

Quantum and Beyond (QB)

International conference devoted to quantum theory and experiment
June 13-16, 2016

Program of the Conference

Arranged by ICMM - International Centre for Mathematical Modeling in Physics,
Engineering and Cognitive Sciences; Linnæus University, Sweden

See: <https://lnu.se/>

Organization committee, QB:

- G. M. D'Ariano (University of Pavia, Italy)
- T. Nieuwenhuizen (University of Amsterdam, the Netherlands)
- B. Nilsson (Linnæus University, Växjö, Sweden)
- A. Khrennikov (Linnæus University, Växjö, Sweden)
- A. Plotnitsky (Purdue University, USA)
- S. Ramelow (University of Vienna, Austria)

Local organizing committee:

Andrei Khrennikov, Linnæus University, Växjö, Sweden

E-mail: andrei.khrennikov@lnu.se

Ekaterina Yurova Axelsson, Linnæus University, Växjö, Sweden

E-mail: ekaterina.yurova@lnu.se

Special Sessions:

- "Fundamentals and Applications of Quantum Imaging", organizers: A. Gatti, S. Ramelow.
- "Quantum nonlocality", organizers: N. Brunner and N. Gisin.
- "BIG Event: Final Bell test", organizer A. Khrennikov.

Main conference auditorium:

Wicksell, main building H, Linnæus University, Växjö

8.00-8.45	Registration: outside the main conference room Wicksell	
08.45-9.00	Opening Ceremony: Andrei Khrennikov	
Wicksell	Chairman: M. D'Ariano	
9.00-9.30	G. Jaeger (Boston University, USA)	Randomness in Quantum Mechanics
9.30-10.00	P. Delsing (Chalmers University of Technology, Sweden)	Coupling sound to an artificial atom
10.00-10.30	L. Vaidman (Tel Aviv University, Israel)	The meaning of weak values
10.30-11.00	Coffee break	
	SPECIAL SESSION: "Quantum nonlocality", organizers N. Brunner and N. Gisin.	
Wicksell	Chairman: N. Gisin	
11.00-11.30	N. Brunner (University of Geneva, Switzerland)	Quantum nonlocality and measurement incompatibility
11.30-12.00	D. Cavalcanti (Institute of Photonic Sciences, Spain)	Certification of quantum teleportation for all entangled states
12.00-12.30	P. Skrzypczyk (University of Bristol, UK)	Quantum steering: Quantification and Applications
12.30-13.00	Yu Cai (National University of Singapore, Singapore)	Measurement-dependent locality with non-i.i.d. measurements
13.10-14.30	Lunch: at Restaurant Kristina	
	Continuation of SPECIAL SESSION: "Quantum nonlocality", organizers N. Brunner and N. Gisin.	
Wicksell	Chairman: N. Brunner	
14.20-14.30	Rector of LNU S. Hwang: welcome speech	
14.30-15.00	S. Wolf (USI Lugano, Switzerland)	Non-Locality without Counterfactual Reasoning
15.00-15.30	R. Chaves (University of Cologne, Germany)	Experimental Test of Nonlocal Causality
15.30-16.00	C. Branciard (Institut Néel – CNRS, France)	Quantum processes with no definite causal order
16.00-16.30	N. Gisin (University of Geneva, Switzerland)	Clever Bell Tests
16.30-17.00	Coffee Break	
17.00-19.00	PARALLEL SESSIONS	Session 1: K1040 Session 2: K1043 Session 3: K1046 Session 4: K1050
Session 1: K1040	Chairman: H. De Raedt	
17.00-17.20	G. Adenier and A. Khrennikov (Linnaeus University, Sweden)	Alternative data analysis of the Hensen loophole-free Bell experiment
17.20-17.40	C. Baladron (University of Valladolid, Spain)	At the crossroads of de Broglie-Bohm theory, quantum information reconstructions and time-symmetric quantum mechanics
17.40-18.00	A. Mattar (ICFO The Institute of Photonic Sciences, Spain)	Experimental multipartite entanglement and randomness certification of the W state in the steering scenario
18.00-18.15	Short break	

