

AQC 2024

10–14 June 2024

Technology and Innovation Centre (TIC),
University of Strathclyde, Glasgow, UK



AQC 2024 Conference Booklet

Monday 10th – Friday 14th June 2024

Technology and Innovation Centre (TIC Building)
University of Strathclyde, Glasgow





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We are grateful to our sponsors for their support of this edition of AQC!

Programme outline:

Invited talks: 40 minutes with 10 minutes for questions.

Contributed talks: 20 minutes with 5 minutes for questions.

Note that the talks are not all in numerical order, due to last minute adjustments to the schedule.

MONDAY 10 th	TUESDAY 11 th	WEDNESDAY 12 th	THURSDAY 13 th	FRIDAY 14 th
9:00 - 9:30 Registration and Coffee available	9:00 - 9:30 Coffee available	9:00 - 9:30 Coffee available	9:00 - 9:30 Coffee available	9:00 - 9:30 Coffee available
Session I	Session V	Session IX	Session XI	Session XV
9:30 - 10:20 Invited talk 3	9:30 - 10:20 Invited talk 2	9:30 - 10:20 Invited talk 4	9:30 - 10:20 Invited talk 5	9:30 - 10:20 Invited talk 6 (remote)
10:20 - 10:45 Contributed talk 11	10:20 - 10:45 Contributed talk 1	10:20 - 10:45 Contributed talk 19	10:20 - 10:45 Contributed talk 23	10:20 - 10:45 Contributed talk 32
10:45 - 11:15 Coffee break	10:45 - 11:15 Coffee break	10:45 - 11:15 Coffee break	10:45 - 11:15 Coffee break	10:45 - 11:15 Coffee break
Session II	Session VI	Session X	Session XIII	Session XVI
11:15 - 12:30 Contributed talks 2, 3, 4	11:15 - 12:30 (talk 12 cancelled) Contributed talks 13 and 14	11:15 - 12:30 Contributed talks 20, 21, 22	11:15 - 12:30 Contributed talks 24, 25, 26	11:15 - 12:30 Contributed talks 33, 34, 35
12:30 - 13:30 Lunch	12:30 - 13:30 Lunch	12:30 - 13:30 Lunch	12:30 - 13:30 Lunch	12:30 - 13:30 Lunch
Session III	Session VII	Free afternoon Lab tours	Session XIII	Session XVII
13:30 - 14:45 Contributed talks 5, 6, 7	13:30 - 14:20 Contributed talks 15, 16		13:30 - 14:45 Contributed talks 27, 28, 29	13:30 - 14:45 Contributed talks 36, 37, 38
14:45 - 15:30 Coffee break	14:20 - 15:10 Contributed talks 17, 18		14:45 - 15:30 Coffee break	14:45 - 15:30 Coffee break
Session IV	Session VIII		Session XIV	Session XVIII
15:30 - 16:45 Contributed talks 8, 9, 10	15:40 - 16:30 Invited talk 1 (remote)		15:30 - 16:20 Contributed talks 30, 31	15:30 - 16:30 Panel session
	16:30 - 18:00 Poster session I	17:45 - 18:00 Coaches depart outside TIC	16:20 - 18:00 Poster session II	conference close
18:00 - 19:30 Civic Reception at Glasgow City Chambers				
		19:00 - 22:15 Conference dinner Burrell Collection Pollock Country Park		

