su Yeon Chang, Bertrand Le Saux, Sofia Vallecorsa and Michele Grossi
275	Loss-tolerant all-optical quantum computing architecture using parity-state-encoded multiphoton qubits	Seok-Hyung Lee, Srikrishna Omkar, Yong Siah Teo and Hyunseok Jeong
277	Security of continuous variable QKD with discrete modulation	Stefan Baeuml, Carlos Pascual, Victoria Wright, Omar Fawzi and Antonio Acin
278	Qubit-oscillator concatenated codes: decoding formalism & code comparison	Yijia Xu, Yixu Wang, En-Jui Kuo and Victor Albert
279	Optimal Strategies of Quantum Metrology with a Strict Hierarchy	Qiushi Liu, Zihao Hu, Haidong Yuan and Yuxiang Yang
282	Looped Pipelines Enabling Effective 3D Qubit Lattices in a Strictly 2D Device	Zhenyu Cai, Adam Siegel and Simon Benjamin
287	A Quantum Online Portfolio Optimization Algorithm	Debbie Huey Chih Lim and Patrick Rebentrost
290	Fast-forwarding quantum walk-based Monte Carlo simulations	Mathys Rennela, Vivien Londe, Alain Sarlette, Martin Roetteler and Matthias Troyer
291	Optimizing the information extracted by a single qubit measurement	Stefano Polla, Gian-Luca R. Anselmetti and Thomas E. O'Brien
292	Local-Dimension-Invariant Stabilizer Codes	Lane Gunderman and Arun Moorthy

294	Enhancing Detection of Topological Order by Local Error Correction	Nishad Maskara, Iris Cong, Minh Tran, Hannes Pichler, Giulia Semeghini, Susanne Yelin, Soonwon Choi and Mikhail Lukin
297	Towards near-term quantum simulation of materials	Laura Clinton, Toby Cubitt, Brian Flynn, Filippo Maria Gambetta, Joel Klassen, Ashley Montanaro, Stephen Piddock, Raul A. Santos and Evan Sheridan
299	Theory-independent randomness generation with spacetime symmetries	Albert Aloy, Caroline Jones, Stefan Ludescher and Markus Müller
305	Single-qubit loss-tolerant quantum position verification protocol secure against entangled attackers	Llorenc Escola Farras and Florian Speelman
306	Classically optimized Hamiltonian simulation	Conor Mc Keever and Michael Lubasch
307	Quantum theory in finite dimension cannot explain every general process with finite memory	Marco Fanizza, Josep Lumbreras and Andreas Winter
310	Improved simulation of quantum circuits dominated by free Fermionic operations	Oliver Reardon-Smith, Michał Oszmaniec and Kamil Korzekwa
311	Evaluating the impact of noise on the performance of the Variational Quantum Eigensolver	Marita Oliv, Andrea Matic, Thomas Messerer and Jeanette Miriam Lorenz
312	Channel Simulation: Finite Blocklengths and Broadcast Channels	Michael Cao, Navneeth Ramakrishnan, Mario Berta and Marco Tomamichel
314	Beyond i.i.d. in the Resource Theory of Asymmetry: An Information-Spectrum Approach for Quantum Fisher Information	Koji Yamaguchi and Hiroyasu Tajima
315	Optimizing Fermionic Encodings for both Hamiltonian and Hardware	Riley Chien and Joel Klassen
320	Parallel window decoding enables scalable fault tolerant quantum computation	Luka Skoric, Dan Browne, Kenton Barnes, Neil Gillespie and Earl Campbell
324	Mermin polytopes in quantum computation and foundations	Cihan Okay, Ho Yiu Chung and Selman Ipek
325	Fault-tolerant Coding for Entanglement-Assisted Communication	Paula Belzig, Matthias Christandl and Alexander Müller-Hermes
326	Quantum LDPC Codes for Modular Architectures	Armands Strikis and Lucas Berent
327	Molecular Quantum Circuit Design	Jakob Kottmann
329	Estimating the entanglement of random multipartite quantum states	Khurshed Fitter, Cécilia Lancien and Ion Nechita
330	Quantum max-flow in the bridge graph	Vincent Steffan, Fulvio Gesmundo and Vladimir Lysikov
331	Variational solutions for local fermion-to-qubit mappings	Jannes Nys and Giuseppe Carleo
332	Page curves and typical entanglement in linear optics	Joseph Iosue, Adam Ehrenberg, Dominik Hangleiter, Abhinav Deshpande and Alexey Gorshkov
333	Classical models are a better explanation of the Jiuzhang 1.0 Gaussian Boson Sampler than its targeted squeezed light model	Javier Martínez-Cifuentes, Karen Fonseca-Romero and Nicolás Quesada
334	Total insecurity of communication via strong converse for quantum privacy amplification	Robert Salzmann and Nilanjana Datta
338	Toys can't play: physical agents in Spekkens' theory	Ladina Hausmann, Nuriya Nurgalieva and Lídia del Rio
340	State Preparation Fidelities for Dicke States	Shamminuj Aktar, Andreas Bärtschi, Abdel-Hameed A. Badawy and Stephan Eidenbenz
345	Circuits of space-time quantum channels	Pavel Kos and Georgios Styliaris
346	Quantum algorithms and the power of forgetting	Andrew Childs, Matthew Coudron and Amin Shiraz Gilani
350	Efficient classical algorithm of molecular vibronic spectra problem	Changhun Oh, Youngrong Lim, Bill Fefferman and Liang Jiang
357	Sharp complexity phase transitions generated by entanglement	Abhinav Deshpande, Bill Fefferman, Soumik Ghosh, Alexey Gorshkov and Dominik Hangleiter
361	Qubit seriation: Undoing data shuffling using spectral ordering	Atithi Acharya, Manuel Rudolph, Jing Chen, Jacob Miler and Alejandro Perdomo-Ortiz
