

24th Australian Institute of Physics Congress

Monday 12 December 2022

AIP: Quantum Science and Technology: QST 1 - Quantum Computing 1 - Room R5 (11:00 - 12:30)

-Conveners: Jingbo Wang

time	[id] title	presenter
11:00	[794] From quantum pictorialism to quantum AI	Prof. COECKE, Bob
11:30	[207] Transversal Injection: A method for direct encoding of ancilla states for non-Clifford gates using stabiliser codes.	GAVRIEL, Jason
11:45	[365] Low Depth Parity Check Gate set for Quantum Error Correction	USTUN, GOZDE
12:00	[510] Experimental Analysis of State Injection for Error-Corrected Quantum Systems	O'ROURKE, Anthony
12:15	[458] Artificial Neural Network Decoding for the Surface Code	GICEV, Spiro

AIP: Quantum Science and Technology: QST 2 - Quantum Semiconductors - Room R6 (11:00 - 12:30)

-Conveners: Ben Sparkes

time	[id] title	presenter
11:00	[793] Chiral transport of hot carriers in graphene in the quantum Hall regime	Prof. SOLOMON, Glenn
11:30	[662] Electronic Transport in Atomically Abrupt Semiconductor Tunnel Junctions	DONNELLY, Matthew
11:45	[50] No Tradeoff between Coherence and Sub-Poissonianity in Heisenberg-Limited Lasers	Prof. WISEMAN, Howard
12:00	[224] Method for in-solution, high-throughput T1 relaxometry using fluorescent nanodiamonds	GRANT, Erin
12:15	[567] Identification and mitigation of quantum relaxometry temporal artifacts	WALSH, Ella

AIP: Quantum Science and Technology: QST 3 - Quantum Computing 2 - Room R5 (14:00 - 15:30)

-Conveners: Bob Coecke

time	[id] title	presenter
14:00	[796] Quantum computed moments – applications and prospects	HOLLENBERG, Lloyd
14:30	[715] Coherent magnetic and electric control of a single spin-7/2 donor atom in silicon	VAARTJES, Arjen
14:45	[331] Deterministic ion implantation of donor spin qubits	Dr HOLMES, Danielle
15:00	[247] Analog Control of the Diamond Quantum Processor	STEARN, Sophie
15:15	[191] Expected Trapped-Ion Fast Gate Performance with Ultrafast Pulsed Lasers	SHIMIZU, Kenji

AIP: Quantum Science and Technology: QST 4 - Quantum Optics - Room R6 (14:00 - 15:30)

-Conveners: Glenn Solomon

time	[id] title	presenter
------	------------	-----------

14:00	[145] Conceptual understanding enabled by efficient automated design of quantum optical setups	Dr TISCHLER, Nora
14:30	[23] Gaussian Boson Sampling experiments with displacements and time-bin encoding	PATEL, Raj
14:45	[56] Channel correction via heralded amplification	SLUSSARENKO, Sergei
15:00	[241] Noise mitigation via a quantum autoencoder	TISCHLER, Nora
15:15	[688] New Methods for Noiseless Linear Amplification and Quantum Teleportation of Multiphoton Quantum States	GUANZON, Joshua

AIP: Quantum Science and Technology: QST 5 - Quantum Computing 3 - Room R5 (16:00 - 17:30)

-Conveners: Ben Travaglione

time	[id] title	presenter
16:00	[800] Recent breakthroughs in optical quantum computing with continuous variables	MENICUCCI, Nicholas
16:30	[133] Streamlined quantum computing with equivalent gate noise on macronode cluster state architectures	WALSHE, Blayne
16:45	[558] Quantum algorithm for time-dependent differential equations using Dyson series	BERRY, Dominic
17:00	[515] Algorithms for quantum non-Markovianity	GIARMATZI, Christina

AIP: Quantum Science and Technology: QST 6 - Vacancy Centres - Room R6 (16:00 - 17:30)

-Conveners: Ben Sparkes

time	[id] title	presenter
16:00	[669] Diamond-based quantum sensors for in situ monitoring of spin active chemical species in molecular structures and single particles	MATHER, Melissa
16:15	[600] Towards compact quantum diamond nuclear magnetic resonance spectrometers	AHMADI, Sepehr
16:30	[684] Quantum sensing with diamond spin maser at room-temperature	RAMAN NAIR, Sarath
16:45	[598] An Optimised Spin Readout Scheme for Quantum Sensors Based on Nitrogen Vacancy Centres in Diamond	WANG, Di
17:00	[541] Extending the low-frequency limit of qubit noise spectroscopy beyond the inverse dephasing time	YU, Xi
17:15	[347] The bound-hole state of the NV- center in diamond	CHEN, YunHeng

