



Quantum 2008:

IV workshop ad memoriam of *Carlo Novero*
Advances in Foundations of Quantum Mechanics
and Quantum Information with atoms and photons

19-23 May 2008 - Turin, Italy.

**Organizers: M. Genovese, G. Brida,
M.L. Rastello, A. Garuccio**

Monday 19		
08.45-09.00	Welcome to participants of I.N.R.I.M. president E. Bava	
Session I - Chairman:		
09.00-09.30	C.F. Wildfeuer	Quantum Optical Metrology: What is new with N00N?
09.30-10.00	L. Krivitsky	Correlation measurement of squeezed light
10.00-10.30	F. De Martini	Macroscopic quantum entanglement in light reflection from Bose-Einstein Condensates
10.30-11.00	Coffee break	
Session II - Chairman:		
11.00-11.30	T. Udem	Frequency Combs and Applications
11.30-12.00	G. Kitaeva	Biphoton wave packets generated in aperiodically poled crystals
12.00-12.30	A. Cabello	Bell's theorem with and without inequalities for graph states
12.30-13.00	L. Lugiato	Quantum signatures in the interference of macroscopic signal-idler beams
13.00-13.20	L. Maccone	Sub-Rayleigh Quantum Imaging
13.20-14.30	Lunch	
Session III – Chairman:		
14.30-15.00	G. Kurizki	Cavity thermodynamics control by frequency measurements
15.00-15.30	G. Leuchs	Strong coupling of a single photon and a single atom in free space
15.30-16.00	M. Bondani	Intense bipartite entangled fields for ghost imaging and secure image transmission
16.00-16.30	Coffee break	
Session IV - Chairman:		
16.30-17.00	E. Santos	Tests of quantum mechanics versus a simple family of local hidden variables theories via polarization correlation experiments
17.00-17.30	R. Alicki	Quantumness witnesses
17.30-18.00	M. Paris	Quantum estimation for quantum technology
18.00-18.30	S. Olivares	Multiparameter quantum estimation from incomplete data

Tuesday 20		
Session I - Chairman:		
09.00-09.30	F. Casagrande	Entanglement and decoherence in a dissipative tripartite cavity QED system
09.30-10.00	N. Gisin	Simulation of entanglement with no-signaling resources
10.00-10.30	A. Sergienko	Engineering multiparameter entangled states with adaptive optics
10.30-11.00	Coffee break	
Session II - Chairman:		
11.00-11.30	F. Cataliotti	Title to be communicated
11.30-12.00	Y. Kim	Minimum disturbance measurement without post-selection
12.00-12.30	A. Khrennikov	The role of von Neumann/Luders postulates in the EPR-Bohm-Bell considerations
12.30-13.00	H.T. Elze	Uncovering the quantum states hidden in classical phase space by an universal attractor
13.00-13.30	A. Laing	Quantum information science with photons on a chip
13.30-14.30	Lunch	
Session III - Chairman		
14.30-15.00	F. Illuminati	Some recent advances in the theory of entanglement and its applications to quantum information and quantum technologies
15.00-15.30	M. Bellini	Probing fundamental quantum rules by experimental implementation of photon creation and annihilation operators
15.30-16.00	S. Kulik	Optimal tomography of biphotons-ququarts
16.00-16.30	Coffee break	
Session IV - Chairman:		
16.30-17.00	S. Mancini	Recovering entanglement from environment
17.00-17.30	Y. Shih	The physics of ghost imaging
17.30-17.50	A. Allevi	Generation and characterization of a three-mode entangled state of radiation

Wednesday 21		
Session I - Chairman:		
09.00-09.30	D. Bruss	Unambiguous discrimination of two mixed quantum states
09.30-10.00	G. Bjork	Protecting entanglement from dissipation by quantum coding
10.00-10.30	A. Garuccio	Toward real NOON-state sources
10.30-11.00	Coffee break	
Session II - Chairman:		
11.00-11.30	B. Sanders	Quantum walks on circles in phase space via cavity or circuit quantum electrodynamics
11.30-12.00	G. Casati	Decoherence and dynamical chaos
12.00-12.30	S. Pascazio	Statistical mechanics of multipartite entanglement
12.30-13.00	M. D'Angelo	Quantum lithography: an overview, from working principle to reality
13.00-13.20	A. Porzio	Measuring the covariance matrix for a bi-partite continuous variable entangled state
13.20-14.30	Lunch	
Session III – Chairman:		
14.30-15.00	J. Laurat	Entanglement of atomic ensembles in the single excitation regime
15.00-15.30	J. Perina	Nonlinear layered media as promising sources of entangled photon pairs
15.30-16.00	H. Nikolic	Bohmian mechanics: from philosophy of nonrelativistic QM towards a testable theory of everything
16.00-16.30	S. Pádua	Quantum interference with one and two photon pairs
16.30-17.00	Coffee break	
Session IV - Chairman:		
17.00-17.30	M. Scala	Non-markovian dynamics of cavity losses
17.30-17.50	R. Lo Franco	N -photon generalized binomial field states: correspondence with coherent atomic states and their efficient generation in a cavity
17.50-18.10	M. Gramegna	<i>Title to be communicated</i>
18.10-19.30	Poster session	