364	A parallel repetition theorem in the quantum commuting operator model	Junqiao Lin, William Slofstra and Henry Yuen
366	Learning quantum processes without input control	Marco Fanizza, Matteo Rosati and Yihui Quek
371	Classification of measurement-based quantum wire in stabilizer PEPS	Paul Herringer and Robert Raussendorf
372	Error propagation in NISQ devices for solving classical optimization problems	Guillermo González-García, Rahul Trivedi and J. Ignacio Cirac
373	From Auditable Quantum Authentication to Best-of-Both-Worlds Multiparty Quantum Computation with Public Verifiable Identifiable Abort	Mi-Ying Huang and Er-Cheng Tang
375	Only Classical Parametrised States have Optimal Measurements	Wilfred Salmon, Sergii Strelchuk and David Arvidsson-Shukur
376	Multiplicative Updates for Quantum Bilinear Optimization	Wayne Lin, Georgios Piliouras, Ryann Sim and Antonios Varvitsiotis

378	Anyon braiding and the renormalization group	Alexander Stottmeister
380	Thermal State Preparation via Rounding Promises	Patrick Rall, Chunhao Wang and Pawel Wocjan
382	Fragile boundaries of tailored surface codes and improved decoding of circuit-level noise	Oscar Higgott, Thomas Bohdanowicz, Aleksander Kubica, Steven Flammia and Earl Campbell
384	Fusion category symmetry-protected topological order in the generalized cluster state	Chris Fechisin, Nathanan Tantivasadakarn, David Aasen, Wenqing Xu, Wenjie Ji, Jason Alicea, John Preskill and Victor Albert
385	Topological data analysis on noisy quantum computers	Ismail Yunus Akhalwaya, Shashanka Ubaru, Kenneth L. Clarkson and Lior Horesh
387	Area laws for steady states of detailed-balance Lindbladians	Itai Arad, Raz Firanko and Moshe Goldstein
389	Rate-Distortion Theory for Mixed States	Debbie Leung, Kohdai Kuroiwa and Zahra Baghali Khanian
390	Large N Matrix Quantum Mechanics as a Quantum Memory	Gong Cheng, Chunjun Cao and Brian Swingle
392	Upper and lower bounds on CSS code dimensions for magic state distillation protocols	Rhea Alexander, Si Gvirtz-Chen, Nikolaos Koukoulekidis and David Jennings
393	A graph-theoretical analysis on first order quantum phase transitions for adiabatic quantum computing	Matthias Werner, Artur Garcia-Saez and Marta P Estarellas
394	Faster Born probability estimation via gate merging and frame optimisation	Nikolaos Koukoulekidis, Hyukjoon Kwon, Hyejung Jee, David Jennings and Myungshik Kim
399	Measurement-free Quantum Error Correction for Gaussian Noise using Gottesman-Kitaev-Preskill States	En Jui Chang and Ching Yi Lai
401	Interpolating between Rényi entanglement entropies for arbitrary bipartitions via operator geometric means	Dávid Bugár and Péter Vrana
405	When is better state preparation worthwhile?	Shivesh Pathak, Antonio Russo, Stefan Seritan and Andrew Baczewski
406	The 2T-qutrit, a two-mode bosonic qutrit	Aurélie Denys and Anthony Leverrier
412	Towards Geometric Quantum Machine Learning	Frederic Sauvage, Martin Larroca, Marco Cerezo, Nguyen Quynh, Louis Schatzki, Paolo Braccia, Michael Ragone and Patrick Coles
415	The power and limitations of self-testing	Jed Kaniewski, David Rasmussen Lolck, Laura Mančinska, Thor Gabelgaard Nielsen and Simon Schmidt
418	Inference Based Quantum Sensing	Cinthia Huerta, Max Hunter Gordon, Frederic Sauvage, Akira Sone, Andrew Sornborger, Patrick Coles and Marco Cerezo
419	Correcting phenomenological errors for quantum memories via belief propagation	Kao-Yueh Kuo and Ching-Yi Lai
420	Holography as a resource for non-local quantum computation	Kfir Dolev and Sam Cree
426	Quantum dichotomies and coherent thermodynamics beyond first-order asymptotics	Patryk Lipka-Bartosik, Christopher Chubb, Joseph Renes, Marco Tomamichel and Kamil Korzekwa
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428	Lattice-Based Quantum Advantage from Rotated Measurements	Yusuf Alnawakhtha, Atul Mantri, Carl Miller and Daochen Wang
429	The dynamical uncertainty principle determines the programmability of quantum processors	Yunlong Xiao, Gaurav Saxena, Ryuji Takagi, Sarvagya Upadhyay and Mile Gu
435	Qubit-Efficient Randomized Quantum Algorithms for Linear Algebra	Samson Wang, Sam McArdle and Mario Berta
441	The Complexity-Theoretic Limits of Quantum Algorithms for Topological Data Analysis	Alexander Schmidhuber and Seth Lloyd
449	Gibbs Sampling of Periodic Potentials on a Quantum Computer	Arsalan Motamedi and Pooya Ronagh
450	A theory of quantum differential equation solvers: limitations and fast-forwarding	Dong An, Jin-Peng Liu, Daochen Wang and Qi Zhao
452	Quantum receivers for near-optimal unambiguous decoding	Jasminder Sidhu, Michael Bullock, Saikat Guha and Cosmo Lupo
456	Quantifying the performance of approximate teleportation and quantum error correction via symmetric two-PPT-extendibility	Tharon Holdsworth, Vishal Singh and Mark Wilde
457	Variational Quantum Algorithms for Semidefinite Programming	Dhrumil Patel, Patrick Coles and Mark Wilde
459	FABLE: Fast Approximate Quantum Circuits for Block-Encodings	Roel Van Beeumen and Daan Camps