K1040	Chairman: R. Lapkiewicz	
18.15-18.35	O. Jimenez Farias (Institute de Ciencias Fotoniques, Spain)	Fully controllable high dimensional quantum systems via the Talbot effect
18.35-18.55	G. Sergioli (University of Cagliari, Italy)	Quantum Pattern Recognition
Session 2: K1043	Chairman: F. De Martini	
17.00-17.20	J. Franson (University of Maryland at Baltimore County, USA)	Generalized Delta Functions, Schrodinger Cats, and Decoherence
17.20-17.40	S. Iriyama (Tokyo University of Science, Japan)	Entropy Change in Open Systems and Its Application for Photosynthesis
17.40-18.00	P. Khrennikova (University of Leicester, UK)	Application of quantum master equation for long-term prognosis of asset-prices
18.00-18.15	Short break	
K1043	Chairman: J. Franson	
18.15-18.35	A. B. Sainz (University of Bristol, UK)	Postquantum Steering
18.35-18.55	Y. Pelosse (University of Swansea, UK)	Complete structural characterization of quantum entanglement as the realization of a self-referential communication task producing free random events
Session 3: K1046	Chairman: P. Lahti	
17.00-17.20	S. Rashkovskiy (Russian Academy of Sciences, Russia)	Quantum mechanics as a theory of the classical field
17.20-17.40	B. La Cour (The University of Texas at Austin, USA)	Decoherence: It's not just for quantum anymore
17.40 -18.00	I. Helland (University of Oslo, Norway)	Statistical principles and the Born rule
18.00-18.15	Short break	
K1046	Chairman: J. Kofler	
18.15-18.35	H. Geurdes (Leiden University, the Netherlands)	Randomness in a consistent violation of CHSH
18.35-18.55	I. Barukcic (Independent Researcher)	Anti Bohr. Quantum Theory And Causality
Session 4: K1050	Chairman: G. Jaeger	
17.00-17.20	S. Kak (Oklahoma State University, USA)	Quantum Communication and Epistemology
17.20-17.40	A. Luis (Universidad Complutense, Spain)	Every state is nonclassical
17.40-18.00	L. Disilvestro (Telecom ParisTech, France)	Quantum Protocols within Spekkens' Toy Model
18.00-18.15	Short break	
K1050	Chairman: M. Appleby	
18.15-18.35	D. BenDaniel (Cornell University, USA)	Implications of Einstein-Weyl Causality on Quantum Mechanics
18.35-18.55	H. Ouerdiane (University of Tunis El Manar, Tunisia)	Holomorphic representation of Lie group and associated unitarizing probability measures

Wicksell	Chairman: F. Buscemi	
9.00-9.30	C. Fuchs (University of Massachusetts Boston, USA)	Introducing the Qplex
9.30-10.00	M. Appleby (University of Sydney, Australia)	Number theoretic features of a SIC
10.00-10.30	I. Bengtsson (Stockholm University, Sweden)	SICS -- A Grand Question Full of Details
10.30-11.00	Coffee break	
11.00-13.00	PARALLEL SESSIONS OF INVITED TALKS	Session 1: Weber Session 2: Wicksell
Session 1: Weber	Chairman: I. Bengtsson	
11.00-11.30	M. Ozawa (Nagoya University, Japan)	Classical Instrument Model of Cognitive Hysteresis
11.30-12.00	M. Bourennane (Stockholm University, Sweden)	Entanglement activation
12.00-12.30	T. Nieuwenhuizen (University of Amsterdam, the Netherlands)	A sub-ensemble theory of ideal quantum measurement processes
12.30-13.00	F. De Martini (Accademia dei Lincei, Italy)	ER = EPR: Quantum entanglement and the Einstein-Rosen bridge
Session 2: Wicksell	Chairman: D. Cavalcanti	
11.00-11.30	E. Dzhafarov (Purdue University, USA)	Quantum Contextuality Extended to Arbitrary Systems of Measurements
11.30-12.00	S. Abramsky (University of Oxford, UK)	Quantifying Contextuality
12.00-12.30	J. Kofler (Max Planck Institute of Quantum Optics, Germany)	No Fine theorem for macrorealism: Eschewing the Leggett-Garg inequality
12.30-13.00	K. Michielsen (Research Centre Juelich, Germany)	Discrete event simulation of double-slit experiments
13.10-14.30	Lunch: at Restaurant Kristina	
Wicksell	Chairman: E. Dzhafarov	
14.30-15.00	A. Plotnitsky (Purdue University, USA)	Three Great Divorces of Quantum Theory
15.00-15.30	M. D'Ariano (University of Pavia, Italy)	Physics without physics
15.30-15.40	Short break	
	SPECIAL SESSION: Fundamentals and Applications of Quantum Imaging", organizers A. Gatti and S. Ramelow	
Wicksell	Chairman: M. Bourennane	
15.40-16.10	S. Ramelow (University of Vienna, Austria)	Imaging single photons in time
16.10-16.40	L. Madsen (Queensland University, Australia)	A quantum noise limited nanoparticle and biomolecule sensor
16.40-17.10	R. Łapkiewicz (Warsaw University, Poland)	Quantum imaging: new developments and old questions
17.10-17.30	Coffee Break	
Wicksell	Chairman: S. Ramelow	
17.30-18.00	M. Chekhova (Max-Planck Institute for the Science of Light, Germany)	Shaping the spatial spectrum of bright squeezed vacuum in an SU(1,1) interferometer
18.00-18.30	M. Padgett (Glasgow University, Scotland)	Photon-sparse microscopy using Ghost-Imaging