Tuesday 13 December 2022

AIP: Quantum Science and Technology: QST 7 - Quantum Measurement - Room R5 (11:00 - 12:30)

-Conveners: Nora Tischler

time	[id] title	presenter
11:00	[798] Testing Quantum Mechanics Underground in the Cosmic Silence	Dr CURCEANU, Catalina
11:30	[435] Imaging stars with quantum error correction	Dr HUANG, Zixin
11:45	[707] Testing Generalised Uncertainty Principles through Quantum Noise and Trajectories	GIRDHAR, Parth
12:00	[500] Modulating the quantum noise of interacting exciton-polaritons in the spontaneous emission regime with a spectral filter	Dr VOLZ, Thomas

AIP: Quantum Science and Technology: QST 8 - Quantum Computing 4 - Room R6 (11:00 - 12:30)

-Conveners: Maria Kieferova

time	[id] title	presenter
11:00	[755] Stabiliser subsystem decompositions for single- and multi-mode	Prof. DOHERTY, Andrew
11:30	[590] Optimal scaling quantum linear systems solver via discrete adiabatic theorem	C.S. COSTA, Pedro
11:45	[545] Reducing Overhead for Quantum Advantage in Topological Data Analysis	BERRY, Dominic
12:00	[700] Signatures of critical dynamics in quantum phase transitions observed through digital quantum simulations	DEHOLLAIN, Juan Pablo
12:15	[418] Ground-state energy estimation of molecular systems on physical quantum computers	JONES, Michael

AIP: Quantum Science and Technology: QST 9 - Quantum Computing 5 - Room R6 (14:00 - 15:30)

-Conveners: Andrew Doherty

time	[id] title	presenter
14:00	[812] Training quantum neural networks with an unbounded loss function	Dr KIEFEROVA, Maria
14:30	[204] Quantum Enhanced Robustness in Adversarial Machine Learning	Mr WEST, Maxwell
14:45	[330] Point Exchange Invariant and Automatically Generated Feature Maps in Quantum Support Vector Machines for Practical Applications	HEREDGE, Jamie
15:00	[564] An Evolutionary Algorithm for the Circuit Synthesis of Arbitrary Quantum States	CREEVEY, Floyd

AIP: Quantum Science and Technology: QST 10 - Quantum Communications & Networks 1 - Room R6 (16:00 - 17:30)

-Conveners: Catalina Curceanu

time	[id] title	presenter
16:00	[164] Quantum-Enhanced Agents: Can Quantum Machines Better Adapt to Complex Environments?	GU, Mile
16:30	[63] Comparison of Discrete and Continuous Variable Quantum Key Distribution Protocols over a Thermal-Loss Channel	KISH, Sebastian

16:45	[523] Satellite-to-Ground Discrete Modulated Continuous Variable Quantum Key Distribution	SAYAT, Mikhael
17:00	[90] A 4-Photon Entangled State for a Truly Reference-Frame-Independent Quantum Key Distribution Protocol	RASLAN, Kareem
17:15	[235] Certified random numbers from quantum steering	SLUSSARENKO, Sergei

Wednesday 14 December 2022

AIP: Quantum Science and Technology: QST 11 - Quantum Fundamentals 1 - Room R6 (11:00 - 12:30)

-Conveners: William Munro

time	[id] title	presenter
11:00	[803] Quantum processing made easier with a little help from bosons	BRENNEN, Gavin
11:30	[753] Compression of QFT States Using Wavelets	GEORGE, Dan
11:45	[401] Quantum control and foundational experiments	TERNO, Daniel
12:00	[696] Fundamental limits of quantum error mitigation	Dr TAKAGI, Ryuji
12:15	[666] Macroscopic realism versus quantum mechanics: Macroscopic Bellinequality violations and Wheeler's delayed choice using cat states	THENABADU, Manushan

AIP: Quantum Science and Technology: QST 12 - Quantum Fundamentals 2 - Room R6 (14:00 - 15:30)