460	On the Impossibility of General Parallel Fast-forwarding of Hamiltonian Simulation	Nai-Hui Chia, Kai-Min Chung, Yao-Ching Hsieh, Han-Hsuan Lin, Yao-Ting Lin and Yu-Ching Shen
472	Discrete Bulk Reconstruction	Scott Aaronson and Jason Pollack

473	Guaranteed efficient energy estimation of quantum many-body Hamiltonians using ShadowGrouping	Alexander Gresch and Martin Kliesch
474	Randomized compiling improves logical performance	Aditya Jain, Pavithran Iyer, Stephen D. Bartlett and Joseph Emerson
478	Quantum networks with coherent routing of information through multiple nodes	Hlér Kristjánsson, Yan Zhong, Anthony Munson and Giulio Chiribella
482	Quantum embedding approaches for materials simulations on quantum computers	Francois Jamet, Abhishek Agarwal and Ivan Rungger
483	On the sampling complexity of open quantum systems	Isobel Aloisio, Gregory White, Charles Hill and Kavan Modi
485	Versatile fidelity estimation with confidence	Akshay Seshadri, Martin Ringbauer, Rainer Blatt, Thomas Monz and Stephen Becker
488	Unconditional Quantum Advantage for Sampling with Shallow Circuits	Adam Bene Watts and Natalie Parham
490	Robustness and Limitations of Quantum Algorithms for Nonconvex Optimization	Weiyuan Gong, Chenyi Zhang and Tongyang Li
491	Distillation of Secret Key and GHZ States from Multipartite Mixed States	Farzin Salek and Andreas Winter
494	Power of sequential protocol in hidden channel discrimination	Sho Sugiura, Arkopal Dutt, Sina Zeytinoglu, William J. Munro and Isaac L. Chuang
495	Information recoverability of noisy quantum states	Xuanqiang Zhao, Benchi Zhao, Zihan Xia and Xin Wang
497	Shadow estimation of gate-set properties from random sequences	Jonas Helsen, Marios Ioannou, Roth Ingo, Jonas Kitzinger, Emilio Onorati, Albert Werner and Jens Eisert
498	Quantum state tomography via non-convex Riemannian gradient descent	Ming-Chien Hsu, En-Jui Kuo, Wei-Hsuan Yu, Jian-Feng Cai and Min-Hsiu Hsieh
501	Breaking barriers in two-party quantum cryptography via stochastic semidefinite programming	Akshay Bansal and Jamie Sikora
504	Catalysis in action via elementary thermal operations	Jeongrak Son and Nelly H. Y. Ng
507	Tight Bounds on Genuine Multipartite Nonlocality for AND	Hafiza Rumlah Amer and Jibran Rashid
508	Error-Robust Quantum Signal Processing using Rydberg Atoms	Sina Zeytinoglu and Sho Sugiura
514	Greatly improved higher-order product formulae for quantum simulation	Mauro Morales, Pedro Costa, Daniel Burgarth, Yuval Sanders and Dominic Berry
517	How to characterise a clock: putting clocks against each other	Nuriya Nurgalieva, Ralph Silva and Renato Renner
520	Geometry of Uniform Matrix Product States	Tim Seynnaeve and Harshit J. Motwani
525	A perturbative gadget for avoiding barren plateaus in variational quantum algorithms	Simon Cichy, Paul K. Faehrmann, Sumeet Khatri and Jens Eisert
529	Quantum metrology beyond the i.i.d. regime: Continuous multiple hypothesis testing	Johannes Jakob Meyer, Sumeet Khatri, Daniel Stilck França, Jens Eisert and Philippe Faist
532	Continuous-Variable Shadow Tomography	Srilekha Gandhari, Victor Albert, Jacob Taylor and Michael Gullans
533	A hybrid framework for estimating nonlinear functions of quantum states	You Zhou and Zhenhuan Liu
534	Extendibility of Werner States	Dávid Jakab, Adrian Solymos and Zoltán Zimborás
535	A random matrix model for approximate t-designs	Piotr Dulian and Adam Sawicki
536	Hunting for quantum-classical crossover in condensed matter problems	Nobuyuki Yoshioka, Tsuyoshi Okubo, Yasunari Suzuki, Yuki Koizumi and Wataru Mizukami
540	Estimating Quantum Hamiltonians via Joint Measurements of Noisy Non-Commuting Observables	Daniel McNulty, Filip Maciejewski and Michał Oszmaniec
544	A Complete Equational Theory for Quantum Circuits	Alexandre Clément, Nicolas Heurtel, Shane Mansfield, Simon Perdrix and Benoît Valiron
548	Fermion-Parity-Based Computation and its Majorana-Zero-Mode Implementation	Campbell McLauchlan and Benjamin Beri
549	Quantum-inspired algorithms for approximating matrix functions	Youngrong Lim and Chanhun Oh
550	Efficient classical simulation of cluster state quantum circuits with alternative inputs	Sahar Atallah, Michael Garn, Sania Jevtic, Yukuan Tao and Shashank Virmani
551	Proof of the Wigner-Araki-Yanase theorem for unbounded conserved observables	Yui Kuramochi and Hiroyasu Tajima
552	Fundamental thresholds of realistic quantum error correction circuits from classical spin models	Davide Vodola, Manuel Rispler, Seyong Kim and Markus Müller
553	Ultra fast quantum circuits for quantum state preparation	Harry Buhrman, Marten Folkertsma and Niels Neumann
557	Even the weakest external quantum correlations forbid catalysis	Seok Hyung Lie and Nelly Ng

559	Circuit depth versus energy in topologically ordered systems	Arkin Tikku and Isaac Kim
560	No-broadcasting theorem for non-signaling boxes and assemblages	Carlos Vieira, Adrian Solymos, Cristhiano Duarte and Zoltán Zimborás