Wednesday, 15th of June 2016

BIG EVENT: FINAL BELL TEST		
Wicksell	Chairman: A. Khrennikov	
9.00-9.30	A. Aspect (College de France, France)	Closing the Door on Einstein and Bohr's Quantum Debate
9.35-10.05	G. Weihs (University of Innsbruck, Austria)	Violation of Bell's Inequality under Strict Einstein Locality Conditions
10.10-10.40	R. Hanson (Delft University of Technology, the Netherlands)	From the first loophole-free Bell test to a quantum Internet
10.45-11.15	Coffee break	

BIG EVENT: FINAL BELL TEST		
Wicksell	Chairman: G. Weihs	
11.15-11.45	M. Giustina (University of Vienna/IQOQI Vienna, Austria) and M. Versteegh (KTH Royal Institute of Technology, Sweden)	Significant-loophole-free test of local realism with entangled photons
11.50-12.20	K. Shalm (National Institute of Standards and Technologies, USA)	A strong loophole-free test of Bell's inequalities
12.25-12.55	H. Weinfurter (LMU Munich, Germany)	Event-ready loophole free Bell test using heralded atom-atom entanglement

13.00-14.30	Lunch: at Restaurant Kristina
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BIG EVENT: FINAL BELL TEST		
Wicksell	Chairman: K. Shalm	
14.30-15.00	P. Grangier (CNRS, France)	Violation of Bell's Inequalities in a quantum realistic framework
15.05-15.35	A. Zeilinger (Austrian Academy of Sciences, Austria)	The Future of Bell Experiments
15.40-16.00	Coffee break	

Wicksell	Chairman: H. Weinfurter	
16.00-16.30	J. Å. Larsson (Linköpings Universitet, Sweden)	Loopholes in Bell inequality tests of local realism, avoided in a significant-loophole-free test of Bell's theorem with entangled photons
16.30-17.00	H. De Raedt (University of Groningen, the Netherlands)	Discrete-event simulation of loophole-free Bell experiments

Conference dinner
at ELITE PARK (!) HOTEL
Time: 19.00-22.00
Address: Västra Esplanaden 10, 351 06 Växjö

