QTML 2017 Programme

All invited and contributed talks, unless otherwise specified, will take place in **Sala Verde, Dipartimento di Informatica, Ca' Vignal 2 - Strada le Grazie 25 - Verona**

MAP

Ca' Vignal 2 ✓

Ca' Vignal 1 ✗

Monday, 6th Nov

8:45 - 9:00	**Welcome**
9:00 - 9:45	**Invited Talk: Marco Loog** Surrogate Losses in Classical Machine Learning
9:45 - 10:30	**Invited Talk: Minh Ha Quang** Covariance Matrices and Covariance Operators in Machine Learning and Pattern Recognition: A Geometrical Framework

Coffee Break

11:00 - 12:20	**Session 1**
11:00	**Jonathan Romero, Jonathan Olson and Alan Aspuru-Guzik.** Quantum autoencoders for efficient compression of quantum data
11:20	**Iris Agresti, Niko Viggianiello, Fulvio Flamini, Nicolò Spagnolo, Andrea Crespi, Roberto Osellame, Nathan Wiebe and Fabio Sciarrino.** Pattern recognition tecniques for Boson Sampling validation
11:40	**Antonio Gentile, Jianwei Wang, Stefano Paesani, Raffaele Santagati, Nathan Wiebe, Maurangelo Petruzzella, Anthony Laing, John Rarity, Jeremy O'Brien and Mark Thompson.** Quantum Hamiltonian learning using Bayesian inference on a quantum photonic simulator
12:00	**Luca Innocenti, Leonardo Banchi, Alessandro Ferraro, Sougato Bose and Mauro Paternostro.** Supervised learning of time-independent Hamiltonians for gate design

Lunch

14:00 - 14:45	**Invited Talk: Davide Venturelli** Challenges to Practical End-to-end Implementation of Quantum Optimization Approaches for Combinatorial problems

14:45 - 16:05	**Session 2**
14:45	**Kentaro Imafuku, Masakazu Hioki, Toshihiro Katashita, Shiro Kawabata, Hanpei Koike, Masaaki Maezawa, Tadashi Nakagawa, Yutaka Oiwa and Toshihiro Sekigawa.** Annealing Computation with Adaptor Mechanism and its Application to Property-Verification of Neural Network Systems
15:05	**Simon Nigg, Niels Loerch and Rakesh Tiwari.** Robust quantum optimizer with full connectivity
15:25	**William De La Cruz De Los Santos, Salvador E. Venegas-Andraca and Marco Lanzagorta.** Adiabatic quantum optimization applied to the stereo matching problem
15:45	**Alejandro Perdomo-Ortiz.** Opportunities and challenges for quantum-assisted machine learning in near-term quantum computers

Coffee Break

16:30 - 18:10	**Session 3**
16:30	**Christopher J. Turner, Konstantinos Meichanetzidis, Zlatko Papić and Jiannis K. Pachos.** Distinguishing free and interacting as pattern recognition
16:50	**Konstantinos Meichanetzidis, Christopher J. Turner, Ashk Farjami, Zlatko Papic and Jiannis Pachos.** Free-fermion descriptions of parafermion chains
17:10	**Ashk Farjami.** Identifying Free Particle Correlations in Topologically Ordered Systems
17:30	**Ivan Glasser.** Neural Networks Quantum States, String-Bond States and chiral topological states
17:50	**Raban Iten, Roger Colbeck and Matthias Christandl.** Quantum Circuits for Quantum Channels

Tuesday, 7th Nov

The following two invited talks will take place in **Aula Tessari**

9:00 - 10:00	**Invited Talk: Seth Lloyd** Prospects in Quantum Machine Learning
10:00 - 10:45	**Invited Talk: Jiannis Pachos** Knots, computation and quantum physics

Coffee Break

11:10 - 12:30	**Session 1**
11:10	**William Huggins and Miles Stoudenmire.** Towards Quantum Machine Learning with Tensor Networks
11:30	**Stefan Dernbach, Arman Mohseni-Kabir, Don Towsley and Siddharth Pal.** Quantum Walk Neural Network
11:50	**Nana Liu and Patrick Rebentrost.** Quantum Machine Learning for Quantum Anomaly Detection
12:10	**Christina Giarmatzi and Fabio Costa.** A Quantum Causal Discovery Algorithm

