






# Day 1, Monday, September 22



QuantArm 2014

National Academy of Sciences of Armenia in Yerevan  
24 Marshal Baghramyan Ave., Presidium building, 2<sup>nd</sup> floor

10:00	<b>Opening Ceremony</b>
10:30	<b>A new concept for high accuracy and high speed laser ranging based on a frequency shifted feedback laser for industrial applications</b> <u>K. Bergmann</u> Department of Physics and OPTIMAS Research Center, Technical University Kaiserslautern, Germany
	<b>11:15 – 13:30 Transfer to Tsaghkadzor and Registration</b> <b>Hotel Multi Rest House, Olimpiakan Street</b>
	<b>13:30 – 14:30 Lunch in Tsaghkadzor</b>
Time	Hall A (4 <sup>th</sup> floor)
Chairman	R. Folman
14:30	<b>Ultimate time resolution in scintillator-based detectors</b> <u>P. Lecoq</u> CERN, Switzerland
15:15	<b>Hot topics in magnetometry</b> <u>D. Budker</u> Helmholtz Institute Mainz, Germany
15:45	<b>Near resonant Kapitza-Dirac diffraction of initially prepared momentum state for multipath atom interferometry</b> <u>A. Muradyan</u> Yerevan State University, Armenia
	<b>16:15 – 17:00 Coffee break and IPR product exhibition</b>
Time	Hall A (4 <sup>th</sup> floor)
	Introduced by A. Papoyan
17:00 Training	<b>How to write a good proposal</b> <u>K. Bergmann</u> Department of Physics and OPTIMAS Research Center, Technical University Kaiserslautern, Germany
	<b>17:45 – 19:00 Walking trip to a 11–13<sup>th</sup> century monastery in Tsaghkadzor</b>
	<b>19:00 – 22:00 Official Conference Dinner</b>

# Day 2, Tuesday, September 23

Time	Hall A (4 <sup>th</sup> floor)
Chairman	<i>D. Meschede</i>
9:00	<b>Quantum Communication</b> <i>N. Gisin</i> University of Geneva, Switzerland
9:45	<b>Non-local nonlinear optics with Rydberg gases</b> <i>M. Fleischhauer</i> University of Kaiserslautern, Germany




## 10:30 – 11:00 Coffee break


Time	Hall A (4 <sup>th</sup> floor) Atomic and matter wave physics	Hall B(1 <sup>st</sup> floor) Scintillating materials
Chairmen	<i>I. Novikova</i>	<i>P. Lecoq</i>
11:00	<b>Nano-cell filled with Potassium vapor: applications in atomic spectroscopy</b> <i>D. Sarkisyan</i> Institute for Physical Research, NAS of Armenia	<b>A new synthesis method of nanoparticles: the pulsed laser ablation in liquid</b> <i>D. Amans</i> The Institute of Light and Matter, France
11:30	<b>Francium trapping at LNL</b> <i>E. Mariotti</i> Università di Siena, Italy	<b>Energy resolution and scintillation mechanisms</b> <i>G. Bizarri</i> Lawrence Berkeley National Laboratory, USA
12:00	<b>The hyperfine Paschen–Back Faraday effect</b> <i>M. Zentile</i> Durham University, UK	<b>Thin scintillators for synchrotron radiation applications</b> <i>T. Martin</i> ESRF, France






## 12:30 – 14:00 Lunch

Time	Hall A (4 <sup>th</sup> floor)
Chairman	<i>K. Bergmann</i>
14:00	<b>Cold Individual Atoms Conquer k-Space and Meet Each Other</b> <i>D. Meschede</i> Institut für Angewandte Physik, Germany


