Dr. Francesco Bariani

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Research Experience

Apr 2010–Present	Postdoctoral Fellow at School of Physics, Georgia Institute of Technology (Atlanta, GA, USA).
Dec 2009–Feb 2010	Research Fellow at Dipartimento di Fisica, Università di Trento and INFM-CNR-BEC (Trento, Italy).

Education

Nov 2009	Ph.D. at Università degli studi di Trento and INFM-CNR-BEC (Trento, Italy). Thesis: Light propagation in ultracold atomic gases. Advisor: Dr. Iacopo Carusotto.
Oct 2006	M.Sc. in Physics at Università degli studi dell'Insubria (Como, Italy). Grade: 110/110 summa cum laude. Final dissertation prepared at INFM-CNR-BEC (Trento, Italy) with financial support by INFM-CNR.
Jan 2005	B.Sc. in Physics at Università degli studi dell'Insubria (Como, Italy). Grade: 110/110 summa cum laude.

List of Publications

F. Bariani and I. Carusotto. *Photon wave-packet manipulation via dynamic electromagnetically induced transparency in multilayer structures*. Phys. Rev. A 81, 013836 (2010).

F. Bariani and I. Carusotto. *Light propagation in atomic Mott insulators*. Journal of the European Optical Society - Rapid Publications 3, 08005 (2008)

I. Carusotto, M. Antezza, F. Bariani, C. Ciuti and S. De Liberato. *Optical properties of atomic Mott insulators: from slow light to dynamical Casimir effects*.Phys. Rev. A 77, 063621 (2008)

Research interests

Light-matter interaction in ultracold atomic gases. Polaritonic dispersion with two-level and three-level atoms. Electromagnetically Induced Transparency and slow light phenomena.

Storage and manipulation of quantum states of light using atomic ensemble: quantum memory and single photon source.

Conferences, Schools and Workshops

2010	Workshop *Mixed States of Light and Matter* (Bonn,Germany; Poster: *Photon Wave-packet Manipulation via dynamic Electromagnetically Induced Transparency in multilayer structures*); Conference *Quantum engineering of states and devices: theory and experiments* (Innsbruck, Austria; Poster: *Photon Wave-packet Manipulation via dynamic Electromagnetically Induced Transparency in multilayer structures*. Granted by European Science Foundation).

2009	Conference *YAO 2009* (Vienna, Austria; Talk: *Playing with Light in Atoms: Dynamic Electromagnetically Induced Transparency*)
2008	Conference *YAO 2008* (Florence,Italy; Talk: *Light Propagation in Atomic Mott Insulators*); International School of Physics Enrico Fermi *Quantum Coherence in Solid State System* (Varenna, Italy, Poster: *Scattering of Slow Light on Defects*); INFM School *Physics in Low Dimensions* (Lucca, Italy; Poster: *1D Propagation of Slow Light via time-dependent Electromagnetically Induced Transparency*); Short Visit to the quantum optics group of prof. Imamoglu at ETH in Zurich.
2007	Workshop *Quantum Gases* in Paris (Granted by European Science Foundation - Quantum Degenerate Dilute Systems Network); Summer School *Advances on Nanophotonics II* (Erice,Italy; Poster: *Light Propagation in Atomic Mott Insulators*); ICTP Summer School *Novel Quantum Phases and Non-equilibrium Phenomena in Cold Atomic Gases* in (Trieste, Italy; Poster: *Light Propagation in Atomic Mott Insulators*); Joint Meeting Trento-Innsbruck *Ultracold Bose and Fermi Gases* (Innsbruck, Austria).
2006	Joint Meeting Trento-Innsbruck *Ultracold Fermi Gases and Molecular States* (Trento, Italy).

Invited talk

2010	Visit to the atomic and molecular group, prof. Gardiner (Durham, UK). Talk: *Light Propagation in Ultracold Atomic Gases.*
2009	Visit to the School of Physics of Università degli Studi dell'Insubria, prof. Parola (Como, Italy). Talk: *Dynamic Photonic Structures using Ultracold Atoms.* Visit to the quantum optics group, prof. Fleischhauer (Kaiserslautern, Germany). Talk: *Photon Wavepacket Manipulation in multi-layer media.* Visit to the group of non-linear dynamics in quantum systems, prof. Buchleitner (Freiburg, Germany). Talk: *Photon wavepacket manipulation via time and space dependent electromagnetically induced transparency.*
2008	Visit to the photonic crystal group, prof. Andreani (Pavia, Italy). Talk: *Dynamic photonic structures using electromagnetically induced transparency.*

Teaching

Feb 2011	Introduction to Rydberg atoms (2 lectures) for the class *Quantum Optics* for undergraduates, School of Physics, Georgia Institute of Technology.
Nov 2007–Jun 2008	Tutor activity for the class *Introduction to Physics* for undergraduates, granted by School of Physics Università di Trento.
Oct 2005–Feb 2006	Lecturers and tutor activity for the class *Quantum Mechanics I* for undergraduates, granted by School of Physics, Università degli Studi dell'Insubria.

Academic service

PhD student representative in the board of the PhD School in Physics at Università di Trento (2008-2009).

Member of Organizing Comittee for *Physics PhD Workshop* 2008 and 2009 at Physics Department, Università di Trento.

Physics & Fun

Mar 2009	Guide for the exhibition *Alle colonne d'Ercole* (At the Pillars of Hercules) at Università degli studi di Trento about recent progress in different areas of physics (cosmology, vacuum, cold matter).

Feb 2006	Guide for the exhibition *Sulle spalle dei giganti* (On the shoulders of Giants) at Università degli studi di Trento about the progress of science and technology during the Middle Age.
Dec 2005–Jan 2006	Collaboration to the preparation of the exhibition *La fisica attorno a noi* (Physics around us) at Università degli studi dell'Insubria. Contributions about Special Relativity (Einstein area) and Quantum Physics (Heisenberg area).

References

These people are familiar with the work I have carried out during M.Sc., PhD and research activity.

Prof. Brian Kennedy. School of Physics, Georgia Institute of Technology, 837 State Street; Atlanta, GA, 30332-0430, USA. E-mail: brian.kennedy@physics.gatech.edu.

Prof. Giuseppe La Rocca. Scuola Normale Superiore di Pisa, Palazzo della Carovana, Piano 3, studio 90; I-56126 Pisa, Italy. E-mail: g.larocca@sns.it.

Dr. Iacopo Carusotto. Università di Trento, Dipartimento di Fisica and INFM-CNR-BEC, via Sommarive 14; I-38123 Povo (TN), Italy. E-mail: carusott@science.unitn.it.

Prof. Alberto Parola. Università dell'Insubria, Dipartimento di Fisica e Matematica, via Valleggio 11; I-22100 Como, Italy. E-mail: alberto.parola@uninsubria.it.

Atlanta, March 7, 2011
Francesco Bariani