



Institute of Physics,
University of Belgrade



Serbian Academy
of Sciences and Arts

CEWQO 2008

15th Central European
Workshop on Quantum Optics

Realized Program

Belgrade, 30 May – 03 June, 2008
Serbian Academy of Sciences and Arts
University of Belgrade, Rectorate

Conference topics

- 1. Fundamental aspects of quantum optics and quantum mechanics**
- 2. Single photons and photon pairs**
- 3. Cavity and circuit QED**
- 4. Atoms in intense fields**
- 5. Neutron, atom and molecular quantum optics**
- 6. Quantum gases and fluids**
- 7. Coherence, entanglement and decoherence**
- 8. Optical properties of condensed matter and nanostructures**
- 9. Open quantum systems and chaos**
- 10. Quantum information processing**

COMMITTEES

Advisory board

Vladimir Buzek (Bratislava, Slovak Republic)
Slobodan Cvejanović (Rijeka, Croatia)
Victor Dodonov (Brasilia, Brazil)
Martial Ducloy (Paris, France)
Zdenek Hradil (Olomouc, Czech Republic)
Jozsef Janszky (Budapest, Hungary)
Nikola Konjević (Belgrade, Serbia)
Ulf Leonhardt (St Andrews, UK)
Margarita Man'ko (Moscow, Russia)
Antonino Messina (Palermo, Italy)
Paulina Marian (Bucharest, Romania)
Saverio Pascazio (Bari, Italy)
Anton Ramsak (Ljubljana, Slovenia)
Helmut Rauch (Vienna, Austria)
Ryszard Tanas (Poznan, Poland)
Nikolay V. Vitanov (Sofia, Bulgaria)
Werner Vogel (Rostock, Germany)
Leposava Vušković (Norfolk, USA)

Organizing committee

Mirjana Božić (chairperson)
Dušan Arsenović (secretary)
Zoran Grujić (webmaster)
Nikola Burić
Milena Davidović
Miroljub Dugić
Radoš Gajić
Nikola Konjević
Vanja Mihajlović
Marina Mijailović
Ilija Savić
Milan Tadić

FRIDAY, 30 MAY – SASA Lecture hall 1

9:00 OPENING CEREMONY

HAJDIN Nikola, President of the Serbian Academy of Sciences and Arts

KOVAČEVIĆ Branko, Rector of the University of Belgrade

POPOVIĆ Dragan, Director of the Institute of Physics

JOVIĆEVIĆ Marina, CEI National Coordinator of Serbia

Chairman: Nikola KONJEVIĆ

- 9:30 **WALTHER Philip**
*Multi-photon entanglement and the possibility to generate single-photons
using room-temperature ensembles of ⁸⁷Rb atoms*
- 10:00 **SKENDEROVIĆ Hrvoje**
Four Wave Mixing with femtosecond pulses
- 10:30 **BECKER Uwe**
Electron entanglement through tunneling-induced coherence between two emitter sites

11:00 - 11:30 **COFFEE BREAK**

Chairman: Antonino MESSINA

- 11:30 **MASTELLONE Andrea**
Protected subspaces against charge noise in coupled charge-phase qubits
- 11:50 **OBLAK Daniel**
Spin Squeezing on the Caesium Clock Transition
- 12:10 **ZIPPER Elzbieta**
Entanglement of distant flux qubits by swapping
- 12:30 **PATEREK Tomasz**
Mathematical undecidability and randomness in quantum experiments

13:00 – 15:00 **LUNCH**

Chairman: Vladimir DODONOV

- 15:00 **HENNRICH Markus**
Universal ion trap quantum computation on logical qubits
- 15:30 **MAN'KO Margarita**
Probabilistic characteristics of classical and quantum waves
- 16:00 **GLIGORIĆ Goran**
*Localized modes in the cigar-shaped Bose-Einstein condensates
in a very deep optical lattice*
- 16:20 **BUHMAN Stefan Yoshi**
Thermodynamics of atoms in nontrivial environments

16:40 - 17:00 **COFFEE BREAK**

FRIDAY, 30 MAY – SASA Lecture hall 1

Chairman: Chaslav BRUKNER

- 17:00 **ISAR Aurelian**
Entanglement in open quantum dynamics
- 17:20 **KHVESHCHENKO Dmitry**
Many-body effects in multi-qubit arrays
- 17:40 **CHIRKIN Anatoly**
Forming four-partite entangled states in nondegenerate parametric amplification at low frequency pumping
- 18:00 **VILLAS Boas Celso**
Reservoir engineering for cavity field and atomic states and decoherence-free evolutions in cavity quantum electrodynamics

