Scientific Report

Proposal Title: *XIIIth International Conference on Optics of Excitons in Confined Systems (OECS13)*

Application Reference N°: 4594

1) Summary (up to one page)

The international conference on Optics of Excitons in Confined Systems has been organized in Rome from 9 to 13 of September 2013. The conference has been attended by over 200 participants from 30 countries. This meeting has covered a broad range of topics related to the exciton physics, in particular:

1) Optical properties and spintronics in low-dimensional meso-materials: quantum wells, quantum wires and quantum dots.
2) Light-matter interaction in micro-cavities.
3) Hybrid exciton-polariton in organic and inorganic meso-materials.
4) Spatial dispersive optics in resonant- photonic crystals and amorphous photonic: random laser effect
5) Non-linear exciton-polaritons, spatio-temporal structures, solitons
6) Bose-Einstein condensation in exciton-polaritons and in cold atoms.
7) Casimir-Polder effect in organic and inorganic meso-materials.
8) Excitons in carbon nanotubes and graphene.
9) Excitons in bi-layer quantum Hall systems.
10) Hybrid Frenkel-Wannier Mott excitons.

The Members oft he ESF POLATOM project Profs. Luis Vina and Richard Phillips have taken part in the meeting. A special attention during the OECS13 has been given to the progress in studies of the Bose-Einstein condensates of exciton-polaritons: a topic which is in the focus of the POLATOM project. Two special sessions on the Bose-Einstein condensation of excitons and exciton-polaritons and on the physics of exciton-polaritons in microcavities have been organised. The program consisted of 18 invited talks, 71 oral and 80 poster presentations. The Best Contributed paper award has been given to Christian Schneider (Wurzburg) for his work on polariton lasing with electric injection. Many other important new works have been presented, reporting both the fundamental discoveries (e.g. the spin currents in exciton condensates presented by L. Butov) and device applications (e.g. the proof of concept experiment on polariton transistors by D. Ballarini). The conference greatly benefited from the unique atmosphere of the medieval convent in the historic heart of Rome („Angelicum“) where the conference venue was organised. The lunches and coffee breaks have been served in the Angelicum. The social program included also a half-day excursion to the ruins of Ostia Antica and the social dinner in the Palace Altieri.
At the meeting oft he Advisory committee of OECS it has been decided that the next OECS conference will take place in Jerusalem in 2015.

2) Description of the scientific content of and discussions at the event (up to four pages)

The OECS covered several subjects. Here we focus on the content of presentations mostly related to the ESF project POLATOM: namely the works on the Bose-Einstein condensation of half-light-half-matter quasiparticles: exciton polaritons and on the polariton lasing.

Laser stands for Light Amplification by Stimulated Emission of Radiation. The amplification of light takes place in electronic systems where stimulated emission exceeds absorption. This condition cannot be fulfilled at thermal equilibrium: it requires the inversion of electronic population, i.e. the negative temperature. To invert its electronic population the system needs external pumping of energy above some critical value, referred to as "lasing threshold". Nowadays, the term "laser" is applied to any device producing coherent, monochromatic and unidirectional light. It turns out that stimulated emission of radiation is not the only way to generate laser light. In *bosonic lasers* discussed at the OECS13 in talks of Sanvitto, Marchetti, Carlos-Anton and Savenko and in the poster presentations by Schneider, Manni, Petrov, Reveret, Nitsche, Kochereshko, Cancillieri, Jano, Cmoun, light is emitted spontaneously by a condensate of particles accumulated in a single quantum state. Bosonic lasers do not require negative temperatures: they may even operate at thermal equilibrium. They still need pumping, but, theoretically, can have zero thresholds. Which particles are good for forming condensates able to emit light? Bosonic condensates of atoms have been realised at extremely low temperatures, and the condensed atoms are usually in their ground state, incapable to emit light. This makes atomic condensates unpractical for generation of light (the term "atom laser" refers to a coherent flow of atoms, not of photons). On the other hand, condensates of mixed light-matter quasiparticles, exciton-polaritons, emit light very well. These condensates may be realised in semiconductor microcavities at relatively high temperatures, even at room temperature. This is why exciton-polariton lasers (polariton lasers) are most likely to become first commercialised bosonic lasers. Till recently, however, only polariton lasers with optical pumping were known. A laser which needs to be pumped by a different laser has a limited area of applications. An important milestone on the way to the large-scale practical use of polariton lasers has been achieved recently: two groups reported polariton lasing with electrical injection.