AQC 2024 Schedule

Talk Title	Number	Name	Affiliation	Day	Time
Welcome and announcements	0	Kendon, Viv	University of Strathclyde	Monday	09:25 – 09:30
Rydberg Blockade Revisited	Invited 3	Natalie Pearson	PASQAL	Monday	09:30 – 10:20
Computational supremacy in quantum simulation	11	King, Dr. Andrew	D-Wave Systems Inc.	Monday	10:20 – 10:45
				coffee	break
Entanglement growth from squeezing on the MPS manifold	2	Leontica, Sebastian	University College London	Monday	11:15 – 11:40
n-local catalysts to speed up quantum annealing	3	Ghosh, Dr. Roopayan	University College London	Monday	11:40 – 12:05
Approximate tensor network contractions for large unit-cells quantum annealers	4	Dziubyna, Anna Maria	Jagiellonian University in Kraków	Monday	12:05 – 12:30
				lunch	break
Classical outperforms quantum reverse annealing in ferromagnetic mean-field models	5	Baldwin, Christopher	Michigan State University	Monday	13:30 – 13:55
Using multiple XX-catalysts in quantum annealing to efficiently solve MWIS problems	6	Nutricati, Luca Armando	University College London	Monday	13:55 – 14:20
Coherent Compressed Sensor for L0-Regularised Compressed Sensing	7	Mastiyage Don, Sudeera Hasaranga Gunathilaka	Tokyo Institute of Technology	Monday	14:20 – 14:45
				coffee	break
Escaping local optima in quantum annealing with XX-couplings	8	Feinstein, Natasha	University College London	Monday	15:30 – 15:55
Gate-based counterdiabatic driving with complexity guarantees	9	van Vreumingen, Dyon	University of Amsterdam / QuSoft	Monday	15:55 – 16:20
Eigenpath traversal by Poisson-distributed phase randomisation	10	Cunningham, Joseph		Monday	16:20 – 16:45
Civic Reception			Glasgow City Chambers	Monday	18:00 – 19:30
Coherence advancements for next-generation quantum technologies	Invited 2	Alexander Whitarcar	D-Wave Systems Inc.	Tuesday	09:30 – 10:20
Quantum error mitigation in quantum annealing	1	Raymond, Dr Jack	D-Wave Systems Inc.	Tuesday	10:20 – 10:45
				coffee	break
Three- and four-body switchable coupler for superconducting qubits to implement the parity encoding scheme	12	<i>Talk Cancelled</i> Miyazaki, Ryoji	NEC Corporation	Tuesday	11:15 – 11:40
Universal quantum computation using quantum annealing with the transverse-field Ising Hamiltonian	13	Imoto, Takashi		Tuesday	11:40 – 12:05
Tight Lieb-Robinson Bound for approximation ratio in Quantum Annealing	14	Braida, Arthur		Tuesday	12:05 – 12:30
				lunch	break
Coherent Flux Qubits for Quantum Annealing	15	López-núñez, David	Qilimanjaro/IFAE	Tuesday	13:30 – 13:55

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A scalable 2-local architecture for quantum annealing of all-to-all Ising models	16	Palacios, Ana	Qilimanjaro Quantum Tech; University of Barcelona	Tuesday	13:55 – 14:20
Quantum simulation of 1D-fermionic systems with Ising Hamiltonians	17	Werner, Matthias	Qilimanjaro Quantum Tech; University of Barcelona	Tuesday	14:20 – 14:45
Efficient sampling in a glassy phase using a machine-learning-assisted Markov Chain Monte Carlo Method	18	Miyamoto, Seiya		Tuesday	14:45 – 15:10
				coffee	break
Scaling Advantage in Approximate Optimization with Quantum Annealing	Invited 1	Daniel Lidar (remote)	USC	Tuesday	15:40 – 16:30
Poster session 1 (odd numbers present)					16:30 – 18:00
AVaQus project progress	Invited 4	Pol Forn Díaz	IFAE, Spain	Wednesday	09:30 – 10:20
Amorphous quantum magnets in a two-dimensional Rydberg atom array	19	Vovorsh, Dr Joseph	PASQAL	Wednesday	10:20 – 10:45
				coffee	break
Demonstration of weighted graph optimisation on a Rydberg atom array using local light-shifts	20	Pritchard, Prof. Jonathan	University Of Strathclyde	Wednesday	11:15 – 11:40
Parametric dependence of effective local fields of Kerr parametric oscillators	21	Yamaji, Dr. Tomohiro	NEC Corporation	Wednesday	11:40 – 12:05
Investigating scaling properties for quantum annealing to solve the Fermi-Hubbard model using the kinetic energy part as the driving Hamiltonian	22	Vyas, Kunal Prakash	Forshungszentrum Juelich	Wednesday	12:05 – 12:30
				lunch	break
Free afternoon: lab tours (sign up for lab tours at registration desk)			Coaches to dinner leave 18:00 sharp		13:30 – 18:00
Conference dinner		Burrell Collection	Pollock Country Park		19:00 – 22:15
Quantum Simulation on a 3x3 Superconducting Qudit Lattice	Invited 5	Sarah Muschinske	MIT	Thursday	09:30 – 10:20
Motivating continuous-time quantum optimisation without recourse to the adiabatic theorem	23	Banks, Robert	University College London	Thursday	10:20 – 10:45
				coffee	break
A thermodynamic approach to optimization in complex quantum systems	24	Chancellor, Dr Nick	Newcastle University	Thursday	11:15 – 11:40
Implementing a cooling protocol on a programmable quantum annealer	25	Humar, Gregor	Jožef Stefan Institute	Thursday	11:40 – 12:05