Lunch

14:15 - 15:00	**Invited Talk: Vedran Dunjko** Progress in Quantum Reinforcement Learning

15:00 - 16:20	**Session 2**
15:00	**Johannes Bausch.** Quantum Neural Networks: A Hamiltonian Complexity Approach
15:20	**Shi-Ju Ran.** Quantum entanglement simulators inspired by tensor network
15:40	**Johnnie Gray, Leonardo Banchi, Abolfazl Bayat and Sougato Bose.** Measuring Entanglement Negativity with Neural Network Estimators
16:00	**Luca Innocenti, Helena Majury, Taira Giordani, Nicolò Spagnolo, Fabio Sciarrino, Mauro Paternostro and Alessandro Ferraro.** Quantum state engineering using one-dimensional discrete-time quantum walks
Coffee Break	
16:50 - 18:30	**Session 3**
16:50	**Yudong Cao, Gian Giacomo Guerreschi and Alán Aspuru-Guzik.** Quantum neuron
17:10	**Alexander Sergienko, David Simon, Casey Fitzpatrick and Shuto Osawa**. Quantum Simulation of Discrete Hamiltonians with Directionally Unbiased Linear-Optical Multiports
17:30	**Peter Johnson, Jhonathan Romero, Jonathan Olson, Yudong Cao and Alan Aspuru-Guzik.** Learning device tailored quantum error recovery by quantum variational optimization
17:50	**P. Baireuther, T. E. O'Brien, B. Tarasinski and C. W. J. Beenakker.** Quantum Error Correction with Recurrent Neural Networks
18:10	**Gael Sentis, Madalin Guta and Gerardo Adesso.** Quantum learning of coherent states

Buffet at 18:30

Wednesday, 8th Nov

9:00 - 9:45	**Invited Talk: Andreas Winter** Correlations, Cones, and Cockroaches
9:45 - 10:30	**Invited Talk: Peter Wittek** Towards Quantum-Assisted Artificial Intelligence

Coffee Break

11:00 - 12:20	**Session 1**
11:00	**Alex Monràs, Gael Sentís and Peter Wittek.** Inductive supervised quantum learning
11:20	**Patrick Huembeli, Alexandre Dauphin and Peter Wittek.** Adversarial Domain Adaptation for Identifying Quantum Phase Transitions
11:40	**John Calsamiglia, Emilio Bagan, Ramon Muñoz-Tapia and Gael Sentís.** Quantum Change Point Identification
12:00	**Giuseppe Sergioli, Ranjith Venkatrama and Roberto Giuntini.** A Quantum-inspired version of the Nearest Mean Classifier

Lunch

14:00 - 14:45	**Invited Talk: Francesco Petruccione** Quantum Machine Learning with Small-scale Devices

14:45 - 16:05	**Session 2**
14:45	**Davide Ferrari and Michele Amoretti.** Demonstration of Envariance and Parity Learning on the IBM 16 Qubit Processor
15:05	**Travis Scholten.** Learning Noise in Quantum Information Processors
15:25	**Adenilton J. Da Silva.** Quantum enhanced neural network architecture evaluation
15:45	**Durga Bhaktavatsala Rao Dasari, Stefan Jesenski, Johannes Greiner, Florian Kaiser and Joerg Wrachtrup.** Learning and Controlling a Spin Environment through Quantum Measurements
Coffee Break	
16:30 - 18:00	**Session 3**
16:30	**Luca Mancino.** Extractable work-based criteria and geometric Quantum Speed Limits for quantum states discrimination
17:00	**Margherita Zorzi and Luca Paolini.** Programming Quantum Computers: Functional Languages and New Perspectives
17:20	**Linda Anticoli and Masoud Gharahi Ghahi.** Modelling Multipartite Entanglement in Quantum Protocols using Evolving Entangled Hypergraphs
17:40	**Carlos Tavares.** Quantum Machine Group Learning

Closing