The papers by Schneider *et al* and Bhattacharya *et al* appeared with just one day difference in Nature and Physical Review Letters, respectively, in 2013. Both groups studied high Q-factor *p-i-n* GaAs/AlGaAs microcavities with semiconductor Bragg mirrors and multiple embedded InGaAs quantum wells. Both groups could clearly observe two lasing thresholds interpreted as polariton and photon lasing, but only in the presence of magnetic fields of several Tesla. In the

regime of polariton lasing, both groups reported a build-up of the spatial coherence and narrowing of the emission linewidth. The threshold of polariton lasing is about 2-5 times lower than the threshold of conventional photon lasing in the Schneider sample, while Bhattacharya *et al* reported the ratio of thresholds of three orders of magnitude. It is still unclear where such a strong difference could come from. The ratio of polariton-to-photon lasing thresholds can be considered as a figure of merit for polariton lasers: this shows in which extent the use of a bosonic condensate helps generating a coherent light.

Both Schneider *et al* and Bhattacharya *et al* experiments have been done at liquid helium temperature, which still leaves a significant room for improvement of the device characteristics: ideally, one would be looking for a room temperature operation. An important fundamental question to both works is: why a polariton lasing threshold is clearly seen only in the presence of external magnetic fields? Both groups argue that the magnetic field stabilises excitons, but the specific dependence of the polariton lasing threshold on the magnetic field still lacks theoretical understanding. The presentation by Schneider *et al* reported also a quenching of Zeeman splitting in the polariton lasing regime, which might be a manifestation of the spin Meissner effect predicted theoretically for the condensates of exciton-polaritons. Without any doubts it will stimulate more experimental and theoretical work on bosonic lasers, paving way to realisation of a new generation of optoelectronic devices based on exciton-polaritons.

In terms of practical applications, polariton lasers still need to find their niche. Their undoubted advantage over conventional lasers is in the significantly lower threshold power, as convincingly demonstrated Schneider *et al* and Bhattacharya *et al*. On the other hand, polariton condensates are fragile: they disentangle as soon as you pump a bit stronger. This is why polariton lasers are not good for high-power operations. On the other hand, bosonic condensates of exciton-polaritons may be manipulated by applying external electric and magnetic fields and by external laser beams. The polarisation and intensity of light emitted by polariton lasers can be switched from one value to another within several tens of picoseconds. This high controllability of the most essential characteristics of emitted light make polariton lasers most promising for applications in optical integrated circuits and at the interface between electronic devices and optical communication lines. Another application area which remains to be explored is stimulation of terahertz frequency generation by polariton condensates (Presentation by Savenko). Given a high demand for compact and reliable sources of coherent terahertz radiation, bosonic cascade lasers based on excitons or exciton-polaritons would offer a valuable alternative to quantum cascade lasers based on electronic transitions in semiconductor superlattices. Potentially, they could operate at room temperature, emit terahertz light in the vertical direction

(normal to the plane of the structure) and be as small as any vertical cavity surface emitting laser (VCSEL).

The next milestone on a way to the practical use of polariton lasers is demonstration of the room temperature operation under electrical injection. Till recently, GaN-based microcavities have been considered as most promising candidates to fulfil this objective given the excitons in GaN are stable at room temperature (presentation by Butte). However, one should not forget also conventional GaAs-based microcavities, which are not yet entirely explored. The strong coupling to microcavity modes stabilizes excitons in GaAs, which is why they might survive up to room temperature in carefully designed structures. Polariton lasing was in the focus of discussions at the OECS13. The community expects very significant further advances in the area of Polaritonics in the coming years if not months.

