

3rd Asia-Pacific Workshop on Quantum Information Science

Singapore, 3-15 January 2005

Programme

Monday, 3 January 2005

IMS Auditorium

8:00–8:45 Registration
8:45–9:00 **Artur Ekert**, Co-Chairman of 3rd APWQIS
 Opening

1st Session, IMS Auditorium, chaired by **Berge Englert**

9:00–10:00 IL **Konrad Banaszek**
 Experimental quantum optics I

10:00–10:20 Tea break

10:20–10:50 CT **Almut Beige**
 Distributed quantum computing with single photon sources

10:50–11:20 CT **Jiannis Pachos**
 New trends of quantum information with optical lattices

11:20–12:20 IL **Reinhard Werner**
 Quantum information without quanta: How to extract key ideas of quantum information theory from the Bell experiment

12:20–15:00 Lunch

2nd Session, IMS Auditorium, chaired by **Leong Chuan Kwek**

15:00–16:00 IL **Karl Vollbrecht**
 Distillable Entanglement I

16:00–16:30 CT **Luis-Gerardo Pedraza-Saavedra**
 A comparison between canonic, variational and Feynman restricted integral methods for extracting quantum electrodynamic field information

16:30–17:00 Tea break

17:00–17:30 CT **Yeong Cherng Liang**
 Bipartite Bell-type Inequalities Violation

17:30–18:30 RS **Naseem Rahman**
 Hidden information in quantum mechanics

IL Invited Lecture
CT Contributed Talk
RS Research Seminar

updated 13 JAN 05 at 11:21

Tuesday, 4 January 2005

3rd Session, IMS Auditorium, chaired by Karl Vollbrecht

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|-------------|----|--|
| 9:00–10:00 | IL | Jens Eisert <i>Quantum information and convex optimization 1</i> |
| 10:00–10:20 | | Tea break |
| 10:20–11:20 | RS | Marek Żukowski <i>All tight multipartite Bell correlation inequalities for three dichotomic observables per observer and the principle of rotational invariance and Bell's Theorem</i> |
| 11:20–12:20 | IL | Reinhard Werner <i>Going to a larger Hilbert space: the structure of quantum channels</i> |
| 12:20–15:00 | | Lunch |

4th Session, IMS Auditorium, chaired by Reinhard Werner

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|-------------|----|---|
| 15:00–16:00 | IL | Konrad Banaszek <i>Experimental quantum optics 2</i> |
| 16:00–16:30 | CT | Zheng-Yao Su <i>Algebraic invariants of multipartite quantum states</i> |
| 16:30–17:00 | | Tea break |
| 17:00–18:00 | RS | Markus Aspelmeyer <i>Multiphoton entanglement for quantum computing</i> |
| 18:00–19:00 | IL | Keqin Feng <i>Quantum codes 1</i> |

IL Invited Lecture
CT Contributed Talk
RS Research Seminar

updated 13 JAN 05 at 11:21

Wednesday, 5 January 2005

5th Session, IMS Auditorium, chaired by Keqin Feng

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|-------------|----|---|
| 9:00–10:00 | IL | Karl Vollbrecht <i>Distillable Entanglement II</i> |
| 10:00–10:20 | | Tea break |
| 10:20–11:20 | IL | Konrad Banaszek <i>Experimental quantum optics 3</i> |
| 11:20–12:20 | IL | Jens Eisert <i>Quantum information and convex optimization 2</i> |
| 12:20–17:00 | | Bus tour of Singapore Please sign up for this event at the registration desk on the first day of the workshop (3rd of January). Contact person: Darwin Gosal |

IL Invited Lecture
CT Contributed Talk
RS Research Seminar

Thursday, 6 January 2005

6th Session, IMS Auditorium, chaired by Jens Eisert

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| 9:00–10:00 | IL | Hans Briegel <i>Graph states: Properties and applications in quantum information 1</i> |
| 10:00–10:20 | | Tea break |
| 10:20–11:20 | RS | Adan Cabello <i>How much larger than classical correlations are quantum correlations?</i> |
| 11:20–12:20 | IL | Karl Vollbrecht <i>Distillable Entanglement III</i> |
| 12:20–15:00 | | Lunch |