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Evaluation and analysis of hybrid method using quantum annealing machine and non-quantum type Ising machine	26	Kikuchi, Dr. Shuta	Keio University	Thursday	12:05 – 12:30
				lunch	break
Finding Spin Glass Ground States Using Multi-stage Quantum Walks	27	Hopkins, Mr Asa	University Of Strathclyde	Thursday	13:30 – 13:55
Advantage of multi-stage quantum walks over QAOA as approximations of quantum annealing	28	Gerblich, Mr Lasse		Thursday	13:55 – 14:20
Parameter-range setting of annealing optimization based on local optimal solutions	29	Sugita, Yusuke	Hitachi, Ltd.	Thursday	14:20 – 14:45
				coffee	break
Relaxed Momentum Annealing Theory and Applications	30	Okuyama, Takuya		Thursday	15:30 – 15:55
Compressed space engineering for constrained combinatorial optimization	31	Shirai, Dr. Tatsuhiko	Waseda University	Thursday	15:55 – 16:20
Poster session 2 (even numbers present)					16:30 – 18:00
Adiabatic Superconductor Logic: Recent Progress Toward Qubit Controllers	Invited 6	Naoki Takeuchi (remote)	AIST	Friday	09:30 – 10:20
Building a Model Learning Method by Reducing the Number of Training Data for Factorization Machine with Annealing	32	Nakano, Mr. Mayumi	Keio University	Friday	10:20 – 10:45
				coffee	break
A hybrid quantum-classical approach for inference on restricted Boltzmann machines	33	Kālis, Mārtiņš	University Of Latvia	Friday	11:15 – 11:40
Diverse solutions via quantum annealing leads to the discovery of diverse material compositions	34	Haba, Renichiro		Friday	11:40 – 12:05
Optimized QUBO formulation methods for quantum computing	35	De Santis, Dario	Scuola Normale Superiore Di Pisa	Friday	12:05 – 12:30
				lunch	break
Load balancing for high performance computing using quantum annealing	36	Rathore, Omer	Durham University	Friday	13:30 – 13:55
Quantum optimization with linear Ising penalties for customer data science	37	Mirkarimi, Puya	Durham University	Friday	13:55 – 14:20
Digitized Counterdiabatic Quantum Computing	38	talk cancelled Hegade, Narendra N.	Kipu Quantum	Friday	14:20 – 14:45
				coffee	break
Panel session				Friday	15:30 – 16:30
Conference close				Friday	16:30 – 17:00