3) Assessment of the results and impact of the event on the future directions of the field (up to two pages)

The conference in Rome was a stunning success. It revealed a huge progress in the optics of excitons in confined systems within the recent decade. The exciton physics is extremely rich in fundamental effects and promising for applications in opto-electronic devices. The interest to this field of research is steadily growing in the worlds, especially in Asiatic countries. The OECS series supported by ESF POLATOM network is one of the most successful European conference series. The OECS conferences are organized every second year since 1983. The next one will be organized by Prof. I. Bar Joseph and Prof. R. Rappaport in Israel in 2015.

The strongest impact of the research presented at the OECS13 is expected to be in the area of realisation of a new generation of opto-electronic devices based on quantum properties of exciton-polaritons. Altogether, these devices would improve the quality of life, as they are expected to positively affect such vital areas as medicine, environment protection, security, communications, computing. Polaritonics brings the quantum coherent phenomena of Bose Einstein condensation, superfluidity, weak localization, quantum complementarity to the everyday life.

- One of these devices is a vertical cavity surface emitting terahertz laser (VCSETL) based on a polariton laser. Appearance of this device in the market would be a breakthrough comparable with invention of semiconductor lasers. The terahertz lasers commercially available now are based on quantum cascade lasers. These are bulky devices with low quantum efficiency costing about 50,000 euro each. Realisation of a VCSETL would allow fabrication of the terahertz lasers of size of a laser pointer, which is crucial for

applications in medicine, in particular. In VCSTEL, emission of terahertz radiation is stimulated by a polariton condensate, which is why this device does not need a terahertz cavity, which makes its realization much simpler. The device will emit green or blue visible light in the same direction as THz radiation, which would make easier manipulations with it.

- Other polariton devices which have been discussed at the OECS13 are: polariton logic gates and optical integrated circuits, polariton sources of non-classical light and entangled photon pairs, possibly photo-controlled superconducting transistors. Realisation of these devices would be a giant step forward in development of quantum technologies, in particular, quantum information. Due to a possibility of direct optical control on the phase and polarization of polariton condensates, polariton devices have a great potentiality for applications in quantum information, which is not yet exploited at present. Direct beneficiaries here would be the banking sector, security and communication industry.

OECS13 program at a glance

REGISTRATION:
Daily from 8 a.m. onwards.