7th Session, IMS Auditorium, chaired by Markus Aspelmeyer

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|-------------|----|---|
| 15:00–16:00 | IL | Daniel Greenberger <i>Bell's inequality and all that</i> |
| 16:00–16:30 | | Tea break |
| 16:30–17:30 | IL | Jens Eisert <i>Quantum information and convex optimization 3</i> |
| 17:30–18:30 | RS | Valerio Scarani <i>Simulating quantum correlations with communication</i> |

IL Invited Lecture
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Friday, 7 January 2005

CONFERENCE , Day 1

Morning Session, I²R Lecture Theatre, chaired by Artur Ekert

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|-------------|----|--|
| 9:00–9:30 | | Guest of Honour, Choy Heng Lai , Vice Provost, NUS Opening address |
| 9:30–10:30 | IL | Andrew Yao Keynote talk on <i>Graph entropy and information bounds</i> |
| 10:30–11:00 | | Tea break |
| 11:00–12:00 | IL | Reinhard Werner <i>Quantum computers: The next generation of supercomputers?</i> |
| 12:00–12:40 | IL | Antia Lamas Linares <i>Experimental quantum cryptography</i> |
| 12:40–13:00 | | Photo-taking session |
| 13:00–14:30 | | Lunch |

Afternoon Session, IMS Auditorium, chaired by Adan Cabello

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|-------------|----|--|
| 14:30–15:30 | RS | Jens Eisert <i>Entanglement, entropy and area</i> |
| 15:30–16:30 | RS | Daniel Greenberger <i>A very general GHZ-type theorem for two particles</i> |
| 16:30–17:00 | | Tea break |
| 17:00–18:00 | RS | Hans Briegel <i>Graph states: Properties and applications in quantum information</i> |
| 19:30 | | Conference Dinner Kent Ridge Guild House, NUS Please sign up for this dinner. Contact person: Darwin Gosal |

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Monday, 10 January 2005

CONFERENCE , Day 2

Morning Session, Faculty of Science, Lecture Theatre 31, chaired by **Marek Żukowski**

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|-------------|----|--|
| 9:00–10:00 | RS | Konrad Banaszek <i>Beating depolarization in quantum communication over optical fibers</i> |
| 10:00–10:20 | | Tea Break |
| 10:20–11:20 | RS | Karl Vollbrecht <i>Ensemble quantum computation with atoms in periodic potentials</i> |
| 11:20–12:20 | RS | Karol Życzkowski <i>Entanglement monotones and Wehrl entropy</i> |
| 12:20–13:30 | | Lunch (outside Lecture Theatre 31) |

Afternoon Session, Faculty of Science, Lecture Theatre 31, chaired by **Kuldip Singh**

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|-------------|----|---|
| 13:30–14:30 | RS | Berge Englert <i>The Singapore protocol for quantum key distribution</i> |
| 14:30–15:30 | RS | Gerard Milburn <i>Quantum entanglement at nonlinear dynamical bifurcations</i> |
| 15:30–16:00 | | Tea break |
| 16:00–17:00 | RS | Reinhard Werner <i>States on infinite lattice systems: entanglement at a quantum critical point</i> |

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Tuesday, 11 January 2005

8th Session, Faculty of Science, Lecture Theatre 31, chaired by **Konrad Banaszek**

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| 9:00–10:00 | IL | Gerard Milburn <i>Three paths to a quantum computer 1: Ion traps</i> |
| 10:00–10:20 | | Tea break |
| 10:20–11:20 | IL | Karol Życzkowski <i>Quantum states and quantum maps 1</i> |
| 11:20–12:20 | IL | Hans Briegel <i>Graph states: Properties and applications in quantum information 2</i> |
| 12:20–15:00 | | Lunch (outside Lecture Theatre 31) |

9th Session, Faculty of Science, Lecture Theatre 31, chaired by **Karol Życzkowski**

