

I W H S Y M P O S I U M

A STRUCTURES & EMMI WORKSHOP

Beyond Digital Computing:

The Power of Quantum and Neural Networks

19. – 21. March 2018

ORGANISATION :

Philipp Preiss, Sebastian Schmitt, Juris Uрманis

(Heidelberg University, Institute for Physics & Kirchhoff-Institute for Physics)

Monday 19.3.

8:30	WELCOME & OPENING REMARKS
9:00	Physical models of brain circuits – A non-Turing approach to computation <i>Karlheinz Meier, Heidelberg University</i>
9:45	Quantum Computing at Google <i>John Martinis, University of California</i>
10:30	COFFEE BREAK
11:00	Machine Learning for Quantum Many-Body Physics <i>Giuseppe Carleo, ETH Zurich</i>
11:45	Spiking neuron ensembles and probabilistic inference <i>Mihai Petrovici, Universität Bern</i>
12:30	LUNCH IWH
14:00	Neural network representation of a near-critical quantum Ising system out of equilibrium <i>Thomas Gasenzer, Heidelberg University</i>
14:45	Machine learning approaches to entangled quantum states <i>Xiaopeng Li, Fudan University</i>
15:30	COFFEE BREAK
16:00	Machine Learning Quantum Phases of Matter <i>Simon Trebst, University of Köln</i>
16:45	Speeding-up the Decision Making of a Learning Agent Using an Ion Trap Quantum Processor <i>Christof Wunderlich, University of Siegen</i>
19:00	CONFERENCE DINNER

Tuesday 20.3.

9:00	The SpiNNaker Project <i>Stephen Furber, University of Manchester</i>
9:45	Quantum Computations and Quantum simulations with trapped ions <i>Rainer Blatt, Institute for Quantum Optics and Quantum Information</i>
10:30	COFFEE BREAK
11:00	Detecting entanglement and non-local correlations of many-body quantum states <i>Antonio Acin, The Institute of Photonic Sciences</i>
11:45	Automated phase and low energy detection <i>Sebastian Huber, ETH Zurich</i>
12:30	LUNCH IWH
14:00	Diamond Quantum Simulator Architectures <i>Martin Plenio, Ulm University</i>
14:45	HOT TOPIC TALKS <i>Iris Schwenk, Karlsruhe Insitute of Technology</i> <i>Nicolaj Zinner, Aarhus University</i> <i>Christof Weitenberg, Institut für Laserphysik Hamburg</i>
16:15	TRANSFER TO NEUENHEIMER FELD CAMPUS
16:45	LAB TOURS <i>at Institute for Physics & Kirchhoff-Institute for Physics</i>
18:00	POSTER SESSION <i>Institute for Physics</i>
19:00	BBQ DINNER <i>at Institute for Physics</i>
21:30	TRANSFER TO HEIDELBERG OLD TOWN

Wednesday 21.3.

9:00	Complex networks on quantum states: from quantum phase transitions to emergent dynamics of quantum cellular automata <i>Lincoln Carr, Colorado School of Mines</i>
9:45	Towards optimality results in the alternating operator ansatz <i>Jacob Biamonte, Skolkovo Institute of Science and Technology</i>
10:30	COFFEE BREAK
11:00	Leveraging the Power of Quantum for Machine Learning <i>Bettina Heim, Microsoft Research</i>
11:45	Real-time dynamics of lattice gauge theories with a few-qubit quantum computer <i>Christine Muschik, Institute for Quantum Computing Waterloo</i>
12:30	LUNCH IWH
14:00	Dealing with imperfect quantum machines <i>Antonio Mezzacapo, IBM Theory of Quantum Computing and information</i>
14:45	Novel detection possibilities with quantum gas microscopes: From hidden correlations to incommensurate magnetism <i>Christian Gross, Max Planck Institute of Quantum Optics</i>
15:30	COFFEE BREAK
16:00	Remote connected science, hybrid human-machine learning in quantum physics and beyond <i>Jacob Sherson, Aarhus University</i>

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