Section in memory of Prof. R. Del Sole

	Monday September 9	Tuesday September 10	Wednesday September 11	Thursday September 12	Friday September 13
	Excitons from first principles	Polariton condensates	Quantum optomechanics	Optics of excitons in quantum wires and dots	Optics of excitons in quantum wires and dots
8:30 - 9:00	opening M. Stern				
9:00 - 9:30	**L.Reining**	**I.Carusotto**	**T.Kippenberg**	R. Hostein M. Reimer	L. Bradley G. Martinez-Criado
9:30 - 10:00	**K. Cho**	N. Takemura T. Guillet	**S. Groblacher**	A. Barth B. J. Witek	M. Kuznetsova A. Malyshev
10:00 - 10:15	S. Vlaming	T. Jacqmin	P. Louis de Assis	M. Hofmann	P. Tighineanu
10:15 - 10:30	J. Jadczak	H. S. Nguyen	I. Wilson-Rae	M. Glässl	S. Moskalenko
10:30 - 11:00	coffee break				
	Excitons in emerging materials	Bose-Einstein condensation of excitons and cold atoms	Polariton condensates	Optics of excitons in quantum wires and dots	Quantum optics, single spin and coherent control
11:00 - 11:15	**E. Molinari**	M. Matuszewski	V. V. Belykh	**D. Rossini**	**A.Tartakovskii**
11:15 - 11:30		**L.Butov**	G. Malpuech		
11:30 - 11:45	**M. Richard**		F. Manni	K. Madsen	S. Smolka
11:45 - 12:00		R. Rapaport	M. Dolores Martin	B. Van Hattem	T. Amand
12:00 - 12:15	M. Shahmohammadi	M. Alloing	Lunch	S. Germanis	A. Gonzalez-Tudela
12:15 - 12:30	P. Hawrylak	H. Stolz		R. Kaji	O. Krebs
12:30 - 14:00	Lunch			Lunch	
14:00 - 14:15	V. Malyshev	Quantum optics, single spin and coherent control		Bose-Einstein condensation of excitons and cold atoms	Polariton condensates
14:15 - 14:30	P. Corfdir	**A.Imamoglu**		**M. Kira**	**D. Sanvitto**
14:30 - 14:45	Organic microcavities	O. Gazzano		J. Repp	A. Berceanu
14:45 - 15:00		M. Munsch		A. V. Kavokin	E. Baudin
15:00 - 15:15	**D.Lidzey**	S. Bounouar		A. Gorbunov	C. Anton
15:15 - 15:30	K. Lee	A. Auffèves		I. Savenko	F. Marchetti
15:30 - 16:00	coffee break			coffee break	
	Organic microcavities	Excitons in photonic structures	EXCURSION	Excitons in photonic structures	Closing
16:00 - 16:15	T. Schwartz	**J.M.Gerard**		R. Cherbunin	
16:15 - 16:30	D. Ballarini			S. Poltavtsev	
16:30 - 17:00	Optics of excitons in quantum wires and dots **W.Langbein**	**D.Gerace**		V. Kochereshko E. Cancellieri	
17:00 - 17:15	L. Gantz	M. Gurioli		S. Reitzenstein	
17:15 - 17:30	A. Vinattieri	K. Kristinsson		M. Minkov	
17:30-17:45	M. Dupertuis	G. Rossbach		A. Poddubny	
17:45 - 18:00	A. Bogucki	N. Somaschi		P. Walker	
18:00 - 19:00	welcome reception	Poster session		Poster session	
				Social dinner	

Speaker:
key-note
invited

Rome 9 -13 September 2013

Monday September 9th

REGISTRATION:

Daily from 8 a.m. onwards.

	Excitons from first principles **chairman Andrea D'Andrea**	
8:30 - 8:45	Andrea D'Andrea Alexey Kavokin	Opening
8:45 - 9:00	Michael Stern	Exciton liquid in coupled quantum wells
9:00 - 9:30	**Lucia Reining**	Coupling of excitations in electronic spectra: fingerprints of correlation
9:30 - 10:00	**Kikuo Cho**	Development of general EM response theories stimulated by a collaboration with Rodolfo De Sole
10:00 - 10:15	Sebastiaan Vlaming	Subdiffusive exciton motion in systems with heavy-tailed disorder
10:15 - 10:30	Joanna Jadczak	Observation of coexistence of nearly free and strongly bound trions in magneto-photoluminescence of two-dimensional quantum structures with tunable electron or hole concentration
10:30 - 11:00	coffee break	
	Excitons in emerging materials **chairman Kikuo Cho**	
11:00 - 11:30	**Elisa Molinari**	Excitations in graphene nanostructures
11:30-12:00	**Maxime Richard**	Properties of a quasi-excitonic one-dimensional polariton condensate in ZnO microwires.
12:00 - 12:15	Mehran Shahmohammadi	Biexciton kinetics in single GaN/AlGaN QWs up to the Mott transition
12:15 - 12:30	Pawel Hawrylak	Theory of excitons in colloidal graphene quantum dots
12:30 - 14:00	**Lunch**	
14:00 - 14:15	Victor Malyshev	Signature of anomalous exciton localization in the optical response of self-assembled organic nanotubes
14:15 - 14:30	Pierre Corfdir	Probing the excitonic properties of GaAs crystal phase quantum discs by confocal orientation-dependent magneto-photoluminescence
	Organic microcavities **chairman Pierre Disseix**	
14:30 - 15:00	**David G. Lidzey**	Strong coupling in organic semiconductor microcavities
15:00 - 15:30	**Karl Leo**	Lasing in metal-organic microcavities
15:30 - 16:00	coffee break	
16:00 - 16:15	Tal Schwartz	Dynamics of Molecular Excitations under Strong Light
16:15 - 16:30	Dario Ballarini	Polariton enhanced emission in organic molecules
	Optics of excitons in quantum wires and dots **chairman Thierry Amand**	
16:30 - 17:00	**Wolfgang Langbein**	Ultrafast coherent exciton nonlinearities and dynamics in individual quantum dots - phonons, coherent coupling and cavity quantum electrodynamics
17:00 - 17:15	Liron Gantz	Entanglement Between a Dark Exciton and a Single Photon
17:15 - 17:30	Anna Vinattieri	Single photon emission and multiexciton states from impurity centers in AlGaAs epilayers on Ge and Si substrates
17:30 - 17:45	Marc-André Dupertuis	Nanostructure symmetry: physics and computing
17:45 - 18:00	Aleksander Bogucki	Anisotropy of the in-plane hole g-factor in CdTe/ZnTe quantum dots
18:00 - 19:00	welcome reception	