561	Two instances of random access code in the quantum regime	Nitica Sakharwade, Michal Studzinski, Michal Eckstein and Pawel Horodecki
568	Shallow shadows: Expectation estimation using low-depth random Clifford circuits	Christian Bertoni, Jonas Haferkamp, Marcel Hinsche, Marios Oannou, Jens Eisert and Hakop Pashayan
570	Multi-agent blind quantum computation without universal cluster state	Shuxiang Cao
571	SeQUeNCe, a Customizable Discrete-Event Simulator of Quantum Networks	Rajkumar Kettimuthu
572	Quantum Accelerated Causal Tomography: Circuit Considerations Towards Applications	Tamal Acharya, Akash Kundu and Aritra Sarkar
678	Genetic Algorithms for Quantum Circuit Optimization	Leo Sünkel, Darya Martyniuk, Denny Mattern and Johannes Jung
713	Variational Quantum Clustering with Pseudo-Labelling	Hyeong-Gyu Kim, Siheon Park and June-Koo Kevin Rhee
763	Logical Majorana Fermions for Fault-Tolerant Quantum Simulation	B. C. A. Morrison and Andrew Landahl

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573	Adaptive Advantage in Entanglement-Assisted Communications	Jef Pauwels, Stefano Pironio, Emmanuel Zambrini Cruzeiro and Armin Tavakoli
575	Quantum Computation for Periodic Solids in Second Quantization	Aleksei V. Ivanov, Christoph Sünderhauf, Nicole Holzmann, Tom Ellaby, Rachel Kerber, Glenn Jones and Joan Camps
576	On the Necessity of Collapsing for Post-Quantum and Quantum Commitments	Marcel Dall'Agnol and Nick Spooner
578	Calculable lower bounds on the efficiency of universal sets of quantum gates	Oskar Słowik and Adam Sawicki
579	Indeterminism and Bell nonlocality with classical systems	Lorenzo Giannelli, Carlo Maria Scandolo and Giulio Chiribella
580	Quantinuum's Quantum Monte Carlo Integration Engine	Ifan Williams, Alexandre Krajenbrink, Michael Spranger, Steven Herbert, Jose Gefaell, Edwin Agnew, Roland Guichard and Julien Sorci
581	How much noise can a Haar-random state withstand before all entanglement is lost?	Daniel Miller and Jens Eisert
582	An adaptive quantum-phase-estimation protocol for NISQ hardware	Joseph Smith, David Arvidsson-Shukur and Crispin Barnes
584	Gauging quantum states with non-anomalous matrix product operator symmetries	Jose Garre Rubio and Ilya Kull
585	Catalysis in Charging Quantum Batteries	Ricard Ravell Rodriguez, Borhan Ahmadi, Pawel Mazurek, Shabir Barzanjeh, Robert Alicki and Pawel Horodecki
586	Constrained quantum optimization for extractive summarization on a trapped-ion quantum computer	Romina Yalovetzky, Pradeep Niroula, Ruslan Shaydulin, Pierre Minssen, Dylan Herman, Shaohan Hu and Marco Pistoia
587	Relaxing hardware requirements for surface codes	Matthew McEwen, Craig Gidney and Dave Bacon
590	Bandwidth Enables Generalization in Quantum Kernel Models	Abdulkadir Canatar, Evan Peters, Cengiz Pehlevan, Stefan Wild and Ruslan Shaydulin
591	Software Tools for Decoding Quantum Low-Density Parity Check Codes	Lucas Berent, Lukas Burgholzer and Robert Wille
592	Optical cluster-state generation with unitary averaging	Deepesh Singh, Austin Lund and Peter Rohde
593	Fourier-based quantum signal processing	Thais Lima Silva, Lucas Borges and Leandro Aolita
594	Classical product code constructions for quantum Calderbank-Shor-Steane codes	Dimiter Ostrev, Davide Orsucci, Francisco Lazaro and Balazs Matuz
595	Transforming Collections of Pauli Operators into Equivalent Collections of Pauli Operators over Minimal Registers	Lane Gunderman
596	Maximally entangled symmetric states of two qubits	Eduardo Serrano-Ensástiga and John Martin
597	Quantum Computation for Simulating Periodic Solid-state Systems Using Plane-wave Basis	Qian Wang, Alice Hu and Yu-Cheng Chen
598	Detection and estimation of progress of brain cancer using quantum-classical CNN based method	Sriya Bada, Sreeraj Warrier and Jayasri Dontabhaktuni
599	Two-qutrit Bell-diagonal states: AI versus Algorithmics	Marcin Wieśniak
600	Motion-blur detection in underwater images using classical-quantum CNN based method	Sreeraj Warrier, Sriya Bada, Jayasri Dontabhaktuni, Rohith Achampeta and Sebastian Uppapalli
601	Robust qudit Hamiltonian engineering from graphical constructions and spherical designs	Hengyun Zhou, Nathaniel Leitao, Haoyang Gao, Leigh Martin, Oksana Makarova, Iris Cong, Alexander Douglas and Mikhail Lukin
602	Quantum Spatial Attention based U-Net (QuSAt-UNet) for Ball Screw Drive Metal Surface Segmentation	Kalpesh Prajapati and Kameshwar Rao Jv
603	Variational Quantum Circuit with Transformer for Classifying Medical Condition based on User Reviews on Drugs	Kalpesh Prajapati and Kameshwar Rao Jv
605	Entanglement in quantum hypergraph states	Jan Nöller and Mariami Gachechiladze
606	Anyon Condensation and Quantum Error Correction	Julio C. Magdalena de la Fuente and Markus S. Kesselring
607	Quantum security of subset cover problems	Samuel Bouaziz-Ermann, Alex B. Grilo and Damien Vergnaud
608	A State Distillation Method Using Quantum Imaginary Time Control for Solving the Generalized Eigenproblems	Mengzhen Ren, Alice Hu and Yu-Cheng Chen