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|-------------|----|--|
| 15:00–15:30 | CT | Leong Chuan Kwek <i>Noisy games</i> |
| 15:30–16:00 | CT | Janet Anders <i>Eavesdropping on the Singapore protocol</i> |
| 16:00–16:30 | CT | Peter Brooke <i>Quantum logic in a decoherence-suppressed subspace with atomic qubits</i> |
| 16:30–17:00 | | Tea break |
| 17:00–18:00 | RS | Jiangfeng Du <i>Geometric phase in Quantum information processing</i> |
| 18:00–18:30 | CT | Bernd Rohwedder <i>Atom Optics Nano-fabrication : An Overview</i> |
| 18:30–19:00 | CT | Angelo Carollo <i>Holonomic coherent evolution induced by adiabatic evolving reservoir</i> |

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Wednesday, 12 January 2005

10th Session, Faculty of Science, Lecture Theatre 31, chaired by **Berge Englert**

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| 9:00–10:00 | RS | Thomas Durt <i>Applications of the generalised Pauli group in prime, prime power and non-prime power dimensions</i> |
| 10:00–10:20 | | Tea break |
| 10:20–11:20 | IL | Karol Życzkowski <i>Quantum states and quantum maps 2</i> |
| 11:20–12:20 | IL | Gerard Milburn <i>Three paths to a quantum computer 2: Superconductors</i> |
| 12:20 | | Lunch (outside Lecture Theatre 31), followed by free afternoon |
| 12:20 | | Poster session |
| 17:00 | | Gather at ground level of Block S16. Buses will ferry participants to Marina South. |
| 18:30 | | Workshop outing/dinner to Marina South. Please sign up for this outing. |

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Thursday, 13 January 2005

11th Session, Faculty of Science, Lecture Theatre 31, chaired by **Ling San**

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|-------------|----|---|
| 9:00–10:00 | IL | Keqin Feng <i>Quantum codes 2</i> |
| 10:00–10:20 | | Tea break |
| 10:20–10:50 | CT | Igor Shparlinski <i>Quantum attacks on some pseudorandom number generators</i> |
| 10:50–11:20 | CT | Raymond Ooi <i>From quantum microscopy using quantum eraser photon pairs to real-time detection of a bacteria spore at a distance</i> |
| 11:20–12:20 | IL | Wei-Min Zhang <i>Free Spin Quantum Computation with Semiconductor Nanostructures</i> |
| 12:20–14:00 | | Lunch (outside Lecture Theatre 31) |

12th Session, Faculty of Science, Lecture Theatre 31, chaired by **Chopin Soo**

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|-------------|----|---|
| 14:00–15:00 | IL | Gerard Milburn <i>Three paths to a quantum computer 3: Photons</i> |
| 15:00–15:30 | CT | Gleb Maslennikov <i>Polarization qutrit state manipulation</i> |
| 15:30–16:00 | | Tea break |
| 16:00–16:30 | CT | Leonid Krivitsky <i>Conditioned unitary transformations on biphotons</i> |
| 16:30–17:00 | CT | Aurel Gabris <i>Vacuum induced Stark shifts for quantum logic using a collective system in a high quality dispersive cavity</i> |
| 17:00–17:30 | CT | Prashant Singh <i>Quantum digital signatures using linear optics</i> |

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Friday, 14 January 2005

13th Session, Faculty of Science, Lecture Theatre 31, chaired by **Dagomir Kaszlikowski**

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|-------------|----|--|
| 9:00–10:00 | IL | Karol Życzkowski <i>Quantum states and quantum maps 3</i> |
| 10:00–10:20 | | Tea break |
| 10:20–11:20 | IL | Reinhard Werner <i>How to correct small quantum errors</i> |
| 11:20–12:20 | IL | Keqin Feng <i>Quantum codes 3</i> |
| 12:20–12:40 | | Photo-taking session |
| 12:40–14:30 | | Lunch (outside Lecture Theatre 31) |

14th Session, Faculty of Science, Lecture Theatre 31, chaired by **Chaoping Xing**

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|-------------|----|---|
| 14:30–15:00 | CT | Dagomir Kaszlikowski <i>Information-theoretic approach to single-particle and two-particle interference in multi-path interferometers</i> |
| 15:00–16:00 | IL | Hans Briegel <i>Graph states: Properties and applications in quantum information 3</i> |
| 16:00–16:30 | | Tea break |
| 16:30–17:30 | IL | Chopin Soo <i>Quantum field theory and entanglement in quantum information science</i> |
| 17:30–18:30 | RS | Artur Ekert <i>Quantum Wires</i> |

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