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Bus to Social Dinner

Thursday 22		
Session I - Chairman:		
09.00-09.30	J. P. Torres	Engineering the frequency properties of entangled photons
09.30-10.00	K. Banaszek	Realistic quantum-enhanced phase estimation
10.00-10.30	D. Salart	Gravity-induced state reduction in a Bell experiment with space-like separation
10.30-11.00	Coffee break	
Session II - Chairman:		
11.00-11.30	J. Altepeter	Sources and gates for telecom-band quantum information
11.30-12.00	M. Lobino	Electromagnetically induced transparency and squeezed light
12.00-12.30	E. Giacobino	Quantum Variables Storage and Retrieval
12.30-13.00	O. Pfister	Playing the quantum harp: from quantum metrology to quantum computing with harmonic oscillators
13.00-13.30	P. Mataloni	Towards one-way quantum computation with cluster states of two photons and six qubits
13.30-14.30	Lunch	
Session III – Chairman:		
14.30-15.00	L. L. Sánchez-Soto	Quantum reconstruction of polarization states
15.00-15.30	A. Migdall	Experimental test of non-local realism using a fiber-based source of polarization-entangled photon pairs
15.30-16.00	G. M. Palma	Ergodicity in randomly colliding qubits
16.00-16.30	I. Degiovanni	Quantum Information Experiments Optimization by Quantum Correlation Bounds Investigations: the Wigner Inequality Case
16.30-17.00	Coffee Break	

Parallel Session IVa - Chairman:		
17.00-17.20	G. Adenier	EPR-Bell statistics from semiclassical theories
17.20-17.40	Jeong Hyunseok	Generation of Schroedinger cat states and their applications to quantum information processing
17.40-18.00	A. F. Kracklauer	Against quantum non-locality
18.00-18.20	M. Zeitlin	Localization, multiscales and complex patterns: general approach
18.20-18.40	A. Fedorova	Pattern formation in complex quantum dynamics
18.40-19.00	Juan Leon	Entanglement without a common cause?

Parallel Section IVb - Chairman:

17.00-17.20	T. Hodgson	Robust storage of exciton qubits in quantum dots through ultrafast multi-pulse control
17.20-17.40	I. Ruo Berchera	Tailoring PDC speckles structure
17.40-18.00	S. Prants	Stability and instability in cavity quantum electrodynamics
18.00-18.20	R. Filip	Noiseless upload to continuous-variable quantum memory
18.20-18.40	Yasser Omar	Quantum walk on a line with two entangled particles
18.40-19.00	P. Villoresi	Experimental Study of a Quantum Channel From the Space to the Earth
19.00-19.20	V. Koroli	Two-photon quantum-statistical properties of the single-mode cavity field interacting with pair of cold atoms

Friday 23		
Session I - Chairman:		
09.00-09.30	N. Datta	Quantum channels with long-term memory
09.30-10.00	G. M. D'Ariano	Probabilistic operational theories: what is special about Quantum Mechanics
10.00-10.30	M. Inguscio	Anderson localization of atomic matter waves
10.30-11.00	Coffee break	
Session II - Chairman:		
11.00-11.30	M. Rasetti	Multiboson logical operators, Laughlin states and the characters of Virasoro algebra
11.30-12.00	F. Raffa	A quantum view on the number base change
12.00-12.30	P. Tombesi	Perfect state transfer in long-range interacting spin chains
12.30-13.00	T. Calarco	Fast and ultrafast quantum gates via optimal control of atoms and photons
13.00-13.30	A. Marzuoli	Braiding and entanglement in spin networks
13.30-14.30	Lunch	
Session III – Chairman:		
14.30-15.00	G. Brida	Experimental tests of specific local realistic models
15.00-15.30	D. Vitali	Dynamical decoupling schemes for inhibiting decoherence in the propagation of single-photon polarization qubits
15.30-16.00	M. Chekhova	Photon correlations and two-mode squeezing in pulsed parametric down-conversion
16.00-16.30	Coffee break	
Session IV - Chairman:		
16.30-17.00	F. Bovino	Title to be communicated
17.00-17.30	L. C. Kwek	Weakening Effects of Berry's Phase under Dzyaloshinskii-Moriya Interaction
17.30-18.00	N. Kiesel	Experiments on multiphoton entanglement
18.00-18.30	V. I. Manko	New formulation of conventional quantum mechanics with probability instead of wave function
18.30-18.40	M. L. Rastello	Concluding remarks