609	A tensor norm approach to quantum compatibility	Andreas Bluhm and Ion Nechita
610	Extension of CL-P bound of Clifford circuits via framed Wigner simulator	Gue Dong Park, Hyukjoon Kwon and Hyunseok Jeong

611	Best practices for multivariant input in parametrized quantum circuits	Dirk Heimann, Gunnar Schönhoff, Elie Mounzer and Frank Kirchner
612	Multispectral Satellite Data Analysis Using Support Vector Machines With Quantum Kernels	Artur Miroszewski, Filip Szczepanek, Grzegorz Czelusta, Bartosz Grabowski, Bertrand Le Saux, Jakub Nalepa and Jakub Mielczarek
613	Quantum Simulation of $\mathbb{Z}_2$ Lattice Gauge theory with minimal requirements	Reinis Irmejs, Mari-Carmen Banuls and J. Ignacio Cirac
614	No graph states can be prepared in quantum networks with bipartite sources	Owidiusz Makuta, Laurens T. Ligthart and Remigiusz Augusiak
615	Syndrome extraction using the spin-photon interface	Elena Callus and Pieter Kok
616	Noise in quantum rigid rotors: from the perspective of error correction	Shubham Jain, Eric Hudson, Wesley Campbell and Victor Albert
617	Exponential data encoding strategy for quantum supervised learning	Seongwook Shin, Yong Siah Teo and Hyunseok Jeong
619	Finite-time Landauer principle at strong coupling	Alberto Rolandi and Martí Perarnau-Llobet
620	Efficient Machine-Learning-based decoder for Heavy Hexagonal QECC	Debasmita Bhoumik, Ritajit Majumdar, Dhiraj Madan, Dhinakaran Vinayagamurthy, Shesha Raghunathan and Susmita Sur-Kolay
621	Efficient Quantum Circuit Generation via Reinforcement Learning	Kim DongHa
622	Classically Approximating Variational Quantum Machine Learning with Random Fourier Features	Jonas Landman, Slimane Thabet, Constantin Dalyac, Hela Mhiri and Elham Kashefi
623	Near Term Quantum Machine Learning with Particle Number Preserving Circuits	Jonas Landman, Iordanis Kerenidis and Natansh Mathur
624	Error mitigation for chemistry simulation on quantum hardware	Christian Gogolin
625	Transcendental properties of entropy-constrained sets: Part II	Vjosa Blakaj and Chokri Manai
626	Quantum Bell Inequalities from Information Causality	Prabhav Jain, Mariami Gachechiladze and Nikolai Miklin
627	Quantum Approximate Optimization Algorithm and its recursive version to solve MAX-CUT problem for Complete graphs	Eunok Bae and Soojoon Lee
628	Universality verification for a set of quantum gates	Adam Sawicki, Lorenzo Mattioli and Zoltan Zimboras
629	Quantum Correlated Policies in Multi-Agent Reinforcement Learning	Hans Hohenfeld
630	Matrix concentration inequalities and random t-designs	Piotr Dulian and Adam Sawicki
632	A new information criterion for quantum state estimation	Hiroshi Yano and Naoki Yamamoto
633	Efficient decomposition of multi-qubit gates	P.V. Sriluckshmy, Vicente Pina-Canelles, Manuel G. Algaba, Fedor Šimkovic and Martin Leib
634	Privacy Amplification with Python	Iyan Mendez Veiga and Esther Hänggi
635	Fault-tolerant Variational Quantum Eigensolver	Hasan Sayginel, Dan Browne, Francois Jamet and Ivan Rungger
636	The Smallest Code with Transversal T	Stergios Koutsioumpas, Darren Banfield and Alastair Kay
637	Multicore quantum computing	Hamza Jnane, Brennan Undseth, Zhenyu Cai, Simon Benjamin and Balint Koczor
638	QuBOBS, physical devices and a visual representation to explain quantum computing	Sophie Laplante, Loris Perez, Sylvie Tissot and Lou Vettier
639	Overcoming fundamental bounds on quantum conference key agreement	Giacomo Carrara, Glaucia Murta and Federico Grasselli
640	Implementing Logical Operators using Code Rewiring	Darren Banfield and Alastair Kay
641	Quantum Machine Learning on Smaller Quantum Computers	Simon Marshall, Casper Gyurik and Vedran Dunjko
642	Minimal Port-based Teleportation	Michal Studzinski and Sergii Strelchuk
643	Dual-unitary circuits: Conservation laws and operator spreading	Tom Holden-Dye, Arijeet Pal and Lluís Masanes
644	Feasibility of NISQ Algorithms for Topological Data Analysis	Shashvat Shukla
645	Generic quantum Wielandt's inequality	Yifan Jia and Angela Capel Cuevas
647	Preparing the XY surface code with high threshold under biased noise	Pei-Kai Tsai, Yue Wu and Shruti Puri
648	Error-correction zoo	Victor V. Albert and Philippe Faist
649	Measurement-free quantum error correction with native multi-qubit gates	Michael A. Perlin, Mark Saffman and Robert J. Joynt
650	On the power of nonstandard quantum oracles	Roozbeh Bassirian, Bill Fefferman and Kunal Marwaha
651	Practical and efficient Hamiltonian learning	Wenjun Yu, Jinzhao Sun, Zeyao Han and Xiao Yuan
652	Quantum World Models: Learning MDP Transitions Using Parametrized Quantum Circuits	Lukas Gross, Dirk Heimann and Hans Hohenfeld

653	Optimising VQE via Bayesian updates of local surrogate models	Jan Lukas Bosse and Ashley Montanaro
654	New techniques to improve zero-noise extrapolation on superconducting qubits	Kathrin Koenig, Finn Reinecke and Thomas Wellens
