

Sixth International Conference for Young Quantum Information Scientists (YQIS 6)

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Book of Abstracts

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Poster / 26

A Bayesian Approach for Characterizing and Mitigating Gate and Measurement Errors

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Academic Standing:

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Yes

Contributed Talk / 91

A Cryptographic approach to Quantum Metrology

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Yes

Poster / 12

A Hardware-Aware Heuristic for the Qubit Mapping Problem in the NISQ Era

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Contributed Talk / 110

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Contributed Talk / 72

Adaptive Variational Quantum Dynamics Simulations

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Contributed Talk / 93

Adaptive variational quantum simulations of correlated electron models

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Poster / 98

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Contributed Talk / 67

Alternative approaches to quantum lattice renormalisation

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Academic Standing:

PhD Student I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Poster / 104

Application of Quantum Computing to Quantum Cosmology

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Academic Standing:

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Contributed Talk / 34

Approximate Bacon-Shor Code and Holography

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Yes

Poster / 87

Approximate Phase Search and Eigen-Estimation using Modified Grover's Algorithm

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Yes

Poster / 111

Approximations in transmon simulation

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Contributed Talk / 80

Bayesian parameter estimation using Gaussian states and measurements

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Contributed Talk / 37

Born's rule in the case of two entangled Bohmian qubits

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Academic Standing:

Post-Doc Fellow I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Poster / 126

Capacity of a lossy photon channel with direct detection

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Academic Standing:

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Yes

Poster / 100

Characterization of QUBO reformulations for the maximum k-colorable subgraph problem

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Contributed Talk / 38

Classical Symmetries and QAOA

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Contributed Talk / 45

Classical-quantum network coding: a story about tensors

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Academic Standing:

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Yes

Poster / 29

Control Optimization for Parametric Hamiltonians by Pulse Reconstruction

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Academic Standing:

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Yes

Contributed Talk / 123

Creation, verification, and scalability of decoherence-free subspaces and noiseless subsystems on superconducting qubits

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Contributed Talk / 68

Device-independent quantum authorization based on the CHSH game

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Poster / 105

Digital quantum computing model in probability representation

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Contributed Talk / 79

Dilation based quantum algorithms for the time-evolution of open quantum systems

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Yes

Contributed Talk / 17

Distributed Quantum Computing and Network Control for Accelerated VQE

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Poster / 16

Dynamics of quantum correlations of the qutrit-qubit system in a classical dephasing environment: A comparative Study

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Academic Standing:

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Yes

Poster / 88

Effects of magnetic fields on the Datta-Das spin field-effect transistor

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Invited Talk / 73

Efficient Construction of Quantum Physical Unclonable Functions with Unitary t-designs

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Academic Standing:

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Contributed Talk / 97

Efficient Use of the Quantum Linear System Algorithms in Interior Point Methods for Linear Optimization

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Yes

Invited Talk / 62

Efficient algorithms for synthesizing T-count and T-depth optimal circuits

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Poster / 44

Elastic and inelastic scattering using ab initio nuclear structure on quantum computers

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Academic Standing:

Ph.D. I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Poster / 103

Entanglement Entropy Bounds in the Higher Spin XXZ Chain

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Poster / 99

Entanglement Renormalisation of Gapless Quantum Liquids

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Academic Standing:

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Contributed Talk / 54

Everettian relative states in the Heisenberg picture

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Academic Standing:

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Yes

Contributed Talk / 25

Experimental demonstration of quantum advantage for NP verification with limited information

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Contributed Talk / 24

Exponential improvement for quantum cooling through finite-memory effects

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PhD Student I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Poster / 23

Extending the functionalities of the quantum extreme value searching algorithm to a constrained quantum searching algorithm

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Ph.D. student I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Contributed Talk / 90

F-flow: determinism in measurement-based quantum computing with qudits

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Yes

Poster / 75

Feedback on the first implementation of a quantum wave equation solver

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Poster / 56

Fully Device Independent Quantum Private Query

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Academic Standing:

PhD Student I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Poster / 39

Geometry of Entanglement Produced in Scattering

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Contributed Talk / 96

Gluon Field Digitization via Group Space Decimation for Quantum Computers

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Yes

Contributed Talk / 92

How efficiently can we simulate the open system dynamics of Ising models?