FRIDAY, 30 MAY – SANU Lecture hall 2

Chairman: Luigi MOI

- 17:00 **TADIĆ Milan**
Excitons in stacks of semiconductor quantum rings
- 17:20 **GORELIK Vladimir**
Massive photons properties in 3D-photonics crystals, filled by dielectrics or metals
- 17:40 **BERKDEMIR Cuneyt**
The temperature-dependent analysis of the quantum limited noise figure for two-level optical fiber amplifiers
- 18:00 **NEMILENTSAU Andrei**
Photonic density of states in the vicinity of finite-length single-wall carbon nanotube

19:00 - 21:00 **WELCOME COCKTAIL – Club SASA, Mezanin**

SATURDAY, 31 MAY – RECTORATE Lecture hall 1

Chairman: Lepasava VUŠKOVIĆ

- 9:00 **KOROLKOVA Natalia**
Entanglement distribution: new concepts and the continuous variable toolbox
- 9:30 **WEIS Antoine**
Multichannel atomic magnetometers
- 10:00 **MOI Luigi**
Photoinduced effects on atoms and clusters embedded in polymer films and nanoporous silica

10:30 - 11:00 **COFFEE BREAK**

Chairman:

- 11:00 **D'ARRIGO Antonio**
Dephasing channels with memory
- 11:20 **LEMR Karel**
Preparation of entangled states of two photons in several spatial modes
- 11:40 **STOBINSKA Magdalena**
Perfect Photon-Atom Coupling in Free Space
- 12:00 **GABRIS Aurel**
Optimized quantum random walk search algorithms

13:00 - 15:00 **LUNCH**

Chairman: Elzbieta ZIPPER

- 15:00 **GAWLIK Wojciech**
Experiments on the Dynamics of Bose-Einstein Condensate in Finite Temperatures
- 15:30 **PASCAZIO Saverio**
Statistical mechanics of multipartite entanglement
- 16:00 **NAPOLI Anna**
A new measure of multipartite entanglement

16:30 - 17:00 **COFFEE BREAK**

17:00 – 18:30 **POSTER SESSION - Topics: 1 and 8**

SATURDAY, 31 MAY – RECTORATE Lecture hall 2

Chairman: Ryszard TANAS

- 11:00 **PERINOVA Vlasta**
Propagation of radiation in the state with at most one photon in a dielectric
- 11:20 **LAZAROU Constantinos**
Entanglement in the adiabatic limit of cavity QED with pairs of atoms
- 11:40 **DODONOV Victor**
Dynamical Casimir effect and resonance frequency shifts in cavities with thin photo-excited semiconductor layers
- 12:00 **NEMETH Istvan**
Quantum Theory of the Coherently Pumped Micromaser
- 12:20 **KHANBEKYAN Mikayel**
*Spontaneous emission of a single atom in a high-Q cavity:
Pulse shape and efficiency of one-photon Fock state preparation*

13:00 - 15:00 **LUNCH**

SUNDAY, 1 JUNE – RECTORATE Lecture hall 1

Chairman: Paulina MARIAN

- 9:00 **VOGEL Werner**
Nonclassical P-functions and space-time dependent correlations
- 9:30 **ZIMAN Mario**
Discrimination of quantum observables
- 10:00 **TANAS Ryszard**
Dynamics of entanglement in a dissipative environment

10:30 - 11:00 **COFFEE BREAK**

Chairman: Uwe BECKER

- 11:00 **DIMITROVA Todorka**
Quantum erasing with single photons: a lecture demonstration experiment
- 11:20 **SANZ Angel**
Bohmian mechanics: A trajectory picture of quantum mechanics
- 11:40 **DAVIDOVIĆ Milena**
Electromagnetic energy flow lines and/or the paths of photons
- 12:00 **KUPCZYNSKI Marian**
Is the Quantum Theory Predictably Complete?
- 12:20 **MAN'KO Olga**
Star-product quantization; symplectic and spin tomographies