656	Efficient simulation of time-dependent Hamiltonians	Guannan Chen, Pranav Singh, Chris Budd and Mohammadali Foroozandeh
657	Dynamics of entanglement of many-body localized systems coupled to an environment	Elisabeth Wybo, Michael Knap and Frank Pollmann
658	Efficient measurement schemes for bosonic systems	Tianren Gu, Xiao Yuan and Bujiao Wu
659	Contractivity and QAOA Performance under Dephasing	Dina Abdelhadi and Daniel Stilck Franca
660	Virtual Resource Distillation in Continuous Variable Systems	Amalina Lai, Mile Gu and Ryuji Takagi
661	Analyses of the viability of automating the quantum circuit construction of Grover's Oracle for executing wildcard searches on NISQ processors	Willie Huang
662	Design of Quantum error correcting code for biased error on heavy-hexagon structure	Younghun Kim, Jeongsoo Kang and Younghun Kwon
665	Quantum simulation of dynamical phase transitions in noisy quantum devices	Younes Javanmard
666	Quantum walk based sampling algorithms	Sára Pituk and András Gilyén
667	Quantum chernoff bounds for advantage distillation DIQKD	Mikka Stasiuk, Ernest Tan and Norbert Lutkenhaus
668	Analytically Realizing Hybrid Boson-Qubit Operations via Hamiltonian Simulation Techniques	Christopher Kang, Micheline Soley, Eleanor Crane, Steven Girvin and Nathan Wiebe
671	Quantum tomography under perturbed Hamiltonian evolution and scrambling of errors - a quantum signature of chaos	Abinash Sahu, Naga Dileep Varikuti and Vaibhav Madhok
672	Comparison of 2-dimensional and high-dimensional BB84 QKD protocols	Claudia De Lazzari, Ilaria Vagniluca, Domenico Ribezzo, Davide Bacco, Alessandro Zavatta and Tommaso Occhipinti
673	Spectral estimation for Hamiltonians: a comparison between classical imaginary-time evolution and quantum real-time evolution	Maarten Stroeks, Jonas Helsen and Barbara Terhal
674	Spacelike Floquet Codes	Simon Burton
675	Certifying Quantum Separability with Adaptive Polytopes	Ties-Albrecht Ohst, Xiao-Dong Yu, Otfried Gühne and H. Chau Nguyen
676	Universal entanglement and correlation measure in two-dimensional conformal field theories	Chao Yin and Zhenhuan Liu
677	Quantum phase detection generalisation from marginal quantum neural network models	Saverio Monaco, Oriel Kiss, Antonio Mandarino, Sofia Vallecorsa and Michele Grossi
679	Statistical mechanics mapping for finite rate LDPC codes	Benedikt Placke and Nikolas Breuckmann
680	Interpolation of Trotter data for eigenvalue and expectation value estimation	Gumaro Rendon, Jacob Watkins and Nathan Wiebe
681	Frequency analysis of nonlinear pendulum via Quantum Fourier Transform	Yi-Lin Cheng, Chih-Yu Chen, Tsung-Wei Huang and Yu-Ping Liao
682	Quantum error correction in a time-dependent transverse field Ising model	Yifan Hong, Jeremy Young, Adam Kaufman and Andrew Lucas
683	Square-root measurements and resource state degradation in port-based teleportation scheme	Piotr Kopszak, Marek Mozrzymas and Michał Studziński
684	Optimizing Bell inequalities via Tropical Algebra	Mengyao Hu, Patrick Emonts and Jordi Tura
685	Faster eigenstate preparation using a distributed quantum protocol	Benjamin Schiffer and Jordi Tura
686	Hardy's paradox and locally (in)accessible information	Maria Violaris and Samuel Kuypers
687	Simultaneous Stoquasticity	Jacob Bringewatt and Lucas Brady
689	Simultaneous transfer of energy and information through a quantum channel.	Bishal Kumar Das, Lav R. Varshney and Vaibhav Madhok
690	Towards a Classical-Interfacing Quantum Data Center	Lara Booth and Agnes Villanyi
691	Classification of Hybrid Quantum-Classical Computing	Frank Phillipson, Niels Neumann and Robert Wezeman
692	Unraveling correlated material properties with noisy quantum computers: solving extended impurity models with the natural-orbitalization algorithm	Pauline Besserve and Thomas Ayral
693	Enhancing binary phase-shift-keying quantum communication with atomic indirect measurement via squeezing operation	Min Namkung and Jeong San Kim
694	Optimising shadow tomography with generalised measurements	Hai Chau Nguyen, Jan Lennart Bönsel, Jonathan Steinberg and Otfried Gühne
695	Advantages of Measurement-based Variational Quantum Eigensolvers	Anna Schroeder, Matthias Heller and Mariami Gachechiladze

696	The Role of Entanglement in Quantum-Relaxation Based Optimization Algorithms	Kosei Teramoto, Rudy Raymond and Hiroshi Imai
697	Quantifying quantum computational complexity via information scrambling	Arash Ahmadi and Eliska Greplova
698	Gaussian interconversion of non-Gaussian resources	Oliver Hahn, Patric Holmvall, Pascal Stadler, Giulia Ferrini and Alessandro Ferraro
699	Stabilizer subsystem decompositions for single- and multi-mode Gottesman-Kitaev-Preskill codes	Mackenzie Shaw, Andrew Doherty and Arne Grimsmo
700	Epsilon-nets and dynamic programming: towards bond dimension witnesses	Patrick Emonts, Mengyao Hu and Jordi Tura
701	the theory prediction for entangle source though double-slit	Shih-Han Weng, Tsung-Wei Huang and Ching-Ling Hsu