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Academic Standing:

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Yes

Poster / 31

Imaginary Time Propagation on a Physical Quantum Chip

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Yes

Contributed Talk / 19

Implementation of Measurement Reduction for the Variational Quantum Eigensolver

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Academic Standing:

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Poster / 77

Implementing a qGAN with Quantum Images

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Academic Standing:

Post-Bachelors SULI Intern I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Contributed Talk / 30

Improving Quantum Metrology with Variational Methods

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² Qutech, TU Delft

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Academic Standing:

PhD Student I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Contributed Talk / 22

Indefinite global time

Author(s): Tom Holden-Dye¹

Co-author(s): Sandu Popescu¹

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Academic Standing:

See comments I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Contributed Talk / 70

Inflated Graph States Refuting Communication-Assisted LHV Models

Uta Isabella Meyer¹ ; Frédéric Grosshans² ; Damian Markham²

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Academic Standing:

Graduate Student **I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:**

Yes

Contributed Talk / 102

Influence of coin symmetry on infinite hitting times in quantum walks

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Academic Standing:

Graduate student **I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:**

Yes

Poster / 116

Information leak and incompatibility of physical context: A modified approach

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Academic Standing:

Ph.D student **I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:**

Yes

Contributed Talk / 114

Lattice Renormalization of Quantum Simulations: Analytic Results

Henry Lamm¹ ; Marcela Carena² ; Wanqiang Liu³ ; Yingying Li⁴

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Academic Standing:

Ph.D Candidate I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Contributed Talk / 115

Lattice Renormalization of Quantum Simulations: Numerical Results

Marcela Carena¹ ; Henry Lamm¹ ; Ying-Ying Li¹ ; Wanqiang Liu²

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Academic Standing:

Postdoc I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Poster / 13

Layers of classicality in the compatibility of measurements

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Academic Standing:

Ph.D student I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Contributed Talk / 21

Local Classical Competitors to QAOA

Kunal Marwaha¹

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Academic Standing:

independent researcher (will enter a Ph.D program in fall 2021) **I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:**

Yes

Poster / 124

Magnon-Mediated Quantum Information Processing in Weakly-Coupled Hybrid Magnon-Photon Systems

Author(s): Cody Trevillian¹

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Academic Standing:

Graduate Student **I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:**

Yes

Contributed Talk / 66

Measurement Error Mitigation in Quantum Computers Through Classical Bit-Flip Correction

Lena Funcke¹ ; Tobias Hartung² ; Karl Jansen³ ; Stefan Kuhn⁴ ; Paolo Stornati⁵ ; Xiaoyang Wang⁶

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Academic Standing:

Postdoctoral Researcher **I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:**

Yes

Poster / 122

Modeling and mitigation of realistic readout noise with applications to the Quantum Approximate Optimization Algorithm

Filip Maciejewski¹ ; Flavio Baccari² ; Zoltan Zimboras³ ; Michał Oszmaniec¹

¹ *Polish Academy of Sciences*

² *Max-Planck-Institut für Quantenoptik*

³ *Wigner Research Centre for Physics*

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Academic Standing:

PhD student I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Poster / 118

Morse Potential on a Quantum Computer for Molecules and Supersymmetric Quantum Mechanics

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Co-author(s): Mohammad Hassan³ ; Yasmin Flores⁴ ; Yuan Feng⁵

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Academic Standing:

Undergraduate Student (Graduated Jan. 2021) I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Contributed Talk / 15

Natural Evolutionary Strategies for Variational Quantum Computation

Author(s): Abhinav Anand¹

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Academic Standing:

Graduate student I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Contributed Talk / 63

Non-Boolean Quantum Amplitude Amplification and Quantum Mean Estimation

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Academic Standing:

Postdoctoral research associate I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Poster / 41

Optimal controls for state preparation in open quantum systems via most-likely paths

Wirawat Kokaew¹ ; Thiparat Chotibut¹ ; Areeya Chantasri²

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Academic Standing:

Undergraduate Student I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Contributed Talk / 119

Optimal resource cost for error mitigation

Ryuji Takagi¹

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Academic Standing:

Postdoc I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Contributed Talk / 74

Optimized Single Qubit Gates via Filter Function Design

Yasuo Oda¹ ; Dennis Lucarelli² ; Kevin Schultz³ ; Dave Clader³ ; Gregory Quiroz³

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Academic Standing:

Graduate Student **I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:**

Yes

Contributed Talk / 58

Partially Coherent Direct Sum Channels & Multilevel Amplitude Damping channels, quantum capacity analysis.

Stefano Chessa¹ ; Vittorio Giovannetti¹

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Corresponding Author(s): vittorio.giovannetti@sns.it, stefano.chessa@sns.it

Academic Standing:

Graduate Student **I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:**

Yes

Poster / 11

Persistence of Topological Phases in Non-Hermitian Quantum Walks

Vikash Mittal¹ ; Aswathy Raj² ; Sanjib Dey³ ; Sandeep Goyal³

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² *Department of Physics, Indian Institute of Science Education & Research (IISER) Bhopal, Bhopal Bypass Road, Bhauri, Bhopal 462066, India*

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Academic Standing:

Graduate Student **I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:**

Yes

Poster / 42

Predicting ground state properties and long-time evolution of many-body systems from short-time evolution on a quantum computer

Edgar Andres Ruiz Guzman¹ ; Denis Lacroix²

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² *IJCLab/CNRS*

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Academic Standing:

Doctoral student I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Contributed Talk / 112

Probably approximately correct quantum source coding

Author(s): Armando Angrisani¹

Co-author(s): Elham Kashefi²

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Academic Standing:

PhD Student I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Poster / 36

Protocol Discovery for the Quantum Control of Majoranas by Differentiable Programming and Natural Evolution Strategies

Luuk Coopmans¹ ; Di Luo² ; Graham Kells³ ; Bryan K. Clark² ; Juan Carrasquilla⁴

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Academic Standing:

PhD Student I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Contributed Talk / 18

Quantifying the Efficiency of State Preparation via Quantum Variational Eigensolvers

Author(s): Gabriel Matos¹

Co-author(s): Sonika Johri² ; Zlatko Papić¹

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² *IonQ Inc.*

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Academic Standing:

PhD Student (2nd Year) I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Poster / 121

Quantum Approximate Optimization Algorithm with Qudits on Superconducting Radio Frequency Cavity-Transmon System

A. Baris Ozguler¹ ; Davide Venturelli² ; Matt Reagor³

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² *NASA Ames*

³ *Rigetti Computing*

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Academic Standing:

Postdoc I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Contributed Talk / 28

Quantum Assisted Simulator

Kishor Bharti¹ ; Tobias Haug²

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Academic Standing:

PhD Student I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Poster / 69

Quantum Entanglement in Universal Systems

Fabian Hildenbrand¹ ; Hans-Werner Hammer^{None}

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Academic Standing:

Post-Doc I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Contributed Talk / 33

Quantum Optimal Control of Nuclear Spin for Quantum Logic with Qudits

Sivaprasad Omanakuttan¹ ; Anupam Mitra¹ ; Ivan Deutsch¹

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Academic Standing:

Graduate student I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Contributed Talk / 82

Quantum Oracle Separations from Complex but Easily Specified States

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Academic Standing:

Postdoc I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Contributed Talk / 95

Quantum Simulation of Quantum Field Theory in the Front Form

Michael Kreshchuk¹ ; William Kirby¹ ; Hugo Beauchemin¹ ; Gary Goldstein¹ ; Peter Love¹ ; Shaoyang Jia² ; James Vary³

¹ *Tufts University*

² *Argonne National Lab*

³ *Iowa State University*

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Academic Standing:

Graduate Student **I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:**

Yes

Poster / 57

Quantum State Classification by Statistical Analysis

Author(s): Spencer King¹

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¹ *Washington University in St. Louis*

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Academic Standing:

Graduate Student **I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:**

Yes

Poster / 81

Quantum machine learning on the entanglement detecting frontier

Alena Mastiukova¹

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Academic Standing:

Master Student **I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:**

Yes

Poster / 120

Quantum walks, Feynman Propagators and graph topology

Yuan Feng^{None} ; Michael McGuigan^{None} ; Raffael Miceli^{None}

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Academic Standing:

Undergraduate Student **I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:**

Yes

Contributed Talk / 40

Qubit-efficient entanglement spectroscopy using qubit resets

Justin Yirka¹ ; Yigit Subasi²

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Academic Standing:

Ph.D. Student **I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:**

Yes

Contributed Talk / 10

Random-Receiver Quantum Communication

Some Sankar Bhattacharya¹ ; Ananda G. Maity² ; Tamal Guha³ ; Giulio Chiribella¹ ; Manik Banik⁴

¹ *The University of Hong Kong*

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Academic Standing:

Postdoc Fellow **I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:**

Yes

Contributed Talk / 65

Randomized Benchmarking with Stabilizer Verification and Gate Synthesis

Ellen Derbyshire¹ ; Rawad Mezher¹ ; Theodoros Kapourniotis² ; Elham Kashefi³

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Academic Standing:

PhD Student I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Contributed Talk / 61

Reducing the CNOT count for Clifford+T circuits on NISQ architectures

Gheorghiu Vlad¹ ; Li Sarah (Meng)² ; Mosca Michele¹ ; Mukhopadhyay Priyanka¹

¹ *Institute for Quantum Computing, University of Waterloo*

² *Dalhousie University*

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Academic Standing:

Undergraduate Student I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Contributed Talk / 35

Reinforcement learning with quantum neural networks

Andrea Skolik¹ ; Vedran Dunjko¹

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Academic Standing:

PhD student I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Contributed Talk / 9

Rodeo Algorithm for Quantum Computation

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Co-author(s): Dean Lee² ; Kenneth Choi³ ; Joey Bonitati¹

¹ *Michigan State University*

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Academic Standing:

Graduate Student **I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:**

Contributed Talk / 59

Sector length distributions of graph states

Author(s): Daniel Miller¹

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Academic Standing:

Graduate Student **I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:**

Yes

Poster / 125

Semi-Device-Independent Quantum Random Number Generator Based on Energy Bound

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Academic Standing:

PhD. **I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:**

Yes

Poster / 89

Semi-device-independent QKD based on a Coherence Equality

Author(s): Mário Silva¹

Co-author(s): Paulo Mateus ² ; Ricardo Faleiro ³

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Academic Standing:

Master's student I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Contributed Talk / 20

Semi-device-independent framework based on restricted distrust in prepare-and-measure experiments

Armin Tavakoli¹

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Academic Standing:

First-year postdoc I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Contributed Talk / 113

Shear Viscosity on a Quantum Computer

Yukari Yamauchi¹ ; Thomas Cohen ² ; Scott Lawrence³ ; Henry Lamm⁴

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³ *University of Colorado - Boulder*

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Academic Standing:

Graduate Student I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Poster / 94

Simulating Extend Hubbard Models in a Digital Quantum Computing Environment

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Academic Standing:

Graduate Student **I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:**

Yes

Poster / 85

Solving Nuclear Pairing Models with Quantum Variational Algorithms

Benjamin Hall¹ ; Morten Hjorth-Jensen²

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Academic Standing:

Graduate Student **I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:**

Yes

Poster / 60

Solving the BCS Hamiltonian gap in Near-Term Quantum Computers

Nahum Rosa Cruz Sá¹ ; Ivan Santos Oliveira¹ ; Itzhak Roditi¹

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Corresponding Author(s): nahumsa@cbpf.br