Rome 9 September 2013

Tuesday September 10th

REGISTRATION:
Daily from 8 a.m. onwards.

	Polariton condensates chairman Guillame Malpuech	
9:00 - 9:30	**Iacopo Carusotto**	Theory and experiments with quantum fluids of polaritons: from superfluid hydrodynamics to quantum Hall liquids of light
9:30 - 9:45	Naotomo Takemura	Biexcitonic Feshbach resonance in spinor polariton gas
9:45 - 10:00	Thierry Guillet	Condensation of polaritons up to 300K and in-plane propagation in a ZnO microcavity
10:00 - 10:15	Thibaut Jacqmin	Polaritonic graphene: condensation in topological states
10:15 - 10:30	Hai Son Nguyen	Nonlinear polariton resonant tunneling diode
10:30 - 11:00	coffee break	
	Bose-Einstein condensation of excitons and cold atoms chairman B. Deveaud-Plédran	
11:00 - 11:15	Michal Matuszewski	Universality in condensation of exciton-polaritons
11:15 - 11:45	**Leonid V. Butov**	Spontaneous coherence and spin current in a cold exciton gas
11:45 - 12:00	Ronen Rapaport	Particle correlations and evidence for dark state condensation in a cold dipolar exciton
12:00 - 12:15	Mathieu Alloing	Experimental evidence for the Bose-Einstein condensation of excitons
12:15 - 12:30	Heinrich Stolz	Imaging interferometry of excitons in two-dimensional structures: Can it detect exciton coherence?
12:30 - 14:00	**Lunch**	
	Quantum optics, single spin and coherent control chairman Alexey Kavokin	
14:00 - 14:30	**Atac Imamoglu**	Spin-photon quantum interface in quantum dots
14:30 - 14:45	Olivier Gazzano	An entangling quantum gate operating with an ultra-bright solid-state single photon source
14:45 - 15:00	Mathieu Munsch	Manipulation of the nuclear spin ensemble in a single InGaAs quantum dot with adiabatic passage
15:00 - 15:15	Samir Bounouar	On-demand generation of polarization entangled pairs of photons
15:15 - 15:30	Alexia Auffèves	Frequency cavity pulling induced by a single semi-conducting artificial atom
15:30 - 16:00	coffee break	
	Excitons in photonic structures chairman Vincenzo Savona	
16:00 - 16:30	**J. M. Gerard**	Quantum optics in photonic wires
16:30 - 17:00	**Dario Gerace**	Exciton-photon coupling in confined photonic structures: from strongly correlated photons to novel quantum devices
17:00 - 17:15	Massimo Gurioli	Mode imaging by near field Fano resonances on Photonic Crystal Nanocavities
17:15 - 17:30	Kristinn Kristinsson	THz emission from dipolaritons
17:30 - 17:45	Georg Rossbach	III-nitride based quantum wells and microcavities under high injection:polariton condensation versus Mott-transition
17:45 - 18:00	Niccolo Somaschi	Amplified Spontaneous Emission in Hybrid Organic-Inorganic Microcavities
18:00 - 19:00	**Poster session A**	

Rome 10 September 2013

Wednesday September 11th

REGISTRATION:
Daily from 8 a.m. onwards.