Number	AQC 2024 Poster Title	Author(s)	Affiliation
1	A Cluster-First Route-Second Framework Using Quantum Annealing for Multi-Vehicle Bike Sharing System Routing Problem	Yamane, Naoki	
2	A Hybrid Method of Ising Machine and Simulated Annealing for Constrained Combinatorial Optimization Problems	Amino, Akane	Keio University
3	Adiabatic Bottlenecks in Quantum Annealing and Nonequilibrium Dynamics of Paramagnons	Bode, Dr. Tim	Forschungszentrum Jülich
4	Analysis of phase transition points in a permutation model on hierarchical lattice by real-space renormalization	Ito, Ryuki	Department of Physics, Tokyo Institute of Technology
5	Annealing with a Single Gap-Tunable Flux Qubit	Chen, Yifei	
6	Annealing-Assisted Column Generation Method for the Combinatorial Optimization Problems with Inequality Constraints	Kanai, Mr. Hiroshi	Keio University Graduate School of Science and Technology
7	Application of Ising machines with multiple-model learning for multi-objective black-box discrete optimization problems	Fukuda, Tokiya	
8	Coherent Ising Machines with Artificial Zeeman terms	Mastiyage Don, Sudeera . Hasaranga Gunathilaka	Tokyo Institute of Technology
9	Comparison between reverse annealing and simulation	Hasegawa, Mr. Yasushi	Tohoku University
10	Deep-learning-based Randomness assessment of Quantum Random Number Generators	Tebyanian, Dr Hamid	University Of York
11	Development of Exact Solution Method for Binary Quadratic Programming Problems Using Quantum Annealing and Dantzig-Wolfe Decomposition	Hirama, Sota	Tohoku University
12	Diagonal catalyst in finite-time quantum annealing	Hattori, Tomohiro	
13	Effectiveness of Quench on the Feasible Solution Acquisition in Quantum Annealing	Takahashi, Mr Keita	Keio University
14	Energy costs of fast-forward scaling	Hatomura, Takuya	NTT Corporation
15	Ensemble learning using quantum annealing: a comparative study of QBoost and black-box optimization	Kodama, Kento	
16	Exploration of new chemical materials using black-box optimization with the D-wave quantum annealer	Doi, Mikiya	Graduate School of Information Sciences, Tohoku University
17	Factorization machine with annealing with data sampling from multiple distributions	Seki, Dr. Yuya	Keio University
18	Fast algorithm for Bayesian optimization of highdimensional combinatorial problems	Morita, Keisuke	Graduate School of Information Sciences, Tohoku University
19	Fast Simulated Annealing inspired by Quantum Monte Carlo	Murashima, Kiyotaka	Sumitomo Electric Industries, Ltd.
20	Human health examination scheduling: flexible formulation and its optimization based on quantum annealing	Otsuka, Makoto	LiLz Inc.
21	Neural Monte Carlo simulations of quantum spin glasses	Brodoloni, Mr. Luca	University Of Camerino
22	Observation of localization based on quantum dynamics	Kudo, Prof. Kazue	Ochanomizu University
23	Optimal noisy quantum transport on complex networks	Radgohar, Roya	Université de Sherbrooke