Academic Standing:

PhD Student **I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:**

Yes

Poster / 83

Some Remarks on The Entanglement Number

Ryan McGaha¹ ; George Androulakis¹

¹ *University of South Carolina*

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Academic Standing:

Graduate Student **I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:**

Yes

Contributed Talk / 108

State Preparation via Lattice Schwinger-Keldysh

Henry Lamm¹ ; Scott Lawrence² ; Erik Gustafson³ ; Siddhartha Harmalkar⁴

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³ *University of Iowa*

⁴ *University of Maryland*

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Academic Standing:

Postdoc I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Poster / 117

Storage properties of a quantum perceptron

Aikaterini Gratsea¹ ; Kasper Valentin¹ ; Maciej Lewenstein¹

¹ *ICFO*

Corresponding Author(s): gratsea.katerina@gmail.com

Academic Standing:

PhD student I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Contributed Talk / 78

Strict hierarchy between parallel, sequential, and indefinite-causal-order strategies for channel discrimination

Jessica Bavaresco¹ ; Mio Murao² ; Marco Tulio Quintino³

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² *The University of Tokyo*

³ *University of Vienna*

Corresponding Author(s): marco.quintino@univie.ac.at, murao@phys.s.u-tokyo.ac.jp, jessica.bavaresco@oeaw.ac.at

Academic Standing:

PhD student I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Contributed Talk / 64

Telecom-heralded entanglement distribution between remote, solid-state multimode quantum memories

Samuele Grandi¹ ; Darío Lago-Rivera¹ ; Jelena V. Rakonjac¹ ; Alessandro Seri¹ ; Hugues de Riedmatten²

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Academic Standing:

Post-doc I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Poster / 109

The controlled SWAP test for determining quantum entanglement

Steph Foulds¹ ; Viv Kendon¹ ; Tim Spiller²

¹ *Durham University*

² *University of York*

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Academic Standing:

PhD student I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Poster / 32

Thermodynamics of Statistical Anyons

Nathan Myers¹ ; Sebastian Deffner¹

¹ *University of Maryland, Baltimore County*

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Academic Standing:

PhD student I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:

Yes

Contributed Talk / 50

Toward simulating the 1+1 Abelian Higgs model on qudit based architectures

Erik Gustafson¹

¹ *University of Iowa*

Corresponding Author(s): erik-j-gustafson@uiowa.edu

Academic Standing:

Graduate Student **I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:**

Yes

Contributed Talk / 106

Towards coherent control of electrons on liquid helium

Niyaz Beysengulov¹ ; J.R. Lane² ; J.M. Kitzman² ; C. Mikolas² ; D.G. Rees³ ; Ø.S. Schøyen⁴ ; H.E. Kristiansen⁵ ; M. Hjorth-Jensen⁶ ; J. Pollanen²

¹ *Michigan State University*

² *Department of Physics and Astronomy, Michigan State University*

³ *EeroQ Corporation*

⁴ *Department of Physics and Center of Mathematics for Applications, University of Oslo*

⁵ *Hylleraas Centre for Quantum Molecular Sciences, Department of Chemistry, University of Oslo*

⁶ *Department of Physics and Astronomy, Michigan State University; Department of Physics and Center of Mathematics for Applications, University of Oslo; Facility for Rare Isotope Beams, Michigan State University*

Corresponding Author(s): beysengu@msu.edu

Academic Standing:

Postdoc **I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:**

Yes

Contributed Talk / 101

Transcending the Circuit Model with the ZX-calculus

Lia Yeh¹

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Academic Standing:

PhD Student **I have attached a PDF of my abstract using the provided Overleaf (LaTeX) template.:**

Yes

Poster / 84

U(1) link dynamics from gauged fermions towards quantum computing

David Berenstein¹ ; Hiroki Kawai² ; Richard Brower²

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Variational Quantum Cloning: Improving Practicality for Quantum Cryptanalysis

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Weakly measured while loops: peeking at quantum states

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Witnessing Wigner Negativity

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