	Quantum optomechanics chairman Nina Voronova	
9:00 - 9:30	**Tobias Kippenberg**	
9:30 - 10:00	Simon Groblacher	Quantum optomechanics and squeezed light
10:00 - 10:15	Pierre Louis de Assis	Strain-induced optomechanical coupling of a semiconductor quantum dot in a photonic wire
10:15 - 10:30	Ignacio Wilson-Rae	Optomechanics and quantum dissipation with nanotube exciton
10:30 - 11:00	coffee break	
	Polariton condensates chairman Richard Phillips	
11:00 - 11:15	Vasily V. Belykh	Dynamics of coherence expansion and polariton condensate formation in a semiconductor microcavity
11:15 - 11:30	Guillaume Malpuech	Non Linear Spin Hall effect and Natural Gauge field in an exciton-polariton fluid
11:30 - 11:45	Francesco Manni	Dissociation Dynamics of Quantized Vortices into Half-Quantum Vortex Pairs
11:45 - 12:00	M. Dolores Martin	Realization of an AND gate with Bose-Einstein exciton-polariton condensates
12:00 - 13:30	**Lunch**	
	Excursion	

Rome 11 September 2013

Thursday September 12th

REGISTRATION:

Daily from 8 a.m. onwards.

	Optics of excitons in quantum wires and dots chairman Maurice Skolnick	
9:00 - 9:15	Richard Hostein	Excitation-induced dephasing in a resonantly driven InAs/GaAs quantum dot
9:15 - 9:30	Michael Reimer	A bright and coherent single-photon source utilizing a single quantum dot in a defect-free nanowire waveguide
9:30 - 9:45	Andreas Barth	Biexciton preparation in quantum dots via adiabatic rapid passage
9:45 - 10:00	Barbara J. Witek	Light hole exciton ground state in GaAs/AlGaAs QDs
10:00 - 10:15	Matthias Hofmann	Localized excitons in carbon nanotubes
10:15 - 10:30	Martin Glässl	Phonon-assisted high-fidelity, fast and robust preparation of excitons and biexcitons in a quantum dot
10:30 - 11:00	coffee break	
	Optics of excitons in quantum wires and dots chairman Masha Vladimirova	
11:00 - 11:30	**Davide Rossini**	Strongly correlated polaritons in coupled cavities
11:30 - 11:45	Kristian Madsen	Measuring the effective phonon density of states of a quantum dot
11:45 - 12:00	Barbara Van Hattem	Charged excitons coupled to a continuum of states: orientation dependent magneto-photoluminescence of InAs quantum dots
12:00 - 12:15	Savvas Germanis	Piezoelectric (211)B InAs quantum dots for single photon emitters at room temperature
12:15 - 12:30	Reina Kaji	Electron and hole g-factor measurements via optically-induced nuclear spin polarizations in single InAs/GaAs quantum rings
12:30 - 14:00	**Lunch**	
	Bose-Einstein condensation of excitons and cold atoms chairman Leonid Butov	
14:00 - 14:30	**Mackillo Kira**	Quantum optics beyond quantum-degenerate excitons
14:30 - 14:45	Jens Repp	Many-body correlations of dipolar, indirect excitons
14:45 - 15:00	Alexey V. Kavokin	Exciton spin currents: theory
15:00 - 15:15	Alexander Gorbunov	Suppression of spin splitting in the Bose gas of dipolar excitons
15:15 - 15:30	Ivan Savenko	Theory of Energy relaxation in Bose-Einstein condensates
15:30 - 16:00	coffee break	
	Excitons in photonic structures chairman Paul Voisin	
16:00 - 16:15	Roman Cherbunin	Giant Faraday rotation induced by trions in semiconductor micro-cavity
16:15 - 16:30	Sergey Poltavtsev	Magnetic-Field Control of Photon Echo from the Electron-Trion System
16:30 - 16:45	Vladimir Kochereshko	Nonreciprocal magneto-optical effects in quantum wells
16:45 - 17:00	Emiliano Cancellieri	Ultra-Fast Stark-Induced Switching of Polaritonic States
17:00 - 17:15	Stephan Reitzenstein	On-Chip Quantum Optics using Electrically Driven Quantum Dot - Micropillar Cavities
17:15 - 17:30	Momchil Minkov	Long-distance, photon-mediated excitation transfer between quantum dots in a disordered photonic crystal waveguide
17:30 - 17:45	Alexander Poddubny	Brillouin scattering of exciton polaritons in quantum-well structures
17:45 - 18:00	Paul Walker	Nonlinear Propagation of Light in Exciton-Polaritonic Waveguides
18:00 - 19:00	**Poster session B**	
	Social dinner	