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24	Optimization of connection patterns to base stations with Quantum Annealing	Takabayashi, Taisei	
25	Partitioning Problems with Two Way-OH by Clustering QUBO Variables	Kamishima, Yuko	Yaskawa Electric Corporation, Keio University
26	Persistent Tensors and Multiqudit Entanglement Transformation	Gharahi, Masoud	
27	Physical Properties of Error Reduction Algorithms for Ising machines	Hino, Mr. Kanta	Keio University
28	Quantum analogues of dissipative circuit elements	Zagoskin, Dr Alexandre	Loughborough University
29	Quantum Annealing for Aircraft Logistics	Chancellor, Dr Nick	Newcastle University
30	Quantum Computing in Power and Energy System Applications	Deb, Dr Sanchari	Newcastle University
31	Random compilers for Hamiltonian simulation via Markov chains	Dubus, Ir. Benoît	Quic Ulb
32	Removal of mislabeled training instances using black-box optimization and quantum annealing	Otsuka, Makoto	LiLz Inc.
33	Similarity and transferability in linearized QAOA parameters	Sakai, Ryo	Jij Inc.
34	Solving constrained combinatorial optimization problems on quantum devices with linear penalty terms	van den Heuvel, Pim	Forschungszentrum Juelich
35	Solving Scheduling Problems Using Finite Temperature Quantum Annealing	Fujii, Toru	Nikon Corporation
36	Stochastic parameterization of an atmospheric model assisted by quantum annealing	Guillaume, Dr. Alexandre	Jet Propulsion Laboratory
37	Temperature-quantum hybrid annealing based on quantum-classical correspondence theory	Abe, Mr. Tetsuro	Keio University
38	Time Dependent Density Functional Theory in Ising Models via Deep Learning Functionals	Costa, Emanuele	University Of Barcelona
39	Approximating the state manifold geometry	Střeleček, Jan	Charles University In Prague
40	Investigating solving QUBO problems on a circuit based quantum computer	Mcneile, Dr Craig	University Of Plymouth
41	Generalising concentratable entanglement for practical applications: mixed, qudit, and optical states	Foulds, Dr Steph	University Of Strathclyde
42	Onset of scrambling as a dynamical transition in tunable-range quantum circuits	Kuriyattil, Sridevi	University Of Strathclyde
43	Annealing Dynamics of Regular Rotor Networks: Universality and Its Breakdown	Grabaritis, Andras	University of Luxembourg
44	Universally Robust Quantum Control	Poggi, Pablo	University Of Strathclyde
45	Optimisation of weighted graph preparation in neutral atom arrays	Pelegri, Gerard	University Of Strathclyde
46	Quantum annealing: Sampling efficiency for 2-SAT problems with multiple solutions	Mehta, Vrinda	Forschungszentrum Jülich
Poster boards are up to A0 portrait size, velcro fixing will be provided.			
Odd numbers present on Tuesday afternoon, poster session 1.			
Even numbers present on Thursday afternoon, poster session 2.			
All posters can be on display in the coffee/lunch area all week.			

Civic Reception Information

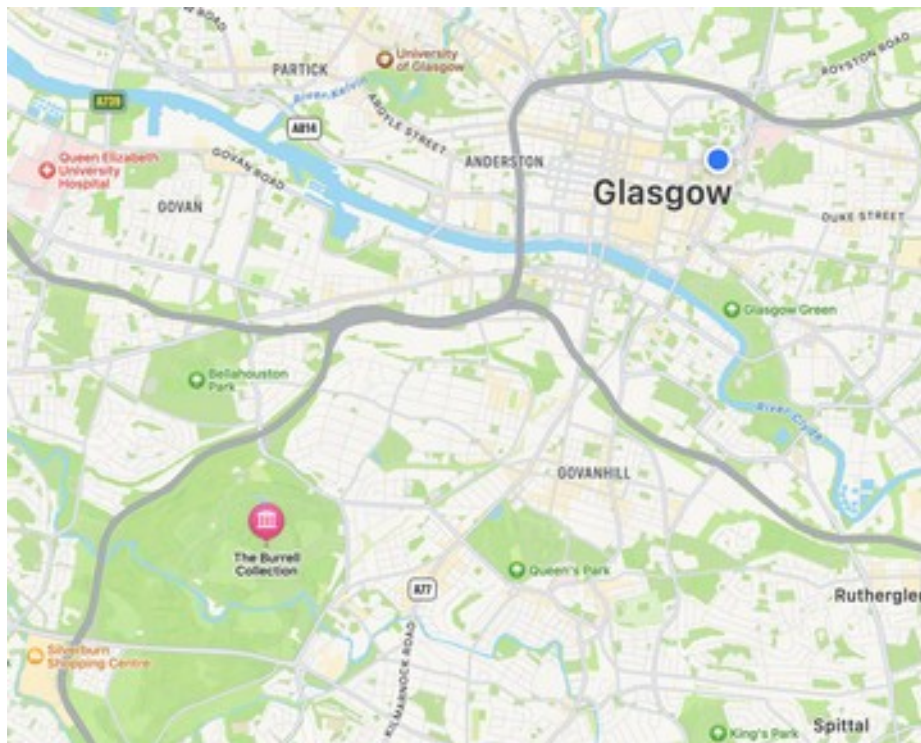
The civic reception will be hosted at Glasgow City Chambers on Monday 10th of June at 6 pm following on from the conference opening day.