-Conveners: Gavin Brennen

time	[id] title	presenter
14:00	[547] Causal Mediation in Quantum Causal Models	CAVALCANTI, Eric
14:30	[724] Quantum Chaos and Universal Trotterisation Behaviours in Quantum Simulations	KARGI, Cahit
14:45	[186] Filtering, Retrofiltering and Smoothing: Optimal quantum state estimation using continuous measurement	LAVERICK, Kiarn
15:00	[717] Enhanced accuracy in dimensionally-constrained quantum models	THOMPSON, Jayne
15:15	[544] Quantum Chaos and Entanglement	DOWLING, Neil

AIP: Quantum Science and Technology: QST 13 - Quantum Communications & Networks 2 - Room R4 (14:00 - 15:30)

-Conveners: Mile Gu

time	[id] title	presenter
14:00	[797] Designing our future Quantum Internet	Prof. MUNRO, William
14:30	[642] Broadcast-based nonlocality activation for noisy quantum states	VILLEGAS AGUILAR, Luis
14:45	[455] Quantum self-oscillation with time-delay feedback	LIU, Yanan
15:00	[194] Quantum steering with vector vortex photon states with the detection loophole closed	GHAFFARI, Farzad
15:15	[149] Achieving the ultimate end-to-end rates of lossy quantum communication networks	WINNELL, Matthew

AIP: Quantum Science and Technology: QST 14 - Quantum Fundamentals 3 - Room R6 (16:00 - 17:30)

-Conveners: Eric Cavalcanti

time	[id] title	presenter
16:00	[480] From many-body to many-time physics	WHITE, Gregory
16:15	[477] Wigner and his Friend's Recursive Experiment	UTRERAS-ALARCON, Anibal

16:30	[296] Quantum mean states are nicer than you think: finding states maximizing average fidelity	Dr FERRIE, Christopher
16:45	[417] Noise-robust energy estimates from deep circuits on real quantum computer hardware	VALLURY, Harish
17:00	[440] Updated Quantum Master Equations for Simulation of Open Quantum Dynamics	CHALERPUSITARAK, Teerawat

Thursday 15 December 2022

AIP: Quantum Science and Technology: OST 15 - Optomechanics - Room R6 (14:00 - 15:30)

-Conveners: Alexander Wood

time	[id] title	presenter
14:00	[801] Quantum Engineering with Levitated Systems	TWAMLEY, Jason
14:30	[413] Tunable Gyromagnetic Augmentation of Nuclear Spins in Diamond	GOLDBLATT, Russell
14:45	[491] Conditional quantum states of a continuously monitored mechanical oscillator	KHADEMI, Soroush
15:00	[663] Microwave mode cooling with room temperature diamonds	DAY, Tom
15:15	[685] Quantum Control of Ensemble Nitrogen-Vacancy Spins in Diamond with Spin Bath Driving	GEORDY, Jemy

AIP: Quantum Science and Technology: OST 16 - Superconducting Quantum Systems - Room R6 (16:00 - 17:30)

-Conveners: Jason Twamley

time	[id] title	presenter
16:00	[799] Precision Metrology with Photons, Phonons and Spins: Answering Major Unsolved Problems in Physics and Advancing Translational Science	TOBAR, Michael
16:30	[395] Passive superconducting circulator on a chip	FEDOROV, Arkady
16:45	[683] Optimising Cryogenic Wiring for Superconducting Qubit Processors in a Dilution Refrigerator	DI LONARDO, Adrien
17:00	[723] Tunable "adiabatic" qubit-cavity gates for digital quantum simulations in circuit QED	MANATULY, Angsar
17:15	[746] Vacuum Noise Squeezing with a Kinetic Inductance Parametric Amplifier	KRINGHOEJ, Anders

Friday 16 December 2022

AIP: Quantum Science and Technology: OST 17 - Quantum Matter-Light Interactions - Room R6 (09:00 - 10:30)

-Conveners: Michael Tobar

time	[id] title	presenter
09:00	[802] Sculpted Light and Applications	RUBINSZTEIN-DUNLOP, Halina
09:30	[429] Designing a Quantum Matterwave Vortex Gyroscope	HUSBAND, Ryan
09:45	[18] Superabsorption in an organic microcavity: towards a quantum battery	QUACH, James
10:00	[636] A quantum spin heat engine with trapped Yb^{+} ions	MCCLELLAND, Liam