702	Trainable Quantum Walks simulation for loading probability distribution	Yen Jui Chang, Wei-Ting Wang, Shih-Wei Liao and Ching-Ray Chang
703	The first quantum metric evaluation on gate-based, annealing-based and photonic quantum hardware	Ward van der Schoot, Robert Wezeman, Frank Phillipson and Niels Neumann
706	Intrinsic decoherence effects on quantum coherence and quantum discord in XXZ Heisenberg model	Zakaria Dahbi, Mansoura Oumennana and Mostafa Mansour
707	Low-depth simulations of fermionic systems on realistic quantum hardware	Manuel G. Algaba, P.V. Sriluckshmy, Martin Leib and Fedor Simkovic
708	Concentration Inequalities for Output Statistics of Quantum Markov Processes	Federico Girotti, Madalin Guta, George Bakewell-Smith and Juan P. Garrahan
709	Multi-qubit Gate Decomposition Techniques for Trapped-Ion Qudits	Anastasiia Nikolaeva, Evgeny Kiktenko and Aleksey Fedorov
710	Full optimization of a single-qubit gate on the generalized sequential quantum optimizer	Kaito Wada, Rudy Raymond, Yuki Sato and Hiroshi Watanabe
712	The effect of errors on Gaussian boson sampling applied to the dense subgraph problem	Naomi Solomons, Oliver Thomas and Dara McCutcheon
714	NISQ friendly approach towards variational quantum eigensolver	Eyuel Eshetu Elala, Aidan Pellow-Jarman, Rowan Pellow-Jarman, Shane McFarthing, Francesco Petruccione and June-Koo Kevin Rhee
717	Energy Filter with 1D Tensor Networks	Kshiti Sneh Rai, Álvaro M. Alhambra and J. Ignacio Cirac
718	Faster convergence to the Parrondo paradox problem via quantum random walks algorithm.	Ran-Yu Chang, Yu-Chao Hsu, Tzu-Jui Liu and Tsung-Wei Huang
719	Taking Advantage of Noise to Speed Up Classical Simulation of NISQ Circuits	Joel Rajakumar, James Watson and Yi-Kai Liu
720	Using Quantum random walks to predict the chemical reaction rate constant	Tsung-Wei Huang, Ran-Yu Chang and Chih-Yu Chen
721	Optimization of coincidence window for QKD in a noisy environment	Hashir Kuniyil and Kadir Durak
722	Entanglement Batteries	Ye-Chao Liu, Stefan Nimmrichter and Otfried Gühne
724	Reduce-and-chop: Shallow circuits for deeper problems	Adrián Pérez-Salinas, Radoica Draskic, Jordi Tura Brugués and Vedran Dunjko
725	Zero noise extrapolation for a small diatomic molecule on a trapped-ion quantum computer	Oliver Maupin, Ashlyn Burch, Christopher Yale, Peter Love, Susan Clark, Brandon Ruzic, Andrew Landahl, Kenneth Rudinger, Antonio Russo, Daniel Lobser and Andrew Baczewski
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729	Composite Pulses in Phase Space: High-Fidelity Universal Measurement-Free Gate Teleportation for Finite-Energy GKP Qubits	Shraddha Singh, Baptiste Royer and Steven M Girvin
730	Universality versus certification of distinctive features in the Bose-Hubbard Hamiltonian	Lukas Pausch, Edoardo G. Carnio, Alberto Rodríguez and Andreas Buchleitner
731	Analyzing and designing fault-tolerant circuits using detector error models	Peter-Jan Derks and Alex Townsend-Teague
732	Spin squeezing inequalities meet randomized measurements	Jan Lennart Bönsel, Satoya Imai, Ye-Chao Liu and Otfried Gühne
734	A toolbox to simulate quantum optomechanical systems	Sampreet Kalita and Amarendra K. Sarma
735	Noisy quantum batteries: optimizing the output ergotropy	Salvatore Tirone, Raffaele Salvia, Stefano Chessa and Vittorio Giovannetti
736	High-dimensional measurement incompatibility and steering	Benjamin Jones, Roope Uola, Thomas Cope, Marie Ioannou, Sebastien Designolle, Pavel Sekatski and Nicolas Brunner
737	Long-range entangled states from stochastic evolution and random measurements	Iosifina Angelidi, Marcin Szyniszewski and Arijeet Pal
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755	High-threshold fault-tolerance in measurement-based error correction with tailored fusion circuits	Kaavya Sahay, Jahan Claes and Shruti Puri
756	Optimising graph codes for measurement-based loss tolerance	Tom Bell and Stefano Paesani
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776	Compressive gate set tomography	Raphael Brieger, Ingo Roth and Martin Kliesch
777	Towards a minimal example of quantum nonlocality without inputs and Topologically robust network nonlocality	Sadra Boreiri, Antoine Girardin, Bora Ulu, Patryk Lipka-Bartosik, Nicolas Brunner and Pavel Sekatski
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779	On the Role of Quantum Communication and Loss in Attacks on Quantum Position Verification	Philip Verduyn Lunel, Rene Allerstorfer, Florian Speelman and Harry Buhrman

780	Towards Practical and Error-Robust Quantum Position Verification	Rene Allerstorfer, Harry Buhrman, Florian Speelman and Philip Verduyn Lunel
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785	Gate teleportation based quantum Fourier transform	Taewan Kim, Yongsoo Hwang, Kyunghyun Baek and Jeongho Bang
786	Computational complexity of optimizing defect braiding quantum circuits by reordering qubits	Kunihiro Wasa, Shin Nishio, Koki Suetsugu, Michael Hanks, Ashley Stephens, Yu Yokoi and Kae Nemoto