The city chambers is a 6 minute walk from the conference location. Please enter through the main entrance which is located at George Square.



Conference Dinner Information

The conference dinner will be at the Burrell collection, located at the heart of Pollock Country Park in the south side of Glasgow, on Wednesday 12th of June, from 7pm until 10:15pm. You will be able to look around parts of this remarkable collection of art and artifacts in the hour before the meal is served.



The Burrell collection can be readily accessed via public transport from the city centre. We are providing coach transport for all delegates, departing at 6pm from the TIC building. If you prefer to make your own way there, instructions for public transport are available from the registration desk.

If you arrive earlier at Pollock Country Park, the nearest bars are

Eala Bhán

Address : 1534 Pollokshaws Road

The Old Stag Inn

Address: 12 Greenview St

about a 20 minute walk from the Burrell Collection Building.

Useful Information

Please find below a collection of information to make your visit to Glasgow as convenient and smooth as possible. For further advice, please ask at the registration desk, or email the conference email: aqc2024-info@phys.strath.ac.uk

Taxi services

There are a number of available taxi services which can be used to travel around Glasgow and for transport to airports.

Glasgow Taxis

Telephone : 0141 429 7070

GlasGo Cabs (private hire)

Telephone : 0141 332 5050 / 0141 774 3000

Saltire Private Hire

Telephone : 0141 319 5344

Services such as Uber are also available.



Scan me!

Delegate offers

Glasgow city council offers a series of discounts available to attendees of the conference. To redeem these discounts, simply show your conference badge. Note that discounts are subject to availability and opening hours.

Link to available discounts can be found by scanning the QR code above.

Local Restaurants

There are many good places to eat in Glasgow, the following are near the conference venue and tried and tested by the organisers.

Italian Kitchen

Italian food located close to the conference venue

Address : 64 Ingram St

Paesano Pizza

Neapolitan style pizza, with a fast service

Address : 94 Miller St

Sugo Pasta

Selection of pasta dishes, located close to Glasgow Central Station

Address : 70 Mitchell St

Bread Meats Bread

Burgers restaurant. They offer all dishes as gluten free also if requested

Address : 65 St Vincent St

Dim Sum

Casual place offering an array of dim sum favorites, and classic Chinese entrees

Address : 69 West Nile St

Santa Lucia

Authentic Italian cuisine located close to conference venue

Address : 68 Ingram St

Turkiye Efes

Turkish food with excellent grilled meats

Address : 97-99 Candleriggs

Dhakin

South Indian cuisine. Every dish at Dakhin is prepared without gluten, nuts, peanuts, sesame, celery, lupin, molluscs and sulphites.

Address : 89 Candleriggs

Elia Greek restaurant

Selection of Greek food located in the centre of Glasgow

Address : 24 George Sq

Local Pubs/Bars

Babbity Bowster

Small family run pub with outdoor benches. A favorite around Glasgow.

Address : 18 Blackfriars St

The Ark

Located just off George Square, large space with outdoor garden space. Live sports also shown.

Address : 42-46 North Frederick Street

Brewdog

Brewdog beer served, also in centre of Glasgow. Burgers also served

Address : 99 Hutcheson St

West Brewery

Brewery serving own beer located in Glasgow Green park. Food also served. Outside seating also available

Address : 15 Binnie Pl, Calton

Drygate

Brewery serving own food. Food also served. Large tables inside for groups

Address : 85 Drygate

Waxy O'Connors

Famous Irish pub near George Square

Address : 44 West George St

Many many more to explore ... (remember the delegate offers !)

Glasgow city map



Scan me!

See below for a map of the wider Glasgow city and local tourist attractions.