13:00 - 15:00 **LUNCH**

15:00 – 20:00 **BELGRADE SIGHTSEEING TOUR**

SUNDAY, 1 JUNE – RECTORATE Lecture Hall 2

Chairman: Allan SOLOMON

11:00 **MACOVEI Mihai**

Phase dependent quantum dynamics induced by ultrashort laser pulses

11:20

11:40 **VVEDENSKII Nikolay**

*Quantum and Semiclassical Calculations of Quasi-DC Current Excitation
in Plasma Created by Few-Cycle Laser Pulse*

13:00 - 15:00

LUNCH

15:00 – 20:00

BELGRADE SIGHTSEEING TOUR

MONDAY, 2 JUNE – RECTORATE Lecture hall 1

Chairman: Philip WALTHER

- 9:00 **VULETIĆ Vladan**
Single-photon bus between atomic spin-wave quantum memories
- 9:30 **RAUCH Helmut**
Basic Quantum Irreversibility in Neutron Interference Experiments
- 10:00 **SALOMON Christophe**
Precision Time Measurement and Fundamental Physics

10:30 - 11:00 **COFFEE BREAK**

Chairman: Margarita MAN'KO

- 11:00 **MARKO Marton**
Missing Kossel-lines and standing waves in neutron scattering
- 11:20 **FERRARO Elena**
Entanglement collapses and revivals in a spin star system
- 11:40 **JIVULESCU Anastasia**
Exact dynamics of a disordered spin star system
- 12:00 **RADONJIĆ Milan**
Line-shapes and widths of CPT resonances - laser beam profile and atomic polarization effects
- 12:20 **SAMBALE Agnes**
Interaction of an atom with absorbing left-handed media

13:00 - 15:00 **LUNCH**

Chairman: Werner VOGEL

- 15:00 **BRUKNER Caslav**
The quantum to classical transition and the complexity of Schrödinger-cat states
- 15:30 **MAN'KO Vladimir**
Quantum correlations in the probability representation of quantum states
- 16:00 **BAUDON Jacques**
Coherent atom optics with rare gas metastable atoms

16:40 - 17:00 **COFFEE BREAK**

17:00 – 18:30 **POSTER SESSION –Topics: 2, 3, 4, 5, 6, 7, 9, 10**

20:00-23:00 **CONFERENCE DINNER**
Restaurant Ušće, Bulevar Ušće bb, New Belgrade

MONDAY, 2 JUNE – RECTORATE Lecture hall 2

Chairman: Saverio PASCAZIO

- 11:00 **LEON Juan**
Entanglement without a common cause?
- 11:20 **SOLOMON Allan**
Quantum Entanglement and Braid Groups
- 11:40 **LASKOWSKI Wieslaw**
Experimentally friendly geometrical criteria for entanglement
- 12:00 **MISTA Ladislav**
Localizable entanglement for continuous variables
- 12:20 **GAINUTDINOV Renat**
*Interaction of an Atom Subject to an Intense Laser Field with Its Own
Radiation Field and Nonlocality of Electromagnetic Interaction*

13:00 - 15:00 **LUNCH**

TUESDAY, 3 JUNE – RECTORATE Lecture hall 1

Chairman: Helmut RAUCH

- 9:00 **BELLINI Marco**
Generation and tomographic analysis of quantum states of light
- 9:30 **DUCLOY Martial**
Nanoscale Quantum Optics: nanocavity QED, atomic spectroscopy, etc.
- 10:00 **MARIAN Paulina**
Quantum Chernoff bound as a measure of nonclassicality for Gaussian states

10:30 - 11:00 **COFFEE BREAK**

Chairman: Wojciech GAWLIK

- 11:00 **MIZRAHI Salomon**
Information Theory and Quantum Mechanics
- 11:20 **KLIMOV Vasily**
Detection of Spiral photons in Quantum Optics
- 11:40 **ANDREEV Vladimir**
Bell inequalities and correlation of spin projection function
- 12:00 **DOMOTOR Piroska**
On global entanglement of N-qubit pure states
- 12:20 **MOSZYNSKI Robert**
Relativistic and QED treatment of long-range resonant interactions between like atoms

13:00 - 13:30 **CLOSING CEREMONY**

14:00 – 15:00 **LUNCH IN THE INSTITUTE OF PHYSICS**

15:00 – 17:00 **VISIT TO THE INSTITUTE OF PHYSICS**