Wicksell	Chairman: N. Watanabe	
09.00-09.30	A. Khrennikov (Linnaeus University, Sweden)	After Bell
09.30-10.00	N. Watanabe (Tokyo University of Science, Japan)	On Complexity for Open System Dynamics
10.00-10.30	Y. Couder (Université Paris Diderot, France)	The quantum-like behaviour of an entity endowed with a temporal extent
10.30-11.00	Coffee break	
11.00-11.30	S. Polyakov (NIST, USA)	Correlation Measurements of Nonclassical States with Photon-number-resolving Detectors
11.30-12.00	F. Buscemi (Nagoya University, Japan)	Thermodynamics as Statistical Comparison Abstract:
12.00-12.30	P. Perinotti (University of Pavia, Italy)	Interacting quantum cellular automata field theories
12.30-13.00	P. Lahti (University of Turku, Finland)	An Axiomatic Basis for Quantum Mechanics
13.00-14.20	Lunch: at Restaurant Kristina	
14.20-17.40	PARALLEL SESSIONS	Session 1: Wicksell Session 2: Weber
Session 1: Wicksell	Chairman: A. Plotnitsky	
14.20-14.40	A. Cabello (University of Seville, Spain)	Experimental test of the free will theorem
14.45-15.05	E. Loubenets (MIEM, National Research University HSE, Russia)	Specifying nonlocality of an N-partite quantum state via its dilation characteristics
15.10-15.30	M. Żukowski (University of Gdansk, Poland)	On Entanglement of Light and Stokes Parameters
15.35-15.55	Yu. Slovokhotov (Moscow State University, Russia)	Mechanics and Chemistry
16.00-16.20	Coffee break	
Wicksell	Chairman: M. Żukowski	
16.20-16.40	J. Marton (Austrian Academy of Sciences, Austria)	Underground test of quantum mechanics – the VIP2 experiment
16.40-17.00	G. Mardari (Open Worlds Research, USA)	Overcoming the EPR paradox: How to think about quanta
17.00-17.20	N. Sánchez-Kuntz (UNAM, Mexico)	Quantum Locality, Ring's a Bell?: Bell's inequality meets local reality and true determinism
17.20-17.40	A. Lemjid (Linnaeus University, Sweden)	Functional central limit theorems and $P(\phi)_1$ -processes for the classical and relativistic Nelson models

Session 2: Weber	Chairman: Y. Couder	
14.20-14.40	F. Brange (Lund University, Sweden)	Minimal Entanglement Witness From Current Correlations in Solid State Conductors
14.45-15.05	C. Lopez (UAH, Spain)	Relativistic locality and the action reaction principles predict de Broglie waves
15.10-15.30	H. Yau (FDNL Research, USA)	A Particle with Vibration in Time and its Mass-Proper Time Uncertainty
15.35-15.55	A. Akhmeteli (LTASolid Inc., USA)	No Drama Quantum Electrodynamics?
16.00-16.20	Coffee break	
Weber	Chairman: C. Fuchs	
16.20-16.40	J. DeBrotta (University of Massachusetts Boston, USA)	The Minimum Distinction Between the Quantum and the Classical
16.40-17.00	N. Johansson (Linköping University, Sweden)	Efficient Classical Simulation of the Deutsch-Jozsa and Simon's Algorithms
17.00-17.20	S. Glancy (National Institute of Standards and Technology, USA)	Data analysis for "A strong loophole-free test of local realism"
17.20-17.40	G. C. Krizek (University of Vienna, Austria)	Ockham's razor and other heuristics in the interpretations of quantum mechanics
17.50-18.00	<i>Conference closing ceremony at Wicksell</i>	

POSTER SESSION	
S. Wengerowsky (ÖAW/University of Vienna, Austria)	Significant-Loophole-Free Test of Bell's Theorem with Entangled Photons
I. M. Dumitru (Stockholms Universitet, Sweden)	Isoentangled bases in bipartite systems
C. Pombo (The Netherlands)	On The archetypal origins of the concept of matrix
R. Zahedi (Hokkaido University, Japan)	On the Logical Origin of the Laws Governing the Fundamental Forces of Nature: a New Axiomatic Approach
D. J. BenDaniel	Implications of Einstein-Weyl Causality on Quantum Mechanics
E. Santucci and G. Sergioli	Quantum Pattern Recognition
B. R. La Cour	Decoherence: It's not just for quantum anymore
B. R. La Cour	A local hidden-variable model for experimental tests of the GHZ puzzle
Hou Yau	A particle with oscillation in time
N. Sánchez Kuntz	Quantum Locality: Ring's a Bell
Per Arve	Locality of interactions gives non-contextuality of probabilities