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788	Deep Spiking Quantum Neural Network for Noisy Image Classification	Debanjan Konar, Aditya Das Sarma, Soham Bhandary and Attila Cangi
790	Easy-to-compute local Clifford invariants for graph states	Frederik Hahn and Adam Burchardt
791	Entanglement-efficient bipartite-distributed quantum computing with entanglement-assisted packing processes	Jun-Yi Wu, Kosuke Matsui, Timothy Forrer, Akihito Soeda, Pablo Andres-Martinez, Daniel Mills, Luciana Henaut, and Mio Murao
792	Harnessing non-Hermitian dissipation for quantum control	Serra Erdamar, Maryam Abbasi, Weijian Chen, Byung Ha, Jacob Muldoon, Yogesh Joglekar and Kater Murch
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801	Optimization of gate-based implementation of algorithms that are based on quantum walks	Maksims Dimitrijevs and Andris Ambainis
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804	Contextuality and memory cost of simulation of Majorana fermions	Susane Calegari, Juani Bermejo-Vega and Michał Oszmaniec
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814	Algebraic Bethe Circuits	Alejandro Sopena, Max Hunter-Gordon, Diego García-Martín, Germán Sierra and Esperanza López
815	Information scrambling in non-KAM quantum systems with application to quantum metrology.	Naga Dileep Varikuti, Abinash Sahu, Arul Lakshminarayan and Vaibhav Madhok
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840	Parallelization of Sequential Quantum Channel Discrimination in the Non-Asymptotic Regime	Bjarne Bergh, Nilanjana Datta, Robert Salzmann and Mark Wilde
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847	Adventures in Building Qudit Circuits	Lia Yeh and John van de Wetering
848	Completeness for arbitrary finite dimensions of ZXW-calculus, a unifying calculus	Boldizsár Poór, Quanlong Wang, Razin Shaikh, Lia Yeh, Richie Yeung and Bob Coecke
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850	Symmetry Adapted Trotter Decomposition for the Simulation of Heisenberg Model on IBM Quantum Devices	Bo Yang and Naoki Negishi
851	Fast-mixing results of quantum Monte Carlo methods for antiferromagnetic Heisenberg model on bipartite graphs	Jun Takahashi, Samuel Slezak and Elizabeth Crosson
852	Resource-efficient Generalized Subspace Expansion	Bo Yang, Kaoru Yamamoto, Hiroyuki Harada, Yuuki Tokunaga, Nobuyuki Yoshioka and Suguru Endo
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859	Unveiling Quantum Entanglement in Many-Body Systems from Partial Information	Flavio Baccari, Irenee Frerot and Antonio Acin
860	Piquasso: A Photonic Quantum Computer Simulation Software Platform	Zoltán Kolarovszki, Tomasz Rybotycki, Péter Rakyta, Ágoston Kaposi, Boldizsár Poór, Szabolcs Jóczik, Kareem H. El-Safty, Gregory Morse, Gábor Németh, Dániel Nagy, Zsófia Kallus, Michał Oszmaniec, Tamás Kozsik and Zoltán Zimborás
861	Addressable quantum gates	Pablo Arrighi, Christopher Cedzich, Marin Costes, Ulysse Rémond and Benoît Valiron

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Multi-qubit noise deconvolution and characterization	Simone Roncallo, Lorenzo Maccone and Chiara Macchiavello
Quantum Algorithms for Testing Hamiltonian Symmetry	Margarite LaBorde and Mark Wilde
Cycle Index Polynomials and Generalized Quantum Separability Tests	Zachary Bradshaw, Margarite Laborde and Mark Wilde
Locality and error correction in quantum dynamics with measurements	Andrew Lucas, Aaron Friedman, Chao Yin and Yifan Hong
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Performance and limitations of the QAOA at constant levels on large sparse hypergraphs and spin glass models	Joao Basso, David Gamarnik, Song Mei and Leo Zhou
Distributed State Preparation with Zero Communication	Ian George, Min-Hsiu Hsieh and Eric Chitambar
Algorithmic-level Error Correction: Arbitrarily Accurate Recovery Of Noisy Quantum Signal Processing	Andrew K. Tan, Yuan Liu, Minh C. Tran and Isaac L. Chuang
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Towards A Scalable Implementation of IRC-VQE Algorithm Incorporating Finite-Difference based Geometry Optimization to Probe Accurately SN2 Reaction Pathway	Nirmal M R, Shampa Sarkar, Manoj Nambiar and Sriram Goverapet Srinivasan
Isomerization Reaction Pathway Tracing of small organic molecules using extended IRC-VQE Framework	Nirmal M R, Shampa Sarkar, Manoj Nambiar and Sriram Goverapet Srinivasan
A Quantum-Enabled Nested Hybrid Scalable Approach for Molecular Geometry Optimization in the NISQ era	Nirmal M R, Shampa Sarkar, Manoj Nambiar and Sriram Goverapet Srinivasan
Improving Amplitude Estimation with Error Mitigation	George Umbrarescu, Adam Callison and Dan E. Browne
Effect of Gaussian and Bessel laser beams on linear and nonlinear optical properties of vertically coupled cylindrical quantum dots	Paytsar Mantashyan, Tigran Sargsian and David Hayrapetyan

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