Rome 12 September 2013

Friday September 13th

REGISTRATION:

Daily from 8 a.m. onwards.

	Optics of excitons in quantum wires and dots chairman Davide Rossini	
9:00 - 9:15	Louise Bradley	Surface plasmon extended optical ruler
9:15 - 9:30	Gema Martinez-Criado	Exploring geometrical quantum confinement effects by spatially time-resolved XEOL
9:30 - 9:45	Mariia Kuznetsova	Nuclear magnetic resonance in InGaAs quantum dots observed by optical pumping technique
9:45 - 10:00	Andrey Malyshev	Electro-optical bistability and hysteresis in compound systems
10:00 - 10:15	Petru Tighineanu	Assessing the optical quality of quantum dots by time-resolved spectroscopy
10:15 - 10:30	Sveatoslav Moskalenko	Light-magnetoexciton coupling in the two-dimensional quantum wells and the polariton formation
10:30 - 11:00	coffee break	
	Quantum optics, single spin and coherent control chairman Alexander Hoegele	
11:00 - 11:30	A. I. Tartakovskii	Hole hyperfine interaction: valence band orbital composition and its effect on hole spin dephasing
11:30 - 11:45	Stephan Smolka	Fano-interference in an optical transition from a neutral quantum dot to a correlated many-body state
11:45 - 12:00	Thierry Amand	Low field electron-nuclear spin coupling in GaAs quantum dots under optical pumping conditions
12:00 - 12:15	Alejandro Gonzalez-Tudela	Unraveling cavity QED dynamics with time and frequency resolved photon correlations
12:15 - 12:30	Olivier Krebs	Magneto-optical signature of a 2Mn-doped InAs/GaAs quantum dot in Faraday and Voigt configuration
12:30 - 14:00	**Lunch**	
	Polariton condensates chairman Alberto Amo	
14:00 - 14:30	Daniele Sanvitto	Manipulating quantum fluids of polariton condensates
14:30 - 14:45	Andrei Berceanu	Dissipation effects in microcavity optical parametric oscillators
14:45 - 15:00	Emmanuel Baudin	Turing patterns in a coherent quantum fluid of polaritons: formation and all-optical control
15:00 - 15:15	Carlos Anton	Energy relaxation and trapping dynamics of polariton condensates in quasi-1D microcavities
15:15 - 15:30	Francesca Marchetti	Superfluid phase transitions in resonantly paired polariton microcavities
15:30 - 16:30	Closing	

Rome 13 September 2013

Annexe 4b): Full list of speakers and participants

Title	LAST name	First Name	Gender	Institution/Company	Address	Postal code	City	Country	Email
Prof.	Kavokin	Alexey	M	University of Southampton	Highfield	SO171B	Southampton	United Kingdom	alexey@phys.soton.ac.uk
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