<i>Time</i>	Hall A (4 <sup>th</sup> floor) Atomic and matter wave physics	Hall B(1 <sup>st</sup> floor) Scintillating materials
Chairmen	<i>M. Fleischhauer</i>	<i>E. Bouret-Courchesne</i>
14:45	<b>Coherent control by phase modulated short laser pulses: Applications in high-order harmonics generation and acceleration of particles</b> <u><i>G. Djotyan</i></u> Wigner Research Center for Physics, Hungarian Academy of Sciences	<b>Undoped and Ce-doped LuAG single crystal fibers grown by micro-pulling down technique for homogeneous dual-readout calorimeters</b> <u><i>K. Lebbou</i></u> The Institute of Light and Matter, France
15:15	<b>Temporal and spatial correlations in off-resonantly driven ultracold Rydberg gases</b> <u><i>M. Höning</i></u> Technische Universität Kaiserslautern, Germany	<b>Laser-based nanoparticles and their applications</b> <u><i>L. Sajti</i></u> Laser Zentrum Hannover e.V., Germany
15:45	<b>Laguerre-Gaussian laser modes for atomic physics experiments : atom channeling and information storage</b> <u><i>L. Pruvost</i></u> Laboratoire Aimé-Cotton, CNRS, Univ. Paris-Sud, Orsay, France	<b>Ce-doped LGSO fiber crystal grown by micro-pulling down (<math>\mu</math>PD) technique and characterization</b> <u><i>V. Kononets</i></u> Institute for Scintillation Materials of NAS of Ukraine
 <b>16:15 – 16:45 Coffee break</b>		
<i>Time</i>	Hall A (4 <sup>th</sup> floor) Atomic and matter wave physics	Hall B(1 <sup>st</sup> floor) Advanced photonics
Chairmen	<i>V. Krainov</i>	<i>L. Sajti</i>
16:45	<b>Nonadiabatic Chemical Dynamics and Molecular Function</b> <u><i>H. Nakamura</i></u> National Chiao Tung University, Japan	<b>Relaxation Dynamics of a Quantum Emitter Resonantly Coupled to a Metal Nanoparticle</b> <u><i>Kh. Nerkararyan</i></u> Yerevan State University, Armenia
17:15	<b>Quantum time-dependent level crossing models</b> <u><i>A. Ishkhanyan</i></u> Institute for Physical Research, NAS of Armenia	<b>Fano resonance in H-like nanostructures</b> <u><i>M. Rodrigues Gonçalves</i></u> Ulm University, Germany

17:45	<b>Hydrogen atom in de Sitter spaces and Heun functions</b> <u>V. Redkov</u> B.I. Stepanov Institute of Physics, NAS of Belarus	<b>Multiphoton blockades beyond the fundamental limit</b> <u>G. Kryuchkyan</u> Institute for Physical Research, NAS of Armenia Yerevan State University, Armenia
18:15 <i>Brokerage Event</i>	<b>On Quantum Information</b>	<b>On Advanced Photonics</b>
 <b>18:45 – 21:00Dinner</b>		

# Day 3, Wednesday, September 24

Time	Hall A (4 <sup>th</sup> floor)	
Chairman	N. Gisin	
9:00	<b>Beyond the Heisenberg uncertainty</b> <u>E. Polzik</u> Niels Bohr Institute, University of Copenhagen, Denmark	
9:45	<b>Quantum optics and quantum information using cold Rydberg atoms in an optical cavity</b> <u>P. Grangier</u> Institut d'Optique, CNRS, France	
 <b>10:30 – 11:00 Coffee break</b>		
Time	Hall A (4 <sup>th</sup> floor) Quantum information	Hall B(1 <sup>st</sup> floor) Advanced photonics
Chairmen	E. Polzik	H. Jauslin
11:00	<b>Semiconductor devices for quantum technologies</b> <u>R. Young</u> Lancaster University, Quantum Base, UK	<b>Photonics and electronics of nanostructured metal films</b> <u>T. Vartanyan</u> ITMO University, Russia
11:30	<b>Quantum repeater without long-lived quantum memories</b> <u>Yu. Malakyan</u> Institute for Physical Research, NAS of Armenia	<b>Electronic and optical properties of quantum rings and quantum dashes</b> <u>H. Sarkisyan</u> Russian-Armenian University, Yerevan State University, Armenia
12:00	<b>Optical measurements beyond the quantum limit</b> <u>I. Novikova</u> College of William & Mary, USA	<b>One-dimensional Hubbard-Luttinger model for carbon nanotubes</b> <u>V. Krainov</u> Moscow Institute of Physics and Technology, Russia
 <b>12:30 – 14:00 Lunch</b>		
Time	Hall A (4 <sup>th</sup> floor)	
Chairman	D. Budker	
14:00	<b>Coherent matter-wave splitting on an atom chip</b> <u>R. Folman</u> Ben-Gurion University of the Negev, Israel	
 <b>14:45 – 20:00 Trip to Lake Sevan with Barbecue/Dinner</b>		

# Day 4, Thursday, September 25

Time	Hall A (4 <sup>th</sup> floor)	
Chairman	Ph. Grangier	
9:00	<b>Surface interactions in matter wave optics and interferometry</b> <u>M. Ducloy</u> Laboratoire de Physique des Lasers, Université Paris-Nord, France	
9:45	<b>Cooperative quantum optics in dense thermal vapours</b> <u>I. Hughes</u> Durham University, UK	
 <b>10:30 – 11:30 Poster session and IPR product exhibition along with a coffee break</b>		
Time	Hall A (4 <sup>th</sup> floor) Atomic and matter wave physics	Hall B(1 <sup>st</sup> floor) Quantum information
Chairmen	M. Ducloy	C. Leroy
11:30	<b>Photo-Double Ionization of Nitrogen</b> <u>B. Joulakian</u> Université de Lorraine, France	<b>Quantum key distribution with time-bin coding for secure satellite communication</b> <u>D. Horoshko</u> Institute of Physics, National Academy of Sciences of Belarus
12:00	<b>Behavior of <sup>39</sup>K atomic transitions on D<sub>1</sub> line in external magnetic field</b> <u>A. Sargsyan</u> Institute for Physical Research, NAS of Armenia	<b>Single photon and multi-photon state generation in a single atom-cavity QED system</b> <u>A. Gogyan</u> Institute for Physical Research, NAS of Armenia
12:30	<b>Approximate Method of Partition Function Calculation for Spin System with Arbitrary Connection</b> <u>B. Kryzhanovsky</u> Center of Optical Neural Technologies SRISA RAS, Russia	<b>Generation of two- and three-qubit entangled states in systems of mutually coupled qubits</b> <u>L. Chakhmakhchyan</u> Institute for Physical Research, NAS of Armenia
13:00		<b>Quantum and classical parametric processes in PT-symmetric quadratic nonlinear couplers with loss</b> <u>D. Antonosyan</u> The Australian National University, Australia



**13:30 – 14:30 Lunch**

14:30–  
17:00

**Free time**

**LIA-IRMAS members and other  
French participants meeting with  
the representatives of the Embassy  
of France**

*Time*

*Hall A (4<sup>th</sup> floor)*

*Introduced by T. Arzumanyan*

17:00  
*Training*

**The Technology Transfer Process and IP search**

*G. Brandon*

Intelligentsia Consultants Sàrl, Luxembourg

17:45  
*Training*

**Market Research, Valuation and Promotion**

*D. Bezdan*

Intelligentsia Consultants Sàrl, Luxembourg

18:30  
*Training*

**Licensing and Negotiations**

*G. Brandon*

Intelligentsia Consultants Sàrl, Luxembourg



**19:15 – 20:30 Dinner**

20:30–  
21:00  
*Brokerage  
event*

**On Atomic and Matter Wave  
Physics**

**On Scintillating Materials**

The Summer School will be held in Yerevan, at the Russian–Armenian Slavonic University (RAU). The lunch for lecturers will be organized at 12:30–13:30 in Tsaghkadzor.

## Thursday, September 25

**13:30 – 14:30 TRANSFER TO YEREVAN, RAU**

**Yerevan, Hovsep Emini St., 123 Building**

*Hall A Introduced by G. Grigoryan*

14:30	<p><b>Population transfer between quantum states to perfection: Stimulated Raman Adiabatic Passage (STIRAP)</b>  <i>K. Bergmann</i>            Department of Physics and OPTIMAS Research Center, Technical University Kaiserslautern, Germany</p>
-------	--

15:15	<p><b>Atom-wall interaction: principles and optical techniques of detection</b>  <i>D. Bloch</i>            Laboratoire de physique des lasers, CNRS and Université Paris13, France</p>
-------	---

*Hall B Introduced by H. Sarkisyan*

14:30	<p><b>Investigation of defects in materials</b>  <i>A. Vedda</i>            Department of Materials Science, University of Milano-Bicocca, Italy</p>
-------	--




15:15	<p><b>Thin layers of atomic vapors: spectroscopy and photophysics</b>  <i>T. Vartanyan</i>            ITMO University, Russia</p>
-------	---



**16:00 – 17:00 Transfer to Tsaghkadzor**



# Day 5, Friday, September 26

<i>Time</i>	<i>Hall A</i> (4 <sup>th</sup> floor)	
Chairman	<i>E. Auffray</i>	
9:00	<b>New Halides Scintillators for Gamma Radiation Detection</b> <i>E. Bourret-Courchesne</i> Lawrence Berkeley National Laboratory, USA	
9:45	<b>Governing the incorporation of rare earth ions in sol-gel silica: from microscopic mechanisms of nano-cluster formation to the realization of scintillating optical fibres</b> <i>A. Vedda</i> Department of Materials Science, University of Milano-Bicocca, Italy	
 <b>10:30 – 11:00 Coffee break</b>		
<i>Time</i>	<i>Hall A</i> (4 <sup>th</sup> floor) Atomic and matter wave physics	
Chairman	<i>I. Hughes</i>	
11:00	<b>Casimir-Polder in the Near-Field van der Waals regime: Experimental Observation of Temperature effects for Cs*/sapphire</b> <i>D. Bloch</i> Laboratoire de physique des lasers, CNRS and Université Paris13, France	
11:30	<b>Topological growing scheme for Laughlin states in synthetic gauge fields</b> <i>F. Grusdt</i> TU Kaiserslautern, Germany	
12:00 <i>Brokerage Event</i>	<b>On Quantum Information</b>	<b>Atomic and Matter Wave Physics</b>
 <b>12:30 – 14:15 Lunch</b>		
14:15– 15:30	<b>Walking trip to Tsaghkadzor ropeway</b>	<b>IPERA Consortium meeting, restricted set of participants</b>
 <b>15:30 – 16:30 Closing ceremony</b>		
<b>17:00 Transfer to Yerevan</b> <b>(Another transfer to Yerevan will be organized on Sept 27<sup>th</sup>, 10:00 am)</b>		

# Poster Presentations

*Posters should be hanged from the start of the Conference  
in the lobby of the 4<sup>th</sup> floor.*

1	<p><b>Sub-Doppler Spectroscopy in a confined vapour: towards three-dimensional confinement</b>  <i>Bloch, Daniel</i> (E. Moufarej, P. Ballin, I. Maurin, A. Laliotis, S. Villalba, L. Lenci, S. Barreiro, A. Lezama, H. Failache)            Laboratoire de physique des lasers, CNRS and Université Paris 13, France</p>
2	<p><b>Studies of <math>\gamma</math>-irradiation induced absorption centers in LuAG:Pr single crystals</b>  <i>Derdzian, Marina</i> (K.L.Ovanesyan, A.G.Petrosyan, I.Gambaryan, G.Patton, F. Moretti, E.Auffray, P.Lecoq, M.Lucchini, K.Pauwels, C.Dujardin)            Institute for Physical Research, NAS of Armenia</p>
3	<p><b>Coherent propagation, storage and retrieval of laser pulses in five-level medium</b>  <i>Gazazyan, Emil</i> (V. Chaltykyan, G. Grigoryan, O. Tikhova)            Institute for Physical Research, NAS of Armenia</p>
4	<p><b>Non-linear stimulated Raman exact tracking</b>  <i>Gevorgyan, Mariam</i>, (C. Leroy, H. R. Jauslin, S. Guérin and A. Ishkhanyan)            Institute for Physical Research, NAS of Armenia            Université deBourgogne, France</p>
5	<p><b>Saturated-absorption spectroscopy in Rb filled micrometer-thin cell: applications in strong magnetic fields</b>  <i>Mirzoyan, Rafayel</i> (A. Tonoyan, A.Sargsyan, D. Sarkisyan)            Institute for Physical Research, NAS of Armenia</p>
6	<p><b>Wigner crystallization of photons via storage of interacting Rydberg polaritons</b>  <i>Moos, Matthias</i> (M. Höning, J. Otterbach, M. Fleischhauer)            TechnischeUniversität Kaiserslautern, Germany</p>
7	<p><b>Properties of LuAG:Ce scintillator crystals with divalent impurities</b>  <i>Ovanesyan, Karine</i> (M.V.Derdzian, A.G.Petrosyan, I.Gambaryan, G.Patton, F. Moretti, E.Auffray, P.Lecoq, M.Lucchini, K.Pauwels, C.Dujardin)            Institute for Physical Research, NAS of Armenia</p>
8	<p><b>Selective reflection of light from Rb<sub>2</sub> molecular vapor</b>  <i>Papoyan, Aram</i> (S.Shmavonyan, A.Khanbekyan, A.Gogyan, M. Movsisyan)            Institute for Physical Research, NAS of Armenia</p>
9	<p><b>Coherent propagation of a single photon in a lossless medium of cold atoms</b>  <i>Petrosyan, Shushan</i> (Yu.Malakyan)            Institute for Physical Research, NAS of Armenia</p>
10	<p><b>Complete-return spectrum of a quantum two-state system at double level-crossing</b>  <i>Shahverdyan, Tigran</i> (T.A. Ishkhanyan, A.M. Ishkhanyan)            Institute for Physical Research, NAS of Armenia</p>

11	<p><b>Creation of a Photonic Time-bin Qubit via Parametric Interaction of Quantum Fields in a driven <math>\Lambda</math>-type Atomic Medium</b></p> <p><i>Sisakyan, Narek (Yu. Malakyan)</i> Institute for Physical Research, NAS of Armenia</p>
12	<p><b>Superluminal propagation and population transfer in W-type resonance media</b></p> <p><i>Tikhova, Olesya (V. Chaltykyan, E. Gazazyan, G. Grigoryan)</i> Institute for Physical Research, NAS of Armenia</p>
13	<p><b>Study of Cs D<sub>2</sub> line, Fg=3 → Fe=5 atomic transitions in a strong external magnetic field</b></p> <p><i>Tonoyan, Ara (A. Sargsyan, G. Hakhumyan, D. Sarkisyan)</i> Institute for Physical Research, NAS of Armenia Université de Bourgogne, France</p>
14	<p><b>Spectral Properties of Interacting Rydberg Polaritons</b></p> <p><i>Unanyan, Razmik (M. Fleischhauer)</i> University of Kaiserslautern, Germany</p>